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United States Patent Application Publication 20250255339
Kind Code A1
Publication Date August 14, 2025
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AEROSOL-GENERATING ARTICLE HAVING A PLURALITY OF STRANDS OF AEROSOL-GENERATING MATERIAL

Abstract

An aerosol-generating article is provided, including: an aerosol-generating section including an aerosol-generating substrate, the substrate including a plurality of strands of aerosol-generating material, the substrate having a mass of between about 120 milligrams and about 350 milligrams, and the aerosol-generating material being a star anise material; a downstream section located downstream of the aerosol-generating section, the downstream section including a support element having an upstream end abutting the aerosol-generating section, the support element including an opening at an end of the support element, a ratio of a width of the opening to an average width of the plurality of strands of aerosol-generating material being less than or equal to about 20; and an upstream section located upstream of the aerosol-generating section, the upstream section including an upstream element having a downstream end abutting the aerosol-generating section.

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Appl. No.: **19/190249**

Filed: **April 25, 2025**

Foreign Application Priority Data

EP	22204251.7	Oct. 27, 2022

Related U.S. Application Data

parent WO continuation PCT/EP2023/080124 20231027 PENDING child US 19190249

Publication Classification

Int. Cl.: **A24D1/20** (20200101); **A24B15/167** (20200101)

U.S. Cl.:

CPC **A24D1/20** (20200101); **A24B15/167** (20161101);

Background/Summary

CROSS-REFERENCE TO RELATED APPLICATIONS [0001] This application is a continuation of and claims benefit under 35 U.S.C. § 120 to PCT/EP2023/080124, filed Oct. 27, 2023, and claims the benefit of priority under 35 U.S.C. § 119 from European Patent Application No. 22204251.7, filed Oct. 27, 2022, the entire contents of each of which are incorporated herein by reference.

TECHNICAL FIELD
[0002] The present disclosure relates to an aerosol-generating article, preferably to an aerosol-generating article comprising an aerosol-generating substrate and adapted to produce an inhalable aerosol upon heating.
DESCRIPTION OF THE RELATED ART
[0003] Aerosol-generating articles in which an aerosol-generating substrate, such as a tobacco-containing material, is heated rather than combusted are known in the art. An aim of such 'heated' aerosol-generating articles is to reduce certain smoke constituents of the type produced by the combustion and pyrolytic degradation of tobacco in conventional cigarettes.
[0004] Typically, in heated aerosol-generating articles an aerosol is generated by the transfer of heat from a heat source to a physically separate aerosol-generating substrate. In use, volatile compounds are released from the aerosol-generating substrate by heat transfer from the heat source to the aerosol-generating substrate and are entrained in air drawn through the aerosol-generating article. As the released compounds cool, they condense to form an aerosol that is inhaled by the user.
[0005] A number of handheld aerosol-generating devices configured to heat aerosol-generating substrates of heated aerosol-generating articles are known in the art. These include electrically-operated aerosol-generating devices in which an aerosol is generated by the transfer of heat from one or more electrical heating elements of the aerosol-generating device to the aerosol-generating substrate of the heated aerosol-generating article. Known handheld electrically operated aerosol-generating devices typically comprise a battery or other power source, control electronics and one or more electrical heating elements for heating the aerosol-generating substrate of a heated aerosol-generating article designed specifically for use with the aerosol-generating device.
[0006] Some known electrically-operated aerosol-generating devices comprise one or more external heating elements. For example, WO 2020/115151 A1 discloses an aerosol-generating system comprising an aerosol-generating article and an electrically-operated aerosol-generating device comprising an external heating element that circumscribes the outer periphery of the aerosol-generating article.
[0007] Other known electrically-operated aerosol-generating devices comprise an internal heating element that is configured to be inserted into the aerosol-generating substrate of a heated aerosol-generating article. For example, WO 2013/098410 A2 discloses an aerosol-generating system comprising an aerosol-generating article and an electrically-operated aerosol-generating device comprising a heating element in the form of a blade that is inserted into the aerosol-generating

substrate of the aerosol-generating article.
[0008] Electrically-operated aerosol-generating devices comprising an inductor configured to inductively heat aerosol-generating substrates of heated aerosol-generating articles are also known in the art. For example, WO 2015/176898 A1 discloses an aerosol-generating system comprising an electrically-operated aerosol-generating device having an inductor for producing a fluctuating electromagnetic field and an aerosol-generating article with an internal susceptor located within the aerosol-generating substrate. In use, the alternating electromagnetic field produced by the inductor induces a current in the susceptor, causing the susceptor to heat up. In a preferred embodiment, the aerosol-forming substrate comprises a gathered sheet of homogenised tobacco material or other aerosol-forming material.
[0009] As described in WO 2015/176898 A1, direct contact between an internal heating element and the aerosol-generating substrate of an aerosol-generating article can provide an efficient means for heating the aerosol-generating substrate to form an inhalable aerosol. In such a configuration, heat from the internal heating element may be conveyed almost instantaneously to at least a portion of the aerosol-generating substrate when the internal heating element is actuated, and this may facilitate the rapid generation of an aerosol. Furthermore, the overall heating energy required to generate an aerosol may be lower than would be the case in an aerosol-generating system comprising an external heating element where the aerosol-generating substrate does not directly contact the external heating element and initial heating of the aerosol-generating substrate occurs primarily by convection or radiation. Where an internal heating element is in direct contact with an aerosol-generating substrate, initial heating of portions of the aerosol-generating substrate that are in direct contact with the internal heating element will be affected primarily by conduction.
[0010] Heated aerosol-generating articles designed for use with an electrically-operated aerosol-generating device are typically inserted into a cavity of the aerosol-generating device in order to be heated. This may cause aerosol-generating material in the aerosol-generating substrate of the aerosol-generating article to be dislodged. Heating of the aerosol-generating substrate during use of the aerosol-generating article may result in drying of aerosol-generating material in the aerosol-generating substrate. This may make the aerosol-generating material more prone to dislodgement. During use of the aerosol-generating article, aerosol-generating material dislodged from the aerosol-generating substrate may fall out of the aerosol-generating article. As a result, the amount and location of aerosol-generating material in the aerosol-generating substrate may vary during use of the aerosol-generating article. This may adversely impact the quality and consistency of aerosol delivered to a user. During use of the aerosol-generating article, aerosol-generating material dislodged from the aerosol-generating substrate may fall into the cavity of the aerosol-generating device. Aerosol-generating material dislodged from the aerosol-generating substrate of the aerosol-generating article that falls into the cavity of the aerosol-generating device may prevent or inhibit optimal functioning of the aerosol-generating device.
[0011] It would be desirable to provide an aerosol-generating article for use with an aerosol-generating device in which the quality and consistency of aerosol delivered to a user is improved compared to known heated tobacco products. It would also be desirable to provide an aerosol-generating article for use with an aerosol-generating device that allows optimal functioning of the aerosol-generating device.
SUMMARY
[0012] The present disclosure relates to an aerosol-generating article, preferably an aerosol-generating article for producing an aerosol upon heating. The aerosol-generating article may comprise an aerosol-generating section. The aerosol-generating section may comprise an aerosol-generating substrate. The aerosol-generating substrate may comprise a plurality of strands of aerosol-generating material. The aerosol-generating article may comprise a downstream section located downstream of the aerosol-generating section. The downstream section may comprise a support element having an upstream end abutting the aerosol-generating section. The support

element may comprise an opening at an end of the support element. A ratio of a width of the opening to an average width of the plurality of strands of aerosol-generating material may be less than or equal to about 20. The aerosol-generating article may comprise an upstream section located upstream of the aerosol-generating section. The upstream section may comprise an upstream element having a downstream end abutting the aerosol-generating section.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] The invention will be further described, by way of example only, with reference to the accompanying figures in which:

[0014] FIG. **1** shows a schematic side sectional view of an aerosol-generating article in accordance with an embodiment of the invention;

[0015] FIG. **2** shows a schematic side sectional view of an aerosol-generating article in accordance with another embodiment of the invention;

[0016] FIG. **3** shows a schematic side sectional view of an aerosol-generating article in accordance with another embodiment of the invention; and

[0017] FIG. **4** shows a schematic side sectional view of an aerosol-generating article in accordance with another embodiment of the invention.

DETAILED DESCRIPTION

[0018] The present invention relates to an aerosol-generating article, preferably an aerosol-generating article for producing an aerosol upon heating. The aerosol-generating article comprises an aerosol-generating section. The aerosol-generating section comprises an aerosol-generating substrate. The aerosol-generating substrate comprises a plurality of strands of aerosol-generating material. The aerosol-generating article comprises a downstream section located downstream of the aerosol-generating section. The downstream section comprises a support element having an upstream end abutting the aerosol-generating section. The support element comprises an opening at an end of the support element. A ratio of a width of the opening to an average width of the plurality of strands of aerosol-generating material may be less than or equal to about 20. The aerosol-generating article comprises an upstream section located upstream of the aerosol-generating section. The upstream section comprises an upstream element having a downstream end abutting the aerosol-generating section.

[0019] The provision of a downstream support element having an opening at one of its ends and the ratio of a width of the opening to an average width of the plurality of strands of aerosol-generating material being less than or equal to about 20 may reduce the risk of any dislodged aerosol-generating material from migrating even further downstream, towards the mouth end of the aerosol-generating article. Such a ratio may ensure that the opening is sufficiently small in relation to the average size of aerosol-generating material in order to hinder said migration of aerosol-generating material. While the opening may be large enough for strands to fit through, the internal packing friction amongst the strands within the aerosol-generating section and the obstruction of other neighbouring strands may also play a role in preventing such migration. However, such a ratio may ensure that the opening is sufficiently small in relation to the average size of aerosol-generating material in order to hinder and reduce said migration of aerosol-generating material, while maintaining an acceptable resistance to draw (RTD) for the overall article such that any impact on the consumer experience may be minimised. Furthermore, the strands generally have an average length that is substantially greater than their average width. Therefore, any strands that may protrude through the opening will still need to travel, with relative difficulty, a distance equivalent to their average length in order to successfully migrate downstream.

[0020] The provision of an upstream element upstream of the aerosol-generating section may

prevent or restrict aerosol-generating material dislodged from the aerosol-generating substrate from exiting the upstream end of the aerosol-generating article during transport or handling of the aerosol-generating article or exiting into a cavity of an aerosol-generating device during use of the aerosol-generating article. The provision of an upstream element in addition to a downstream support element effectively sandwiches the aerosol-generating section between the upstream element and the downstream support element so as to reduce the aerosol-generating material migration both upstream and downstream of the aerosol-generating section, while maintaining an acceptable resistance to draw (RTD) for the overall article such that any impact on the consumer experience may be minimised.

[0021] As used herein, the term “aerosol-generating article” is used to describe an article comprising an aerosol-generating substrate that is heated to generate an inhalable aerosol for delivery to a user.

[0022] As used herein, the term “aerosol-generating substrate” is used to describe a substrate comprising aerosol-generating material that is capable of releasing upon heating volatile compounds that can generate an aerosol.

[0023] As used herein, the term “aerosol” is used to describe a dispersion of solid particles, or liquid droplets, or a combination of solid particles and liquid droplets, in a gas. The aerosol may be visible or invisible. The aerosol may include vapours of substances that are ordinarily liquid or solid at room temperature as well as solid particles, or liquid droplets, or a combination of solid particles and liquid droplets.

[0024] As used herein, the term “aerosol-generating device” is used to describe a device that interacts with the aerosol-generating substrate of an aerosol-generating article to generate an aerosol.

[0025] The aerosol-generating article has a proximal end through which, in use, an aerosol exits the aerosol-generating article for delivery to a user. The proximal end of the aerosol-generating article may also be referred to as the downstream end or mouth end of the aerosol-generating article. In use, a user draws directly or indirectly on the proximal end of the aerosol-generating article in order to inhale an aerosol generated by the aerosol-generating article.

[0026] The aerosol-generating article has a distal end. The distal end is opposite the proximal end. The distal end of the aerosol-generating article may also be referred to as the upstream end of the aerosol-generating article.

[0027] Components of the aerosol-generating article may be described as being upstream or downstream of one another based on their relative positions between the proximal end of the aerosol-generating article and the distal end of the aerosol-generating article.

[0028] As used herein, the term “longitudinal” is used to describe the direction between the upstream end and the downstream end of the aerosol-generating article. In use, air is drawn through the aerosol-generating article in the longitudinal direction.

[0029] As used herein, the term “length” is used to describe the maximum dimension of the aerosol-generating article or a component of the aerosol-generating article in the longitudinal direction.

[0030] As used herein, the term “transverse” is used to describe the direction perpendicular to the longitudinal direction. Unless otherwise stated, references to the “cross-section” of the aerosol-generating article or a component of the aerosol-generating article refer to the transverse cross-section.

[0031] As used herein the term “width” is used to describe the maximum dimension of the aerosol-generating article or a component of the aerosol-generating article in the transverse direction. Where the aerosol-generating article has a substantially circular cross-section, the width of the aerosol-generating article corresponds to the diameter of the aerosol-generating article. Where a component of the aerosol-generating article has a substantially circular cross-section, the width of the component of the aerosol-generating article corresponds to the diameter of the component of

the aerosol-generating article.
[0032] As used herein, the term “thickness” is used to describe the maximum dimension of the aerosol-generating article or a component of the aerosol-generating article in a direction perpendicular to both the longitudinal direction and the transverse direction.
[0033] As used herein, the term “elongate” is used to describe a component or element having a length that is greater than the width and the thickness thereof. For example, the length of an elongate component or element may be at least twice the width thereof. An elongate component or element may have a width that is substantially the same as the thickness thereof. For example, an elongate element may have a substantially square cross-section or a substantially circular cross-section. An elongate component or element may have a width that is greater than the thickness thereof. For example, an elongate element may have a substantially rectangular cross-section or a substantially elliptical or oval circular cross-section.
[0034] As used herein in relation to the aerosol-generating substrate, the term “strand” describes an elongate element of aerosol-generating material having a length that is substantially greater than the width and the thickness thereof.
[0035] As used herein in relation to the aerosol-generating substrate, the term “density” refers to the bulk density of the aerosol-generating substrate in the aerosol-generating section of the aerosol-generating article. The density of the aerosol-generating substrate is calculated by dividing the mass of the aerosol-generating substrate in the aerosol-generating section of the aerosol-generating article by the volume occupied by the aerosol-generating substrate in the aerosol-generating section of the aerosol-generating article. For example, where the aerosol-generating section of the aerosol-generating article is substantially cylindrical and comprises a mass of aerosol-generating substrate circumscribed by a wrapper, the density of the aerosol-generating substrate is equal to the mass of the aerosol-generating substrate divided by the cylindrical volume bounded by the inner surface of the wrapper.
[0036] As used herein, the term “susceptor element” is used to describe an element comprising a susceptor material that is capable of converting electromagnetic energy into heat. When located within an alternating or fluctuating electromagnetic field, at least one of hysteresis losses and eddy currents induced in the susceptor element cause heating of the susceptor element.
[0037] As used herein, the term “nicotine” is used to describe nicotine, a nicotine base or a nicotine salt. In embodiments in which the aerosol-generating substrate comprises a nicotine base or a nicotine salt, amounts of nicotine recited herein are the amount of free base nicotine or amount of protonated nicotine, respectively.
[0038] As used herein, the term “tobacco cut filler” is used to describe an aerosol-generating substrate comprising a plurality of strands of tobacco lamina. Where the aerosol-generating substrate is tobacco cut filler, the average width of the plurality of strands of aerosol-generating material is the mean cut width of the tobacco cut filler.
[0039] As used herein, the term “homogenised plant material” is used to describe a material formed by agglomerating particulate plant material. Homogenised plant material may be formed by agglomerating particles of plant material obtained by pulverising, grinding or comminuting plant material. Homogenised plant material may be produced by casting, extrusion, paper making processes or other suitable processes known in the art.
[0040] As used herein, the term “homogenised tobacco material” is used to describe a material formed by agglomerating particulate tobacco material.
[0041] As used herein, the term “gel” is used to describe a substantially dilute cross-linked material, which exhibits no flow in the steady state.
[0042] As used herein, the term “heat transfer enhancement element” is used to describe an element having a thermal conductivity at 25 degrees Celsius that is greater than the thermal conductivity of the plurality of strands of aerosol-generating material at 25 degrees Celsius.
[0043] As used herein, the term “hollow tubular element” is used to describe a generally cylindrical

element having a lumen along a longitudinal axis thereof. The hollow tubular element may have a substantially circular, oval or elliptical cross-section. The lumen may have a substantially circular, oval or elliptical cross-section. In particular, the term “hollow tubular element” is used to describe an element defining at least one airflow conduit establishing an uninterrupted fluid communication between an upstream end of the hollow tubular element and a downstream end of the hollow tubular element.

[0044] In the context of the present disclosure, a hollow tubular element provides an unrestricted flow channel. This means that the hollow tubular element provides a negligible level of resistance to draw (RTD). As used herein, the term “negligible level of RTD” is used to describe an RTD of less than 1 mm H.sub.2O per 10 millimetres of length of the hollow tubular element, less than 0.4 mm H.sub.2O per 10 millimetres of length of the hollow tubular element, or less than 0.1 mm H.sub.2O per 10 millimetres of length of the hollow tubular element. The flow channel should therefore be free from any components that would obstruct the flow of air in a longitudinal direction. The flow channel may be substantially empty.

[0045] As used herein, the term “ventilation level” describes a volume ratio of the airflow admitted into the aerosol-generating article via the ventilation zone (ventilation airflow) and the sum of the aerosol airflow and the ventilation airflow. The greater the ventilation level, the higher the dilution of the aerosol flow delivered to a user.

[0046] Unless otherwise stated, percentages by weight of components of the aerosol-generating substrate recited herein are based on the dry weight of the aerosol-generating substrate.

[0047] Unless otherwise stated, percentages by weight of components of the aerosol-generating material recited herein are based on the dry weight of the aerosol-generating material.

[0048] Unless otherwise stated, averages values recited herein are arithmetic means.

[0049] Unless otherwise stated, the resistance to draw (RTD) of the aerosol-generating article or a component of the aerosol-generating article is measured in accordance with ISO 6565-2015 at a volumetric flow rate of 17.5 millilitres per second at the proximal end of the aerosol-generating article or the component thereof at a temperature of 22 degrees Celsius, a pressure of 101 kPa (760 Torr) and a relative humidity of 60%.

[0050] As used herein, the RTD per unit length of the aerosol-generating article or a component of the aerosol-generating article is equal to the RTD of the aerosol-generating article divided by the length of the aerosol-generating article or the RTD of the component divided by the length of the component, respectively.

[0051] The aerosol-generating article may have a total length of at least 35 millimetres, at least 38 millimetres, at least 40 millimetres, or at least 42 millimetres.

[0052] The aerosol-generating article may have a total length of less than or equal to 100 millimetres, less than or equal to 70 millimetres, less than or equal to 60 millimetres, or less than or equal to 50 millimetres.

[0053] The aerosol-generating article may have a total length of between 35 millimetres and 100 millimetres, between 35 millimetres and 70 millimetres, between 35 millimetres and 60 millimetres, or between 35 millimetres and 50 millimetres.

[0054] The aerosol-generating article may have a total length of between 38 millimetres and 100 millimetres, between 38 millimetres and 70 millimetres, between 38 millimetres and 60 millimetres, or between 38 millimetres and 50 millimetres.

[0055] The aerosol-generating article may have a total length of between 40 millimetres and 100 millimetres, between 40 millimetres and 70 millimetres, between 40 millimetres and 60 millimetres, or between 40 millimetres and 50 millimetres.

[0056] The aerosol-generating article may have a total length of between 42 millimetres and 100 millimetres, between 42 millimetres and 70 millimetres, between 42 millimetres and 60 millimetres, or between 42 millimetres and 50 millimetres.

[0057] For example, the aerosol-generating article may have a total length of 45 millimetres.

[0058] The aerosol-generating article may be substantially cylindrical.
[0059] The aerosol-generating article may have a substantially circular cross-section.
[0060] The aerosol-generating article may have an external diameter of at least 5 millimetres, at least 6 millimetres, or at least 7 millimetres.
[0061] The aerosol-generating article may have an external diameter of less than or equal to 12 millimetres, less than or equal to 10 millimetres, or less than or equal to 8 millimetres.
[0062] The aerosol-generating article may have an external diameter of between 5 millimetres and 12 millimetres, between 5 millimetres and 10 millimetres, or between 5 millimetres and 8 millimetres.
[0063] The aerosol-generating article may have an external diameter of between 6 millimetres and 12 millimetres, between 6 millimetres and 10 millimetres, or between 6 millimetres and 8 millimetres.
[0064] The aerosol-generating article may have an external diameter of between 7 millimetres and 12 millimetres, between 7 millimetres and 10 millimetres, or between 7 millimetres and 8 millimetres.
[0065] For example, the aerosol-generating article may have an external diameter of 7.1 millimetres or an external diameter of 7.2 millimetres.
[0066] The aerosol-generating section may have a length of at least 4 millimetres, at least 6 millimetres, at least 8 millimetres, or at least 10 millimetres.
[0067] The aerosol-generating section may have a length of less than or equal to 60 millimetres, less than or equal to 45 millimetres, less than or equal to 35 millimetres, less than or equal to 25 millimetres, or less than or equal to 15 millimetres.
[0068] The aerosol-generating section may have a length of between 4 millimetres and 60 millimetres, between 4 millimetres and 45 millimetres, between 4 millimetres and 35 millimetres, between 4 millimetres and 25 millimetres, or between 4 millimetres and 15 millimetres.
[0069] The aerosol-generating section may have a length of between 6 millimetres and 60 millimetres, between 6 millimetres and 45 millimetres, between 6 millimetres and 35 millimetres, between 6 millimetres and 25 millimetres, or between 6 millimetres and 15 millimetres.
[0070] The aerosol-generating section may have a length of between 8 millimetres and 60 millimetres, between 8 millimetres and 45 millimetres, between 8 millimetres and 35 millimetres, between 8 millimetres and 25 millimetres, or between 8 millimetres and 15 millimetres.
[0071] The aerosol-generating section may have a length of between 10 millimetres and 60 millimetres, between 10 millimetres and 45 millimetres, between 10 millimetres and 35 millimetres, between 10 millimetres and 25 millimetres, or between 10 millimetres and 15 millimetres.
[0072] For example, the aerosol-generating section may have a length of 11 millimetres or a length of 12 millimetres.
[0073] A ratio of a length of the aerosol-generating section to a total length of the aerosol-generating article may be at least 0.10, at least 0.15, or at least 0.20.
[0074] A ratio of a length of the aerosol-generating section to a total length of the aerosol-generating article may be less than or equal to 0.60, less than or equal to 0.50, less than or equal to 0.40, less than or equal to 0.35, or less than or equal to 0.30.
[0075] A ratio of a length of the aerosol-generating section to a total length of the aerosol-generating article may be between 0.10 and 0.60, between 0.10 and 0.50, between 0.10 and 0.40, between 0.10 and 0.35, or between 0.10 and 0.30.
[0076] A ratio of a length of the aerosol-generating section to a total length of the aerosol-generating article may be between 0.15 and 0.60, between 0.15 and 0.50, between 0.15 and 0.40, between 0.15 and 0.35, or between 0.15 and 0.30.
[0077] A ratio of a length of the aerosol-generating section to a total length of the aerosol-generating article may be between 0.20 and 0.60, between 0.20 and 0.50, between 0.20 and 0.40,

between 0.20 and 0.35, or between 0.20 and 0.30.
[0078] For example, a ratio of a length of the aerosol-generating section to a total length of the aerosol-generating article may be 0.27.
[0079] The aerosol-generating section may be substantially cylindrical.
[0080] The aerosol-generating section may have a substantially circular cross-section.
[0081] The aerosol-generating section may have an external diameter that is substantially the same as an external diameter of the aerosol-generating article.
[0082] The aerosol-generating section may have an external diameter of at least 5 millimetres, at least 6 millimetres, or at least 7 millimetres.
[0083] The aerosol-generating section may have an external diameter of less than or equal to 12 millimetres, less than or equal to 10 millimetres, or less than or equal to 8 millimetres.
[0084] The aerosol-generating section may have an external diameter of between 5 millimetres and 12 millimetres, between 5 millimetres and 10 millimetres, or between 5 millimetres and 8 millimetres.
[0085] The aerosol-generating section may have an external diameter of between 6 millimetres and 12 millimetres, between 6 millimetres and 10 millimetres, or between 6 millimetres and 8 millimetres.
[0086] The aerosol-generating section may have an external diameter of between 7 millimetres and 12 millimetres, between 7 millimetres and 10 millimetres, or between 7 millimetres and 8 millimetres.
[0087] For example, the aerosol-generating section may have an external diameter of 7 millimetres or 7.1 millimetres.
[0088] The RTD of the aerosol-generating section may be at least 4 millimetres H.sub.2O, at least 5 millimetres H.sub.2O, or at least 6 millimetres H.sub.2O.
[0089] The RTD of the aerosol-generating section may be less than or equal to 25 millimetres H.sub.2O, less than or equal to 20 millimetres H.sub.2O, or less than or equal to 15 millimetres H.sub.2O.
[0090] The RTD of the aerosol-generating section may be less than or equal to 10 millimetres H.sub.2O, less than or equal to 9 millimetres H.sub.2O, or less than or equal to 8 millimetres H.sub.2O.
[0091] The RTD of the aerosol-generating section may be between 4 millimetres H.sub.2O and 25 millimetres H.sub.2O, between 4 millimetres H.sub.2O and 20 millimetres H.sub.2O, or between 4 millimetres H.sub.2O and 20 millimetres H.sub.2O.
[0092] The RTD of the aerosol-generating section may be between 4 millimetres H.sub.2O and 10 millimetres H.sub.2O, between 4 millimetres H.sub.2O and 9 millimetres H.sub.2O, or between 4 millimetres H.sub.2O and 8 millimetres H.sub.2O.
[0093] The RTD of the aerosol-generating section may be between 5 millimetres H.sub.2O and 25 millimetres H.sub.2O, between 5 millimetres H.sub.2O and 20 millimetres H.sub.2O, or between 5 millimetres H.sub.2O and 15 millimetres H.sub.2O.
[0094] The RTD of the aerosol-generating section may be between 5 millimetres H.sub.2O and 10 millimetres H.sub.2O, between 5 millimetres H.sub.2O and 9 millimetres H.sub.2O, or between 5 millimetres H.sub.2O and 8 millimetres H.sub.2O.
[0095] The RTD of the aerosol-generating section may be between 6 millimetres H.sub.2O and 25 millimetres H.sub.2O, between 6 millimetres H.sub.2O and 20 millimetres H.sub.2O, or between 6 millimetres H.sub.2O and 15 millimetres H.sub.2O.
[0096] The RTD of the aerosol-generating section may be between 6 millimetres H.sub.2O and 10 millimetres H.sub.2O, between 6 millimetres H.sub.2O and 9 millimetres H.sub.2O, or between 6 millimetres H.sub.2O and 8 millimetres H.sub.2O.
[0097] The aerosol-generating substrate may have a density of at least 100 milligrams per cubic centimetre, at least 150 milligrams per cubic centimetre, at least 200 milligrams per cubic

centimetre at least 250 milligrams per cubic centimetre, or at least 275 milligrams per cubic centimetre.

[0098] The aerosol-generating substrate may have a density of less than or equal to 700 milligrams per cubic centimetre, less than or equal to 650 milligrams per cubic centimetre, less than or equal to 600 milligrams per cubic centimetre, less than or equal to 550 milligrams per cubic centimetre, or less than or equal to 500 milligrams per cubic centimetre.

[0099] The aerosol-generating substrate may have a density of between 100 milligrams per cubic centimetre and 700 milligrams per cubic centimetre, between 100 milligrams per cubic centimetre and 650 milligrams per cubic centimetre, between 100 milligrams per cubic centimetre and 600 milligrams per cubic centimetre, between 100 milligrams per cubic centimetre and 550 milligrams per cubic centimetre, or between 100 milligrams per cubic centimetre and 500 milligrams per cubic centimetre.

[0100] The aerosol-generating substrate may have a density of between 150 milligrams per cubic centimetre and 700 milligrams per cubic centimetre, between 150 milligrams per cubic centimetre and 650 milligrams per cubic centimetre, between 150 milligrams per cubic centimetre and 600 milligrams per cubic centimetre, between 150 milligrams per cubic centimetre and 550 milligrams per cubic centimetre, or between 150 milligrams per cubic centimetre and 500 milligrams per cubic centimetre.

[0101] The aerosol-generating substrate may have a density of between 200 milligrams per cubic centimetre and 700 milligrams per cubic centimetre, between 200 milligrams per cubic centimetre and 650 milligrams per cubic centimetre, between 200 milligrams per cubic centimetre and 600 milligrams per cubic centimetre, between 200 milligrams per cubic centimetre and 550 milligrams per cubic centimetre, or between 200 milligrams per cubic centimetre and 500 milligrams per cubic centimetre.

[0102] The aerosol-generating substrate may have a density of between 250 milligrams per cubic centimetre and 700 milligrams per cubic centimetre, between 250 milligrams per cubic centimetre and 650 milligrams per cubic centimetre, between 250 milligrams per cubic centimetre and 600 milligrams per cubic centimetre, between 250 milligrams per cubic centimetre and 550 milligrams per cubic centimetre, or between 250 milligrams per cubic centimetre and 500 milligrams per cubic centimetre.

[0103] The aerosol-generating substrate may have a density of between 275 milligrams per cubic centimetre and 700 milligrams per cubic centimetre, between 275 milligrams per cubic centimetre and 650 milligrams per cubic centimetre, between 275 milligrams per cubic centimetre and 600 milligrams per cubic centimetre, between 275 milligrams per cubic centimetre and 550 milligrams per cubic centimetre, or between 275 milligrams per cubic centimetre and 500 milligrams per cubic centimetre.

[0104] The aerosol-generating substrate may have a mass of at least 120 milligrams, at least 130 milligrams, at least 140 milligrams, at least 150 milligrams, or at least 160 milligrams.

[0105] The aerosol-generating substrate may have a mass of less than or equal to 340 milligrams, less than or equal to 310 milligrams, less than or equal to 280 milligrams, less than or equal to 250 milligrams, or less than or equal to 220 milligrams.

[0106] The aerosol-generating substrate may have a mass of between 120 milligrams and 340 milligrams, between 120 milligrams and 310 milligrams, between 120 milligrams and 280 milligrams, between 120 milligrams and 250 milligrams, or between 120 milligrams and 220 milligrams.

[0107] The aerosol-generating substrate may have a mass of between 130 milligrams and 340 milligrams, between 130 milligrams and 310 milligrams, between 130 milligrams and 280 milligrams, between 130 milligrams and 250 milligrams, or between 130 milligrams and 220 milligrams.

[0108] The aerosol-generating substrate may have a mass of between 140 milligrams and 340

milligrams, between 140 milligrams and 310 milligrams, between 140 milligrams and 280 milligrams, between 140 milligrams and 250 milligrams, or between 140 milligrams and 220 milligrams.
[0109] The aerosol-generating substrate may have a mass of between 150 milligrams and 340 milligrams, between 150 milligrams and 310 milligrams, between 150 milligrams and 280 milligrams, between 150 milligrams and 250 milligrams, or between 150 milligrams and 220 milligrams.
[0110] The aerosol-generating substrate may have a mass of between 160 milligrams and 340 milligrams, between 160 milligrams and 310 milligrams, between 160 milligrams and 280 milligrams, between 160 milligrams and 250 milligrams, or between 160 milligrams and 220 milligrams.
[0111] The aerosol-generating substrate comprises a plurality of strands of aerosol-generating material.
[0112] The plurality of strands of aerosol-generating material may be randomly oriented within the aerosol-generating section. In use, this may help to retain generated aerosol within the aerosol-generating section between puffs.
[0113] The plurality of strands of aerosol-generating material may be arranged substantially parallel to each other within the aerosol-generating section.
[0114] The strands of aerosol-generating material may be arranged substantially longitudinally within the aerosol-generating section. That is, a longitudinal axis of the strands of aerosol-generating material may be approximately parallel to a longitudinal axis of the aerosol-generating section. For example, a longitudinal axis of the strands of aerosol-generating material may be within plus or minus 10 degrees of parallel to a longitudinal axis of the aerosol-generating section.
[0115] The aerosol-generating substrate may be circumscribed by wrapper. The aerosol-generating substrate may be circumscribed by a paper wrapper. For example, the aerosol-generating substrate may be circumscribed by a plug wrap.
[0116] The strands of aerosol-generating material may have an average length of at least 0.5 millimetres, at least 1 millimetre, at least 2 millimetres, or at least 5 millimetres.
[0117] The average length of the strands of aerosol-generating material is equal to the sum of the individual lengths of each of the strands of aerosol-generating material in the aerosol-generating substrate divided by the number of strands of aerosol-generating material in the aerosol-generating substrate.
[0118] The strands of aerosol-generating material may have an average length of less than or equal to 80 millimetres, less than or equal to 50 millimetres, less than or equal to 30 millimetres, less than or equal to 25 millimetres, less than or equal to 20 millimetres, or less than or equal to 15 millimetres.
[0119] The strands of aerosol-generating material may have an average length of between 0.5 millimetres and 80 millimetres, between 0.5 millimetres and 50 millimetres, between 0.5 millimetres and 30 millimetres, between 0.5 millimetres and 25 millimetres, between 0.5 millimetres and 20 millimetres, or between 0.5 millimetres and 15 millimetres.
[0120] The strands of aerosol-generating material may have an average length of between 1 millimetre and 80 millimetres, between 1 millimetre and 50 millimetres, between 1 millimetre and 30 millimetres, between 1 millimetre and 25 millimetres, between 1 millimetre and 20 millimetres, or between 1 millimetre and 15 millimetres.
[0121] The strands of aerosol-generating material may have an average length of between 2 millimetres and 80 millimetres, between 2 millimetres and 50 millimetres, between 2 millimetres and 30 millimetres, between 2 millimetres and 25 millimetres, between 2 millimetres and 20 millimetres, or between 2 millimetres and 15 millimetres.
[0122] The strands of aerosol-generating material may have an average length of between 5 millimetres and 30 millimetres, between 5 millimetres and 25 millimetres, between 5 millimetres

and 20 millimetres, or between 5 millimetres and 15 millimetres.
[0123] For example, the strands of aerosol-generating material may have a length of 11 millimetres or a length of 12 millimetres.
[0124] The plurality of strands of aerosol-generating material may have substantially the same length.
[0125] The length of the strands of aerosol-generating material may be substantially the same as the length of the aerosol-generating section.
[0126] The length of the strands of aerosol-generating material may be determined by a manufacturing process of the aerosol-generating section in which a longer section is severed to form a plurality of shorter sections.
[0127] The strands of aerosol-generating material may an average width of at least 0.1 millimetres, at least 0.3 millimetres, at least 0.4 millimetres, at least 0.5 millimetres, or at least 0.6 millimetres.
[0128] The average width of the strands of aerosol-generating material is equal to the sum of the individual widths of each of the strands of aerosol-generating material in the aerosol-generating substrate divided by the number of strands of aerosol-generating material in the aerosol-generating substrate.
[0129] Where the aerosol-generating substrate is tobacco cut filler, the average width of the plurality of strands of aerosol-generating material is the mean cut width of the tobacco cut filler. The mean cut width of the tobacco cut filler is equal to the sum of the individual cut widths of each of the strands of tobacco lamina in the aerosol-generating substrate divided by the number of strands of tobacco lamina in the aerosol-generating substrate.
[0130] The strands of aerosol-generating material may an average width of less than or equal to 5 millimetres, less than or equal to 2 millimetres, less than or equal to 1.5 millimetres, less than or equal to 1.2 millimetres, or less than or equal to 0.9 millimetres.
[0131] The strands of aerosol-generating material may have an average width of between 0.1 millimetres and 5 millimetres, between 0.1 millimetres and 2 millimetres, between 0.1 millimetres and 1.5 millimetres, between 0.1 millimetres and 1.2 millimetres or between 0.1 millimetres and 0.9 millimetres.
[0132] The strands of aerosol-generating material may have an average width of between 0.3 millimetres and 5 millimetres, between 0.3 millimetres and 2 millimetres, between 0.3 millimetres and 1.5 millimetres, between 0.3 millimetres and 1.2 millimetres or between 0.3 millimetres and 0.9 millimetres.
[0133] The strands of aerosol-generating material may have an average width of between 0.4 millimetres and 5 millimetres, between 0.4 millimetres and 2 millimetres, between 0.4 millimetres and 1.5 millimetres, between 0.4 millimetres and 1.2 millimetres or between 0.4 millimetres and 0.9 millimetres.
[0134] The strands of aerosol-generating material may have an average width of between 0.5 millimetres and 5 millimetres, between 0.5 millimetres and 2 millimetres, between 0.5 millimetres and 1.5 millimetres, between 0.5 millimetres and 1.2 millimetres or between 0.5 millimetres and 0.9 millimetres.
[0135] The strands of aerosol-generating material may have an average width of between 0.6 millimetres and 5 millimetres, between 0.6 millimetres and 2 millimetres, between 0.6 millimetres and 1.5 millimetres, between 0.6 millimetres and 1.2 millimetres or between 0.6 millimetres and 0.9 millimetres.
[0136] For example, the strands of aerosol-generating material may an average width of 0.7 millimetres or 0.8 millimetres.
[0137] The strands of aerosol-generating material may have an average thickness substantially the same as the average width thereof.
[0138] The average thickness of the strands of aerosol-generating material is equal to the sum of the individual thicknesses of each of the strands of aerosol-generating material in the aerosol-

generating substrate divided by the number of strands of aerosol-generating material in the aerosol-generating substrate.
[0139] Where the aerosol-generating substrate is tobacco cut filler, the thickness of the plurality of strands of tobacco lamina is equal to the thickness of the tobacco lamina.
[0140] The strands of aerosol-generating material may have a substantially circular cross-section.
[0141] The strands of aerosol-generating material may have an average width greater than the average thickness thereof.
[0142] The strands of aerosol-generating material may have a substantially rectangular cross-section.
[0143] The strands of aerosol-generating material may an average thickness of at least 0.1 millimetres, at least 0.15 millimetres, at least 0.18 millimetres, or at least 0.2 millimetres.
[0144] The strands of aerosol-generating material may an average thickness of less than or equal to 2 millimetres, less than or equal to 1 millimetres, less than or equal to 0.6 millimetres, or less than or equal to 0.3 millimetres.
[0145] The strands of aerosol-generating material may have an average thickness of between 0.1 millimetres and 2 millimetres, between 0.1 millimetres and 1 millimetre, between 0.1 millimetres and 0.6 millimetres, or between 0.1 millimetres and 0.3 millimetres.
[0146] The strands of aerosol-generating material may have an average thickness of between 0.15 millimetres and 2 millimetres, between 0.15 millimetres and 1 millimetre, between 0.15 millimetres and 0.6 millimetres, or between 0.15 millimetres and 0.3 millimetres.
[0147] The strands of aerosol-generating material may have an average thickness of between 0.18 millimetres and 2 millimetres, between 0.18 millimetres and 1 millimetre, between 0.18 millimetres and 0.6 millimetres, or between 0.18 millimetres and 0.3 millimetres.
[0148] The strands of aerosol-generating material may have an average thickness of between 0.2 millimetres and 2 millimetres, between 0.2 millimetres and 1 millimetre, between 0.2 millimetres and 0.6 millimetres, or between 0.2 millimetres and 0.3 millimetres.
[0149] For example, the strands of aerosol-generating material may have an average thickness of 0.25 millimetres.
[0150] The aerosol-generating material may be a plant material.
[0151] The aerosol-generating material may be a non-tobacco plant material. Examples of suitable non-tobacco plant materials include cannabis material, ginger material, eucalyptus material, clove material and star anise material.
[0152] The aerosol-generating material may be a tobacco material.
[0153] The aerosol-generating substrate may be tobacco cut filler. The aerosol-generating material may be tobacco cut filler.
[0154] The aerosol-generating material may be a homogenised plant material.
[0155] Strands of homogenised plant material may be formed by cutting or shredding a sheet of homogenised plant material. Strands of homogenised plant material may be formed by other methods. For example, strands of homogenised plant material may be formed by extrusion.
[0156] The aerosol-generating material may be a homogenised non-tobacco plant material
[0157] The aerosol-generating material may be a homogenised tobacco material.
[0158] The aerosol-generating material may be a gel material.
[0159] Strands of gel material may be formed by cutting or shredding a sheet of gel material. Strands of gel material may be formed by other methods. For example, strands of gel material may be formed by extrusion.
[0160] The aerosol-generating material may comprise an aerosol former.
[0161] The aerosol former may be any suitable known compound or mixture of compounds that, in use, facilitates formation of a dense and stable aerosol. The aerosol former may be substantially resistant to thermal degradation at temperatures typically reached during use of the aerosol-generating article.

[0162] Examples of suitable aerosol formers include: polyhydric alcohols such as, for example, triethylene glycol, 1,3-butanediol, propylene glycol and glycerine; esters of polyhydric alcohols such as, for example, glycerol mono-, di- or triacetate; aliphatic esters of mono-, di- or polycarboxylic acids such as, for example, dimethyl dodecanedioate and dimethyl tetradecanedioate; and combinations thereof.
[0163] The aerosol former may comprise one or more of glycerine and propylene glycol. The aerosol former may consist of glycerine. The aerosol former may consist of propylene glycol. The aerosol former may consist of a combination of glycerine and propylene glycol.
[0164] The aerosol-generating material may comprise at least 1 percent by weight of aerosol former, at least 5 percent by weight of aerosol former, at least 10 percent by weight of aerosol former, or at least 15 percent by weight of aerosol former. That is, the aerosol-generating material may have an aerosol former content of at least 1 percent by weight, at least 5 percent by weight, at least 10 percent by weight, or at least 15 percent by weight.
[0165] The aerosol-generating material may comprise less than or equal to 30 percent by weight of aerosol former, less than or equal to 25 percent by weight of aerosol former, or less than or equal to 20 percent by weight of aerosol former. That is, the aerosol-generating material may have an aerosol former content of less than or equal to 30 percent by weight, less than or equal to 25 percent by weight, or less than or equal to 20 percent by weight.
[0166] The aerosol-generating material may comprise between 1 percent and 30 percent by weight of aerosol former, between 1 percent and 25 percent by weight of aerosol former, or between 1 percent and 20 percent by weight of aerosol former.
[0167] The aerosol-generating material may comprise between 5 percent and 30 percent by weight of aerosol former, between 5 percent and 25 percent by weight of aerosol former, or between 5 percent and 20 percent by weight of aerosol former.
[0168] The aerosol-generating material may comprise between 10 percent and 30 percent by weight of aerosol former, between 10 percent and 25 percent by weight of aerosol former, or between 10 percent and 20 percent by weight of aerosol former.
[0169] The aerosol-generating material may comprise between 15 percent and 30 percent by weight of aerosol former, between 15 percent and 25 percent by weight of aerosol former, or between 15 percent and 20 percent by weight of aerosol former.
[0170] The aerosol-generating material may comprise at least 50 percent by weight of aerosol former, at least 60 percent by weight of aerosol former, or at least 70 percent by weight of aerosol former.
[0171] The aerosol-generating material may comprise less than or equal to 85 percent by weight of aerosol former, less than or equal to 80 percent by weight of aerosol former, or less than or equal to 75 percent by weight of aerosol former.
[0172] The aerosol-generating material may comprise between 50 percent and 85 percent by weight of aerosol former, between 50 percent and 80 percent by weight of aerosol former, or between 50 percent and 75 percent by weight of aerosol former.
[0173] The aerosol-generating material may comprise between 60 percent and 85 percent by weight of aerosol former, between 60 percent and 80 percent by weight of aerosol former, or between 60 percent and 75 percent by weight of aerosol former.
[0174] The aerosol-generating material may comprise between 70 percent and 85 percent by weight of aerosol former, between 70 percent and 80 percent by weight of aerosol former, or between 70 percent and 75 percent by weight of aerosol former.
[0175] The aerosol-generating material may comprise nicotine.
[0176] The aerosol-generating material may comprise natural nicotine, or synthetic nicotine, or a combination of natural nicotine and synthetic nicotine.
[0177] The aerosol-generating material may comprise at least 0.5 percent by weight of nicotine, at least 1 percent by weight of nicotine, at least 1.5 percent by weight of nicotine, or at least 2 percent

by weight of nicotine. That is, the aerosol-generating material may have a nicotine content of at least 0.5 percent by weight, at least 1 percent by weight, at least 1.5 percent by weight, or at least 2 percent by weight.

[0178] The aerosol-generating material may comprise less than or equal to 10 percent by weight of nicotine, less than or equal to 8 percent by weight of nicotine, less than or equal to 6 percent by weight of nicotine, or less than or equal to 4 percent by weight of nicotine. That is, the aerosol-generating material may have a nicotine content of less than or equal to 10 percent by weight, less than or equal to 8 percent by weight, less than or equal to 6 percent by weight, or less than or equal to 4 percent by weight.

[0179] The aerosol-generating material may comprise between 0.5 percent and 10 percent by weight of nicotine, between 0.5 percent and 8 percent by weight of nicotine, between 0.5 percent and 6 percent by weight of nicotine, or between 0.5 percent and 4 percent by weight of nicotine.

[0180] The aerosol-generating material may comprise between 1 percent and 10 percent by weight of nicotine, between 1 percent and 8 percent by weight of nicotine, between 1 percent and 6 percent by weight of nicotine, or between 1 percent and 4 percent by weight of nicotine.

[0181] The aerosol-generating material may comprise between 1.5 percent and 10 percent by weight of nicotine, between 1.5 percent and 8 percent by weight of nicotine, between 1.5 percent and 6 percent by weight of nicotine, or between 1.5 percent and 4 percent by weight of nicotine.

[0182] The aerosol-generating material may comprise between 2 percent and 10 percent by weight of nicotine, between 2 percent and 8 percent by weight of nicotine, between 2 percent and 6 percent by weight of nicotine, or between 2 percent and 4 percent by weight of nicotine.

[0183] The aerosol-generating substrate may comprise a plurality of strands of aerosol-generating material of substantially the same composition. For example, the aerosol-generating substrate may comprise a plurality of strands of homogenised tobacco material of substantially the same composition.

[0184] The aerosol-generating substrate may comprise a plurality of strands of aerosol-generating material of different composition. For example, the aerosol-generating substrate may comprise one or more strands of a first aerosol-generating material having a first composition and one or more strands of a second aerosol-generating material having a second composition, wherein the first composition is different to the second composition. For example, the aerosol-generating substrate may comprise one or more strands of homogenised tobacco material having a first composition and one or more strands of gel material having a second composition.

[0185] Where the aerosol-generating substrate comprises strands of aerosol-generating material of different composition, at least one of the strands of aerosol-generating material may have an aerosol former content as a percentage by weight as set out above. For example, the aerosol-generating substrate may comprise one or more strands of a first aerosol-generating material having a first composition and one or more strands of a second aerosol-generating material having a second composition, wherein the first composition is different to the second composition and wherein at least one of the first aerosol-generating material and the second aerosol-generating material has an aerosol former content of between 5 percent and 30 percent by weight. For example, the aerosol-generating substrate may comprise one or more strands of a first aerosol-generating material having an aerosol former content of between 5 percent and 30 percent by weight and one or more strands of a second aerosol-generating material having an aerosol former content of between 50 percent and 85 percent by weight.

[0186] Where the aerosol-generating substrate comprises strands of aerosol-generating material of different composition, the strands of aerosol-generating material may have an average aerosol former content as a percentage by weight as set out above. For example, the strands of aerosol-generating material may have an average aerosol former content of between 5 percent and 30 percent by weight, between 5 percent and 25 percent by weight, or between 5 percent and 20 percent by weight. For example, the strands of aerosol-generating material may have an average

aerosol former content of between 50 percent and 85 percent by weight, between 50 percent and 80 percent by weight, or between 50 percent and 75 percent by weight.
[0187] The average aerosol former content of the strands of aerosol-generating material is equal to the sum of the individual aerosol former contents of each of the strands of aerosol-generating material in the aerosol-generating substrate as a percentage by weight divided by the number of strands of aerosol-generating material in the aerosol-generating substrate.
[0188] Where the aerosol-generating substrate comprises strands of aerosol-generating material of different composition, each of the strands of aerosol-generating material may have an aerosol former content as a percentage by weight as set out above. For example, the aerosol-generating substrate may comprise one or more strands of a first aerosol-generating material having a first composition and one or more strands of a second aerosol-generating material having a second composition, wherein the first composition is different to the second composition and wherein the first aerosol-generating material has an aerosol former content of between 5 percent and 30 percent by weight and the second aerosol-generating material has an aerosol former content of between 5 percent and 30 percent by weight.
[0189] Where the aerosol-generating substrate comprises strands of aerosol-generating material of different composition, at least one of the strands of aerosol-generating material may have a nicotine content as a percentage by weight as set out above. For example, the aerosol-generating substrate may comprise one or more strands of a first aerosol-generating material having a first composition and one or more strands of a second aerosol-generating material having a second composition, wherein the first composition is different to the second composition and wherein at least one of the first aerosol-generating material and the second aerosol-generating material has a nicotine content of between 0.5 percent and 10 percent by weight. For example, the aerosol-generating substrate may comprise one or more strands of a first aerosol-generating material having a nicotine content of between 0.5 percent and 10 percent by weight and one or more strands of a second aerosol-generating material having a nicotine content of 0 percent by weight.
[0190] Where the aerosol-generating substrate comprises strands of aerosol-generating material of different composition, the strands of aerosol-generating material may have an average aerosol nicotine content as a percentage by weight as set out above. For example, the strands of aerosol-generating material may have an average nicotine content of between 0.5 percent and 10 percent by weight, between 0.5 percent and 8 percent by weight, between 0.5 percent and 6 percent by weight, or between 0.5 percent and 4 percent by weight.
[0191] The average nicotine content of the strands of aerosol-generating material is equal to the sum of the individual nicotine contents of each of the strands of aerosol-generating material in the aerosol-generating substrate as a percentage by weight divided by the number of strands of aerosol-generating material in the aerosol-generating substrate.
[0192] Where the aerosol-generating substrate comprises strands of aerosol-generating material of different composition, each of the strands of aerosol-generating material may have nicotine content as a percentage by weight as set out above. For example, the aerosol-generating substrate may comprise one or more strands of a first aerosol-generating material having a first composition and one or more strands of a second aerosol-generating material having a second composition, wherein the first composition is different to the second composition and wherein the first aerosol-generating material has a nicotine content of between 0.5 percent and 10 percent by weight and the second aerosol-generating material has a nicotine content of between 0.5 percent and 10 percent by weight.
[0193] The aerosol-generating section may comprise a heat transfer enhancement element located within the aerosol-generating substrate.
[0194] The heat transfer enhancement element may be in thermal contact with the aerosol-generating substrate.
[0195] The heat transfer enhancement element may advantageously be in direct contact with the aerosol-generating substrate.

[0196] The heat transfer enhancement element may facilitate heat transfer from an internal heating element to the plurality of strands of aerosol-generating material.
[0197] The heat transfer enhancement element may facilitate heat transfer between the plurality of strands of aerosol-generating material.
[0198] The heat transfer enhancement element may have a thermal conductivity in at least one direction at 25 degrees Celsius of at least 0.15 W/(mK), at least 0.2 W/(mK), at least 0.25 W/(mK), or at least 0.3 W/(mK).
[0199] The heat transfer enhancement element may have a thermal conductivity in at least one direction at 25 degrees Celsius of less than or equal to 1700 W/(mK), less than or equal to 1600 W/(mK), or less than or equal to 1500 W/(mK).
[0200] The heat transfer enhancement element may have a thermal conductivity in at least one direction at 25 degrees Celsius of between 0.15 W/(mK) and 1700 W/(mK), between 0.15 W/(mK) and 1600 W/(mK), or between 0.15 W/(mK) and 1500 W/(mK).
[0201] The heat transfer enhancement element may have a thermal conductivity in at least one direction at 25 degrees Celsius of between 0.2 W/(mK) and 1700 W/(mK), between 0.2 W/(mK) and 1600 W/(mK), or between 0.2 W/(mK) and 1500 W/(mK).
[0202] The heat transfer enhancement element may have a thermal conductivity in at least one direction at 25 degrees Celsius of between 0.25 W/(mK) and 1700 W/(mK), between 0.25 W/(mK) and 1600 W/(mK), or between 0.25 W/(mK) and 1500 W/(mK).
[0203] The heat transfer enhancement element may have a thermal conductivity in at least one direction at 25 degrees Celsius of between 0.3 W/(mK) and 1700 W/(mK), between 0.3 W/(mK) and 1600 W/(mK), or between 0.3 W/(mK) and 1500 W/(mK).
[0204] The heat transfer enhancement element may comprise one or more thermally conductive materials. The heat transfer enhancement element may comprise one or more metals, one or more alloys, one or more carbon-containing materials, or a combination thereof. For example, the heat transfer enhancement element may comprise one or more of aluminium, copper, gold, silver, tungsten, stainless steel, diamond, graphene, graphite, and expanded graphite.
[0205] The heat transfer enhancement element may comprise an aerosol former.
[0206] Examples of suitable aerosol formers include: polyhydric alcohols such as, for example, triethylene glycol, 1,3-butanediol, propylene glycol and glycerine; esters of polyhydric alcohols such as, for example, glycerol mono-, di- or triacetate; aliphatic esters of mono-, di- or polycarboxylic acids such as, for example, dimethyl dodecanedioate and dimethyl tetradecanedioate; and combinations thereof.
[0207] The aerosol former may comprise one or more of glycerine and propylene glycol. The aerosol former may consist of glycerine. The aerosol former may consist of propylene glycol. The aerosol former may consist of a combination of glycerine and propylene glycol.
[0208] The heat transfer enhancement element may comprise a plurality of discrete thermally conductive elements. The plurality of discrete thermally conductive elements may be substantially homogeneously distributed within the aerosol-generating substrate.
[0209] The heat transfer element may comprise a plurality of thermally conductive particles. For example, the heat transfer enhancement element may comprise: a plurality of metal particles; a plurality of alloy particles; a plurality of carbon-containing particles, such as graphene particles, graphite particles, and expanded graphite particles; or a combination thereof. The thermally conductive particles may comprise an aerosol former.
[0210] The heat transfer element may comprise a plurality of thermally conductive strands. For example, the heat transfer enhancement element may comprise: a plurality of strands of metal foil, such as aluminium foil or copper foil; a plurality of strands of alloy foil, such as stainless steel foil; a plurality of strands of carbon-containing foil, such as graphite foil; or a combination thereof. The thermally conductive strands may comprise an aerosol former.
[0211] The aerosol generating section of the aerosol-generating article may comprise an internal

heating element located within the aerosol-generating substrate.
[0212] The aerosol-generating device of the aerosol-generating system may comprise an internal heating element for insertion into the aerosol-generating substrate of the aerosol-generating section of the aerosol-generating article.
[0213] The internal heating element may be in thermal contact with the plurality of strands of aerosol-generating material. In use, heat from the internal heating element may be conveyed to the plurality of strands of aerosol-generating material.
[0214] The internal heating element may advantageously be in direct contact with the plurality of strands of aerosol-generating material.
[0215] The internal heating element may have a length of at least 4 millimetres, at least 6 millimetres, at least 8 millimetres, or at least 10 millimetres.
[0216] The internal heating element may have a length of less than or equal to 45 millimetres, less than or equal to 35 millimetres, less than or equal to 25 millimetres, or less than or equal to 15 millimetres.
[0217] The internal heating element may have a length of between 4 millimetres and 45 millimetres, between 4 millimetres and 35 millimetres, between 4 millimetres and 25 millimetres, or between 4 millimetres and 15 millimetres.
[0218] The internal heating element may have a length of between 6 millimetres and 45 millimetres, between 6 millimetres and 35 millimetres, between 6 millimetres and 25 millimetres, or between 6 millimetres and 15 millimetres.
[0219] The internal heating element may have a length of between 8 millimetres and 45 millimetres, between 8 millimetres and 35 millimetres, between 8 millimetres and 25 millimetres, or between 8 millimetres and 15 millimetres.
[0220] The internal heating element may have a length of between 10 millimetres and 45 millimetres, between 10 millimetres and 35 millimetres, between 10 millimetres and 25 millimetres, or between 10 millimetres and 15 millimetres.
[0221] For example, the internal heating element may have a length of 11 millimetres or a length of 12 millimetres.
[0222] For example, the susceptor element may have a length of 11 millimetres or a length of 12 millimetres.
[0223] The aerosol generating section of the aerosol-generating article may comprise a plurality of internal heating elements located within the aerosol-generating substrate.
[0224] The aerosol generating section of the aerosol-generating article may comprise a plurality of internal heating elements of substantially the same length located within the aerosol-generating substrate.
[0225] The aerosol generating section of the aerosol-generating article may comprise a plurality of internal heating elements of different length located within the aerosol-generating substrate. For example, the aerosol-generating substrate may comprise one or more first internal heating elements having a first length located within the aerosol-generating substrate and one or more second internal heating elements having a second length located within the aerosol-generating substrate, wherein the first length is different to the second length.
[0226] The aerosol generating device may comprise a plurality of internal heating elements for insertion into the aerosol-generating substrate of the aerosol-generating section of the aerosol-generating article.
[0227] The aerosol generating device may comprise a plurality of internal heating elements of substantially the same length for insertion into the aerosol-generating substrate of the aerosol-generating section of the aerosol-generating article.
[0228] The aerosol generating device may comprise a plurality of internal heating elements of different length for insertion into the aerosol-generating substrate of the aerosol-generating section of the aerosol-generating article. For example, the aerosol-generating device may comprise one or

more first internal heating elements having a first length for insertion into the aerosol-generating substrate of the aerosol-generating section of the aerosol-generating article and one or more second internal heating elements having a second length for insertion into the aerosol-generating substrate of the aerosol-generating section of the aerosol-generating article, wherein the first length is different to the second length.

[0229] Where there are a plurality of internal heating elements, at least one of the plurality of internal heating elements may have a length in millimetres as set out above. For example, the aerosol-generating substrate may comprise one or more first internal heating elements located within the aerosol-generating substrate having a first length and one or more second internal heating elements located within the aerosol-generating substrate having a second length, wherein at least one of the first length and the second length is between 4 millimetres and 45 millimetres.

[0230] Where there are a plurality of internal heating elements, the plurality of internal heating elements may have an average length in millimetres as set out above. For example, the plurality of internal heating elements may have an average length of between 4 millimetres and 45 millimetres, between 4 millimetres and 35 millimetres, between 4 millimetres and 25 millimetres, or between 4 millimetres and 15 millimetres.

[0231] The average length of the plurality of internal heating elements is equal to the sum of the individual lengths of each of the internal heating elements divided by the number of internal heating elements.

[0232] Where there are a plurality of internal heating elements, each of the plurality of internal heating elements may have a length in millimetres as set out above. For example, each of the plurality of internal heating elements may have a length of between 4 millimetres and 45 millimetres.

[0233] A ratio of an average length of the plurality of strands of aerosol-generating material to a length of the internal heating element may be at least 0.04, at least 0.07, at least 0.10, at least 0.12, at least 0.15, at least 0.20, or at least 0.25.

[0234] A ratio of an average length of the plurality of strands of aerosol-generating material to a length of the internal heating element may be less than or equal to 7, less than or equal to 4, less than or equal to 1, less than or equal to 0.8, less than or equal to 0.7, less than or equal to 0.6, or less than or equal to 0.5.

[0235] A ratio of an average length of the plurality of strands of aerosol-generating material to a length of the internal heating element may be between 0.04 and 7, between 0.04 and 4, between 0.04 and 1, between 0.04 and 0.8, between 0.04 and 0.7, between 0.04 and 0.6, or between 0.04 and 0.5.

[0236] A ratio of an average length of the plurality of strands of aerosol-generating material to a length of the internal heating element may be between 0.07 and 7, between 0.07 and 4, between 0.07 and 1, between 0.07 and 0.8, between 0.07 and 0.7, between 0.07 and 0.6, or between 0.07 and 0.5.

[0237] A ratio of an average length of the plurality of strands of aerosol-generating material to a length of the internal heating element may be between 0.10 and 7, between 0.10 and 4, between 0.10 and 1, between 0.10 and 0.8, between 0.10 and 0.7, between 0.10 and 0.6, or between 0.10 and 0.5.

[0238] A ratio of an average length of the plurality of strands of aerosol-generating material to a length of the internal heating element may be between 0.12 and 7, between 0.12 and 4, between 0.12 and 1, between 0.12 and 0.8, between 0.12 and 0.7, between 0.12 and 0.6, or between 0.12 and 0.5.

[0239] A ratio of an average length of the plurality of strands of aerosol-generating material to a length of the internal heating element may be between 0.15 and 7, between 0.15 and 4, between 0.15 and 1, between 0.15 and 0.8, between 0.15 and 0.7, between 0.15 and 0.6, or between 0.15 and 0.5.

[0240] A ratio of an average length of the plurality of strands of aerosol-generating material to a length of the internal heating element may be between 0.20 and 7, between 0.20 and 4, between 0.20 and 1, between 0.20 and 0.8, between 0.20 and 0.7, between 0.20 and 0.6, or between 0.20 and 0.5.
[0241] Where there are a plurality of internal heating elements, a ratio of an average length of the plurality of strands of aerosol-generating material to a length of at least one of the plurality of internal heating elements may be as set out above. For example, the aerosol-generating substrate may comprise one or more first internal heating elements located within the aerosol-generating substrate having a first length and one or more second internal heating elements located within the aerosol-generating substrate having a second length, wherein a ratio of an average length of the plurality of strands of aerosol-generating material to at least one of the first length and the second length is between 0.04 and 7.
[0242] Where there are a plurality of internal heating elements, a ratio of an average length of the plurality of strands of aerosol-generating material to an average length of the plurality of internal heating elements may be as set out above. For example, a ratio of an average length of the plurality of strands of aerosol-generating material to an average length of the plurality of internal heating elements may be between 0.04 and 7, between 0.04 and 4, between 0.04 and 1, between 0.04 and 0.8, between 0.04 and 0.7, between 0.04 and 0.6, or between 0.04 and 0.5.
[0243] Where there are a plurality of internal heating elements, a ratio of an average length of the plurality of strands of aerosol-generating material to a length of each of the plurality of internal heating elements may be as set out above. For example, a ratio of an average length of the plurality of strands of aerosol-generating material to a length of each of the plurality of internal heating elements may be between 0.04 and 7.
[0244] A ratio of a length of the internal heating element to a total length of the aerosol-generating article may be at least 0.10, at least 0.15, or at least 0.20.
[0245] A ratio of a length of the internal heating element to a total length of the aerosol-generating article may be less than or equal to 0.40, less than or equal to 0.35, or less than or equal to 0.30.
[0246] A ratio of a length of the internal heating element to a total length of the aerosol-generating article may be between 0.10 and 0.40, between 0.10 and 0.35, or between 0.10 and 0.30.
[0247] A ratio of a length of the internal heating element to a total length of the aerosol-generating article may be between 0.15 and 0.40, between 0.15 and 0.35, or between 0.15 and 0.30.
[0248] A ratio of a length of the internal heating element to a total length of the aerosol-generating article may be between 0.20 and 0.40, between 0.20 and 0.35, or between 0.20 and 0.30.
[0249] For example, a ratio of a length of the internal heating element to a total length of the aerosol-generating article may be 0.27.
[0250] Where there are a plurality of internal heating elements, a ratio of a length of at least one of the plurality of internal heating elements to a total length of the aerosol-generating article may be as set out above. For example, the aerosol-generating substrate may comprise one or more first internal heating elements located within the aerosol-generating substrate having a first length and one or more second internal heating elements located within the aerosol-generating substrate having a second length, wherein a ratio of at least one of the first length and the second length to a total length of the aerosol-generating article is between 0.10 and 0.40.
[0251] Where there are a plurality of internal heating elements, a ratio of an average length of the plurality of internal heating elements to a total length of the aerosol-generating article may be as set out above. For example, a ratio of an average length of the plurality of internal heating elements to a total length of the aerosol-generating article may be between 0.10 and 0.40, between 0.10 and 0.35, or between 0.10 and 0.30.
[0252] Where there are a plurality of internal heating elements, a ratio of a length of each of the plurality of internal heating elements to a total length of the aerosol-generating article may be as set out above. For example, a ratio of a length of each of the plurality of internal heating elements to a

total length of the aerosol-generating article may be between 0.10 and 0.40.
[0253] The internal heating element may have a width of at least 0.5 millimetres, at least 1 millimetre, at least 1.5 millimetres, at least 2 millimetres, or at least 2.5 millimetres.
[0254] The internal heating element may have a width of less than or equal to 8 millimetres, less than or equal to 7 millimetres, less than or equal to 6 millimetres, less than or equal to 5 millimetres, or less than or equal to 4 millimetres.
[0255] The internal heating element may have a width of between 0.5 millimetres and 8 millimetres, between 0.5 millimetres and 7 millimetres, between 0.5 millimetres and 6 millimetres, between 0.5 millimetres and 5 millimetres, or between 0.5 millimetres and 4 millimetres.
[0256] The internal heating element may have a width of between 1 millimetre and 8 millimetres, between 1 millimetre and 7 millimetres, between 1 millimetre and 6 millimetres, between 1 millimetre and 5 millimetres, or between 1 millimetre and 4 millimetres.
[0257] The internal heating element may have a width of between 1.5 millimetres and 8 millimetres, between 1.5 millimetres and 7 millimetres, between 1.5 millimetres and 6 millimetres, between 1.5 millimetres and 5 millimetres, or between 1.5 millimetres and 4 millimetres.
[0258] The internal heating element may have a width of between 2 millimetres and 8 millimetres, between 2 millimetres and 7 millimetres, between 2 millimetres and 6 millimetres, between 2 millimetres and 5 millimetres, or between 2 millimetres and 4 millimetres.
[0259] The internal heating element may have a width of between 2.5 millimetres and 8 millimetres, between 2.5 millimetres and 7 millimetres, between 2.5 millimetres and 6 millimetres, between 2.5 millimetres and 5 millimetres, or between 2.5 millimetres and 4 millimetres.
[0260] For example, the internal heating element may have a width of 4 millimetres.
[0261] The aerosol generating section of the aerosol-generating article may comprise a plurality of internal heating elements of substantially the same width located within the aerosol-generating substrate.
[0262] The aerosol generating section of the aerosol-generating article may comprise a plurality of internal heating elements of different width located within the aerosol-generating substrate. For example, the aerosol-generating substrate may comprise one or more first internal heating elements having a first width located within the aerosol-generating substrate and one or more second internal heating elements having a second width located within the aerosol-generating substrate, wherein the first width is different to the second width.
[0263] The aerosol generating device may comprise a plurality of internal heating elements of substantially the same width for insertion into the aerosol-generating substrate of the aerosol-generating section of the aerosol-generating article.
[0264] The aerosol generating device may comprise a plurality of internal heating elements of different width for insertion into the aerosol-generating substrate of the aerosol-generating section of the aerosol-generating article. For example, the aerosol-generating device may comprise one or more first internal heating elements having a first width for insertion into the aerosol-generating substrate of the aerosol-generating section of the aerosol-generating article and one or more second internal heating elements having a second width for insertion into the aerosol-generating substrate of the aerosol-generating section of the aerosol-generating article, wherein the first width is different to the second width.
[0265] Where there are a plurality of internal heating elements, at least one of the plurality of internal heating elements may have a width in millimetres as set out above. For example, the aerosol-generating substrate may comprise one or more first internal heating elements located within the aerosol-generating substrate having a first width and one or more second internal heating elements located within the aerosol-generating substrate having a second width, wherein at least one of the first width and the second width is between 0.5 millimetres and 8 millimetres.
[0266] Where there are a plurality of internal heating elements, the plurality of internal heating elements may have an average width in millimetres as set out above. For example, the plurality of

internal heating elements may have an average width of between 0.5 millimetres and 8 millimetres, between 0.5 millimetres and 7 millimetres, between 0.5 millimetres and 6 millimetres, between 0.5 millimetres and 5 millimetres, or between 0.5 millimetres and 4 millimetres.

[0267] The average width of the plurality of internal heating elements is equal to the sum of the individual widths of each of the internal heating elements divided by the number of internal heating elements.

[0268] Where there are a plurality of internal heating elements, each of the plurality of internal heating elements may have a width in millimetres as set out above. For example, each of the plurality of internal heating elements may have a width between 0.5 millimetres and 8 millimetres.

[0269] A ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element may be at least 0.05, at least 0.06, at least 0.08, at least 0.09, at least 0.10, at least 0.11, at least 0.12, or at least 0.13.

[0270] A ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element may be less than or equal to 4, less than or equal to 3, less than or equal to 2, less than or equal to 1.8, less than or equal to 1.6, less than or equal to 1.5, less than or equal to 1.4, or less than or equal to 1.3.

[0271] A ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element may be between 0.05 and 4, between 0.05 and 3, between 0.05 and 2, between 0.05 and 1.8, between 0.05 and 1.6, between 0.05 and 1.5, between 0.05 and 1.4, or between 0.05 and 1.3.

[0272] A ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element may be between 0.06 and 4, between 0.06 and 3, between 0.06 and 2, between 0.06 and 1.8, between 0.06 and 1.6, between 0.06 and 1.5, between 0.06 and 1.4, or between 0.06 and 1.3.

[0273] A ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element may be between 0.08 and 4, between 0.08 and 3, between 0.08 and 2, between 0.08 and 1.8, between 0.08 and 1.6, between 0.08 and 1.5, between 0.08 and 1.4, or between 0.08 and 1.3.

[0274] A ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element may be between 0.09 and 4, between 0.09 and 3, between 0.09 and 2, between 0.09 and 1.8, between 0.09 and 1.6, between 0.09 and 1.5, between 0.09 and 1.4, or between 0.09 and 1.3.

[0275] A ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element may be between 0.10 and 4, between 0.10 and 3, between 0.10 and 2, between 0.10 and 1.8, between 0.10 and 1.6, between 0.10 and 1.5, between 0.10 and 1.4, or between 0.10 and 1.3.

[0276] A ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element may be between 0.11 and 4, between 0.11 and 3, between 0.11 and 2, between 0.11 and 1.8, between 0.11 and 1.6, between 0.11 and 1.5, between 0.11 and 1.4, or between 0.11 and 1.3.

[0277] A ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element may be between 0.12 and 4, between 0.12 and 3, between 0.12 and 2, between 0.12 and 1.8, between 0.12 and 1.6, between 0.12 and 1.5, between 0.12 and 1.4, or between 0.12 and 1.3.

[0278] A ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element may be between 0.13 and 4, between 0.13 and 3, between 0.13 and 2, between 0.13 and 1.8, between 0.13 and 1.6, between 0.13 and 1.5, between 0.13 and 1.4, or between 0.13 and 1.3.

[0279] Where there are a plurality of internal heating elements, a ratio of an average width of the plurality of strands of aerosol-generating material to a width of at least one of the plurality of

internal heating elements may be as set out above. For example, the aerosol-generating substrate may comprise one or more first internal heating elements located within the aerosol-generating substrate having a first width and one or more second internal heating elements located within the aerosol-generating substrate having a second width, wherein a ratio of an average width of the plurality of strands of aerosol-generating material to at least one of the first width and the second width is between 0.05 and 4.

[0280] Where there are a plurality of internal heating elements, a ratio of an average width of the plurality of strands of aerosol-generating material to an average width of the plurality of internal heating elements may be as set out above. For example, a ratio of an average width of the plurality of strands of aerosol-generating material to an average width of the plurality of internal heating elements may be between 0.05 and 4, between 0.05 and 3, between 0.05 and 2, between 0.05 and 1.8, between 0.05 and 1.6, between 0.05 and 1.5, between 0.05 and 1.4, or between 0.05 and 1.3.

[0281] Where there are a plurality of internal heating elements, a ratio of an average width of the plurality of strands of aerosol-generating material to a width of each of the plurality of internal heating elements may be as set out above. For example, a ratio of an average width of the plurality of strands of aerosol-generating material to a width of each of the plurality of internal heating elements may be between 0.05 and 4.

[0282] A ratio of a width of the internal heating element to a width of the aerosol-generating section may be at least 0.1, at least 0.2, at least 0.3, or at least 0.4,

[0283] A ratio of a width of the internal heating element to a width of the aerosol-generating section may be less than or equal to 0.9, less than or equal to 0.8, less than or equal to 0.7, or less than or equal to 0.6.

[0284] A ratio of a width of the internal heating element to a width of the aerosol-generating section may be between 0.1 and 0.9, between 0.1 and 0.8, between 0.1 and 0.7, or between 0.1 and 0.6.

[0285] A ratio of a width of the internal heating element to a width of the aerosol-generating section may be between 0.2 and 0.9, between 0.2 and 0.8, between 0.2 and 0.7, or between 0.2 and 0.6.

[0286] A ratio of a width of the internal heating element to a width of the aerosol-generating section may be between 0.3 and 0.9, between 0.3 and 0.8, between 0.3 and 0.7, or between 0.3 and 0.6.

[0287] A ratio of a width of the internal heating element to a width of the aerosol-generating section may be between 0.4 and 0.9, between 0.4 and 0.8, between 0.4 and 0.7, or between 0.4 and 0.6.

[0288] Where there are a plurality of internal heating elements, a ratio of a width of at least one of the plurality of internal heating elements to a width of the aerosol-generating article may be as set out above. For example, the aerosol-generating substrate may comprise one or more first internal heating elements located within the aerosol-generating substrate having a first width and one or more second internal heating elements located within the aerosol-generating substrate having a second width, wherein a ratio of at least one of the first width and the second width to a width of the aerosol-generating section is between 0.1 and 0.9.

[0289] Where there are a plurality of internal heating elements, a ratio of an average width of the plurality of internal heating elements to a width of the aerosol-generating article may be as set out above. For example, a ratio of an average width of the plurality of internal heating elements to a width of the aerosol-generating article may be between 0.1 and 0.9, between 0.1 and 0.8, between 0.1 and 0.7, or between 0.1 and 0.6.

[0290] Where there are a plurality of internal heating elements, a ratio of a width of each of the plurality of internal heating elements to a width of the aerosol-generating article may be as set out above. For example, a ratio of a width of each of the plurality of internal heating elements to a width of the aerosol-generating article may be between 0.1 and 0.9.

[0291] The internal heating element may be substantially cylindrical.
[0292] The internal heating element may be in the form of a pin.
[0293] The internal heating element may have a thickness substantially the same as the width thereof.
[0294] The internal heating element may have a substantially circular cross-section.
[0295] The internal heating element may have the form of a needle or pin.
[0296] The internal heating element may have a diameter of at least 0.5 millimetres, at least 1 millimetre, at least 1.5 millimetres, at least 2 millimetres, or at least 2.5 millimetres.
[0297] The internal heating element may have a diameter of less than or equal to 5 millimetres, less than or equal to 4.5 millimetres, less than or equal to 4 millimetres, less than or equal to 3.5 millimetres, or less than or equal to 3 millimetres.
[0298] The internal heating element may have a diameter of between 0.5 millimetres and 5 millimetres, between 0.5 millimetres and 4.5 millimetres, between 0.5 millimetres and 4 millimetres, between 0.5 millimetres and 3.5 millimetres, or between 0.5 millimetres and 3 millimetres.
[0299] The internal heating element may have a diameter of between 1 millimetre and 5 millimetres, between 1 millimetre and 4.5 millimetres, between 1 millimetre and 4 millimetres, between 1 millimetre and 3.5 millimetres, or between 1 millimetre and 3 millimetres.
[0300] The internal heating element may have a diameter of between 1.5 millimetres and 5 millimetres, between 1.5 millimetres and 4.5 millimetres, between 1.5 millimetres and 4 millimetres, between 1.5 millimetres and 3.5 millimetres, or between 1.5 millimetres and 3 millimetres.
[0301] The internal heating element may have a diameter of between 2 millimetres and 5 millimetres, between 2 millimetres and 4.5 millimetres, between 2 millimetres and 4 millimetres, between 2 millimetres and 3.5 millimetres, or between 2 millimetres and 3 millimetres.
[0302] The internal heating element may have a diameter of between 2.5 millimetres and 5 millimetres, between 2.5 millimetres and 4.5 millimetres, between 2.5 millimetres and 4 millimetres, between 2.5 millimetres and 3.5 millimetres, or between 2.5 millimetres and 3 millimetres.
[0303] For example, the internal heating element may have a diameter of 3 millimetres.
[0304] The aerosol generating section of the aerosol-generating article may comprise a plurality of internal heating elements of substantially the same diameter located within the aerosol-generating substrate.
[0305] The aerosol generating section of the aerosol-generating article may comprise a plurality of internal heating elements of different diameter located within the aerosol-generating substrate. For example, the aerosol-generating substrate may comprise one or more first internal heating elements having a first diameter located within the aerosol-generating substrate and one or more second internal heating elements having a second diameter located within the aerosol-generating substrate, wherein the first diameter is different to the second diameter.
[0306] The aerosol generating device may comprise a plurality of internal heating elements of substantially the same diameter for insertion into the aerosol-generating substrate of the aerosol-generating section of the aerosol-generating article.
[0307] The aerosol generating device may comprise a plurality of internal heating elements of different diameter for insertion into the aerosol-generating substrate of the aerosol-generating section of the aerosol-generating article. For example, the aerosol-generating device may comprise one or more first internal heating elements having a first diameter for insertion into the aerosol-generating substrate of the aerosol-generating section of the aerosol-generating article and one or more second internal heating elements having a second diameter for insertion into the aerosol-generating substrate of the aerosol-generating section of the aerosol-generating article, wherein the first diameter is different to the second diameter.

[0308] Where there are a plurality of internal heating elements, at least one of the plurality of internal heating elements may have a diameter in millimetres as set out above. For example, the aerosol-generating substrate may comprise one or more first internal heating elements located within the aerosol-generating substrate having a first diameter and one or more second internal heating elements located within the aerosol-generating substrate having a second diameter, wherein at least one of the first diameter and the second diameter is between 0.5 millimetres and 5 millimetres.
[0309] Where there are a plurality of internal heating elements, the plurality of internal heating elements may have an average diameter in millimetres as set out above. For example, the plurality of internal heating elements may have an average diameter of between 0.5 millimetres and 5 millimetres, between 0.5 millimetres and 4.5 millimetres, between 0.5 millimetres and 4 millimetres, between 0.5 millimetres and 3.5 millimetres, or between 0.5 millimetres and 3 millimetres.
[0310] The average diameter of the plurality of internal heating elements is equal to the sum of the individual diameters of each of the internal heating elements divided by the number of internal heating elements.
[0311] Where there are a plurality of internal heating elements, each of the plurality of internal heating elements may have a diameter in millimetres as set out above. For example, each of the plurality of internal heating elements may have a diameter of between 0.5 millimetres and 5 millimetres.
[0312] The internal heating element may have a width greater than the thickness thereof.
[0313] The internal heating element may have a substantially rectangular cross-section.
[0314] The internal heating element may have the form of a blade or a strip.
[0315] The internal heating element may have a substantially constant cross-section along the length of the internal heating element.
[0316] The internal heating element may have a thickness of at least 0.01 millimetres, at least 0.02 millimetres, at least 0.03 millimetres, or at least 0.05 millimetres.
[0317] The internal heating element may have a thickness of less than or equal to 2 millimetres, less than or equal to 1 millimetre, less than or equal to 0.5 millimetres, or less than or equal to 0.1 millimetres.
[0318] The internal heating element may have a thickness of between 0.01 millimetres and 2 millimetres, between 0.01 millimetres and 1 millimetre, between 0.01 millimetres and 0.5 millimetres, or between 0.01 millimetres and 0.1 millimetres.
[0319] The internal heating element may have a thickness of between 0.02 millimetres and 2 millimetres, between 0.02 millimetres and 1 millimetre, between 0.02 millimetres and 0.5 millimetres, or between 0.02 millimetres and 0.1 millimetres.
[0320] The internal heating element may have a thickness of between 0.03 millimetres and 2 millimetres, between 0.03 millimetres and 1 millimetre, between 0.03 millimetres and 0.5 millimetres, or between 0.03 millimetres and 0.1 millimetres.
[0321] The internal heating element may have a thickness of between 0.05 millimetres and 2 millimetres, between 0.05 millimetres and 1 millimetre, between 0.05 millimetres and 0.5 millimetres, or between 0.05 millimetres and 0.1 millimetres.
[0322] The internal heating element may have a thickness of at least 55 micrometres, at least 56 micrometres, at least 57 micrometres, or at least 58 micrometres.
[0323] The internal heating element may have a thickness of less than or equal to 65 micrometres, less than or equal to 64 micrometres, less than or equal to 63 micrometres, or less than or equal to 62 micrometres.
[0324] The internal heating element may have a thickness of between 55 micrometres and 65 micrometres, between 55 micrometres and 64 micrometres, between 55 micrometres and 63 micrometres, or between 55 micrometres and 62 micrometres.

[0325] The internal heating element may have a thickness of between 56 micrometres and 65 micrometres, between 56 micrometres and 64 micrometres, between 56 micrometres and 63 micrometres, or between 56 micrometres and 62 micrometres.
[0326] The internal heating element may have a thickness of between 57 micrometres and 65 micrometres, between 57 micrometres and 64 micrometres, between 57 micrometres and 63 micrometres, or between 57 micrometres and 62 micrometres.
[0327] The internal heating element may have a thickness of between 58 micrometres and 65 micrometres, between 58 micrometres and 64 micrometres, between 58 micrometres and 63 micrometres, or between 58 micrometres and 62 micrometres.
[0328] For example, the internal heating element may have a thickness of 60 micrometres.
[0329] The aerosol generating section of the aerosol-generating article may comprise a plurality of internal heating elements of substantially the same thickness located within the aerosol-generating substrate.
[0330] The aerosol generating section of the aerosol-generating article may comprise a plurality of internal heating elements of different thickness located within the aerosol-generating substrate. For example, the aerosol-generating substrate may comprise one or more first internal heating elements having a first thickness located within the aerosol-generating substrate and one or more second internal heating elements having a second thickness located within the aerosol-generating substrate, wherein the first thickness is different to the second thickness.
[0331] The aerosol generating device may comprise a plurality of internal heating elements of substantially the same thickness for insertion into the aerosol-generating substrate of the aerosol-generating section of the aerosol-generating article.
[0332] The aerosol generating device may comprise a plurality of internal heating elements of different thickness for insertion into the aerosol-generating substrate of the aerosol-generating section of the aerosol-generating article. For example, the aerosol-generating device may comprise one or more first internal heating elements having a first thickness for insertion into the aerosol-generating substrate of the aerosol-generating section of the aerosol-generating article and one or more second internal heating elements having a second thickness for insertion into the aerosol-generating substrate of the aerosol-generating section of the aerosol-generating article, wherein the first thickness is different to the second thickness.
[0333] Where there are a plurality of internal heating elements, at least one of the plurality of internal heating elements may have a thickness in millimetres or micrometres as set out above. For example, the aerosol-generating substrate may comprise one or more first internal heating elements located within the aerosol-generating substrate having a first thickness and one or more second internal heating elements located within the aerosol-generating substrate having a second thickness, wherein at least one of the first thickness and the second thickness is between 0.01 millimetres and 2 millimetres. For example, the aerosol-generating substrate may comprise one or more first internal heating elements located within the aerosol-generating substrate having a first thickness and one or more second internal heating elements located within the aerosol-generating substrate having a second thickness, wherein at least one of the first thickness and the second thickness is between 55 micrometres and 65 micrometres.
[0334] Where there are a plurality of internal heating elements, the plurality of internal heating elements may have an average thickness in millimetres or micrometres as set out above. For example, the plurality of internal heating elements may have an average thickness of between 0.01 millimetres and 2 millimetres, between 0.01 millimetres and 1 millimetre, between 0.01 millimetres and 0.5 millimetres, or between 0.01 millimetres and 0.1 millimetres. For example, the plurality of internal heating elements may have an average thickness of between 55 micrometres and 65 micrometres, between 55 micrometres and 64 micrometres, between 55 micrometres and 63 micrometres, or between 55 micrometres and 62 micrometres.
[0335] The average thickness of the plurality of internal heating elements is equal to the sum of the

individual thicknesses of each of the internal heating elements divided by the number of internal heating elements.
[0336] Where there are a plurality of internal heating elements, each of the plurality of internal heating elements may have a thickness in millimetres or micrometres as set out above. For example, each of the plurality of internal heating elements may have a thickness of between 0.01 millimetres and 2 millimetres. For example, each of the plurality of internal heating elements may have a thickness of between 55 micrometres and 65 micrometres.
[0337] The internal heating element may be located within the aerosol-generating substrate.
[0338] The internal heating element may be arranged substantially longitudinally within the aerosol-generating section. That is, a longitudinal axis of the internal heating element may be approximately parallel to a longitudinal axis of the aerosol-generating section. For example, a longitudinal axis of the internal heating element may be within plus or minus 10 degrees of parallel to a longitudinal axis of the aerosol-generating section.
[0339] The internal heating element may be arranged centrally within the aerosol-generating section. The internal heating element may extend along a longitudinal axis of the aerosol-generating section.
[0340] The internal heating element may extend from a downstream end of the aerosol-generating section towards an upstream end of the aerosol-generating section.
[0341] The internal heating element may extend from an upstream end of the aerosol-generating section towards a downstream end of the aerosol-generating section.
[0342] The internal heating element may extend from an upstream end of the aerosol-generating section to a downstream end of the aerosol-generating substrate. That is, the internal heating element may extend along the entire length of the aerosol-generating section.
[0343] The length of the internal heating element may be substantially the same as the length of the aerosol-generating section.
[0344] The internal heating element may extend part way along the length of the aerosol-generating section.
[0345] The internal heating element may be spaced apart from a downstream end of the aerosol-generating section.
[0346] The internal heating element may be spaced apart from an upstream end of the aerosol-generating section.
[0347] The internal heating element may be spaced apart from both a downstream end and an upstream end of the aerosol-generating section.
[0348] The length of the internal heating element may be less than the length of the aerosol-generating section.
[0349] The internal heating element may be entirely enclosed within the aerosol-generating substrate. That is, the aerosol-generating substrate may completely surround the internal heating element.
[0350] The internal heating element may be a susceptor element.
[0351] The susceptor element may extend from an upstream end of the aerosol-generating section towards a downstream end of the aerosol-generating section.
[0352] The susceptor element may extend from an upstream end of the aerosol-generating section to a downstream end of the aerosol-generating substrate. That is, the susceptor element may extend along the entire length of the aerosol-generating section.
[0353] The susceptor element may comprise any susceptor material that can be inductively heated to a temperature sufficient to generate an aerosol from the aerosol-generating substrate. For example, the susceptor element may comprise a metal, an alloy, or carbon.
[0354] The susceptor element may comprise a ferromagnetic material. For example, the susceptor element may comprise a ferromagnetic alloy, ferritic iron, or a ferromagnetic steel or stainless steel. The susceptor element may comprise aluminium. The susceptor element may comprise 400 series

stainless steels. For example, the susceptor element may comprise grade 410, or grade 420, or grade 430 stainless steel. Different susceptor materials will dissipate different amounts of energy when positioned within electromagnetic fields having similar values of frequency and field strength.

[0355] Thus, parameters of the susceptor element such as susceptor material type, length, width, and thickness may all be altered to provide a desired power dissipation within a known electromagnetic field. The susceptor element may be heated to a temperature in excess of 250 degrees Celsius.

[0356] The susceptor element may comprise a non-metallic core with a metal layer disposed on the non-metallic core. For example, the susceptor element may comprise metallic tracks formed on a surface of a ceramic core.

[0357] The susceptor element may comprise a protective outer layer. For example, the susceptor element may comprise a protective outer ceramic layer, a protective outer glass layer, or a protective outer inert metal layer.

[0358] The susceptor element may comprise a protective coating. For example, the susceptor element may comprise a protective coating formed by a glass, a ceramic, or an inert metal.

[0359] The susceptor element may be a multi-material susceptor element. For example, the susceptor element may comprise a first susceptor material and a second susceptor material.

[0360] The internal heating-element may be a resistive heating element.

[0361] An aerosol-generating article according to the present disclosure may comprise an upstream section located upstream of the aerosol-generating section. The upstream section may be adjacent to the aerosol-generating section. The upstream section may be adjacent to the upstream end of the aerosol-generating section. The upstream section may be located immediately upstream of the aerosol-generating section. The upstream section may abut the aerosol-generating section. The upstream section may abut the upstream end of the aerosol-generating section. The downstream end of the upstream section may abut the aerosol-generating section. The downstream end of an upstream element of the upstream section may abut the aerosol-generating section. The upstream end of the aerosol-generating article may be defined by the upstream end of the upstream section.

[0362] The upstream section may comprise one or more upstream elements. The upstream section, and an upstream element thereof, advantageously prevents direct physical contact with the upstream end of the aerosol-generating substrate of the aerosol-generating section.

[0363] For example, where the aerosol-generating section comprises a susceptor element, the upstream element may prevent direct physical contact with the upstream end of the susceptor element. This helps to prevent the displacement or deformation of the susceptor element during handling or transport of the aerosol-generating article. This in turn helps to secure the form and position of the susceptor element. Furthermore, the presence of an upstream element helps to prevent any loss of the substrate, which may be advantageous, for example, if the substrate contains particulate plant material.

[0364] Where the aerosol-generating substrate of the aerosol-generating section comprises a plurality of strands or shredded tobacco, such as tobacco cut filler, the upstream section and elements thereof may additionally help to prevent the loss of loose particles of tobacco from the upstream end of the article. This may be particularly important when the bulk density of the aerosol-generating substrate is relatively low, for example.

[0365] The upstream section, or upstream element thereof, may also additionally provide a degree of protection to the aerosol-generating substrate during storage, as the presence of an upstream section offsets the aerosol-generating section away from the upstream end of the article and also covers at least to some extent the upstream end of the aerosol-generating substrate, which may otherwise be exposed.

[0366] For aerosol-generating articles that are intended to be inserted into a cavity in an aerosol-generating device such that the aerosol-generating substrate can be externally heated within the

cavity, the upstream section may advantageously facilitate the insertion of the upstream end of the article into the cavity. The inclusion of the upstream element may additionally protect the end of the aerosol-generating substrate during the insertion of the article into the cavity such that the risk of damage to the substrate is minimised.
[0367] The upstream section, or upstream element thereof, may also provide an improved appearance to the upstream end of the aerosol-generating article. Furthermore, if desired, the upstream section may be used to provide information on the aerosol-generating article, such as information on brand, flavour, content, or details of the aerosol-generating device that the article is intended to be used with.
[0368] An upstream element may comprise or be a plug element. An upstream element may comprise or be a porous plug element. An upstream element may be formed of a solid cylindrical plug element having a filled cross-section. Such a plug element may be referred to as a ‘plain’ element. The solid plug element may be porous, as described above, but does not have a tubular form and therefore does not provide a longitudinal flow channel. The solid plug element may have a substantially uniform transverse cross section.
[0369] An upstream element may have a porosity of at least 50 percent in the longitudinal direction of the aerosol-generating article. An upstream element may have a porosity of between 50 percent and 90 percent in the longitudinal direction. The porosity of an upstream element in the longitudinal direction is defined by the ratio of the cross-sectional area of material forming the upstream element and the internal cross-sectional area of the aerosol-generating article at a position along the upstream element.
[0370] An upstream element may be made of a porous material or may comprise a plurality of openings. This may, for example, be achieved through laser perforation. The plurality of openings may be distributed homogeneously over the cross-section of the upstream element.
[0371] The porosity or permeability of an upstream element may advantageously be designed in order to provide an aerosol-generating article with a particular overall resistance to draw (RTD) without substantially impacting the filtration provided by other portions of the article.
[0372] An upstream element may be formed from a material that is impermeable to air. The aerosol-generating article may be configured such that air flows into the aerosol-generating substrate through suitable ventilation means provided in a surrounding wrapper.
[0373] It may be desirable to minimise the RTD of an upstream element. For example, this may be the case for articles that are intended to be inserted the cavity of an aerosol-generating device such that the aerosol-generating substrate is externally heated. It may be desirable to provide the article with as low an RTD as possible, so that the majority of the RTD experience by the consumer is provided by the aerosol-generating device and not the article.
[0374] The RTD of an upstream element may be less than or equal to 30 millimetres H.sub.2O. The RTD of an upstream element may be less than or equal to 20 millimetres H.sub.2O. The RTD of an upstream element may be less than or equal to 10 millimetres H.sub.2O. The RTD of the upstream element may be less than or equal to 5 millimetres H.sub.2O. The RTD of the upstream element may be less than or equal to 2 millimetres H.sub.2O.
[0375] The RTD of an upstream element may be at least 0 millimetres H.sub.2O, or at least 0.1 millimetres H.sub.2O, or at least 0.25 millimetres H.sub.2O, or at least 0.5 millimetres H.sub.2O.
[0376] The RTD of an upstream element may be from 0 or 0.1 millimetres H.sub.2O to 30millimetres H.sub.2O, or from 0.25 millimetres H.sub.2O to 30 millimetres H.sub.2O, or from 0.5 millimetres H.sub.2O to 30 millimetres H.sub.2O. The RTD of an upstream element may be from 0 or 0.1 millimetres H.sub.2O to 20 millimetres H.sub.2O, or from 0.25 millimetres H.sub.2O to 20 millimetres H.sub.2O, or from 0.5 millimetres H.sub.2O to 20 millimetres H.sub.2O. The RTD of an upstream element may be from 0 or 0.1 millimetres H.sub.2O to 10 millimetres H.sub.2O, or from 0.25 millimetres H.sub.2O to 10 millimetres H.sub.2O, or from 0.5 millimetres H.sub.2O to 10 millimetres H.sub.2O. The RTD of an upstream element may be from 0 or 0.1

millimetres H.sub.2O to 5 millimetres H.sub.2O, or from 0.25 millimetres H.sub.2O to 5 millimetres H.sub.2O, or from 0.5 millimetres H.sub.2O to 5 millimetres H.sub.2O. The RTD of an upstream element may be from 0 or 0.1 millimetres H.sub.2O to 2 millimetres H.sub.2O, or from 0.25 millimetres H.sub.2O to 2 millimetres H.sub.2O, or from 0.5 millimetres H.sub.2O to 2 millimetres H.sub.2O.

[0377] An upstream element may have an RTD of less than or equal to 2 millimetres H.sub.2O per millimetre of length, or less than or equal to 1.5 millimetres H.sub.2O per millimetre of length, or less than or equal to 1 millimetre H.sub.2O per millimetre of length, or less than or equal to 0.5 millimetres H.sub.2O per millimetre of length, or less than or equal to 0.3 millimetres H.sub.2O per millimetre of length, or less than or equal to 0.2 millimetres H.sub.2O per millimetre of length.

[0378] The combined RTD of the upstream section, or an upstream element thereof, and the aerosol-generating substrate may be less than or equal to 15 millimetres H.sub.2O, or less than or equal to 12 millimetres H.sub.2O, or less than or equal to 10 millimetres H.sub.2O.

[0379] An upstream element may be formed of a hollow tubular element defining a longitudinal cavity providing an unrestricted flow channel. An upstream element can provide protection for the aerosol-generating substrate, as described above, whilst having a minimal effect on the overall resistance to draw (RTD) and filtration properties of the article.

[0380] A diameter of the longitudinal cavity of the hollow tubular element forming an upstream element may be at least 3 millimetres, or at least 3.5 millimetres, or at least 4 millimetres, or at least 4.5 millimetres. The diameter of the longitudinal cavity may be maximised in order to minimise the RTD of the upstream section, or an upstream element thereof.

[0381] A wall thickness of the hollow tubular element may be less than or equal to 2 millimetres, or less than or equal to 1.5 millimetres or less than or equal to 1 millimetre.

[0382] An upstream element of the upstream section may be made of any material suitable for use in an aerosol-generating article. The upstream element may, for example, be made of a same material as used for one of the other components of the aerosol-generating article, such as a downstream filter element or a downstream hollow tubular element. Suitable materials for forming the upstream element of the present disclosure include filter materials, ceramic, polymer material, cellulose acetate, cardboard, zeolite or aerosol-generating substrate. The upstream element may comprise a plug of cellulose acetate. The upstream element may comprise a hollow acetate tube, or a cardboard tube.

[0383] An upstream element may be formed of a heat resistant material. For example, an upstream element is formed of a material that resists temperatures of up to 350 degrees Celsius. This ensures that an upstream element is not adversely affected by the heating means for heating the aerosol-generating substrate.

[0384] The upstream section, or an upstream element thereof, may have an external diameter that is approximately equal to the external diameter of the aerosol-generating article. The external diameter of the upstream section, or an upstream element thereof, may be between 5 millimetres and 8 millimetres, or between 5.25 millimetres and 7.5 millimetres, or between 5.5 millimetres and 7 millimetres.

[0385] The upstream section or an upstream element may have a length of between 2 millimetres and 10 millimetres, or between 3 millimetres and 8 millimetres, or between 2 millimetres and 6 millimetres. The upstream section or an upstream element may have a length of 5 millimetres. The length of the upstream section or an upstream element can advantageously be varied in order to provide the desired total length of the aerosol-generating article. For example, where it is desired to reduce the length of one of the other components of the aerosol-generating article, the length of the upstream section or an upstream element may be increased in order to maintain the same overall length of the article.

[0386] In addition, the length of the upstream section, or an upstream element thereof, can be used to control the position of the aerosol-generating article within the cavity of an aerosol-generating

device, for articles which are intended to be externally heated. This can advantageously ensure that the position of the aerosol-generating substrate within the cavity can be optimised for heating and the position of any ventilation can also be optimised.

[0387] The upstream section may be circumscribed by a wrapper, such as a plug wrap. The wrapper circumscribing the upstream section may be a stiff plug wrap, for example, a plug wrap having a basis weight of at least 80 grams per square metre (gsm), or at least 100 gsm, or at least 110 gsm. This provides structural rigidity to the upstream section.

[0388] The upstream section may be connected to the aerosol-generating section by means of an outer wrapper. The upstream section may also be connected to at least a part of the downstream section by means of an outer wrapper, either the same outer wrapper connecting the upstream section to the aerosol-generating section or a different one.

[0389] An aerosol-generating article according to the present disclosure comprises a downstream section located downstream of the aerosol-generating section. The downstream section may be adjacent to the aerosol-generating section. The downstream section may be adjacent to the downstream end of the aerosol-generating section. The downstream section may be located immediately downstream of the aerosol-generating section. The downstream section may abut the aerosol-generating section. The downstream section may abut the downstream end of the aerosol-generating section. The upstream end of the downstream section may abut the aerosol-generating section. The downstream section of the aerosol-generating article may extend between the aerosol-generating section and the downstream end of the aerosol-generating article. The downstream end of the aerosol-generating article may be defined by the downstream end of the downstream section. The downstream end of the aerosol-generating article may coincide with the downstream end of the downstream section.

[0390] The downstream section may comprise one or more elements, each of which are described in more detail within the present disclosure. The upstream end of an element of the downstream section may abut the aerosol-generating section. The downstream end of an element of the downstream section may define the downstream end of the aerosol-generating article.

[0391] The length of the downstream section may be at least 20 millimetres. The length of the downstream section may be at least 25 millimetres. The length of the downstream section may be at least 30 millimetres.

[0392] The length of the downstream section may be less than or equal to 75 millimetres. The length of the downstream section may be equal to or less than 70 millimetres. The length of the downstream section may be equal to or less than 65 millimetres.

[0393] The length of the downstream section may be between 20 millimetres and 75 millimetres, or between 25 millimetres and 75 millimetres, or between 30 millimetres and 75 millimetres. The length of the downstream section may be between 20 millimetres and 70 millimetres, or between 25 millimetres and 70 millimetres, or between 30 millimetres and 70 millimetres. The length of the downstream section may be between 20 millimetres and 65 millimetres, or between 25 millimetres and 65 millimetres, or between 30 millimetres and 65 millimetres.

[0394] Providing a relatively long downstream section, ensures that a suitable length of the aerosol-generating article protrudes from an aerosol-generating device when the article is received therein. Such a suitable protrusion length facilitates the ease of insertion and extraction of the article from the device, which also ensures that the upstream portions of the article are suitably inserted into the device with reduced risk of damage, particularly during insertion.

[0395] A ratio between the length of the downstream section and an overall length of the aerosol-generating article may be less than or equal to 0.85. A ratio between the length of the downstream section and an overall length of the aerosol-generating article may be less than or equal to 0.80. A ratio between the length of the downstream section and an overall length of the aerosol-generating article may be less than or equal to 0.75. A ratio between the length of the downstream section and an overall length of the aerosol-generating article may be less than or equal to 0.70.

[0396] A ratio between the length of the downstream section and an overall length of the aerosol-generating article may be at least 0.50. A ratio between the length of the downstream section and an overall length of the aerosol-generating article may be at least 0.55. A ratio between the length of the downstream section and an overall length of the aerosol-generating article may be at least 0.60. A ratio between the length of the downstream section and an overall length of the aerosol-generating article may be at least 0.65.
[0397] A ratio between the length of the downstream section and an overall length of the aerosol-generating article may be from 0.50 to 0.85, from 0.55 to 0.85, from 0.60 to 0.85, or from 0.65 to 0.85. A ratio between the length of the downstream section and an overall length of the aerosol-generating article may be from 0.50 to 0.80, from 0.55 to 0.80, from 0.60 to 0.80, or from 0.65 to 0.80. A ratio between the length of the downstream section and an overall length of the aerosol-generating article may be from 0.50 to 0.75, from 0.55 to 0.75, from 0.60 to 0.75, or from 0.65 to 0.75. A ratio between the length of the downstream section and an overall length of the aerosol-generating article may be from 0.50 to 0.70, from 0.55 to 0.70, from 0.60 to 0.70, or from 0.65 to 0.70.
[0398] A ratio between the length of the downstream section and the length of the upstream section may be less than or equal to 30. A ratio between the length of the downstream section and the length of the upstream section may be less than or equal to 20. A ratio between the length of the downstream section and the length of the upstream section may be less than or equal to 15. A ratio between the length of the downstream section and the length of the upstream section may be less than or equal to 10.
[0399] A ratio between the length of the downstream section and the length of the upstream section may be at least 4. A ratio between the length of the downstream section and the length of the upstream section may be at least 5. A ratio between the length of the downstream section and the length of the upstream section may be at least 6. A ratio between the length of the downstream section and the length of the upstream section may be at least 7.
[0400] A ratio between the length of the downstream section and the length of the upstream section may be from 4 to 30, from 5 to 30, from 6 to 30, or from 7 to 18. A ratio between the length of the downstream section and the length of the upstream section may be from 4 to 20, from 5 to 20, from 6 to 20, or from 7 to 20. A ratio between the length of the downstream section and the length of the upstream section may be from 4 to 15, from 5 to 15, from 6 to 15, or from 7 to 15. A ratio between the length of the downstream section and the length of the upstream section may be from 4 to 10, from 5 to 10, from 6 to 10, or from 7 to 10.
[0401] A ratio between the length of the downstream section and the length of the aerosol-generating section may be at least 1.0. A ratio between the length of the downstream section and the length of the aerosol-generating section may be at least 1.25. A ratio between the length of the downstream section and the length of the aerosol-generating section may be at least 1.5. A ratio between the length of the downstream section and the length of the aerosol-generating section may be at least 1.75.
[0402] A ratio between the length of the downstream section and the length of the aerosol-generating section may be less than or equal to 3.5. A ratio between the length of the downstream section and the length of the aerosol-generating section may be less than or equal to 3.25. A ratio between the length of the downstream section and the length of the aerosol-generating section may be less than or equal to 3.0. A ratio between the length of the downstream section and the length of the aerosol-generating section may be less than or equal to 2.75.
[0403] A ratio between the length of the downstream section and the length of the aerosol-generating section may be from 1.0 to 3.5, from 1.25 to 3.5, from 1.50 to 3.5, or from 1.75 to 3.5. A ratio between the length of the downstream section and the length of the aerosol-generating section may be from 1.0 to 3.25, from 1.25 to 3.25, from 1.50 to 3.25, or from 1.75 to 3.25. A ratio between the length of the downstream section and the length of the aerosol-generating section may be from

1.0 to 3.0, from 1.25 to 3.0, from 1.50 to 3.0, or from 1.75 to 3.0. A ratio between the length of the downstream section and the length of the aerosol-generating section may be from 1.0 to 2.75, from 1.25 to 2.75, from 1.50 to 2.75, or from 1.75 to 2.75.

[0404] The downstream section of an aerosol-generating article may comprise a support element provided downstream of the aerosol-generating section. The support element may be provided immediately downstream of the aerosol-generating section. In other words, the support element may abut a downstream end of the aerosol-generating section. The support element may define an upstream end of the downstream section of the aerosol-generating article. The support element may also define a downstream end of the downstream section of the aerosol-generating article. The support element may also extend to the downstream end of the aerosol-generating article. The downstream section of the aerosol-generating article may comprise a single support element. In other words, the downstream section of the aerosol-generating article may comprise only one support element. The downstream section may comprise two or more support elements in accordance with the present disclosure.

[0405] The support element of the downstream section may comprise a hollow tubular element. The downstream section of an aerosol-generating article may comprise a hollow tubular element provided downstream of the aerosol-generating section. The hollow tubular element may be provided immediately downstream of the aerosol-generating section. In other words, the hollow tubular element may abut a downstream end of the aerosol-generating section. The hollow tubular element may define an upstream end of the downstream section of the aerosol-generating article. The hollow tubular element may also define a downstream end of the downstream section of the aerosol-generating article. The hollow tubular element may also extend to the downstream end of the aerosol-generating article. The downstream section of the aerosol-generating article may comprise a single hollow tubular element. In other words, the downstream section of the aerosol-generating article may comprise only one hollow tubular element. The downstream section may comprise two or more hollow tubular elements in accordance with the present disclosure.

[0406] The support element may have a length of at least 10 millimetres, or at least 15 millimetres.

[0407] The support element may have a length of less than or equal to 30 millimetres, or less than or equal to 25 millimetres, or less than or equal to 22 millimetres.

[0408] The support element may have a length of from 10 millimetres to 30 millimetres, from 15 millimetres to 25 millimetres, or from 15 millimetres to 22 millimetres. For example, the support element may have a length of 16 millimetres.

[0409] The downstream section may comprise a filter segment or filter element. A filter segment or element may be referred to as a mouthpiece element or segment. The filter element may extend to a downstream end of the downstream section. The filter element may be located at the downstream end of the aerosol-generating article. The downstream end of the filter element may define the downstream end of the aerosol-generating article.

[0410] The filter element may be located downstream of a support element of the downstream section. The filter element may extend between the support element and the downstream end of the aerosol-generating article. The filter element may abut the support element of the downstream section. The upstream end of the filter element may abut the downstream end of the support element of the downstream section.

[0411] The filter element may be a solid plug, which may also be described as a ‘plain’ plug and is non-tubular. The filter element therefore may have a substantially uniform transverse cross section.

[0412] The filter element may be formed of a fibrous filtration material. The fibrous filtration material may be for filtering the aerosol that is generated from the aerosol-generating substrate. Suitable fibrous filtration materials are known to the skilled person. The filter element may comprise a cellulose acetate filter element formed of cellulose acetate tow.

[0413] The downstream section may include a single filter element. The downstream section may include two or more filter elements axially aligned in an abutting end to end relationship with each

other.
[0414] The filter element may comprise a flavourant, which may be provided in any suitable form. For example, the filter element may comprise one or more capsules, beads or granules of a flavourant, or one or more flavour loaded threads or filaments.
[0415] The filter element may have a low particulate filtration efficiency.
[0416] The filter element may be circumscribed by a plug wrap. The filter element may be unventilated such that air does not enter the aerosol-generating article along the filter element.
[0417] The filter element may be connected to one or more of the adjacent upstream components of the aerosol-generating article by means of a tipping wrapper.
[0418] The filter element may have an external diameter that may be approximately equal to the external diameter of the aerosol-generating article. The diameter of a filter element may be substantially the same as the outer or external diameter of the support element.
[0419] The external diameter of the filter element may be between 5 millimetres and 10 millimetres. The diameter of the filter element may be between 5.5 millimetres and 9 millimetres. The diameter of the filter element may be between 6 millimetres and 8 millimetres. The diameter of the filter element may be less than or equal to 7 millimetres.
[0420] The resistance to draw (RTD) of the downstream section may be at least 0 millimetres H.sub.2O. The RTD of the downstream section may be at least 3 millimetres H.sub.2O. The RTD of the downstream section may be at least 6 millimetres H.sub.2O.
[0421] The RTD of the downstream section may be less than or equal to 12 millimetres H.sub.2O. The RTD of the downstream section may be less than or equal to 11 millimetres H.sub.2O. The RTD of the downstream section may be less than or equal to 10 millimetres H.sub.2O.
[0422] The resistance to draw of the downstream section may be greater than or equal to 0 millimetres H.sub.2O and less than or equal to 12 millimetres H.sub.2O. The resistance to draw of the downstream section may be greater than or equal to 3 millimetres H.sub.2O and less than or equal to 12 millimetres H.sub.2O. The resistance to draw of the downstream section may be greater than or equal to 0 millimetres H.sub.2O and less than or equal to 11 millimetres H.sub.2O. The resistance to draw of the downstream section may be greater than or equal to 3 millimetres H.sub.2O and less than or equal to 11 millimetres H.sub.2O. The resistance to draw of the downstream section may be greater than or equal to 6 millimetres H.sub.2O and less than or equal to 10 millimetres H.sub.2O. The resistance to draw of the downstream section may be 8 millimetres H.sub.2O.
[0423] The resistance to draw (RTD) characteristics of the downstream section may be wholly or mostly attributed to the RTD characteristics of the filter element of the downstream section. In other words, the RTD of the filter element of the downstream section may wholly define the RTD of the downstream section.
[0424] The resistance to draw (RTD) of the filter element may be at least 0 millimetres H.sub.2O. The RTD of the filter element may be at least 3 millimetres H.sub.2O. The RTD of the filter element may be at least 6 millimetres H.sub.2O.
[0425] The RTD of the filter element may be less than or equal to 12 millimetres H.sub.2O. The RTD of the filter element may be less than or equal to 11 millimetres H.sub.2O. The RTD of the filter element may be less than or equal to 10 millimetres H.sub.2O.
[0426] The resistance to draw of the filter element may be greater than or equal to 0 millimetres H.sub.2O and less than or equal to 12 millimetres H.sub.2O. The resistance to draw of the filter element may be greater than or equal to 3 millimetres H.sub.2O and less than or equal to 12 millimetres H.sub.2O. The resistance to draw of the filter element may be greater than or equal to 0 millimetres H.sub.2O and less than or equal to 11 millimetres H.sub.2O. The resistance to draw of the filter element may be greater than or equal to 3 millimetres H.sub.2O and less than or equal to 11 millimetres H.sub.2O. The resistance to draw of the filter element may be greater than or equal to 6 millimetres H.sub.2O and less than or equal to 10 millimetres H.sub.2O. The resistance to

draw of the filter element may be 8 millimetres H.sub.2O.
[0427] As mentioned above, the filter element may be formed of a fibrous filtration material. The filter element may be formed of a porous material. The filter element may be formed of a biodegradable material. The filter element may be formed of a cellulose material, such as cellulose acetate. For example, a filter element may be formed from a bundle of cellulose acetate fibres having a denier per filament between 10 and 15. For example, a filter element formed from relatively low density cellulose acetate tow, such as cellulose acetate tow comprising fibres of 12 denier per filament.
[0428] The filter element may be formed of a polylactic acid based material. The filter element may be formed of a bioplastic material or a starch-based bioplastic material. The filter element may be made by injection moulding or by extrusion. Bioplastic-based materials are advantageous because they are able to provide filter element structures which are simple and cheap to manufacture with a particular and complex cross-sectional profile, which may comprise a plurality of relatively large air flow channels extending through the filter element material, that provides suitable RTD characteristics.
[0429] The filter element may be formed from a sheet of suitable material that has been crimped, pleated, gathered, woven or folded into an element that defines a plurality of longitudinally extending channels. Such sheet of suitable material may be formed of paper, cardboard, a polymer, such as polylactic acid, or any other cellulose-based, paper-based material or bioplastic-based material. A cross-sectional profile of such a filter element may show the channels as being randomly oriented.
[0430] The filter element may be formed in any other suitable manner. For example, the filter element may be formed from a bundle of longitudinally extending tubes. The longitudinally extending tubes may be formed from polylactic acid. The filter element may be formed by extrusion, moulding, lamination, injection, or shredding of a suitable material. Thus, it is preferred that there is a low-pressure drop (or RTD) from an upstream end of the filter element to a downstream end of the filter element.
[0431] The length of the filter element may be at least 5 millimetres. The length of the filter element may be at least 7 millimetres. The length of the filter element may less than or equal to 15 millimetres. The length of the filter element may be less than or equal to 12 millimetres. For example, the length of the filter element may be between 5 millimetres and 15 millimetres, or between 7 millimetres and 15 millimetres, or between 5 millimetres and 12 millimetres, or between 7millimetres and 12 millimetres.
[0432] A ratio between the length of the filter element and the length of the downstream section may be less than or equal to 0.55. A ratio between the length of the filter element and the length of the downstream section may be less than or equal to 0.45. A ratio between the length of the filter element and the length of the downstream section may be less than or equal to 0.35. A ratio between the length of the filter element and the length of the downstream section may be less than or equal to 0.25.
[0433] A ratio between the length of the filter element and the length of the downstream section may be at least 0.05. A ratio between the length of the filter element and the length of the downstream section may be at least 0.10. A ratio between the length of the filter element and the length of the downstream section may be at least 0.15. A ratio between the length of the filter element and the length of the downstream section may be at least 0.20.
[0434] A ratio between the length of the filter element and the length of the downstream section may be from 0.05 to 0.55, from 0.10 to 0.55, from 0.15 to 0.55, or from 0.20 to 0.55. A ratio between the length of the filter element and the length of the downstream section may be from 0.05 to 0.45, from 0.10 to 0.45, from 0.15 to 0.45, or from 0.20 to 0.45. A ratio between the length of the filter element and the length of the downstream section may be from 0.05 to 0.35, from 0.10 to 0.35, from 0.15 to 0.35, or from 0.20 to 0.35. A ratio between the length of the filter element and

the length of the downstream section may be between 0.20 and 0.25, or a ratio between the length of the filter element and the length of the downstream section may be 0.25.
[0435] A ratio between the length of the filter element and an overall length of the aerosol-generating article may be less than or equal to 0.40. A ratio between the length of the filter element and an overall length of the aerosol-generating article may be less than or equal to 0.30. A ratio between the length of the filter element and an overall length of the aerosol-generating article may be less than or equal to 0.25. A ratio between the length of the filter element and an overall length of the aerosol-generating article may be less than or equal to 0.20.
[0436] A ratio between the length of the filter element and an overall length of the aerosol-generating article may be at least 0.05. A ratio between the length of the filter element and an overall length of the aerosol-generating article may be at least 0.07. A ratio between the length of the filter element and an overall length of the aerosol-generating article may be at least 0.10. A ratio between the length of the filter element and an overall length of the aerosol-generating article may be at least 0.15.
[0437] A ratio between the length of the filter element and an overall length of the aerosol-generating article may be from 0.05 to 0.40, from 0.07 to 0.40, from 0.10 to 0.40, or from 0.15 to 0.40. A ratio between the length of the filter element and an overall length of the aerosol-generating article may be from 0.05 to 0.30, from 0.07 to 0.30, from 0.10 to 0.30, or from 0.15 to 0.30. A ratio between the length of the filter element and an overall length of the aerosol-generating article may be from 0.05 to 0.25, from 0.07 to 0.25, from 0.10 to 0.25, or from 0.15 to 0.25. A ratio between the length of the filter element and an overall length of the aerosol-generating article may be between 0.15 and 0.20, or ratio between the length of the filter element and an overall length of the aerosol-generating article may be 0.16.
[0438] Where the downstream section may comprise a support element and a filter element, a ratio of the length of the support element to the length of the filter element may be at least 1.25. In other words, the length of the support element may be equivalent to 125% of the length of the filter element. A ratio of the length of the support element to the length of the filter element may be at least 1.5. A ratio of the length of the support element to the length of the filter element may be at least 2.
[0439] A ratio of the length of the support element to the length of the filter element may be equal to or less than 8.5. A ratio of the length of the support element to the length of the filter element may be equal to or less than 6. A ratio of the length of the support element to the length of the filter element may be equal to or less than 4.
[0440] A ratio of the length of the support element to the length of the filter element may be between 1.25 and 8.5. A ratio of the length of the support element to the length of the filter element may be between 1.5 and 6. A ratio of the length of the support element to the length of the filter element may be between 2 and 4.
[0441] The downstream section may further comprise a mouth end cavity located at a downstream end of the aerosol-generating article. The mouth end cavity may be defined by a further hollow tubular element provided at the downstream end of the aerosol-generating article. The mouth end cavity may be located downstream of the filter element, where present. The mouth end cavity may be defined by a wrapper circumscribing one or more adjacent components of the aerosol-generating article, wherein the wrapper extends in a downstream direction from the one or more adjacent components.
[0442] The aerosol-generating article may comprise a ventilation zone at a location along the downstream section. The aerosol-generating article may comprise a ventilation zone at a location along the support element of the downstream section. As discussed in the present disclosure, the support element may comprise a hollow tubular element. Such, or any, ventilation zone may extend through the peripheral wall of the support element, where the support element comprises a hollow tubular element. As such, fluid communication may be established between the flow channel

internally defined by the hollow tubular element and the outer environment. The ventilation zone is further described within the present disclosure.
[0443] As such, a ventilated cavity may be provided downstream of the aerosol-generating substrate. This provides several potential technical benefits.
[0444] First of all, it has been found that one such ventilated hollow tubular element provides a particularly efficient cooling of the aerosol. Thus, a satisfactory cooling of the aerosol can be achieved even by means of a relatively short downstream section. This is especially desirable as it enables the provision of an aerosol-generating article wherein an aerosol-generating substrate (and particularly a tobacco-containing one) is heated rather than combusted that combines a satisfactory aerosol delivery with an efficient cooling of the aerosol down to temperatures that are desirable for the consumer.
[0445] Secondly, it has been surprisingly found that such rapid cooling of the volatile species released upon heating the aerosol-generating substrate promotes enhances nucleation of aerosol particles. This effect is felt particularly when the ventilation zone is arranged at a precisely defined location along the length of the hollow tubular element relative to other components of the aerosol-generating article. In effect, the inventors have found that the favourable effect of the enhanced nucleation is capable of significantly countering potentially less desirable effects of the dilution induced by the introduction of ventilation air.
[0446] A distance between the ventilation zone and an upstream end of the aerosol-generating article (or upstream end of the upstream section) may be at least 25 millimetres. As used herein, the term ‘distance between the ventilation zone and another element or portion of the aerosol-generating article’ refers to a distance measured in the longitudinal direction, that is, in a direction extending along, or parallel to, the cylindrical axis of the aerosol-generating article.
[0447] A distance between the ventilation zone and an upstream end of the aerosol-generating article may be at least 26 millimetres. A distance between the ventilation zone and an upstream end of the aerosol-generating article may be at least 27 millimetres.
[0448] A distance between the ventilation zone and an upstream end of the aerosol-generating article may be less than or equal to 40 millimetres. A distance between the ventilation zone and an upstream end of the aerosol-generating article may be less than or equal to 37 millimetres. A distance between the ventilation zone and an upstream end of the aerosol-generating article may be less than or equal to 34 millimetres.
[0449] A distance between the ventilation zone and an upstream end of the aerosol-generating article may be from 25 millimetres to 40 millimetres, from 26 millimetres to 40 millimetres, or from 27 millimetres to 40 millimetres.
[0450] A distance between the ventilation zone and an upstream end of the aerosol-generating article may be from 25 millimetres to 37 millimetres, from 26 millimetres to 37 millimetres, or from 27 millimetres to 37 millimetres.
[0451] A distance between the ventilation zone and an upstream end of the aerosol-generating article may be from 25 millimetres to 34 millimetres, from 26 millimetres to 34 millimetres, or from 27 millimetres to 34 millimetres.
[0452] Aerosol-generating articles comprising a ventilation zone at a location along the hollow tubular element at a distance from an upstream end of the aerosol-generating article falling within the ranges described above have been found to present multiple benefits.
[0453] Firstly, such articles have been observed to provide particularly satisfactory aerosol deliveries to the consumer, particularly where the aerosol-generating substrate comprises tobacco.
[0454] Without wishing to be bound by theory, the intense cooling caused by the ambient air drawn into the cavity of the hollow tubular element at the ventilation zone is understood to accelerate the condensation of droplets of aerosol former (for example, glycerin) that has been released from the aerosol-generating substrate upon heating. In turn, the volatilised nicotine and organic acids similarly released from the tobacco substrate accumulate onto the newly formed droplets of aerosol

former, and subsequently combine into nicotine salts. Accordingly, the overall proportion of the aerosol particulate phase to the aerosol gas phase may be enhanced compared with existing aerosol-generating articles.

[0455] Positioning the ventilation zone at a distance from an upstream end of the aerosol-generating article as described above advantageously reduces the fly time of the volatilised nicotine before the volatilised nicotine particles reach the droplets of aerosol former. At the same time, one such positioning of the ventilation zone relative to an upstream end of the aerosol-generating article ensures there are enough time and room for the accumulation of nicotine and formation of nicotine salts to occur in a significant proportion before the flow of aerosol reaches the consumer's mouth.

[0456] The ventilation zone may typically comprise a plurality of perforations extending through the peripheral wall of the hollow tubular element. The ventilation zone may comprise at least one circumferential row of perforations. The ventilation zone may comprise two circumferential rows of perforations. For example, the perforations may be formed online during manufacturing of the aerosol-generating article. Each circumferential row of perforations may comprise from 8 to 30 perforations.

[0457] An aerosol-generating article may have a ventilation level of at least 2 percent. The term “ventilation level” is used throughout the present disclosure to denote a volume ratio between of the airflow admitted into the aerosol-generating article via the ventilation zone (ventilation airflow) and the sum of the aerosol airflow and the ventilation airflow. The greater the ventilation level, the higher the dilution of the aerosol flow delivered to the consumer. The aerosol-generating article may have a ventilation level of at least 5 percent, or at least 10 percent, or at least 12 percent or at least 15 percent. The aerosol-generating article may have a ventilation level of at least 20 percent, or at least 30 percent, or at least 40 percent.

[0458] An aerosol-generating article may have a ventilation level of up to 90 percent. An aerosol-generating article may have a ventilation level of less than or equal to 80 percent, or less than or equal to 70 percent, or less than or equal to 60 percent, or less than or equal to 50 percent.

[0459] Thus, an aerosol-generating article may have a ventilation level from 2 percent to 90 percent, from 5 percent to 90 percent, from 10 percent to 90 percent, or from 15 percent to 90 percent. An aerosol-generating article may have a ventilation level from 2 percent to 80 percent, from 5 percent to 80 percent, from 10 percent to 80 percent, or from 15 percent to 80 percent. An aerosol-generating article may have a ventilation level from 2 percent to 70 percent, from 5 percent to 70 percent, from 10 percent to 70 percent, or from 15 percent to 70 percent. An aerosol-generating article may have a ventilation level from 2 percent to 60 percent, from 5 percent to 60 percent, from 10 percent to 60 percent, or from 15 percent to 60 percent. An aerosol-generating article may have a ventilation level from 2 percent to 50 percent, from 5 percent to 50 percent, from 10 percent to 50 percent, or from 15 percent to 50 percent.

[0460] The aerosol-generating article may have a ventilation level from 20 percent to 50 percent, from 20 percent to 40 percent, or from 20 percent to 30 percent. The aerosol-generating article may have a ventilation level from 30 percent to 50 percent, or from 30 percent to 40 percent. The aerosol-generating article may have a ventilation level from 40 percent to 50 percent.

[0461] Without wishing to be bound by theory, the inventors have found that the temperature drop caused by the admission of cooler, external air into the hollow tubular element via the ventilation zone may have an advantageous effect on the nucleation and growth of aerosol particles.

[0462] Formation of an aerosol from a gaseous mixture containing various chemical species depends on a delicate interplay between nucleation, evaporation, and condensation, as well as coalescence, all the while accounting for variations in vapour concentration, temperature, and velocity fields. The so-called classical nucleation theory is based on the assumption that a fraction of the molecules in the gas phase are large enough to stay coherent for long times with sufficient probability (for example, a probability of one half). These molecules represent some kind of a critical, threshold molecule clusters among transient molecular aggregates, meaning that, on

average, smaller molecule clusters are likely to disintegrate rather quickly into the gas phase, while larger clusters are, on average, likely to grow. Such critical cluster is identified as the key nucleation core from which droplets are expected to grow due to condensation of molecules from the vapour. It is assumed that virgin droplets that just nucleated emerge with a certain original diameter, and then may grow by several orders of magnitude. This is facilitated and may be enhanced by rapid cooling of the surrounding vapour, which induces condensation. In this connection, it helps to bear in mind that evaporation and condensation are two sides of one same mechanism, namely gas—liquid mass transfer. While evaporation relates to net mass transfer from the liquid droplets to the gas phase, condensation is net mass transfer from the gas phase to the droplet phase. Evaporation (or condensation) will make the droplets shrink (or grow), but it will not change the number of droplets.

[0463] In this scenario, which may be further complicated by coalescence phenomena, the temperature and rate of cooling can play a critical role in determining how the system responds. In general, different cooling rates may lead to significantly different temporal behaviours as concerns the formation of the liquid phase (droplets), because the nucleation process is typically nonlinear. Without wishing to be bound by theory, it is hypothesised that cooling can cause a rapid increase in the number concentration of droplets, which is followed by a strong, short-lived increase in this growth (nucleation burst). This nucleation burst would appear to be more significant at lower temperatures. Further, it would appear that higher cooling rates may favour an earlier onset of nucleation. By contrast, a reduction of the cooling rate would appear to have a favourable effect on the final size that the aerosol droplets ultimately reach.

[0464] Therefore, the rapid cooling induced by the admission of external air into the hollow tubular element via the ventilation zone can be favourably used to favour nucleation and growth of aerosol droplets. However, at the same time, the admission of external air into the hollow tubular element has the immediate drawback of diluting the aerosol stream delivered to the consumer.

[0465] The inventors have surprisingly found how the favourable effect of enhanced nucleation promoted by the rapid cooling induced by the introduction of ventilation air into the article is capable of significantly countering the less desirable effects of dilution. As such, satisfactory values of aerosol delivery are consistently achieved with aerosol-generating articles in accordance with the invention.

[0466] The inventors have also surprisingly found that the diluting effect on the aerosol—which can be assessed by measuring, in particular, the effect on the delivery of aerosol former (for example, glycerol) included in the aerosol-generating substrate—is advantageously minimised when the ventilation level is within the ranges described above.

[0467] As the ventilated hollow tubular element substantially does not contribute to the overall RTD of the aerosol-generating article, in aerosol-generating articles in accordance with the invention the overall RTD of the article can advantageously be fine-tuned by adjusting the length and density of the aerosol-generating substrate or the length and optionally the length and density of any segment of filtration material forming part of the downstream section, such as for example a filter element, or the length and density of a segment of filtration material provided upstream of the aerosol-generating substrate. Thus, aerosol-generating articles that have a predetermined RTD can be manufactured consistently and with great precision, such that satisfactory levels of RTD can be provided for the consumer even in the presence of ventilation.

[0468] A distance between the ventilation zone and a downstream end of the aerosol-generating substrate may be at least 4 millimetres or at least 6 millimetres or at least 8 millimetres. A distance between the ventilation zone and a downstream end of the aerosol-generating substrate may be at least 9 millimetres. A distance between the ventilation zone and a downstream end of the aerosol-generating substrate may be at least 10 millimetres. A distance between the ventilation zone and a downstream end of the aerosol-generating substrate may be at least 11 millimetres.

[0469] A distance between the ventilation zone and a downstream end of the aerosol-generating

substrate may be less than or equal to 21 millimetres. A distance between the ventilation zone and a downstream end of the aerosol-generating substrate may be less than or equal to 19 millimetres. A distance between the ventilation zone and a downstream end of the aerosol-generating substrate may be less than or equal to 17 millimetres. A distance between the ventilation zone and a downstream end of the aerosol-generating substrate may be less than or equal to 15 millimetres.
[0470] A distance between the ventilation zone and a downstream end of the aerosol-generating substrate may be from 4 millimetres to 21 millimetres, from 7 millimetres to 21 millimetres, from 10 millimetres to 21 millimetres, or from 11 millimetres to 21 millimetres. A distance between the ventilation zone and a downstream end of the aerosol-generating substrate may be from 8 millimetres to 19 millimetres, from 9 millimetres to 19 millimetres, or from 10 millimetres to 19 millimetres, or from 11 millimetres to 19 millimetres. A distance between the ventilation zone and a downstream end of the aerosol-generating substrate may be from 8 millimetres to 17 millimetres, from 9 millimetres to 17 millimetres, from 10 millimetres to 17 millimetres, or from 11 millimetres to 17 millimetres.
[0471] Positioning the ventilation zone at a distance from a downstream end of the aerosol-generating substrate within the ranges described above has the benefit of generally ensuring that, during use, the ventilation zone is just outside of the heating device when the aerosol-generating article is inserted in the heating device while reducing the risk of the ventilation zone being inadvertently obstructed by a user's lips or hands. Additionally, it has been found that positioning the ventilation zone at a distance from a downstream end of the aerosol-generating substrate within the ranges described above may advantageously enhance nucleation and aerosol formation and delivery.
[0472] A distance between the ventilation zone and a downstream end of the hollow tubular element may be at least 3 millimetres. A distance between the ventilation zone and a downstream end of the hollow tubular element may be at least 5 millimetres. A distance between the ventilation zone and a downstream end of the hollow tubular element may be at least 7 millimetres.
[0473] A distance between the ventilation zone and a downstream end of the hollow tubular element may be less than or equal to 14 millimetres. A distance between the ventilation zone and a downstream end of the hollow tubular element may be less than or equal to 12 millimetres. A distance between the ventilation zone and a downstream end of the hollow tubular element may be less than or equal to 10 millimetres.
[0474] A distance between the ventilation zone and a downstream end of the hollow tubular element may be from 3 millimetres to 14 millimetres, from 5 millimetres to 14 millimetres, or from 7 millimetres to 14 millimetres. A distance between the ventilation zone and a downstream end of the hollow tubular element may be from 3 millimetres to 12 millimetres, from 5 millimetres to 12 millimetres, or from 7 millimetres to 12 millimetres. A distance between the ventilation zone and a downstream end of the hollow tubular element may be from 3 millimetres to 10 millimetres, from 5 millimetres to 10 millimetres, or from 7 millimetres to 10 millimetres.
[0475] Positioning the ventilation zone at a distance from a downstream end of the hollow tubular element within the ranges described above has the benefit of generally ensuring that, during use, the ventilation zone is just outside of the heating device when the aerosol-generating article is inserted in the heating device while reducing the risk of the ventilation zone being inadvertently obstructed by a user's lips or hands. Additionally, it has been found that positioning the ventilation zone at a distance from a downstream end of the hollow tubular element within the ranges described above may advantageously lead to the formation and delivery of a comparatively more homogenous aerosol.
[0476] A distance between the ventilation zone and a downstream end of the aerosol-generating article may be at least 10 millimetres. A distance between the ventilation zone and a downstream end of the aerosol-generating article may be at least 12 millimetres. A distance between the ventilation zone and a downstream end of the aerosol-generating article may be at least 15

millimetres.
[0477] A distance between the ventilation zone and a downstream end of the aerosol-generating article may be less than or equal to 21 millimetres. A distance between the ventilation zone and a downstream end of the aerosol-generating article may be less than or equal to 19 millimetres. A distance between the ventilation zone and a downstream end of the aerosol-generating article may be less than or equal to 17 millimetres.
[0478] A distance between the ventilation zone and a downstream end of the aerosol-generating article may be from 10 millimetres to 21 millimetres, from 12 millimetres to 21 millimetres, or from 15 millimetres to 21 millimetres. A distance between the ventilation zone and a downstream end of the aerosol-generating article may be from 10 millimetres to 19 millimetres, from 12 millimetres to 19 millimetres, or from 15 millimetres to 19 millimetres. A distance between the ventilation zone and a downstream end of the aerosol-generating article may be from 10 millimetres to 17 millimetres, from 12 millimetres to 17 millimetres, or from 15 millimetres to 17 millimetres.
[0479] Positioning the ventilation zone at a distance from a downstream end of the aerosol-generating article within the ranges described above has the benefit of generally ensuring that, during use, when the aerosol-generating article is partially received within the heating device, a portion of the aerosol-generating article extending outside of the heating device is long enough for the consumer to comfortably hold the article between their lips while reducing the risk of the ventilation zone being inadvertently obstructed by a user's lips or hands. At the same time, evidence suggests that a length of the portion of the aerosol-generating article extending outside of the heating device were greater, it may become easy to inadvertently and undesirably bend the aerosol-generating article, and this may impair aerosol delivery or in general the intended use of the aerosol-generating article.
[0480] As discussed in the present disclosure, the support element of the downstream section may comprise a hollow tubular element. Such a hollow tubular element may be referred to as a downstream hollow tubular element or a hollow tubular downstream element. The downstream section may comprise a single hollow tubular element in accordance with the present disclosure. In other words, the downstream section of the aerosol-generating article may comprise only one hollow tubular element.
[0481] As discussed in the present disclosure, the upstream section or upstream element may also comprise a hollow tubular element. Such a hollow tubular element may be referred to as an upstream hollow tubular element or a hollow tubular upstream element. The upstream section may comprise a single hollow tubular element in accordance with the present disclosure. In other words, the upstream section of the aerosol-generating article may comprise only one hollow tubular element.
[0482] The hollow tubular downstream element may abut a downstream end of the aerosol-generating section. The upstream end of the hollow tubular downstream element may abut a downstream end of the aerosol-generating section. The downstream end of the hollow tubular downstream element may define the downstream end of the aerosol-generating article.
[0483] The hollow tubular upstream element may abut an upstream end of the aerosol-generating section. The downstream end of the hollow tubular upstream element may abut an upstream end of the aerosol-generating section. The upstream end of the hollow tubular upstream element may define the upstream end of the aerosol-generating article.
[0484] As used throughout the present disclosure, the term “hollow tubular element” denotes a generally elongate element defining a lumen or airflow passage along a longitudinal axis thereof. The upstream section, the downstream section or both may comprise a hollow tubular element. Unless stated otherwise, general reference to a “hollow tubular element” may refer both to a hollow tubular element of the upstream section and to a hollow tubular element of the support element or of the downstream section.

[0485] In particular, the term “tubular” or “hollow tubular” may be used in the following with reference to a tubular element or hollow tubular element having a substantially cylindrical cross-section and defining at least one airflow conduit establishing an uninterrupted fluid communication substantially between an upstream end of the tubular element and a downstream end of the tubular element. However, it will be understood that alternative geometries (for example, alternative cross-sectional shapes) of the tubular element may be possible. A hollow tubular element may be an individual, discrete element of the aerosol-generating article which has a defined length and thickness. The cavity of a hollow tubular element may have an area as measured perpendicular to the longitudinal direction of the hollow tubular element.
[0486] A hollow tubular element may comprise an end wall defining either the downstream end or the upstream end of the hollow tubular element. A hollow tubular element may comprise an end wall portion defining either the downstream end or the upstream end of the hollow tubular element. A hollow tubular element may comprise an upstream end wall portion defining the upstream end of the hollow tubular element. A hollow tubular element may comprise a downstream end wall portion defining the downstream end of the hollow tubular element.
[0487] A hollow tubular element may comprise an opening at an end of the hollow tubular element. The opening provides fluid communication into the cavity of the hollow tubular element from the exterior of the hollow tubular element. A hollow tubular element may comprise an opening at an end wall or end wall portion of the hollow tubular element. A hollow tubular element may comprise an upstream opening at the upstream end of the hollow tubular element. A hollow tubular element may comprise a downstream opening at the downstream end wall of the hollow tubular element. In other words, the opening may be defined through the downstream end wall of the hollow tubular element. A hollow tubular element may comprise an upstream opening at the upstream end wall of the hollow tubular element. In other words, the opening may be defined through the upstream end wall of the hollow tubular element. An opening at the end of the hollow tubular element may denote an entrance or access to the cavity, which is defined between the upstream and downstream ends of the hollow tubular element.
[0488] An end of the hollow tubular element may be flanged. A hollow tubular element may comprise a flanged end portion defining either the downstream end or the upstream end of the hollow tubular element. A hollow tubular element may comprise a flanged end portion defining the upstream end of the hollow tubular element. A hollow tubular element may comprise a flanged end portion defining the downstream end of the hollow tubular element. A flanged end portion may form or define an end wall or end wall portion of the hollow tubular element. Such an end wall or end wall portion may delimit an opening between the cavity and the exterior of the hollow tubular element. In other words, the opening may be defined through the end wall or end wall portion.
[0489] A flanged end of the hollow tubular element may be defined by a folded end of the hollow tubular element. An end of the hollow tubular element may be folded. A hollow tubular element may comprise a folded end portion defining either the downstream end or the upstream end of the hollow tubular element. A hollow tubular element may comprise a folded end portion defining the upstream end of the hollow tubular element. A hollow tubular element may comprise a folded end portion defining the downstream end of the hollow tubular element. A folded end portion may form or define an end wall or end wall portion of the hollow tubular element. Such an end wall or end wall portion may delimit an opening between the cavity and the exterior of the hollow tubular element. In other words, the opening may be defined through the end wall or end wall portion.
[0490] An end wall or end wall portion of a hollow tubular element may effectively define a closed end of the hollow tubular element. For example, a flanged end or folded end of a hollow tubular element may define a closed end of the hollow tubular element. The flange defined at a flanged or folded end of a hollow tubular element preferably extends inwardly towards the central longitudinal axis of the hollow tubular element.
[0491] A hollow tubular element may comprise an upstream opening, a downstream opening, or

both. Each opening provides access to the air passage or cavity defined within the hollow tubular element. Each end of the hollow tubular element may comprise only one opening. In other words, the downstream end of the hollow tubular element may comprise only one opening and the upstream end of the hollow tubular element may comprise only one opening.

[0492] The external diameter of the hollow tubular element is preferably substantially uniform along its length. In other words, the external diameter of hollow tubular element at its flanged end may correspond to the external diameter of the hollow tubular element. A flanged or folded end of the hollow tubular element preferably does not modify the external diameter of the hollow tubular element when measured at its ends.

[0493] A hollow tubular element may comprise a tubular body defining a cavity extending from a first end of the tubular body to a second end of the tubular body. A hollow tubular element may comprise a first end portion forming an end wall at the first end of the tubular body, the first end wall delimiting an opening for airflow between the cavity and the exterior of the second tubular element. A hollow tubular element may comprise a second end portion forming an end wall at the second end of the tubular body, the second end wall delimiting another opening for airflow between the cavity and the exterior of the second tubular element.

[0494] An end wall may extend partially into the cavity of the tubular body and forms an angle of less than or equal to 90 degrees with the inner surface of the tubular body, an angle of less than or equal to 80 degrees with the inner surface of the tubular body, or an angle of less than or equal to 70 degrees with the inner surface of the tubular body. This may be achieved by ensuring that, during manufacture of a hollow tubular element, a folding force is applied to the hollow tubular element such that at least part of an end portion of the hollow tubular element is pushed into the cavity of the tubular body. Such arrangements may advantageously increase the likelihood of an end wall remaining stationary with respect to the tubular body after the hollow tubular element has been manufactured. In particular, such arrangements may help to overcome any natural resilience in the material forming the hollow tubular element, such that the folded or flanged end portion of the hollow tubular element is less likely to revert towards its pre-folded condition after manufacture.

[0495] An opening delimited by an end wall may be the only opening in an end wall. An opening may be disposed in a generally radially central position of the hollow tubular element. An end wall may be generally annular shaped.

[0496] An end wall may extend from a fold point on the hollow tubular element and towards a radially central position of the hollow tubular element. The fold point may generally correspond to the first end of the tubular body of the hollow tubular element.

[0497] The cavity may have a constant cross-section along its length, as measured perpendicular to the longitudinal direction of the hollow tubular element. That is, preferably the cross-section of the cavity at a first longitudinal position of the tubular body is the same as the cross-section of the cavity at second and further longitudinal position of the tubular body. Consequently, the area of the cavity may be constant along the length of the tubular body. However, if the cavity does not may have a constant cross-section along its length (for example, because the internal surface of the hollow tubular body tapers along the length of the hollow tubular body), then the area of the cavity as measured as measured perpendicular to the longitudinal direction of the hollow tubular element is taken to be the smallest such area of the cavity along the length of the tubular body.

[0498] The tubular body of a hollow tubular element provides an unrestricted flow channel. This means that the tubular body portion of the hollow tubular element provides a negligible level of resistance to draw (RTD). The flow channel should therefore be free from any components that would obstruct the flow of air in a longitudinal direction. The flow channel is substantially empty. In such a case, the tubular body of the hollow tubular element defines an empty cavity.

[0499] The tubular element of the present disclosure provides an improved component for an aerosol-generating article. By forming a hollow tubular element from a tubular body defining a

cavity extending from a first end of the tubular body to a second end of the tubular body, a relatively large proportion of the hollow tubular element can be empty and permit unimpeded airflow. Where a hollow tubular element is provided downstream of an aerosol-generating substrate, this may help to improve cooling and nucleation of the aerosol. Furthermore, such a configuration may also help to minimise filtration of any compounds released from the aerosol-generating substrate, particularly when compared to prior art hollow acetate tubes.

[0500] By providing a hollow tubular element with a folded or flanged end portion forming an end wall at an end of the tubular body, the hollow tubular element can be configured to have a desired RTD through configuration of the size and shape of the end wall. In particular, a hollow tubular element and its or each end wall can be manufactured efficiently and at high speed, with a satisfactory RTD and low RTD variability from one article to another. Furthermore, the configuration of a hollow tubular element and its end wall means that RTD can be localised at a specific longitudinal position of the hollow tubular element, rather than being continuously distributed along the length of the hollow tubular element.

[0501] Where an end wall of the hollow tubular element is adjacent to an aerosol-generating substrate, the end wall may provide a barrier which may restrict movement of the aerosol-generating substrate. This arrangement can also advantageously enable one or both of air and aerosol to flow through the opening into the cavity. The construction of the hollow tubular element may also be better suited to withstanding the temperatures generated by a heating blade or susceptor element.

[0502] By providing the opening of the end wall with a size as defined in the present disclosure either in respect of an absolute value or with reference to one or more of: the area of the cavity of the tubular body; the diameter of the cavity of the tubular body; and the outer or external diameter of the tubular body, the RTD of the hollow tubular element may be precisely tuned to a desired value. Furthermore, where the hollow tubular element is positioned downstream of an aerosol-generating substrate, selection of such a size of opening may help in the formulation of an aerosol having desirable properties, such as a desirably high level of aerosol constituents including one or both of nicotine and glycerin.

[0503] The aerosol-generating section and a hollow tubular element may be adjacent to one another and in contact with one another. For example, an end wall of a hollow tubular element may be adjacent to the aerosol-generating substrate of the aerosol-generating section and in contact with the aerosol-generating substrate of the aerosol-generating section.

[0504] The aerosol-generating section and a hollow tubular element may be adjacent to one another but not in contact with one another because a small gap of empty space separates the aerosol-generating section from the hollow tubular element in the longitudinal direction of the aerosol-generating article. For example, an end wall of the hollow tubular element may be adjacent to the aerosol-generating substrate but not in contact with the aerosol-generating substrate. The gap may be 2 millimetres or less. The gap may be 1 millimetre or less.

[0505] As discussed above, the upstream element may comprise or may be a hollow tubular element. Thus, a hollow tubular element may be positioned upstream of the aerosol-generating section. In such embodiments, the hollow tubular element may be referred to as an upstream hollow tubular element.

[0506] As discussed above, the downstream element may comprise or may be a hollow tubular element. Thus, a hollow tubular element may be positioned downstream of the aerosol-generating section. In such embodiments, the hollow tubular element may be referred to as a downstream hollow tubular element.

[0507] The aerosol-generating article may comprise two hollow tubular elements, one being a downstream hollow tubular element positioned downstream of the aerosol-generating section and the other being an upstream hollow tubular element positioned upstream of the aerosol-generating section. The downstream and upstream tubular elements may each have any feature or combination

of features, which are described above or below in respect of the hollow tubular element of the present disclosure.

[0508] For example, the hollow tubular element may be a downstream hollow tubular element, which is positioned downstream of the aerosol-generating section with an end wall of the downstream hollow tubular element adjacent to the downstream end of the aerosol-generating substrate. The aerosol-generating article may further comprise an upstream hollow tubular element. The upstream hollow tubular element may be positioned upstream of the aerosol-generating section. An end wall of the upstream hollow tubular element may be adjacent to the upstream end of the aerosol-generating substrate. As a result, the aerosol-generating section comprising the aerosol-generating substrate may be sandwiched between upstream and downstream hollow tubular elements, where each tubular element has a respective end wall adjacent to or in abutment with the upstream or downstream end of the aerosol-generating section.

[0509] The aerosol-generating substrate of the aerosol-generating section may comprise a plurality of strands of aerosol-generating material. A ratio of a width (or diameter) of an opening of a hollow tubular element to an average width of the plurality of strands of aerosol-generating material may be less than or equal to 20. A ratio of a width of an opening of the hollow tubular element to an average width of the plurality of strands of aerosol-generating material may be less than or equal to 15. A ratio of a width of an opening of a hollow tubular element to an average width of the plurality of strands of aerosol-generating material may be less than or equal to 10. A ratio of a width of an opening of a hollow tubular element to an average width of the plurality of strands of aerosol-generating material may be less than or equal to 7.5. A ratio of a width of an opening of a hollow tubular element to an average width of the plurality of strands of aerosol-generating material may be less than or equal to 5. A ratio of a width of an opening of a hollow tubular element to an average width of the plurality of strands of aerosol-generating material may be less than or equal to 2.5. Such an opening of a hollow tubular element may refer to an upstream opening, a downstream opening, or both openings of a hollow tubular element.

[0510] A ratio of a width (or diameter) of an opening of the hollow tubular element to an average width of the plurality of strands of aerosol-generating material may be at least 0.1. A ratio of a width of an opening of the hollow tubular element to an average width of the plurality of strands of aerosol-generating material may be at least 0.2. A ratio of a width of an opening of the hollow tubular element to an average width of the plurality of strands of aerosol-generating material may be at least 0.5. A ratio of a width of an opening of the hollow tubular element to an average width of the plurality of strands of aerosol-generating material may be at least 1. A ratio of a width of an opening of the hollow tubular element to an average width of the plurality of strands of aerosol-generating material may be at least 2. A ratio of a width of an opening of the hollow tubular element to an average width of the plurality of strands of aerosol-generating material may be at least 3. Such an opening of the hollow tubular element may refer to an upstream opening, a downstream opening, or both openings of the hollow tubular element.

[0511] A ratio of a width (or diameter) of an opening of the hollow tubular element to an average width of the plurality of strands of aerosol-generating material may be between 0.1 and 20, between 0.1 and 15, between 0.1 and 10, between 0.1 and 7.5, between 0.1 and 5, or between 0.1 and 2.5. A ratio of a width of an opening of the hollow tubular element to an average width of the plurality of strands of aerosol-generating material may be between 0.2 and 20, between 0.2 and 15, between 0.2 and 10, between 0.2 and 7.5, between 0.2 and 5, or between 0.2 and 2.5. A ratio of a width of an opening of the hollow tubular element to an average width of the plurality of strands of aerosol-generating material may be between 0.5 and 20, between 0.5 and 15, between 0.5 and 10, between 0.5 and 7.5, between 0.5 and 5 , or between 0.5 and 2.5. A ratio of a width of an opening of the hollow tubular element to an average width of the plurality of strands of aerosol-generating material may be between 1 and 20, between 1 and 15, between 1 and 10, between 1 and 7.5, between 1 and 5, or between 1 and 2.5. A ratio of a width of an opening of the hollow tubular

element to an average width of the plurality of strands of aerosol-generating material may be between 2 and 20, between 2 and 15, between 2 and 10, between 2 and 7.5, between 2 and 5, or between 2 and 2.5. A ratio of a width of an opening of the hollow tubular element to an average width of the plurality of strands of aerosol-generating material may be between 3 and 20, between 3 and 15, between 3 and 10, between 3 and 7.5, or between 3 and 5. Such an opening of the hollow tubular element may refer to an upstream opening, a downstream opening, or both openings of the hollow tubular element.

[0512] A ratio of a width (or diameter) of an opening of the upstream element to an average width of the plurality of strands of aerosol-generating material may be less than or equal to 20. A ratio of a width of an opening of the upstream element to an average width of the plurality of strands of aerosol-generating material may be less than or equal to 15. A ratio of a width of an opening of the upstream element to an average width of the plurality of strands of aerosol-generating material may be less than or equal to 10. A ratio of a width of an opening of the upstream element to an average width of the plurality of strands of aerosol-generating material may be less than or equal to 7.5. A ratio of a width of an opening of the upstream element to an average width of the plurality of strands of aerosol-generating material may be less than or equal to 5. A ratio of a width of an opening of the upstream element to an average width of the plurality of strands of aerosol-generating material may be less than or equal to 2.5. Such an opening of the upstream element may refer to an upstream opening, a downstream opening, or both openings of the upstream element. The upstream element may comprise a hollow tubular element, as described herein.

[0513] A ratio of a width (or diameter) of an opening of the upstream element to an average width of the plurality of strands of aerosol-generating material may be at least 0.1. A ratio of a width of an opening of the upstream element to an average width of the plurality of strands of aerosol-generating material may be at least 0.2. A ratio of a width of an opening of the upstream element to an average width of the plurality of strands of aerosol-generating material may be at least 0.5. A ratio of a width of an opening of the upstream element to an average width of the plurality of strands of aerosol-generating material may be at least 1. A ratio of a width of an opening of the upstream element to an average width of the plurality of strands of aerosol-generating material may be at least 2. A ratio of a width of an opening of the upstream element to an average width of the plurality of strands of aerosol-generating material may be at least 3. Such an opening of the upstream element may refer to an upstream opening, a downstream opening, or both openings of the upstream element. The upstream element may comprise a hollow tubular element, as described herein.

[0514] A ratio of a width (or diameter) of an opening of the upstream element to an average width of the plurality of strands of aerosol-generating material may be between 0.1 and 20, between 0.1 and 15, between 0.1 and 10, between 0.1 and 7.5, between 0.1 and 5, or between 0.1 and 2.5. A ratio of a width of an opening of the upstream element to an average width of the plurality of strands of aerosol-generating material may be between 0.2 and 20, between 0.2 and 15, between 0.2 and 10, between 0.2 and 7.5, between 0.2 and 5, or between 0.2 and 2.5. A ratio of a width of an opening of the upstream element to an average width of the plurality of strands of aerosol-generating material may be between 0.5 and 20, between 0.5 and 15, between 0.5 and 10, between 0.5 and 7.5, between 0.5 and 5, or between 0.5 and 2.5. A ratio of a width of an opening of the upstream element to an average width of the plurality of strands of aerosol-generating material may be between 1 and 20, between 1 and 15, between 1 and 10, between 1 and 7.5, between 1 and 5, or between 1 and 2.5. A ratio of a width of an opening of the upstream element to an average width of the plurality of strands of aerosol-generating material may be between 2 and 20, between 2 and 15, between 2 and 10, between 2 and 7.5, between 2 and 5, or between 2 and 2.5. A ratio of a width of an opening of the upstream element to an average width of the plurality of strands of aerosol-generating material may be between 3 and 20, between 3 and 15, between 3 and 10, between 3 and 7.5, or between 3 and 5. Such an opening of the upstream element may refer to an upstream

opening, a downstream opening, or both openings of the upstream element. The upstream element may comprise a hollow tubular element, as described herein.
[0515] The above ratios have been found to reduce the risk of any dislodged aerosol-generating material from migrating upstream from the aerosol-generating section, towards the upstream end of the aerosol-generating article. Such ratios may ensure that the opening is sufficiently small in relation to the average size of aerosol-generating material in order to hinder said migration of aerosol-generating material. While the opening may be large enough for strands to fit through, the internal packing friction amongst the strands within the aerosol-generating section and the obstruction of other strands may also play a role in preventing such migration. However, such a ratio may ensure that the opening is sufficiently small in relation to the average size of aerosol-generating material in order to hinder and reduce said migration of aerosol-generating material, while maintaining an acceptable resistance to draw (RTD) for the overall article. Furthermore, the strands generally have an average length that is substantially greater than their average width. Any strands that may protrude through the opening will still need to travel, with relative difficulty, a distance equivalent to their average length in order to successfully migrate upstream.
[0516] A ratio of a width (or diameter) of an opening of the support element to an average width of the plurality of strands of aerosol-generating material may be less than or equal to 20. A ratio of a width of an opening of the support element to an average width of the plurality of strands of aerosol-generating material may be less than or equal to 15. A ratio of a width of an opening of the support element to an average width of the plurality of strands of aerosol-generating material may be less than or equal to 10. A ratio of a width of an opening of the support element to an average width of the plurality of strands of aerosol-generating material may be less than or equal to 7.5. A ratio of a width of an opening of the support element to an average width of the plurality of strands of aerosol-generating material may be less than or equal to 5. A ratio of a width of an opening of the support element to an average width of the plurality of strands of aerosol-generating material may be less than or equal to 2.5. Such an opening of the support element may refer to an upstream opening, a downstream opening, or both openings of the support element. The support element may comprise a hollow tubular element, as described herein.
[0517] A ratio of a width (or diameter) of an opening of the support element to an average width of the plurality of strands of aerosol-generating material may be at least 0.1. A ratio of a width of an opening of the support element to an average width of the plurality of strands of aerosol-generating material may be at least 0.2. A ratio of a width of an opening of the support element to an average width of the plurality of strands of aerosol-generating material may be at least 0.5. A ratio of a width of an opening of the support element to an average width of the plurality of strands of aerosol-generating material may be at least 1. A ratio of a width of an opening of the support element to an average width of the plurality of strands of aerosol-generating material may be at least 2. A ratio of a width of an opening of the support element to an average width of the plurality of strands of aerosol-generating material may be at least 3. Such an opening of the support element may refer to an upstream opening, a downstream opening, or both openings of the support element. The support element may comprise a hollow tubular element, as described herein.
[0518] A ratio of a width (or diameter) of an opening of the support element to an average width of the plurality of strands of aerosol-generating material may be between 0.1 and 20, between 0.1 and 15, between 0.1 and 10, between 0.1 and 7.5, between 0.1 and 5, or between 0.1 and 2.5. A ratio of a width of an opening of the support element to an average width of the plurality of strands of aerosol-generating material may be between 0.2 and 20, between 0.2 and 15, between 0.2 and 10, between 0.2 and 7.5, between 0.2 and 5, or between 0.2 and 2.5. A ratio of a width of an opening of the support element to an average width of the plurality of strands of aerosol-generating material may be between 0.5 and 20, between 0.5 and 15, between 0.5 and 10, between 0.5 and 7.5, between 0.5 and 5, or between 0.5 and 2.5. A ratio of a width of an opening of the support element to an average width of the plurality of strands of aerosol-generating material may be between 1 and 20,

between 1 and 15, between 1 and 10, between 1 and 7.5, between 1 and 5, or between 1 and 2.5. A ratio of a width of an opening of the support element to an average width of the plurality of strands of aerosol-generating material may be between 2 and 20, between 2 and 15, between 2 and 10, between 2 and 7.5, between 2 and 5, or between 2 and 2.5. A ratio of a width of an opening of the support element to an average width of the plurality of strands of aerosol-generating material may be between 3 and 20, between 3 and 15, between 3 and 10, between 3 and 7.5, or between 3 and 5. Such an opening of the support element may refer to an upstream opening, a downstream opening, or both openings of the support element. The support element may comprise a hollow tubular element, as described herein.

[0519] The above ratios have been found to reduce the risk of any dislodged aerosol-generating material from migrating downstream from the aerosol-generating section, towards the downstream or mouth end of the aerosol-generating article. Such ratios may ensure that the opening is sufficiently small in relation to the average size of aerosol-generating material in order to hinder said migration of aerosol-generating material. While the opening may be large enough for strands to fit through, the internal packing friction amongst the strands within the aerosol-generating section and the obstruction of other strands may also play a role in preventing such migration. However, such a ratio may ensure that the opening is sufficiently small in relation to the average size of aerosol-generating material in order to hinder and reduce said migration of aerosol-generating material, while maintaining an acceptable resistance to draw (RTD) for the overall article. Furthermore, the strands generally have an average length that is substantially greater than their average width. Any strands that may protrude through the opening will still need to travel, with relative difficulty, a distance equivalent to their average length in order to successfully migrate downstream.

[0520] An opening of the hollow tubular element, as measured perpendicular to the longitudinal direction of the hollow tubular element, may have an area of from 0.6 percent to 60 percent of a cross-sectional area of the cavity. An opening of the hollow tubular element may have an area of from 1.5 percent to 21 percent of a cross-sectional area of the cavity.

[0521] An opening at an end of the hollow tubular element may have an area, as measured perpendicular to the longitudinal direction of the hollow tubular element, of at least 0.6 percent of the area of the cavity. The opening may have an area, as measured perpendicular to the longitudinal direction of the hollow tubular element, of at least 1.5 percent of the area of the cavity. The opening may have an area, as measured perpendicular to the longitudinal direction of the hollow tubular element, of at least 2.5 percent of the area of the cavity. The opening may have an area, as measured perpendicular to the longitudinal direction of the hollow tubular element, of at least 4 percent of the area of the cavity.

[0522] An opening at the end of the hollow tubular element may have an area, as measured perpendicular to the longitudinal direction of the hollow tubular element, less than or equal to 60 percent of the area of the cavity. The opening may have an area, as measured perpendicular to the longitudinal direction of the hollow tubular element, less than or equal to 21 percent of the area of the cavity. The opening may have an area, as measured perpendicular to the longitudinal direction of the hollow tubular element, less than or equal to 10 percent of the area of the cavity. The opening may have an area, as measured perpendicular to the longitudinal direction of the hollow tubular element, less than or equal to 9.5 percent of the area of the cavity. The opening may have an area, as measured perpendicular to the longitudinal direction of the hollow tubular element, less than or equal to 7 percent of the area of the cavity.

[0523] The hollow tubular element may have an internal diameter which defines the cavity. The internal diameter of the hollow tubular element may therefore be referred to as the diameter of the cavity. The opening at an end of the hollow tubular element may have a diameter of from 8 percent to 77 percent of the diameter of the cavity. The opening may have a diameter of from 12 percent to 46 percent of the diameter of the cavity. The opening may have a diameter of from 15 percent to 30

percent of the diameter of the cavity.
[0524] The opening at an end of the hollow tubular element may have a diameter of at least 8 percent of the diameter of the cavity. The opening may have a diameter of at least 12 percent of the diameter of the cavity. The opening may have a diameter of at least 15 percent of the diameter of the cavity.
[0525] The opening at an end of the hollow tubular element may have a diameter less than or equal to 77 percent of the diameter of the cavity. The opening may have a diameter less than or equal to 50 percent of the diameter of the cavity. The opening may have a diameter less than or equal to 46 percent of the diameter of the cavity. The opening may have a diameter less than or equal to 30 percent of the diameter of the cavity. The opening may have a diameter less than or equal to 25 percent of the diameter of the cavity.
[0526] The hollow tubular element may have an external diameter. The opening at an end of the hollow tubular element may have a diameter of from 7 percent to 70 percent of the external diameter of the hollow tubular element. The opening at an end of the hollow tubular element may have a diameter of from 11 percent to 45 percent of the external diameter of the hollow tubular element. The opening at an end of the hollow tubular element may have a diameter of from 13 percent to 27 percent of the external diameter of the hollow tubular element. The opening at an end of the hollow tubular element may have a diameter of from 27 percent to 42 percent of the external diameter of the hollow tubular element.
[0527] The opening at an end of the hollow tubular element may have a diameter of at least 7 percent of the external diameter of the hollow tubular element. The opening at an end of the hollow tubular element may have a diameter of at least 10 percent of the external diameter of the hollow tubular element. The opening at an end of the hollow tubular element may have a diameter of at least 11 percent of the external diameter of the hollow tubular element. The opening at an end of the hollow tubular element may have a diameter of at least 13 percent of the external diameter of the hollow tubular element.
[0528] The opening at an end of the hollow tubular element may have a diameter less than or equal to 70 percent of the external diameter of the hollow tubular element. The opening at an end of the hollow tubular element may have a diameter less than or equal to 45 percent of the external diameter of the hollow tubular element. The opening at an end of the hollow tubular element may have a diameter less than or equal to 42 percent of the external diameter of the hollow tubular element. The opening at an end of the hollow tubular element may have a diameter less than or equal to 30 percent of the external diameter of the hollow tubular element. The opening at an end of the hollow tubular element may have a diameter less than or equal to 27 percent of the external diameter of the hollow tubular element.
[0529] The opening may have a diameter of from 0.5 millimetres to 5 millimetres. The opening may have a diameter of from 0.8 millimetres to 3 millimetres. The opening may have a diameter of from 1 millimetres to 2 millimetres. The opening may have a diameter of from 1.5 millimetres to 2.5 millimetres. The opening may have a diameter of from 0.5 millimetres to 5 millimetres.
[0530] The opening may have a diameter of at least 0.5 millimetres. The opening may have a diameter of at least 0.8 millimetres. The opening may have a diameter of at least 1 millimetres. The opening may have a diameter of at least 1.5 millimetres. The opening may have a diameter of at least 2 millimetres.
[0531] The opening may have a diameter less than or equal to 5 millimetres. The opening may have a diameter less than or equal to 4 millimetres. The opening may have a diameter less than or equal to 3 millimetres. The opening may have a diameter less than or equal to 2.5 millimetres.
[0532] The cavity may have a constant cross-section along its length, as measured perpendicular to the longitudinal direction of the hollow tubular element. That is, preferably the cross-section of the cavity at a first longitudinal position of the hollow tubular element is the same as the cross-section of the cavity at second and further longitudinal position of the hollow tubular element.

Consequently, the area of the cavity may be constant along the length of the hollow tubular element. However, if the cavity does not may have a constant cross-section along its length (for example, because the internal surface of the hollow tubular element tapers along the length of the hollow tubular element), then the area of the cavity as measured as measured perpendicular to the longitudinal direction of the hollow tubular element is taken to be the smallest such area of the cavity along the length of the hollow tubular element.

[0533] The hollow tubular element provides an unrestricted flow channel. This means that a tubular body portion of the hollow tubular element provides a negligible level of resistance to draw (RTD). The flow channel should therefore be free from any components that would obstruct the flow of air in a longitudinal direction. The flow channel is substantially empty. In such a case, a tubular body of the hollow tubular element may define an empty cavity.

[0534] The hollow tubular element of the present disclosure may provide an improved component for an aerosol-generating article. By forming the hollow tubular element from a tubular body defining a cavity extending from a first end of the tubular body to a second end of the tubular body, a relatively large proportion of the hollow tubular element can be empty and permit unimpeded airflow. Where the hollow tubular element is downstream of an aerosol-generating substrate, this may help to improve cooling and nucleation of the aerosol. Furthermore, such a configuration may also help to minimise filtration of any compounds released from the aerosol-generating substrate, particularly when compared to prior art hollow acetate tubes.

[0535] By providing the hollow tubular element with a folded or flanged end portion forming an end wall, the hollow tubular element can be configured to have a desired RTD through configuration of the size and shape of the end wall. In particular, the hollow tubular element and its end wall can be manufactured efficiently and at high speed, with a satisfactory RTD and low RTD variability from one article to another. Furthermore, the configuration of the hollow tubular element and its end wall means that RTD can be localised at a specific longitudinal position of the hollow tubular element, rather than being continuously distributed along the length of the hollow tubular element.

[0536] Where an end wall of the hollow tubular element is adjacent to an aerosol-generating substrate, the end wall may provide a barrier which may restrict movement of the aerosol-generating substrate. This arrangement can also advantageously enable one or both of air and aerosol to flow through the opening into the cavity. The construction of the hollow tubular element may also be better suited to withstanding the temperatures generated by a heating blade or susceptor element.

[0537] By providing the opening of the end wall with a size as defined above either in respect of an absolute value or with reference to one or more of: the area of the cavity of the tubular body; the diameter of the cavity of the tubular body; and the outer or external diameter of the tubular body, the RTD of the hollow tubular element may be precisely tuned to a desired value, while reducing the risk of migration of aerosol-generating substrate material. Furthermore, where the hollow tubular element is positioned downstream of an aerosol-generating section, selection of such a size of opening may help in the formulation of an aerosol having desirable properties, such as a desirably high level of aerosol constituents including one or both of nicotine and glycerin.

[0538] The aerosol-generating section and a hollow tubular element may be adjacent to one another and in contact with one another. For example, an end wall of the hollow tubular element may be adjacent to the aerosol-generating substrate of the aerosol-generating section and in contact with the aerosol-generating substrate of the aerosol-generating section.

[0539] The aerosol-generating section and a hollow tubular element may be adjacent to one another but not in contact with one another because a small gap of empty space separates the aerosol-generating section from the hollow tubular element in the longitudinal direction of the aerosol-generating article. For example, an end wall of the hollow tubular element may be adjacent to the aerosol-generating substrate but not in contact with the aerosol-generating substrate. The gap may

be 2 millimetres or less. The gap may be 1 millimetre or less.
[0540] As discussed above, the upstream element may comprise or may be a hollow tubular element. Thus, a hollow tubular element may be positioned upstream of the aerosol-generating section. In such embodiments, the hollow tubular element may be referred to as an upstream hollow tubular element.
[0541] As discussed above, the downstream element may comprise or may be a hollow tubular element. Thus, a hollow tubular element may be positioned downstream of the aerosol-generating section. In such embodiments, the hollow tubular element may be referred to as a downstream hollow tubular element.
[0542] The aerosol-generating article may comprise two hollow tubular elements, one being a downstream hollow tubular element positioned downstream of the aerosol-generating section and the other being an upstream hollow tubular element positioned upstream of the aerosol-generating section. The downstream and upstream tubular elements may each have any feature or combination of features, which are described above or below in respect of the hollow tubular element of the present disclosure.
[0543] For example, the hollow tubular element may be a downstream hollow tubular element, which is positioned downstream of the aerosol-generating section with an end wall of the downstream hollow tubular element adjacent to the downstream end of the aerosol-generating substrate. The aerosol-generating article may further comprise an upstream hollow tubular element. The upstream hollow tubular element may be positioned upstream of the aerosol-generating section. An end wall of the upstream hollow tubular element may be adjacent to the upstream end of the aerosol-generating substrate. As a result, the aerosol-generating section comprising the aerosol-generating substrate may be sandwiched between upstream and downstream hollow tubular elements, where each tubular element has a respective end wall adjacent to or in abutment with the upstream or downstream end of the aerosol-generating section.
[0544] At least the first portion of the hollow tubular element forming an end wall may be substantially air impermeable. Put another way, an end wall may be substantially non-porous. An end wall may not comprise any perforations. The material forming an end wall may have a porosity of less than or equal to 2000 Coresta units. The material forming an end wall may have a porosity of less than or equal to 1000 Coresta units. The material forming an end wall may have a porosity of less than or equal to 500 Coresta units.
[0545] The tubular body of the hollow tubular element is substantially air impermeable. The tubular body may be substantially non-porous. The tubular body may not comprise any perforations. The material forming the tubular body may have a porosity of less than or equal to 2000 Coresta units. The material forming the tubular body may have a porosity of less than or equal to 1000 Coresta units. The material forming the tubular body may have a porosity of less than or equal to 500 Coresta units.
[0546] Where the aerosol-generating section comprises a susceptor element within the aerosol-generating substrate, the opening in the first wall may be generally aligned with the radial position of the susceptor element. This can advantageously help to keep a distance between an end wall of the hollow tubular element and the susceptor of the aerosol-generating section. Keeping such a distance may help to mitigate any undesirable heating of an end wall of the hollow tubular element by the susceptor element.
[0547] A hollow tubular element may have an outer or external diameter that is approximately equal to the outer or external diameter of the aerosol-generating article. Where the aerosol-generating section is formed as a rod, a hollow tubular element may have an outer or external diameter that is approximately equal to the outer or external diameter of the aerosol-generating section.
[0548] A hollow tubular element may have an external diameter of between 6 millimetres and 10 millimetres, for example of between 7 millimetres and 9 millimetres or of between 7.5 millimetres

and 8.5 millimetres. A hollow tubular element may have an external diameter of 7.8 millimetres.
[0549] A hollow tubular element or its tubular body may have an equivalent internal diameter of at least 5.5 millimetres. A hollow tubular element or its tubular body may have an equivalent internal diameter of at least 6 millimetres. A hollow tubular element or its tubular body may have an equivalent internal diameter of at least 7 millimetres. The term “equivalent internal diameter” is used herein to denote the diameter of a circle having the same surface area of a cross-section of the airflow conduit internally defined by a hollow tubular element. A cross-section of the airflow conduit may have any suitable shape. However, as described briefly above, a circular cross-section is preferred—that is, a hollow tubular element or its tubular body is effectively a cylindrical tube. In that case, the equivalent internal diameter of a hollow tubular element or its tubular body effectively coincides with the internal diameter of the cylindrical tube.
[0550] The equivalent internal diameter of a hollow tubular element or its tubular body may be less than or equal to 10 millimetres. The equivalent internal diameter of a hollow tubular element or its tubular body is less than or equal to 9.5 millimetres, or less than or equal to 9 millimetres.
[0551] A hollow tubular element may have a wall thickness of at least 0.1 millimetres, or at least 0.2 millimetres.
[0552] A hollow tubular element or its tubular body may have a wall thickness of less than or equal to 1.5 millimetres, or less than or equal to 1.25 millimetres. A hollow tubular element or its tubular body may have a wall thickness of less than or equal to 1 millimetre.
[0553] A hollow tubular element or its tubular body therefore may have a wall thickness of between 0.1 millimetres and 1.5 millimetres, or between 0.2 millimetres and 1.25 millimetres, or between 0.5 millimetres and 1 millimetre.
[0554] Providing a hollow tubular element or its tubular body with such wall thickness can help to improve the tubular element's resistance to collapse or deformation, whilst still enabling an end wall to be formed by a folded or flanged end portion of the hollow tubular element.
[0555] The sizing of a hollow tubular element may be equivalent to an upstream element or a support element described in the present disclosure.
[0556] The RTD of a hollow tubular element may be between 0 millimetres H.sub.2O (about 0 Pa) to 20 millimetres H.sub.2O (about 100 Pa), or between 0 millimetres H.sub.2O (about 0 Pa) to 10 millimetres H.sub.2O (about 100 Pa).
[0557] A hollow tubular element may be formed from a paper material, such as paper, paperboard or cardboard. A hollow tubular element may be formed from a plurality of overlapping paper layers, such as a plurality of parallel wound paper layers or a plurality of spirally wound paper layers. Forming a hollow tubular element from a plurality of overlapping paper layers can help to improve the tubular element's resistance to collapse or deformation, whilst still enabling an end wall to be formed by a folded or flanged end portion of a hollow tubular element.
[0558] A hollow tubular element may comprise at least two paper layers. A hollow tubular element may comprise fewer than eleven paper layers.
[0559] Where a hollow tubular element is formed from a paper material, the paper material may have a basis weight of at least 90 grams per square metre. The paper material may have a basis weight of less than or equal to 300 grams per square metre. The paper material may have a basis weight of from 100 to 200 grams per square metre. Providing a hollow tubular element with such wall basis weight can help to improve the tubular element's resistance to collapse or deformation, whilst still enabling an end wall to be formed by a folded or flanged end portion of the hollow tubular element.
[0560] The aerosol-generating device may be a handheld aerosol-generating device.
[0561] The aerosol-generating device may be an electrically-operated aerosol-generating device.
[0562] The aerosol-generating device may comprise a power supply and control electronics.
[0563] The aerosol-generating device may comprise a battery and control electronics.
[0564] The aerosol-generating device may comprise a housing defining a device cavity.

[0565] The device cavity may be configured to receive at least a portion of the aerosol-generating article.
[0566] The device cavity may be configured to receive at least the aerosol-generating section of the aerosol-generating article.
[0567] The device cavity may be substantially cylindrical.
[0568] The device cavity may have a substantially circular cross-section.
[0569] The aerosol-generating device may comprise a heating element.
[0570] The aerosol-generating device may comprise an external heating element.
[0571] The external heating element may be located around a perimeter of the device cavity.
[0572] The external heating element may be a resistive heating element.
[0573] The external heating element may be a susceptor element
[0574] The aerosol-generating device may comprise an internal heating element for insertion into the aerosol-generating substrate of the aerosol-generating section of the aerosol-generating article.
[0575] The internal heating element may have a pointed end to facilitate insertion of the internal heating element into the aerosol-generating substrate of the aerosol-generating section of the aerosol-generating article.
[0576] The internal heating element may be located within the device cavity.
[0577] The internal heating element may be arranged substantially longitudinally within the device cavity. That is, a longitudinal axis of the internal heating element may be approximately parallel to a longitudinal axis of the device cavity.
[0578] The internal heating element may be arranged centrally within the device cavity. The internal heating element may extend along a longitudinal axis of the device cavity.
[0579] The internal heating element may be a resistive heating element.
[0580] The internal heating element may be a susceptor element.
[0581] The aerosol-generating device may comprise an induction element.
[0582] The induction element may comprise one or more induction coils.
[0583] The induction element may be located around a perimeter of the device cavity.
[0584] The aerosol-generating system may comprise: a consumable aerosol-generating article; and a reusable aerosol-generating device.
[0585] Below, there is provided a non-exhaustive list of non-limiting examples. Any one or more of the features of these examples may be combined with any one or more features of another example, embodiment, or aspect described herein. [0586] EX1. An aerosol-generating article comprising: an aerosol-generating section, the aerosol-generating section comprising: an aerosol-generating substrate comprising a plurality of strands of aerosol-generating material. [0587] EX2. An aerosol-generating article according to example EX1, wherein the aerosol generating section comprises: an elongate internal heating element located within the aerosol-generating substrate in thermal contact with the plurality of strands of aerosol-generating material. [0588] EX3. An aerosol-generating article according to example EX2, wherein the internal heating element extends between an upstream end of the aerosol-generating section and a downstream end of the aerosol-generating section. [0589] EX4. An aerosol-generating system comprising: an aerosol-generating article comprising: an aerosol-generating section, the aerosol-generating section comprising: an aerosol-generating substrate comprising a plurality of strands of aerosol-generating material; and an aerosol-generating device. [0590] EX5. An aerosol-generating system according to example EX4, wherein the aerosol-generating device comprises: an elongate internal heating element for insertion into the aerosol-generating substrate of the aerosol-generating section of the aerosol-generating article. [0591] EX6. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating substrate has a density of at least 100 milligrams per cubic centimetre. [0592] EX7. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating substrate has a density of at least 150 milligrams per cubic centimetre. [0593] EX8. An aerosol-generating article or

aerosol-generating system according to any preceding example, wherein the aerosol-generating substrate has a density of at least 200 milligrams per cubic centimetre. [0594] EX9. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating substrate has a density of at least 250 milligrams per cubic centimetre. [0595] EX10. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating substrate has a density of at least 275 milligrams per cubic centimetre. [0596] EX11. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating substrate has a density of less than or equal to 700 milligrams per cubic centimetre. [0597] EX12. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating substrate has a density of less than or equal to 650 milligrams per cubic centimetre. [0598] EX13. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating substrate has a density of less than or equal to 600 milligrams per cubic centimetre. [0599] EX14. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating substrate has a density of less than or equal to 550 milligrams per cubic centimetre. [0600] EX15. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating substrate has a density of less than or equal to 500 milligrams per cubic centimetre. [0601] EX16. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating substrate has a mass of at least 120 milligrams. [0602] EX17. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating substrate has a mass of at least 130 milligrams. [0603] EX18. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating substrate has a mass of at least 140 milligrams. [0604] EX19. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating substrate has a mass of at least 150 milligrams. [0605] EX20. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating substrate has a mass of at least 160 milligrams. [0606] EX21. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating substrate has a mass of less than or equal to 340 milligrams. [0607] EX22. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating substrate has a mass of less than or equal to 310 milligrams. [0608] EX23. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating substrate has a mass of less than or equal to 280 milligrams. [0609] EX24. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating substrate has a mass of less than or equal to 250 milligrams. [0610] EX25. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating substrate has a mass of less than or equal to 220 milligrams. [0611] EX26. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating substrate is tobacco cut filler. [0612] EX27. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating section comprises: a heat transfer enhancement element located within the aerosol-generating substrate in thermal contact with the plurality of strands of aerosol-generating material. [0613] EX28. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average length of at least 0.5 millimetres. [0614] EX29. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average length of at least 1 millimetre. [0615] EX30. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average

length of at least 2 millimetres. [0616] EX31. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average length of at least 5 millimetres. [0617] EX32. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average length of less than or equal to 80 millimetres. [0618] EX33. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average length of less than or equal to 50 millimetres. [0619] EX34. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average length of less than or equal to 30 millimetres. [0620] EX35. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average length of less than or equal to 25 millimetres. [0621] EX36. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average length of less than or equal to 20 millimetres. [0622] EX37. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average length of less than or equal to 15 millimetres. [0623] EX38. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average width of at least 0.1 millimetres. [0624] EX39. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average width of at least 0.3 millimetres. [0625] EX40. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average width of at least 0.4 millimetres. [0626] EX41. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average width of at least 0.5 millimetres. [0627] EX42. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average width of at least 0.6 millimetres. [0628] EX43. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average width of less than or equal to 5 millimetres. [0629] EX44. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average width of less than or equal to 2 millimetres. [0630] EX45. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average width of less than or equal to 1.5 millimetres. [0631] EX46. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average width of less than or equal to 1.2 millimetres. [0632] EX47. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average width of less than or equal to 0.9 millimetres. [0633] EX48. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average thickness of at least 0.1 millimetres. [0634] EX49. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average thickness of at least 0.15 millimetres. [0635] EX50. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average thickness of at least 0.18 millimetres. [0636] EX51. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material

have an average thickness of at least 0.2 millimetres. [0637] EX52. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average thickness of less than or equal to 2 millimetres. [0638] EX53. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average thickness of less than or equal to 1 millimetre. [0639] EX54. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average thickness of less than or equal to 0.6 millimetres. [0640] EX55. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the plurality of strands of aerosol-generating material have an average thickness of less than or equal to 0.3 millimetres. [0641] EX56. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating material comprises at least 1 percent by weight of aerosol former. [0642] EX57. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating material comprises at least 5 percent by weight of aerosol former. [0643] EX58. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating material comprises at least 10 percent by weight of aerosol former. [0644] EX59. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating material comprises at least 15 percent by weight of aerosol former. [0645] EX60. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating material comprises less than or equal to 30 percent by weight of aerosol former. [0646] EX61. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating material comprises less than or equal to 25 percent by weight of aerosol former. [0647] EX62. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating material comprises less than or equal to 20 percent by weight of aerosol former. [0648] EX63. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating material comprises at least 0.5 percent by weight of nicotine. [0649] EX64. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating material comprises at least 1.0 percent by weight of nicotine. [0650] EX65. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating material comprises at least 1.5 percent by weight of nicotine. [0651] EX66. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating material comprises at least 2.0 percent by weight of nicotine. [0652] EX67. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating material comprises less than or equal to 10 percent by weight of nicotine. [0653] EX68. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating material comprises less than or equal to 8 percent by weight of nicotine. [0654] EX69. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating material comprises less than or equal to 6 percent by weight of nicotine. [0655] EX70. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the aerosol-generating material comprises less than or equal to 4 percent by weight of nicotine. [0656] EX71. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the internal heating element is a susceptor element. [0657] EX72. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the internal heating element has a length of at least 4 millimetres. [0658] EX73. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the internal heating element has a length of at least 6 millimetres. [0659] EX74. An aerosol-generating article or aerosol-generating system according to any

preceding example, wherein the internal heating element has a length of at least 8 millimetres. [0660] EX75. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the internal heating element has a length of at least 10 millimetres. [0661] EX76. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the internal heating element has a length of less than or equal to 45 millimetres. [0662] EX77. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the internal heating element has a length of less than or equal to 35 millimetres. [0663] EX78. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the internal heating element has a length of less than or equal to 25 millimetres. [0664] EX79. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the internal heating element has a length of less than or equal to 15 millimetres. [0665] EX80. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the internal heating element has a width of at least 0.5 millimetres. [0666] EX81. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the internal heating element has a width of at least 1 millimetre. [0667] EX82. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the internal heating element has a width of at least 1.5 millimetres. [0668] EX83. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the internal heating element has a width of at least 2 millimetres. [0669] EX84. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the internal heating element has a width of at least 2.5 millimetres. [0670] EX85. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the internal heating element has a width of less than or equal to 8 millimetres. [0671] EX86. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the internal heating element has a width of less than or equal to 7 millimetres. [0672] EX87. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the internal heating element has a width of less than or equal to 6 millimetres. [0673] EX88. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the internal heating element has a width of less than or equal to 5 millimetres. [0674] EX89. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the internal heating element has a width of less than or equal to 4.5 millimetres. [0675] EX90. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the internal heating element has a width of less than or equal to 4 millimetres. [0676] EX91. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the internal heating element has a width of less than or equal to 3.5 millimetres. [0677] EX92. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein the internal heating element has a width of less than or equal to 3 millimetres. [0678] EX93. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element is at least 0.05. [0679] EX94. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element is at least 0.06. [0680] EX95. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element is at least 0.08. [0681] EX96. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element is at least 0.09. [0682] EX97. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average width of the plurality of strands of aerosol-generating material to a

width of the internal heating element is at least 0.10. [0683] EX98. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element is at least 0.11. [0684] EX99. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element is at least 0.12. [0685] EX100. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element is at least 0.13. [0686] EX101. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element is less than or equal to 4. [0687] EX102. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element is less than or equal to 3. [0688] EX103. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element is less than or equal to 2. [0689] EX104. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element is less than or equal to 1.8. [0690] EX105. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element is less than or equal to 1.6. [0691] EX106. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element is less than or equal to 1.5. [0692] EX107. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element is less than or equal to 1.4. [0693] EX108. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average width of the plurality of strands of aerosol-generating material to a width of the internal heating element is less than or equal to 1.3. [0694] EX109. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average length of the plurality of strands of aerosol-generating material to a length of the internal heating element is at least 0.04. [0695] EX110. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average length of the plurality of strands of aerosol-generating material to a length of the internal heating element is at least 0.07. [0696] EX111. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average length of the plurality of strands of aerosol-generating material to a length of the internal heating element is at least 0.10. [0697] EX112. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average length of the plurality of strands of aerosol-generating material to a length of the internal heating element is at least 0.12. [0698] EX113. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average length of the plurality of strands of aerosol-generating material to a length of the internal heating element is at least 0.15. [0699] EX114. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average length of the plurality of strands of aerosol-generating material to a length of the internal heating element is at least 0.20. [0700] EX115. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average length of the plurality of strands of aerosol-generating material to a length of the

internal heating element is at least 0.25. [0701] EX116. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average length of the plurality of strands of aerosol-generating material to a length of the internal heating element is less than or equal to 7. [0702] EX117. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average length of the plurality of strands of aerosol-generating material to a length of the internal heating element is less than or equal to 4. [0703] EX118. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average length of the plurality of strands of aerosol-generating material to a length of the internal heating element is less than or equal to 1. [0704] EX119. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average length of the plurality of strands of aerosol-generating material to a length of the internal heating element is less than or equal to 0.8. [0705] EX120. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average length of the plurality of strands of aerosol-generating material to a length of the internal heating element is less than or equal to 0.7. [0706] EX121. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average length of the plurality of strands of aerosol-generating material to a length of the internal heating element is less than or equal to 0.6. [0707] EX122. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of an average length of the plurality of strands of aerosol-generating material to a length of the internal heating element is less than or equal to 0.5. [0708] EX123. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of a width of the internal heating element to a width of the aerosol-generating section is at least 0.1. [0709] EX124. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of a width of the internal heating element to a width of the aerosol-generating section is at least 0.2. [0710] EX125. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of a width of the internal heating element to a width of the aerosol-generating section is at least 0.3. [0711] EX126. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of a width of the internal heating element to a width of the aerosol-generating section is at least 0.4. [0712] EX127. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of a width of the internal heating element to a width of the aerosol-generating section is less than or equal to 0.9. [0713] EX128. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of a width of the internal heating element to a width of the aerosol-generating section is less than or equal to 0.8. [0714] EX129. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of a width of the internal heating element to a width of the aerosol-generating section is less than or equal to 0.7. [0715] EX130. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of a width of the internal heating element to a width of the aerosol-generating section is less than or equal to 0.6. [0716] EX131. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of a length of the internal heating element to a total length of the aerosol-generating article is at least 0.10. [0717] EX132. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of a length of the internal heating element to a total length of the aerosol-generating article is at least 0.15. [0718] EX133. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of a length of the internal heating element to a total length of the aerosol-generating article is at least 0.20. [0719] EX134. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of a length of the internal heating element to a total length of the aerosol-generating article is less than or equal to 0.40.

[0720] EX135. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of a length of the internal heating element to a total length of the aerosol-generating article is less than or equal to 0.35. [0721] EX136. An aerosol-generating article or aerosol-generating system according to any preceding example, wherein a ratio of a length of the internal heating element to a total length of the aerosol-generating article is less than or equal to 0.30. [0722] EX137. An aerosol-generating system according to any preceding example, wherein the aerosol-generating device comprises: a device cavity for receiving the aerosol-generating article. [0723] EX138. An aerosol-generating system according to any preceding example, wherein the aerosol-generating device comprises: an induction element. [0724] EX139. An aerosol-generating article according to any preceding example, comprising a downstream section located downstream of the aerosol-generating section. [0725] EX140. An aerosol-generating article according to example EX139, wherein the downstream section comprises a support element abutting a downstream end of the aerosol-generating section. [0726] EX141. An aerosol-generating article according to example EX140, wherein the support element comprises an opening at an end of the support element. [0727] EX142. An aerosol-generating article according to example EX141, wherein a ratio of a width of the opening of the support element to an average width of the plurality of strands of aerosol-generating material is at least 0.1. [0728] EX143. An aerosol-generating article according to example EX141, wherein a ratio of a width of the opening of the support element to an average width of the plurality of strands of aerosol-generating material is at least 0.5. [0729] EX144. An aerosol-generating article according to example EX141, wherein a ratio of a width of the opening of the support element to an average width of the plurality of strands of aerosol-generating material is at least 1. [0730] EX145. An aerosol-generating article according to example EX141, wherein a ratio of a width of the opening of the support element to an average width of the plurality of strands of aerosol-generating material is at least 3. [0731] EX146. An aerosol-generating article according to any of examples EX141 to EX145, wherein a ratio of a width of the opening of the support element to an average width of the plurality of strands of aerosol-generating material is less than or equal to 20. [0732] EX147. An aerosol-generating article according to any of examples EX141 to EX145, wherein a ratio of a width of the opening of the support element to an average width of the plurality of strands of aerosol-generating material is less than or equal to 10. [0733] EX148. An aerosol-generating article according to any of examples EX141 to EX145, wherein a ratio of a width of the opening of the support element to an average width of the plurality of strands of aerosol-generating material is less than or equal to 7.5. [0734] EX149. An aerosol-generating article according to any of examples EX141 to EX145, wherein a ratio of a width of the opening of the support element to an average width of the plurality of strands of aerosol-generating material is less than or equal to 5. [0735] EX150. An aerosol-generating article according to any of examples EX141 to EX149, wherein the support element comprises a hollow tubular downstream element having an end wall defining either the downstream end or the upstream end of the hollow tubular downstream element, optionally the end wall being defined by a flanged end of the hollow tubular downstream element. [0736] EX151. An aerosol-generating article according to any of examples EX141 to EX150, wherein the opening of the support element is defined through the end wall. [0737] EX152. An aerosol-generating article according to any of examples EX141 to EX151, wherein the opening of the support element is located at the upstream end of the support element. [0738] EX153. An aerosol-generating article according to any of examples EX141 to EX152, wherein the support element comprises a hollow tubular downstream element defining a cavity extending longitudinally along the hollow tubular downstream element. [0739] EX153. An aerosol-generating article according to any preceding example, comprising an upstream section located upstream of the aerosol-generating section. [0740] EX154. An aerosol-generating article according to example EX153, wherein the upstream section comprises an upstream element abutting an upstream end of the aerosol-generating section. [0741] EX155. An aerosol-generating article according to example EX154, wherein the upstream element comprises a

plug element. [0742] EX156. An aerosol-generating article according to example EX153 or EX154, wherein the upstream element comprises an opening at an end of the upstream element, optionally the opening is defined at a flanged end of the upstream element. [0743] EX157. An aerosol-generating article according to example EX156, wherein a ratio of a width of the opening of the upstream element to an average width of the plurality of strands of aerosol-generating material is at least 0.1. [0744] EX158. An aerosol-generating article according to example EX156, wherein a ratio of a width of the opening of the upstream element to an average width of the plurality of strands of aerosol-generating material is at least 0.5. [0745] EX159. An aerosol-generating article according to example EX156, wherein a ratio of a width of the opening of the upstream element to an average width of the plurality of strands of aerosol-generating material is at least 1. [0746] EX160. An aerosol-generating article according to example EX156, wherein a ratio of a width of the opening of the upstream element to an average width of the plurality of strands of aerosol-generating material is at least 3. [0747] EX161. An aerosol-generating article according any of examples EX156 to EX160, wherein a ratio of a width of the opening of the upstream element to an average width of the plurality of strands of aerosol-generating material is less than or equal to 20. [0748] EX162. An aerosol-generating article according any of examples EX156 to EX160, wherein a ratio of a width of the opening of the upstream element to an average width of the plurality of strands of aerosol-generating material is less than or equal to 10. [0749] EX163. An aerosol-generating article according any of examples EX156 to EX160, wherein a ratio of a width of the opening of the upstream element to an average width of the plurality of strands of aerosol-generating material is less than or equal to 7.5. [0750] EX164. An aerosol-generating article according any of examples EX156 to EX160, wherein a ratio of a width of the opening of the upstream element to an average width of the plurality of strands of aerosol-generating material is less than or equal to 5. [0751] EX165. An aerosol-generating article according any of examples EX156 to EX164, wherein the opening of the upstream element is located at the downstream end of the upstream element. [0752] EX166. An aerosol-generating article according to any of examples EX153 to EX165, wherein the upstream element comprises a hollow tubular upstream element defining a cavity extending longitudinally along the hollow tubular upstream element, optionally the hollow tubular upstream element having a flanged end defining an end wall of the hollow tubular upstream element.

[0753] FIG. **1** shows an aerosol-generating article **1** in accordance with an embodiment of the invention. The aerosol-generating article **1** is substantially cylindrical and has a total length of 45 millimetres and an external diameter of 7.2 millimetres.

[0754] The aerosol-generating article **1** comprises an aerosol-generating section **12** and a downstream section **14**. The downstream section **14** is located downstream of the aerosol-generating section **12**. The upstream end of the aerosol-generating section **12** corresponds to the upstream end of the aerosol-generating article **1**. The downstream end of the downstream section **14** corresponds to the downstream end of the aerosol-generating article **1**. The aerosol-generating section **12** has a length of 12 millimetres. The downstream section has a length of 23 millimetres.

[0755] The aerosol-generating section **12** comprises an aerosol-generating substrate **16** and a susceptor element **18** located within the aerosol-generating substrate **16**.

[0756] The aerosol-generating substrate **16** comprises 180 milligrams of tobacco cut filler. The tobacco cut filler is circumscribed by a wrapper (not shown). The tobacco cut filler comprises a plurality of strands of tobacco lamina. The tobacco cut filler comprises 90 percent by weight of tobacco lamina. The glycerine content of the tobacco cut filler is 18 percent by weight. The average cut width of the tobacco cut filler is 0.6 millimetres. The aerosol-generating substrate has a density of 325 milligrams per cubic centimetre.

[0757] The downstream section **14** comprises a support element **20** and a mouthpiece element **22**. The support element **20** is located immediately downstream of the aerosol-generating section **12**. The upstream end of the support element **20** abuts the downstream end of the aerosol-generating

section **12**. The support element has a length of 21 millimetres. As shown in FIG. **1**, the support element **20** is a hollow tubular element. The hollow tubular element has an internal diameter of 6.7 millimetres. The hollow tubular element is a hollow cylindrical cardboard tube. The thickness of the peripheral wall of the hollow cylindrical cardboard tube is 0.25 millimetres. The hollow tubular element defines an internal cavity or lumen **26** that extends from the upstream end of the hollow tubular element to the downstream end of the hollow tubular element. The internal cavity **26** is substantially empty. In use, airflow through the internal cavity **26** defined by the hollow tubular element is substantially unrestricted.

[0758] The upstream end of the support element **20** comprises an opening or aperture **21** defined through an end wall **25**. The end wall **25** defines the upstream end of the support element **20**. As shown in FIG. **1**, the upstream end of the support element **20** is flanged to define the end wall **25** and the single opening **21**. Such an upstream end wall **25** of the support element **20** abuts the downstream end of the aerosol-generating section **12** to minimise migration of material, such as cut filler, from the aerosol-generating substrate **16** towards the downstream end of the article **1**. The opening **21** allows air or aerosol to flow into the internal cavity **26** of the support element **20**. The opening **21** is substantially circular. The effective width or diameter of the opening **21** is 1 mm. Therefore, the ratio of the width of the opening **21** to an average width of the plurality of strands of tobacco lamina is 1.67.

[0759] The aerosol-generating article **1** comprises a ventilation zone **24** at a location along the downstream section **14**. The distance between the ventilation zone **24** and the downstream end of the downstream section **14** is 16 millimetres. The distance between the ventilation zone **24** and the downstream end of the aerosol-generating section **12** is 12 millimetres. The distance between the ventilation zone and the upstream end of the aerosol-generating section **12** is 24 millimetres. As shown in FIG. **1**, the ventilation zone is at a location along the support element **20**. The ventilation zone **24** comprises a circumferential row of perforations. The perforations extend through the peripheral wall of the hollow cylindrical cardboard tube. In use, the perforations allow air flow from the exterior of the aerosol-generating article **1** into the internal cavity **26** defined by the hollow tubular element.

[0760] The mouthpiece element **22** is located immediately downstream of the support element **20**. The upstream end of the mouthpiece element **22** abuts the downstream of the support element **20**. The downstream end of the mouthpiece element **22** corresponds to the downstream end of the aerosol-generating article **1**. The mouthpiece element **22** has a length of 7 millimetres. The mouthpiece element **22** is a cylindrical segment of low-density, cellulose acetate tow circumscribed by a wrapper (not shown). The RTD of the mouthpiece element **22** is 8 millimetres H.sub.2O.

[0761] The aerosol-generating article **1** comprises an upstream section **32**. The upstream section **32** is located upstream of the aerosol-generating section **12**. The upstream end of the upstream section **32** corresponds to the upstream end of the aerosol-generating article **1**. The upstream section **32** has a length of 5 millimetres.

[0762] The upstream section **32** comprises an upstream element **34**. The upstream element **34** is located immediately upstream of the aerosol-generating section **12**. The downstream end of the upstream element **34** abuts the upstream end of the aerosol-generating section **12**. The upstream end of the upstream element **34** corresponds to the upstream end of the aerosol-generating article **1**. The upstream element **34** has a length of 5 millimetres.

[0763] As shown in FIG. **1**, the upstream element **34** is a cylindrical segment of cellulose acetate circumscribed by a wrapper (not shown). The RTD of the upstream element is 30 millimetres H.sub.2O.

[0764] The aerosol-generating article **1** comprises an upstream wrapper (not shown) circumscribing the aerosol-generating section **12** and an adjacent upstream portion of the support element **20** of the downstream section **14**. The upstream wrapper has a length of 24 millimetres.

[0765] The aerosol-generating article **1** also comprises a downstream wrapper (not shown)

circumscribing the mouthpiece element **22** and an adjacent downstream portion of the support element **20** of the downstream section **14**. The downstream wrapper has a length of 26 millimetres. The downstream wrapper overlies a downstream portion of the upstream wrapper.
[0766] The perforations of the ventilation zone **24** extend through the upstream wrapper and the downstream wrapper.
[0767] FIG. **2** shows an aerosol-generating article **2** in accordance with another embodiment of the invention. The aerosol-generating article **2** shown in FIG. **2** is similar to the aerosol-generating article **1** shown in FIG. **1** and described above. Accordingly, the aerosol-generating article **2** shown in FIG. **2** will be described only insofar as it differs from the aerosol-generating article **1** shown in FIG. **1**.
[0768] The aerosol-generating article **2** shown in FIG. **2** differs from the aerosol-generating article **1** shown in FIG. **1** in that the upstream element **34** is a hollow tubular element similar to that of the support element **20**. Similar to the support element **20**, the hollow tubular element of the upstream element **34** has an internal diameter of **6**.**7** millimetres. The hollow tubular element of the upstream element **34** is a hollow cylindrical cardboard tube. The thickness of the peripheral wall of the hollow cylindrical cardboard tube is 0.25 millimetres. The hollow tubular element defines an internal cavity or lumen **36** that extends from the upstream end of the hollow tubular element to the downstream end of the hollow tubular element. The internal cavity **36** is substantially empty. In use, airflow through the internal cavity **36** defined by the hollow tubular element is substantially unrestricted.
[0769] As shown in FIG. **2**, the downstream end of the upstream element **34** comprises an opening or aperture **33** defined through an end wall **37**. The end wall **37** defines the downstream end of the upstream element **34**. As shown in FIG. **2**, the downstream end of the upstream element **34** is flanged to define the end wall **37** and the single opening **33**. Such a downstream end wall **37** of the upstream element **34** abuts the upstream end of the aerosol-generating section **12** to minimise migration of material, such as cut filler, from the aerosol-generating substrate **16** towards the upstream end of the article **1**. The opening **33** allows air to flow out of (or exit) the internal cavity **36** of the upstream element **34**, towards the aerosol-generating section **12**. The opening **33** is substantially circular. The effective width or diameter of the opening **33** is 1 mm. Therefore, the ratio of the width of the opening **33** to an average width of the plurality of strands of tobacco lamina is 1.67.
[0770] FIG. **3** shows an aerosol-generating article **3** in accordance with another embodiment of the invention. The aerosol-generating article **3** shown in FIG. **3** is similar to the aerosol-generating article **2** shown in FIG. **2** and described above. Accordingly, the aerosol-generating article **3** shown in FIG. **3** will be described only insofar as it differs from the aerosol-generating article **2** shown in FIG. **2**.
[0771] The aerosol-generating article **3** shown in FIG. **3** differs from the aerosol-generating article **2** shown in FIG. **2** in that the upstream end of the upstream element **34** also comprises an opening or aperture **31** defined through an end wall **35**. The end wall **35** defines the upstream end of the upstream element **34**. The end wall **35** defines the upstream end of the article **3**. As shown in FIG. **3**, the upstream end of the upstream element **34** is flanged to define the end wall **35** and the single opening **31**. Therefore, the upstream element **34** of the aerosol-generating article **3** comprises an upstream end wall **35** and a downstream end wall **37**. Accordingly, both ends of the upstream element **34** of the aerosol-generating article **3** are flanged. Such an upstream end wall **35** may further minimise migration of any material, such as cut filler, from the aerosol-generating substrate **16** that has entered into the internal cavity **36** via the downstream opening **33** towards the upstream end of the article **1**. The opening **31** allows air to enter the internal cavity **36** of the upstream element **34** and flow downstream towards the aerosol-generating section **12**. The opening **31** is substantially circular. The effective width or diameter of the opening **31** is 1 mm. Therefore, the ratio of the width of the opening **31** to an average width of the plurality of strands of tobacco

lamina is 1.67.
[0772] FIG. **4** shows an aerosol-generating article **4** in accordance with another embodiment of the invention. The aerosol-generating article **4** shown in FIG. **4** is similar to the aerosol-generating article **3** shown in FIG. **3** and described above. Accordingly, the aerosol-generating article **4** shown in FIG. **4** will be described only insofar as it differs from the aerosol-generating article **3** shown in FIG. **3**.
[0773] The aerosol-generating article **4** shown in FIG. **4** differs from the aerosol-generating article **3** shown in FIG. **3** in that the downstream end of the support element **20** comprises an opening or aperture **23** defined through an end wall **27**. The end wall **27** defines the downstream end of the support element **20**. As shown in FIG. **4**, the downstream end of the support element **20** is flanged to define the end wall **27** and the single opening **23**. Therefore, the support element **20** of the aerosol-generating article **3** comprises an upstream end wall **25** and a downstream end wall **27**. Accordingly, both ends of the support element **20** of the aerosol-generating article **3** are flanged. Such a downstream end wall **27** may further minimise migration towards the downstream end of the article **1** of any material, such as cut filler, from the aerosol-generating substrate **16** that has entered into the internal cavity **26** via the upstream opening **21**. The opening **23** allows air to enter the internal cavity **26** of the support element **20** and flow downstream towards the aerosol-generating section **12**. The opening **23** is substantially circular. The effective width or diameter of the opening **23** is 1 mm. Therefore, the ratio of the width of the opening **23** to an average width of the plurality of strands of tobacco lamina is 1.67.
[0774] The specific embodiments and examples described above illustrate, but do not limit, the invention. It is to be understood that other embodiments of the invention may be made and the specific embodiments and examples described herein are not exhaustive.
[0775] In particular, in the specific embodiments and examples described above the aerosol-generating substrate comprises tobacco cut filler comprising a plurality of strands of tobacco lamina. However, it is to be understood that other embodiments of the invention may be made in which the aerosol-generating substrate comprises a plurality of strands of other aerosol-generating material. For example, other embodiments of the invention may be made in which the aerosol-generating substrate comprises a plurality of strands of homogenised tobacco material or a plurality of strands of nicotine-containing gel material.
[0776] The aerosol-generating articles of specific embodiments and examples described above may further comprise a susceptor element arranged longitudinally within the aerosol-generating substrate. The susceptor may be positioned centrally within the aerosol-generating substrate and extends along the longitudinal axis of the aerosol-generating section. The susceptor element may be in accordance with any description within the present disclosure related to a susceptor element or a susceptor.
[0777] For the purpose of the present description and of the appended claims, except where otherwise indicated, all numbers expressing amounts, quantities, percentages, and so forth, are to be understood as being modified in all instances by the term “about”. In this context, therefore, a number A is understood as A ±10 percent of A. Within this context, a number A may be considered to include numerical values that are within general standard error for the measurement of the property that the number A modifies. The number A, in some instances as used in the appended claims, may deviate by the percentages enumerated above provided that the amount by which A deviates does not materially affect the basic and novel characteristic(s) of the claimed invention. Also, all ranges include the maximum and minimum points disclosed and include any intermediate ranges therein, which may or may not be specifically enumerated herein.

Claims

1. An aerosol-generating article, comprising: an aerosol-generating section comprising an aerosol-generating substrate, wherein the aerosol-generating substrate comprises a plurality of strands of aerosol-generating material, wherein the aerosol-generating substrate has a mass of between about 120 milligrams and about 350 milligrams, and wherein the aerosol-generating material is a star anise material; a downstream section located downstream of the aerosol-generating section, wherein the downstream section comprises a support element having an upstream end abutting the aerosol-generating section, the support element comprising an opening at an end of the support element, wherein a ratio of a width of the opening to an average width of the plurality of strands of aerosol-generating material is less than or equal to about 20; and an upstream section located upstream of the aerosol-generating section, wherein the upstream section comprises an upstream element having a downstream end abutting the aerosol-generating section.

2. The aerosol-generating article according to claim 1, wherein the upstream element comprises a plug element

3. The aerosol-generating article according to claim 1, wherein the upstream element comprises an opening at an end of the upstream element, and wherein a ratio of a width of the opening of the upstream element to an average width of the plurality of strands of aerosol-generating material is less than or equal to about 20.

4. The aerosol-generating article according to claim 3, wherein the opening of the upstream element is located at a downstream end of the upstream element

5. The aerosol-generating article according to claim 1, wherein the support element further comprises a hollow tubular downstream element having a flanged end defining an end wall, the opening of the support element being defined through the end wall.

6. The aerosol-generating article according to claim 1, wherein the opening of the support element is located at the upstream end of the support element.

7. The aerosol-generating article according to claim 1, wherein the support element further comprises a hollow tubular downstream element defining a cavity extending longitudinally along the hollow tubular downstream element

8. The aerosol-generating article according to claim 1, wherein the upstream element comprises a hollow tubular upstream element defining a cavity extending longitudinally along the hollow tubular upstream element

9. The aerosol-generating article according to claim 1, wherein a ratio of a width of the opening of the support element to an average width of the plurality of strands of aerosol-generating material is less than or equal to about 10.

10. The aerosol-generating article according to claim 1, wherein a ratio of a width of the opening of the support element to an average width of the plurality of strands of aerosol-generating material is less than or equal to about 7.5.

11. The aerosol-generating article according to claim 1, wherein a ratio of a width of the opening of the support element to an average width of the plurality of strands of aerosol-generating material is less than or equal to about 5.

12. The aerosol-generating article according to claim 1, wherein a ratio of a width of the opening of the upstream element to an average width of the plurality of strands of aerosol-generating material is less than or equal to about 10.

13. The aerosol-generating article according to claim 1, wherein a ratio of a width of the opening of the upstream element to an average width of the plurality of strands of aerosol-generating material is less than or equal to about 7.5.

14. The aerosol-generating article according to claim 3, wherein a ratio of a width of the opening of the upstream element to an average width of the plurality of strands of aerosol-generating material is less than or equal to about 5.

15. The aerosol-generating article according to claim 1, wherein a ratio of a width of the opening of

the support element to an average width of the plurality of strands of aerosol-generating material is at least 3.

16. The aerosol-generating article according to claim 1, wherein the aerosol-generating substrate has a bulk density of between about 100 milligrams per cubic centimetre and about 500 milligrams per cubic centimetre.