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A CONSUMABLE FOR USE WITH AN AEROSOL PROVISION DEVICE

Abstract

A consumable (**24**) for use with an aerosol provision device (**2**) is disclosed. The consumable (**24**) comprises a support (**28**), an aerosol-generating material (**26**), and one or more perforations (**38**). The perforations (**38**) are configured to allow the passage of heat or aerosol along the perforation (**38**).

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Background/Summary

PRIORITY CLAIM [0001] The present application claims priority to PCT/EP2022/063587 filed May 19, 2022, which claims priority to GB Application No. 2107265.7 filed May 20, 2021, both of which are hereby incorporated by reference in their entirety.

TECHNICAL FIELD
[0002] This disclosure relates to the field of non-combustible smoking articles, in particular to consumables for use with an aerosol provision device, and an aerosol provision system including a consumable and an aerosol provision device.
BACKGROUND
[0003] Smoking articles such as cigarettes, cigars and the like burn tobacco during use to create tobacco smoke. Alternatives to these types of articles release an inhalable aerosol or vapour by releasing compounds from a substrate material by heating without burning. These may be referred to as non-combustible smoking articles, aerosol generating assemblies, or aerosol provision devices.
[0004] One example of such a product is a heating device which releases compounds by heating, but not burning, an aerosolizable material which may be referred to as a solid aerosol-generating material. This solid aerosol-generating material may, in some cases, contain a tobacco material. The heating volatilizes at least one component of the material, typically forming an inhalable aerosol. These products may be referred to as heat-not-burn devices, tobacco heating devices or tobacco heating products. Various different arrangements for volatilizing at least one component of the solid aerosol-generating material are known.
[0005] As another example, there are hybrid devices. These hybrid devices contain a liquid source (which may or may not contain nicotine) which is vaporized by heating to produce an inhalable vapour or aerosol. The device additionally contains a solid aerosol-generating material (which may or may not contain a tobacco material) and components of this material are entrained in the inhalable vapour or aerosol to produce the inhaled medium.
SUMMARY
[0006] According to a first aspect of the present disclosure there is provided a consumable for use with an aerosol provision device, in which the consumable comprises a support, an aerosol-generating material, and one or more perforations in which the perforations are configured to allow the passage of heat or aerosol along the perforations.
[0007] According to a second aspect of the present disclosure there is provided an aerosol provision system comprising an aerosol provision device and a consumable according to the first aspect of the present disclosure.
[0008] According to a third aspect of the present disclosure there is provided a method of generating aerosol from a consumable according to the first aspect of the present disclosure using an aerosol-generating device with at least one heat source disposed to heat, but not burn, the consumable in use; wherein at least one heat source is a resistive heater element or a magnetic field generator suitable for causing electrical eddy-currents in a susceptor.

Description

DRAWINGS

[0009] Further features and advantages of the present disclosure will become apparent from the following description of embodiments of the disclosure given by way of example and with reference to the accompanying drawings.

[0010] FIG. **1** shows a schematic view of an embodiment of an aerosol provision device and an embodiment of a consumable according to the present disclosure;

[0011] FIG. **2** shows a first embodiment of the consumable of FIG. **1** along section-line AA′;

[0012] FIG. **3** shows a second embodiment of the consumable of FIG. **1** along section-line AA′;

[0013] FIG. **4** shows a perspective view of a part of the consumable of FIG. **2** or FIG. **3**;

[0014] FIG. **5** shows a third embodiment of the consumable of FIG. **1** along section-line AA′;

[0015] FIG. **6** shows a fourth embodiment of the consumable of FIG. **1** along section-line AA′; and

[0016] FIG. **7** shows a perspective view of a part of the consumable of FIG. **5** or FIG. **6**.

DETAILED DESCRIPTION

[0017] The consumable of the present description may be alternatively referred to as an article.

[0018] In some embodiments, the consumable may comprise aerosol-generating material, an aerosol-generating material storage area, an aerosol-generating material transfer component, an aerosol generator, an aerosol generation area, a housing, a wrapper, an aerosol-modifying agent, one or more active constituents, one or more flavors, one or more aerosol-former materials, and/or one or more other functional materials.

[0019] The apparatus for heating the aerosol-generating material with which the consumable is to be used is a part of a non-combustible aerosol provision system. Non-combustible aerosol provision systems release compounds from an aerosol-generating material without combusting the aerosol-generating material, such as electronic cigarettes, tobacco heating products, and hybrid systems to generate aerosol using a combination of aerosol-generating materials.

[0020] According to the present disclosure, a “non-combustible” aerosol provision system is one where a constituent aerosol-generating material of the aerosol provision system (or component thereof) is not combusted or burned in order to facilitate delivery of at least one substance to a user.

[0021] In some embodiments, the delivery system is a non-combustible aerosol provision system, such as a powered non-combustible aerosol provision system.

[0022] In some embodiments, the non-combustible aerosol provision system is an electronic cigarette, also known as a vaping device or electronic nicotine delivery system (END), although it is noted that the presence of nicotine in the aerosol-generating material is not a requirement.

[0023] In some embodiments, the non-combustible aerosol provision system is an aerosol-generating material heating system, also known as a heat-not-burn system. An example of such a system is a tobacco heating system.

[0024] In some embodiments, the non-combustible aerosol provision system is a hybrid system to generate aerosol using a combination of aerosol-generating materials, one or a plurality of which may be heated. Each of the aerosol-generating materials may be, for example, in the form of a solid, liquid or gel and may or may not contain nicotine. In some embodiments, the hybrid system comprises a liquid or gel aerosol-generating material and a solid aerosol-generating material. The solid aerosol-generating material may comprise, for example, tobacco or a non-tobacco product.

[0025] Typically, the non-combustible aerosol provision system may comprise a non-combustible aerosol provision device and a consumable for use with the non-combustible aerosol provision device.

[0026] In some embodiments, the non-combustible aerosol provision system, such as a non-combustible aerosol provision device may comprise a power source and a controller. The power source may, for example, be an electric power source or an exothermic power source. In some embodiments, the exothermic power source comprises a carbon substrate which may be energized so as to distribute power in the form of heat to an aerosol-generating material or to a heat transfer

material in proximity to the exothermic power source.
[0027] In some embodiments, the non-combustible aerosol provision system may comprise an area for receiving the consumable, an aerosol generator, an aerosol generation area, a housing, a mouthpiece, a filter and/or an aerosol-modifying agent.
[0028] In an embodiment of any of the above embodiments the consumable comprises a support, an aerosol-generating material, and one or more perforations, in which the perforations are configured to allow the passage of heat or aerosol along the perforation. The perforations are not so configured or arranged on or in the consumable that they facilitate tearing the consumable along a tear path.
[0029] In some embodiments of any of the above embodiments the perforations have a cross-sectional area of at least 0.01 mm.sup.2, at least 0.05 mm.sup.2, at least 0.1 mm.sup.2, at least 0.5 mm.sup.2, at least 1 mm.sup.2, at least 2 mm.sup.2, or at least 3 mm.sup.2. Such an arrangement is advantageous in that the consumable allows aerosol or heat generated in or adjacent to one part of the consumable to pass to another part of the consumable along the perforations, movement which could be blocked by the structure of the consumable in consumables not according to the present disclosure. For example, aerosol generated one side of a planar support may migrate or transfer to the other side of the support. This allows the aerosol generated by the consumable to fully mix at the location of generation of the aerosol before the mixed vapour moves to the mouthpiece of the aerosol provision device. In another example, a perforation can extend from a mouth which is closed by a susceptor through the support and into the aerosol-generating material so as to transmit heat from the susceptor to the aerosol-generating material.
[0030] In some embodiments of the above embodiments the support supports the aerosol-generating material on a surface of the support.
[0031] In some embodiments of the above embodiments the support further supports an aerosol-generating material on a second surface of the support.
[0032] In some embodiments of the above embodiments at least some of the aerosol-generating material supported on the first surface of the support is supported as one or more discrete portions of aerosol-generating material. Those discrete portions may be distributed over the first surface of the support and spaced from each other.
[0033] In some embodiments of the above embodiments at least some of the aerosol-generating material supported on the second surface of the support is supported as one or more discrete portions of aerosol-generating material. Those discrete portions may be distributed over the first surface of the support and spaced from each other.
[0034] In some embodiments of the above embodiments the number of discrete portions of aerosol-generating material on the first surface corresponds to the number of discrete portions on the second surface, and the positions of the discrete portions on the first surface of the support substantially corresponds to the positions of the discrete portions supported on the second surface of the support. This arrangement has the effect that for a substantially planar or flat support, at certain positions on the support there is aerosol-generating material supported on both surfaces, typically the two major surfaces (those with the greatest area), of the support. Perforations may, in some embodiments, extend from a position within the aerosol-generating material supported on the first surface to a position within the aerosol-generating material supported on the second surface. In other embodiments the perforations may pass from a free surface (one that is in contact with the atmosphere rather than another element of the consumable) of the aerosol-generating material supported on the first surface to a free surface of the aerosol-generating material supported on the second surface.
[0035] In some embodiments of the above embodiments all of the aerosol-generating material supported on the support is of substantially the same composition.
[0036] In some embodiments of the above embodiments the aerosol-generating material supported on the support is comprised of two or more discrete portions, and at least one discrete portion has a

different composition to at least one of the other discrete portions. This allows different discrete portions to provide the user with different experiences, for example flavors, when the different discrete portions are aerosolized.
[0037] In some embodiments of the above embodiments one or more of the perforations have at least one open end which opens through a surface of the support, aerosol-generating material, or any other element of the consumable, and the open end is defined by that surface. An open end of a perforation is an end that is open to the atmosphere surrounding the consumable and which is not blocked or closed by an element of the consumable.
[0038] In some embodiments of the above embodiments one or more of the perforations have at least one blind end which is closed by the support, by the aerosol-generating material, or by any other element of the consumable. A blind end of a perforation is an end that is which is blocked or closed by an element of the consumable and not in communication with the atmosphere surrounding the consumable other, perhaps than via the perforation itself.
[0039] In some embodiments of the above embodiments one or more of the perforations extend at least partially through the support or aerosol-generating material.
[0040] In some embodiments of the above embodiment at least some of the aerosol-generating material is supported on a first surface of the support as one or more of discrete portions of aerosol-generating material. Such an arrangement is advantageous because it allows discreet portions of the aerosol-generating material to be aerosolized at different times. A further advantage is that the composition of at least one different discrete portion of aerosol-generating material may be different from the other different discrete portions of aerosol-generating material. The separation of those discrete portions makes selection of a discrete portion of a particular composition of aerosol-generating material easier than if there were no gaps between discrete portions of the aerosol-generating material.
[0041] In some embodiments of any of the above embodiments one or more of the open ends of the perforations on the first or second surface are overlaid, blocked or closed by the aerosol-generating material supported on that surface. Such an arrangement allows aerosol generated from the aerosol-generating material overlying, blocking or closing the ends of the perforations to enter into the perforations and to flow to another surface of the support to that supporting the aerosol-generating material. Such an arrangement may also provide an improved adherence of the aerosol-generating material to the support because some of the aerosol-generating material may key into the perforations.
[0042] In some embodiments of any of the above embodiments one or more of the open ends of the perforations on the first or second surface are not overlaid, blocked or closed by the aerosol-generating material supported on that surface. Such an arrangement is advantageous because those perforations readily allow the passage of aerosol from the surface of the support supporting the aerosol-generating material to a second surface.
[0043] In some embodiments of any of the above embodiments the support supports aerosol-generating material on the other of the first and second surfaces of the support. That is, the support supports aerosol-generating material on both the first and second surfaces of the support. Such an arrangement is advantageous because it increases the amount of aerosol-generating material that may be supported on a consumable of the present embodiment relative to a consumable with aerosol-generating material supported on only one surface of the support.
[0044] In some embodiments of any of the above embodiments at least some of the aerosol-generating material is supported on the other of the first and second surfaces of the support as one or more discrete portions of aerosol-generating material.
[0045] In some embodiments of any of the above embodiments one or more of the open ends of the perforations on the other of the first and second surfaces are overlaid by the aerosol-generating material supported on that surface.
[0046] In some embodiments of any of the above embodiments a second number of the open ends

of the perforations on the other of the first and second surfaces are not overlaid by the aerosol-generating material supported on that surface.
[0047] In some embodiments of any of the above embodiments the position or positions of the aerosol-generating material supported on the first surface of the support substantially corresponds to the position or positions of the aerosol-generating material supported on the second surface of the support.
[0048] In some embodiments of any of the above embodiments the support comprises an impermeable material, optionally the impermeable material is a sheet material. The impermeable material is impermeable to at least the constituents of the aerosol-generating material. In such embodiments, the constituents of the aerosol-generating material cannot migrate or diffuse into the support.
[0049] In some embodiments of any of the above embodiments the impermeable material is a ferrous or non-ferrous metal.
[0050] In some embodiments of any of the above embodiments the impermeable material is a susceptor.
[0051] A susceptor is a material that is heatable by penetration with a varying magnetic field, such as an alternating magnetic field. The susceptor may be an electrically-conductive material, so that penetration thereof with a varying magnetic field causes induction heating of the susceptor by resistive heating as a result of electric eddy currents. The susceptor may be magnetic material, so that penetration thereof with a varying magnetic field causes magnetic hysteresis heating of the susceptor. The susceptor may be both electrically-conductive and magnetic, so that the susceptor is heatable by both heating mechanisms. The device that is configured to generate the varying magnetic field is referred to as a magnetic field generator.
[0052] The susceptor may comprise a ferromagnetic metal such as iron or an iron alloy such as steel or an iron nickel alloy. Some example ferromagnetic metals are a 400 series stainless steel such as grade 410 stainless steel, or grade 420 stainless steel, or grade 430 stainless steel, or stainless steel of similar grades. Alternatively, the susceptor may comprise a suitable non-magnetic, in particular paramagnetic, conductive material, such as aluminium. In a paramagnetic conductive material inductive heating occurs solely by resistive heating due to eddy currents. Alternatively, the susceptor may comprise a non-conductive ferrimagnetic material, such as a non-conductive ferrimagnetic ceramic. In that case, heat is only by generated by hysteresis losses. The susceptor may comprise a commercial alloy like Phytherm 230 (with a composition (in % by weight=wt %) with 50 wt % Ni, 10 wt % Cr and the rest Fe) or Phytherm 260 (with a composition with 50 wt % Ni, 9 wt % Cr and the rest Fe).
[0053] In some embodiments of any of the above embodiments the impermeable material is an aluminium foil.
[0054] In some embodiments of any of the above embodiments the impermeable material is comprised of two or more discrete portions.
[0055] In some embodiments of any of the above embodiments the discrete portions of impermeable material correspond in number or location to the one or more discrete portions of aerosol-generating material.
[0056] In some embodiments of any of the above embodiments each discrete portion of aerosol-generating material is supported on the surface of a discrete portion of impermeable material. In such embodiments each discrete portion of impermeable material can be a susceptor which may be individually caused to heat. The use of discrete portions of susceptor is advantageous because in embodiments of consumable which include two or more discrete portions of aerosol-generating material the discontinuity of the susceptor lessens the amount of heat transferred from one discrete portion of aerosol-generating material which is being heated to an adjacent portion of aerosol-generating material which is not being heated.
[0057] In some embodiments of any of the above embodiments one or more of the perforations

extend through aerosol-generating material supported on one or both of the first and second surfaces of the support. An advantage of such an arrangement is that the surface area of the aerosol-generating material is increased by the perforations and as such the efficiency of generation of the aerosol from the aerosol-generating material is increased relative an aerosol-generating material of smaller surface area. A further advantage is that the aerosol that is formed from the aerosol-generating material adjacent the perforations may readily pass in either direction along the passage formed by the perforation.

[0058] In some embodiments of any of the above embodiments the position of one or more of the perforations through the support is determined by the position of the aerosol-generating material on one or both of the first and second surfaces of the support.

[0059] In some embodiments of any of the above embodiments the aerosol-generating material is an amorphous solid.

[0060] In some embodiments of any of the above embodiments the aerosol-generating material is an aerosolizable gel.

[0061] In some embodiments of any of the above embodiments all of the aerosol-generating material supported on the first and or second surfaces of the support is of substantially the same composition.

[0062] In an embodiment of any of the above embodiments the aerosol-generating material supported on the support is so located that there is a band of support on both surfaces of the support which extends a predetermined distance onto the support from the edge that is free from aerosol-generating material. That band may extend the same distance from the edge of the support for the whole length of the edge of the support. The band may assist in the handling of the consumable during use and or packaging. The band may be continuous along the whole length of the edge of the support or it may be discontinuous. The band may extend different distances onto the surfaces of the support at different positions around the edge of the support.

[0063] In an embodiment of any of the above embodiments the aerosol-generating material comprises an active substance.

[0064] The active substance as used herein may be a physiologically active material, which is a material intended to achieve or enhance a physiological response. The active substance may for example be selected from nutraceuticals, nootropics, psychoactives. The active substance may be naturally occurring or synthetically obtained. The active substance may comprise for example nicotine, caffeine, taurine, terpenes of non-cannabinoid origin, theine, vitamins such as B6 or B12 or C, melatonin, cannabinoids, or constituents, derivatives, or combinations thereof.

[0065] The active substance may comprise one or more constituents, derivatives or extracts of tobacco, cannabis or another botanical.

[0066] The active substance may comprise one or more constituents, derivatives or extracts of cannabis, such as one or more cannabinoids or terpenes.

[0067] In some embodiments, the active substance comprises nicotine. In some embodiments, the active substance comprises caffeine, melatonin or vitamin B12.

[0068] The active substance may comprise or be derived from one or more botanicals or constituents, derivatives or extracts thereof. As used herein, the term “botanical” includes any material derived from plants including, but not limited to, extracts, leaves, bark, fibres, stems, roots, seeds, flowers, fruits, pollen, husk, shells or the like. Alternatively, the material may comprise an active compound naturally existing in a botanical, obtained synthetically. The material may be in the form of liquid, gas, solid, powder, dust, crushed particles, granules, pellets, shreds, strips, sheets, or the like. Example botanicals are tobacco, eucalyptus, star anise, hemp, cocoa, cannabis, fennel, lemongrass, peppermint, spearmint, rooibos, chamomile, flax, ginger, Ginkgo biloba, hazel, hibiscus, laurel, licorice (liquorice), matcha, mate, orange skin, papaya, rose, sage, tea such as green tea or black tea, thyme, clove, cinnamon, coffee, aniseed (anise), basil, bay leaves, cardamom, coriander, cumin, nutmeg, oregano, paprika, rosemary, saffron, lavender, lemon

peel, mint, juniper, elderflower, vanilla, wintergreen, beefsteak plant, curcuma, turmeric, sandalwood, cilantro, bergamot, orange blossom, myrtle, cassis, valerian, pimento, mace, damien, marjoram, olive, lemon balm, lemon basil, chive, carvi, verbena, tarragon, geranium, mulberry, ginseng, theanine, theacrine, maca, ashwagandha, damiana, guarana, chlorophyll, baobab or any combination thereof. The mint may be chosen from the following mint varieties: Mentha Arventis, Mentha c.v., Mentha niliaca, Mentha piperita, Mentha piperita citrata c.v., Mentha piperita c.v, Mentha spicata crispa, Mentha cardifolia, Memtha longifolia, Mentha suaveolens variegata, Mentha pulegium, Mentha spicata c.v. and Mentha suaveolens

[0069] In some embodiments, the active substance comprises or is derived from one or more botanicals or constituents, derivatives or extracts thereof and the botanical is tobacco.

[0070] In some embodiments, the active substance comprises or derived from one or more botanicals or constituents, derivatives or extracts thereof and the botanical is selected from eucalyptus, star anise, cocoa and hemp.

[0071] In some embodiments, the active substance comprises or derived from one or more botanicals or constituents, derivatives or extracts thereof and the botanical is selected from rooibos and fennel.

[0072] In some embodiments, the aerosol-generating material comprises a flavor or flavorant.

[0073] As used herein, the terms “flavor” and “flavorant” refer to materials which, where local regulations permit, may be used to create a desired taste, aroma or other somatosensorial sensation in a product for adult consumers. They may include naturally occurring flavor materials, botanicals, extracts of botanicals, synthetically obtained materials, or combinations thereof (e.g., tobacco, cannabis, licorice (liquorice), hydrangea, eugenol, Japanese white bark magnolia leaf, chamomile, fenugreek, clove, maple, matcha, menthol, Japanese mint, aniseed (anise), cinnamon, turmeric, Indian spices, Asian spices, herb, wintergreen, cherry, berry, red berry, cranberry, peach, apple, orange, mango, clementine, lemon, lime, tropical fruit, papaya, rhubarb, grape, durian, dragon fruit, cucumber, blueberry, mulberry, citrus fruits, Drambuie, bourbon, scotch, whiskey, gin, tequila, rum, spearmint, peppermint, lavender, aloe vera, cardamom, celery, cascarilla, nutmeg, sandalwood, bergamot, geranium, khat, naswar, betel, shisha, pine, honey essence, rose oil, vanilla, lemon oil, orange oil, orange blossom, cherry blossom, cassia, caraway, cognac, jasmine, ylang-ylang, sage, fennel, wasabi, piment, ginger, coriander, coffee, hemp, a mint oil from any species of the genus Mentha, eucalyptus, star anise, cocoa, lemongrass, rooibos, flax, Ginkgo biloba, hazel, hibiscus, laurel, mate, orange skin, rose, tea such as green tea or black tea, thyme, juniper, elderflower, basil, bay leaves, cumin, oregano, paprika, rosemary, saffron, lemon peel, mint, beefsteak plant, curcuma, cilantro, myrtle, cassis, valerian, pimento, mace, damien, marjoram, olive, lemon balm, lemon basil, chive, carvi, verbena, tarragon, limonene, thymol, camphene), flavor enhancers, bitterness receptor site blockers, sensorial receptor site activators or stimulators, sugars and/or sugar substitutes (e.g., sucralose, acesulfame potassium, aspartame, saccharine, cyclamates, lactose, sucrose, glucose, fructose, sorbitol, or mannitol), and other additives such as charcoal, chlorophyll, minerals, botanicals, or breath freshening agents. They may be imitation, synthetic or natural ingredients or blends thereof. They may be in any suitable form, for example, liquid such as an oil, solid such as a powder, or gas.

[0074] In some embodiments, the flavor comprises menthol, spearmint and/or peppermint. In some embodiments, the flavor comprises flavor components of cucumber, blueberry, citrus fruits and/or redberry. In some embodiments, the flavor comprises eugenol. In some embodiments, the flavor comprises flavor components extracted from tobacco. In some embodiments, the flavor comprises flavor components extracted from cannabis.

[0075] In some embodiments, the flavor may comprise a sensate, which is intended to achieve a somatosensorial sensation which are usually chemically induced and perceived by the stimulation of the fifth cranial nerve (trigeminal nerve), in addition to or in place of aroma or taste nerves, and these may include agents providing heating, cooling, tingling, numbing effect. A suitable heat effect

agent may be, but is not limited to, vanillyl ethyl ether and a suitable cooling agent may be, but not limited to eucolyptol, WS-3.
[0076] The aerosol-generating material is a material that is capable of generating aerosol, for example when heated, irradiated or energized in any other way. Aerosol-generating material may, for example, be in the form of a solid, liquid or gel which may or may not contain an active substance and/or flavorants. In some embodiments, the aerosol-generating material may comprise an “amorphous solid”, which may alternatively be referred to as a “monolithic solid” (i.e. non-fibrous). In some embodiments, the amorphous solid may be a gel or dried gel. The amorphous solid is a solid material that may retain some fluid, such as liquid, within it. In some embodiments, the aerosol-generating material may for example comprise from about 50 wt %, 60 wt % or 70 wt % of amorphous solid, to about 90 wt %, 95 wt % or 100 wt % of amorphous solid.
[0077] The amorphous solid comprises an aerosol generating agent.
[0078] In some embodiments the aerosol generating agent may comprise one or more constituents capable of forming an aerosol. In some embodiments, the aerosol generating agent may comprise one or more of glycerol, propylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, 1,3-butylene glycol, erythritol, meso-Erythritol, ethyl vanillate, ethyl laurate, a diethyl suberate, triethyl citrate, triacetin, a diacetin mixture, benzyl benzoate, benzyl phenyl acetate, tributyrin, lauryl acetate, lauric acid, myristic acid, and propylene carbonate. In particular examples, the aerosol generating agent comprises glycerol.
[0079] In some embodiments, the aerosol generating agent comprises one or more polyhydric alcohols, such as propylene glycol, triethylene glycol, 1,3-butanediol and glycerin; esters of polyhydric alcohols, such as glycerol mono-, di- or triacetate; and/or aliphatic esters of mono-, di- or polycarboxylic acids, such as dimethyl dodecanedioate and dimethyl tetradecanedioate.
[0080] In some embodiments, the amorphous solid may comprise from about 0.1 wt %, 0.5 wt %, 1 wt %, 3 wt %, 5 wt %, 7 wt % or 10% to about 50 wt %, 45 wt %, 40 wt %, 35 wt %, 30 wt % or 25 wt % of an aerosol generating agent (all calculated on a dry weight basis). The aerosol generating agent may act as a plasticiser. For example, the amorphous solid may comprise 0.5-40 wt %, 3-35 wt % or 10-25 wt % of an aerosol generating agent.
[0081] In some embodiments, the amorphous solid may comprise from about 5 wt %, 10 wt %, 20 wt %, 25 wt %, 27 wt % or 30 wt % to about 60 wt %, 55 wt %, 50 wt %, 45 wt %, 40 wt %, or 35 wt % of an aerosol generating agent (DWB). For example, the amorphous solid may comprise 10-60 wt %, 20-50 wt %, 25-40 wt % or 30-35 wt % of an aerosol generating agent.
[0082] In some embodiments, the amorphous solid may comprise up to about 80 wt %, such as about 40 to 80 wt %, 40 to 75 wt %, 50 to 70 wt %, or 55 to 65 wt % of an aerosol generating agent (DWB).
[0083] The amorphous solid may also comprise a gelling agent.
[0084] In some embodiments, the gelling agent comprises a hydrocolloid. In some embodiments, the gelling agent comprises one or more compounds selected from the group comprising alginates, pectins, starches (and derivatives), celluloses (and derivatives), gums, silica or silicones compounds, clays, polyvinyl alcohol and combinations thereof. For example, in some embodiments, the gelling agent comprises one or more of alginates, pectins, hydroxyethyl cellulose, hydroxypropyl cellulose, carboxymethylcellulose, pullulan, xanthan gum guar gum, carrageenan, agarose, acacia gum, fumed silica, PDMS, sodium silicate, kaolin and polyvinyl alcohol. In some cases, the gelling agent comprises alginate and/or pectin, and may be combined with a setting agent (such as a calcium source) during formation of the amorphous solid. In some cases, the amorphous solid may comprise a calcium-crosslinked alginate and/or a calcium-crosslinked pectin.
[0085] In some embodiments, the gelling agent comprises one or more compounds selected from cellulosic gelling agents, non-cellulosic gelling agents, guar gum, acacia gum and mixtures thereof.
[0086] In some embodiments, the cellulosic gelling agent is selected from the group consisting of:

hydroxymethyl cellulose, hydroxyethyl cellulose, hydroxypropyl cellulose, carboxymethylcellulose (CMC), hydroxypropyl methylcellulose (HPMC), methyl cellulose, ethyl cellulose, cellulose acetate (CA), cellulose acetate butyrate (CAB), cellulose acetate propionate (CAP) and combinations thereof.

[0087] In some embodiments, the gelling agent comprises (or is) one or more of hydroxyethyl cellulose, hydroxypropyl cellulose, hydroxypropyl methylcellulose (HPMC), carboxymethylcellulose, guar gum, or acacia gum.

[0088] In some embodiments, the gelling agent comprises (or is) one or more non-cellulosic gelling agents, including, but not limited to, agar, xanthan gum, gum Arabic, guar gum, locust bean gum, pectin, carrageenan, starch, alginate, and combinations thereof. In preferred embodiments, the non-cellulose based gelling agent is alginate or agar.

[0089] In some embodiments, the gelling agent comprises alginate, and the alginate is present in the amorphous solid in an amount of from 10-30 wt % of the amorphous solid (calculated on a dry weight basis). In some embodiments, alginate is the only gelling agent present in the amorphous solid. In other embodiments, the gelling agent comprises alginate and at least one further gelling agent, such as pectin.

[0090] In some embodiments, the amorphous solid comprises from about 1 wt %, 5 wt %, 10 wt %, 15 wt %, 20 wt % or 25 wt % to about 60 wt %, 50 wt %, 45 wt %, 40 wt % or 35 wt % of a gelling agent (all calculated on a dry weight basis). For example, the amorphous solid may comprise 1-50 wt %, 5-45 wt %, 10-40 wt % or 20-35 wt % of a gelling agent.

[0091] In some embodiments, the amorphous solid comprises from about 20 wt % 22 wt %, 24 wt % or 25 wt % to about 30 wt %, 32 wt % or 35 wt % of a gelling agent (all calculated on a dry weight basis). For example, the amorphous solid may comprise 20-35 wt % or 25-30 wt % of a gelling agent.

[0092] In some cases, the amorphous solid may comprise from about 1 wt %, 5 wt %, 10 wt %, 15 wt % or 20 wt % to about 60 wt %, 50 wt %, 40 wt %, 30 wt % or 25 wt % of a gelling agent (DWB). For example, the amorphous solid may comprise 10-40 wt %, 15-30 wt % or 20-25 wt % of a gelling agent (DWB).

[0093] In examples, the amorphous solid comprises gelling agent and filler, taken together, in an amount of from about 10 wt %, 20 wt %, 25 wt %, 30 wt %, or 35 wt % to about 60 wt %, 55 wt %, 50 wt %, or 45 wt % of the amorphous solid. In examples, the amorphous solid comprises gelling agent and filler, taken together, in an amount of from about 20 to 60 wt %, 25 to 55 wt %, 30 to 50 wt %, or 35 to 45 wt % of the amorphous solid.

[0094] In examples, the amorphous solid comprises gelling agent (i.e. without taking into account the amount of filler) in an amount of from about 5 wt %, 10 wt %, 15 wt %, 20 wt %, 25 wt %, 30 wt %, or 35 wt % to about 60 wt %, 55 wt %, 50 wt %, or 45 wt % of the amorphous solid. In examples, the amorphous solid comprises gelling agent (i.e. without taking into account the amount of filler) in an amount of from about 5 to 60 wt %, 20 to 60 wt %, 25 to 55 wt %, 30 to 50 wt %, or 35 to 45 wt % of the amorphous solid.

[0095] In some examples, alginate is comprised in the gelling agent in an amount of from about 5 to 40 wt % of the amorphous solid, or 15 to 40 wt %. That is, the amorphous solid comprises alginate in an amount of about 5 to 40 wt % by dry weight of the amorphous solid, or 15 to 40 wt %. In some examples, the amorphous solid comprises alginate in an amount of from about 20 to 40 wt %, or about 15 wt % to 35 wt % of the amorphous solid.

[0096] In some examples, pectin is comprised in the gelling agent in an amount of from about 3 to 15 wt % of the amorphous solid. That is, the amorphous solid comprises pectin in an amount of from about 3 to 15 wt % by dry weight of the amorphous solid. In some examples, the amorphous solid comprises pectin in an amount of from about 5 to 10 wt % of the amorphous solid.

[0097] In some examples, guar gum is comprised in the gelling agent in an amount of from about 3 to 40 wt % of the amorphous solid. That is, the amorphous solid comprises guar gum in an amount

of from about 3 to 40 wt % by dry weight of the amorphous solid. In some examples, the amorphous solid comprises guar gum in an amount of from about 5 to 10 wt % of the amorphous solid. In some examples, the amorphous solid comprises guar gum in an amount of from about 15 to 40 wt % of the amorphous solid, or from about 20 to 40 wt %, or from about 15 to 35 wt %. In examples, the alginate is present in an amount of at least about 50 wt % of the gelling agent. In examples, the amorphous solid comprises alginate and pectin, and the ratio of the alginate to the pectin is from 1:1 to 10:1. The ratio of the alginate to the pectin is typically >1:1, i.e. the alginate is present in an amount greater than the amount of pectin. In examples, the ratio of alginate to pectin is from about 2:1 to 8:1, or about 3:1 to 6:1, or is approximately 4:1.

[0098] The amorphous solid may be formed by (a) forming a slurry comprising components of the amorphous solid or precursors thereof, (b) forming a layer of the slurry, (c) setting the slurry to form a gel, and (d) drying to form an amorphous solid.

[0099] The (b) forming a layer of the slurry typically comprises spraying, casting or extruding the slurry. In examples, the slurry layer is formed by electrospraying the slurry. In examples, the slurry layer is formed by casting the slurry.

[0100] In some examples, (b) and/or (c) and/or (d), at least partially, occur simultaneously (for example, during electrospraying). In some examples, (b), (c) and (d) occur sequentially.

[0101] In some examples, the slurry is applied to a support. The layer may be formed on a support.

[0102] In examples, the slurry comprises gelling agent, aerosol-former material and active substance. The slurry may comprise these components in any of the proportions given herein in relation to the composition of the amorphous solid. For example, the slurry may comprise (on a dry weight basis): [0103] gelling agent and, optionally, filler, wherein the amount of gelling agent and filler taken together is about 10 to 60 wt % of the slurry; [0104] aerosol-former material in an amount of about 40 to 80 wt % of the slurry; and [0105] optionally, active substance in an amount of up to about 20 wt % of the slurry.

[0106] The setting the gel (c) may comprise supplying a setting agent to the slurry. For example, the slurry may comprise sodium, potassium or ammonium alginate as a gel-precursor, and a setting agent comprising a calcium source (such as calcium chloride), may be added to the slurry to form a calcium alginate gel.

[0107] In examples, the setting agent comprises or consists of calcium acetate, calcium formate, calcium carbonate, calcium hydrogencarbonate, calcium chloride, calcium lactate, or a combination thereof. In some examples, the setting agent comprises or consists of calcium formate and/or calcium lactate. In particular examples, the setting agent comprises or consists of calcium formate. The inventors have identified that, typically, employing calcium formate as a setting agent results in an amorphous solid having a greater tensile strength and greater resistance to elongation.

[0108] The total amount of the setting agent, such as a calcium source, may be 0.5-5 wt % (calculated on a dry weight basis). Suitably, the total amount may be from about 1 wt %, 2.5 wt % or 4 wt % to about 4.8 wt % or 4.5 wt %. The inventors have found that the addition of too little setting agent may result in an amorphous solid which does not stabilize the amorphous solid components and results in these components dropping out of the amorphous solid. The inventors have found that the addition of too much setting agent results in an amorphous solid that is very tacky and consequently has poor handleability.

[0109] When the amorphous solid does not contain tobacco, a higher amount of setting agent may need to be applied. In some cases the total amount of setting agent may therefore be from 0.5-12 wt % such as 5-10 wt %, calculated on a dry weight basis. Suitably, the total amount may be from about 5 wt %, 6 wt % or 7 wt % to about 12 wt % or 10 wt %. In this case the amorphous solid will not generally contain any tobacco.

[0110] In examples, supplying the setting agent to the slurry comprises spraying the setting agent on the slurry, such as a top surface of the slurry.

[0111] Alginate salts are derivatives of alginic acid and are typically high molecular weight

polymers (10-600 kDa). Alginic acid is a copolymer of β-D-mannuronic (M) and α-L-guluronic acid (G) units (blocks) linked together with (1,4)-glycosidic bonds to form a polysaccharide. On addition of calcium cations, the alginate crosslinks to form a gel. It has been found that alginate salts with a high G monomer content more readily form a gel on addition of the calcium source. In some cases therefore, the gel-precursor may comprise an alginate salt in which at least about 40%, 45%, 50%, 55%, 60% or 70% of the monomer units in the alginate copolymer are α-L-guluronic acid (G) units.

[0112] In examples, the drying (d) removes from about 50 wt %, 60 wt %, 70 wt %, 80 wt % or 90 wt % to about 80 wt %, 90 wt % or 95 wt % (WWB) of water in the slurry.

[0113] In examples, the drying (d) reduces the cast material thickness by at least 80%, suitably 85% or 87%. For instance, the slurry is cast at a thickness of 2 mm, and the resulting dried amorphous solid material has a thickness of 0.2 mm.

[0114] In some examples, the slurry solvent consists essentially of or consists of water. In some examples, the slurry comprises from about 50 wt %, 60 wt %, 70 wt %, 80 wt % or 90 wt % of solvent (WWB).

[0115] In examples where the solvent consists of water, the dry weight content of the slurry may match the dry weight content of the amorphous solid. Thus, the discussion herein relating to the solid composition is explicitly disclosed in combination with the slurry aspect of the invention.

[0116] The amorphous solid may comprises a flavor. Suitably, the amorphous solid may comprise up to about 80 wt %, 70 wt %, 60 wt %, 55 wt %, 50 wt % or 45 wt % of a flavor. In some cases, the amorphous solid may comprise at least about 0.1 wt %, 1 wt %, 10 wt %, 20 wt %, 30 wt %, 35 wt % or 40 wt % of a flavor (all calculated on a dry weight basis). For example, the amorphous solid may comprise 1-80 wt %, 10-80 wt %, 20-70 wt %, 30-60 wt %, 35-55 wt % or 30-45 wt % of a flavor. In some cases, the flavor comprises, consists essentially of or consists of menthol.

[0117] The amorphous solid may comprises a filler.

[0118] In some embodiments, the amorphous solid comprises less than 60 wt % of a filler, such as from 1 wt % to 60 wt %, or 5 wt % to 50 wt %, or 5 wt % to 30 wt %, or 10 wt % to 20 wt %.

[0119] In other embodiments, the amorphous solid comprises less than 20 wt %, suitably less than 10 wt % or less than 5 wt % of a filler. In some cases, the amorphous solid comprises less than 1 wt % of a filler, and in some cases, comprises no filler.

[0120] In some such cases the amorphous solid comprises at least 1 wt % of the filler, for example, at least 5 wt %, at least 10 wt %, at least 20 wt % at least 30 wt %, at least 40 wt %, or at least 50 wt % of the filler. In some embodiments, the amorphous solid comprises 5-25 wt % of the filler.

[0121] The filler, if present, may comprise one or more inorganic filler materials, such as calcium carbonate, perlite, vermiculite, diatomaceous earth, colloidal silica, magnesium oxide, magnesium sulphate, magnesium carbonate, and suitable inorganic sorbents, such as molecular sieves. The filler may comprise one or more organic filler materials such as wood pulp, cellulose and cellulose derivatives (such as methylcellulose, hydroxypropyl cellulose, and carboxymethyl cellulose (CMC)). In particular cases, the amorphous solid comprises no calcium carbonate such as chalk.

[0122] In particular embodiments which include filler, the filler is fibrous. For example, the filler may be a fibrous organic filler material such as wood pulp, hemp fibre, cellulose or cellulose derivatives (such as methylcellulose, hydroxypropyl cellulose, and carboxymethyl cellulose (CMC)).

[0123] Without wishing to be bound by theory, it is believed that including fibrous filler in an amorphous solid may increase the tensile strength of the material. This may be particularly advantageous in examples wherein the amorphous solid is provided as a sheet, such as when an amorphous solid sheet circumscribes a rod of aerosolizable material.

[0124] In some embodiments, the amorphous solid does not comprise tobacco fibres. In particular embodiments, the amorphous solid does not comprise fibrous material.

[0125] In some embodiments, the aerosol generating material does not comprise tobacco fibres. In

particular embodiments, the aerosol generating material does not comprise fibrous material.
[0126] The aerosol-generating material may comprise one or more active substances and/or flavors, one or more aerosol-former materials, and optionally one or more other functional material.
[0127] In some embodiments, the amorphous solid additionally comprises an active substance. For example, in some cases, the amorphous solid additionally comprises a tobacco material and/or nicotine. In some embodiments, the amorphous solid comprises powdered tobacco and/or nicotine and/or a tobacco extract.
[0128] In some cases, the amorphous solid may comprise 5-60 wt % (calculated on a dry weight basis) of a tobacco material and/or nicotine. In some cases, the amorphous solid may comprise from about 1 wt %, 5 wt %, 10 wt %, 15 wt %, 20 wt % or 25 wt % to about 70 wt %, 60 wt %, 50 wt %, 45 wt %, 40 wt %, 35 wt %, or 30 wt % (calculated on a dry weight basis) of an active substance. In some cases, the amorphous solid may comprise from about 1 wt %, 5 wt %, 10 wt %, 15 wt %, 20 wt % or 25 wt % to about 70 wt %, 60 wt %, 50 wt %, 45 wt %, 40 wt %, 35 wt %, or 30 wt % (calculated on a dry weight basis) of a tobacco material. For example, the amorphous solid may comprise 10-50 wt %, 15-40 wt % or 20-35 wt % of a tobacco material. In some cases, the amorphous solid may comprise from about 1 wt %, 2 wt %, 3 wt % or 4 wt % to about 20 wt %, 18 wt %, 15 wt % or 12 wt % (calculated on a dry weight basis) of nicotine. For example, the amorphous solid may comprise 1-20 wt %, 2-18 wt % or 3-12 wt % of nicotine.
[0129] In some cases, the amorphous solid comprises an active substance such as tobacco extract. In some cases, the amorphous solid may comprise 5-60 wt % (calculated on a dry weight basis) of tobacco extract. In some cases, the amorphous solid may comprise from about 5 wt %, 10 wt %, 15 wt %, 20 wt % or 25 wt % to about 60 wt %, 50 wt %, 45 wt %, 40 wt %, 35 wt %, or 30 wt % (calculated on a dry weight basis) tobacco extract. For example, the amorphous solid may comprise 10-50 wt %, 15-40 wt % or 20-35 wt % of tobacco extract. The tobacco extract may contain nicotine at a concentration such that the amorphous solid comprises 1 wt % 1.5 wt %, 2 wt % or 2.5 wt % to about 6 wt %, 5 wt %, 4.5 wt % or 4 wt % (calculated on a dry weight basis) of nicotine. In some cases, there may be no nicotine in the amorphous solid other than that which results from the tobacco extract.
[0130] In some embodiments the amorphous solid comprises no tobacco material but does comprise nicotine. In some such cases, the amorphous solid may comprise from about 1 wt %, 2 wt %, 3 wt % or 4 wt % to about 20 wt %, 18 wt %, 15 wt % or 12 wt % (calculated on a dry weight basis) of nicotine. For example, the amorphous solid may comprise 1-20 wt %, 2-18 wt % or 3-12 wt % of nicotine.
[0131] In some cases, the total content of active substance and/or flavor may be at least about 0.1 wt %, 1 wt %, 5 wt %, 10 wt %, 20 wt %, 25 wt % or 30 wt %. In some cases, the total content of active substance and/or flavor may be less than about 90 wt %, 80 wt %, 70 wt %, 60 wt %, 50 wt % or 40 wt % (all calculated on a dry weight basis).
[0132] In some cases, the total content of tobacco material, nicotine and flavor may be at least about 0.1 wt %, 1 wt %, 5 wt %, 10 wt %, 20 wt %, 25 wt % or 30 wt %. In some cases, the total content of active substance and/or flavor may be less than about 90 wt %, 80 wt %, 70 wt %, 60 wt %, 50 wt % or 40 wt % (all calculated on a dry weight basis).
[0133] The aerosol-generating composition may comprise one or more active substances. In examples, the amorphous solid comprises one or more active substances, e.g. up to about 20 wt % of the amorphous solid. In examples, the amorphous solid comprises active substance in an amount of from about 1 wt %, 5 wt %, 10 wt %, or 15 wt % to about 20 wt %, 15 wt %, 15 wt % or 5 wt % of the amorphous solid.
[0134] The active substance may comprise a physiologically and/or olfactory active substance which is included in the aerosol-generating composition in order to achieve a physiological and/or olfactory response.
[0135] Tobacco material may be present in the aerosol-generating composition in an amount of

from about 50 to 95 wt %, or about 60 to 90 wt %, or about 70 to 90 wt %, or about 75 to 85 wt %.
[0136] The tobacco material may be present in any format, but is typically fine-cut (e.g. cut into narrow shreds). Fine-cut tobacco material may advantageously be blended with the amorphous solid to provide an aerosol-generating composition which has an even dispersion of tobacco material and amorphous solid throughout the aerosol-generating composition.
[0137] In examples, the tobacco material comprises one or more of ground tobacco, tobacco fibre, cut tobacco, extruded tobacco, tobacco stem, reconstituted tobacco and/or tobacco extract. Surprisingly, the inventors have identified that it is possible to use a relatively large amount of lamina tobacco in the aerosol-generating composition and still provide an acceptable aerosol when heated by a non-combustible aerosol provision system. Lamina tobacco typically provides superior sensory characteristics. In examples, the tobacco material comprises lamina tobacco in an amount of at least about 50 wt %, 60 wt %, 70 wt %, 80 wt %, 85 wt %, 90 wt %, or 95 wt % of the tobacco material. In particular examples, the tobacco material comprises cut tobacco in an amount of at least about 50 wt %, 60 wt %, 70 wt %, 80 wt %, 85 wt %, 90 wt %, or 95 wt % of the tobacco material.
[0138] The tobacco used to produce tobacco material may be any suitable tobacco, such as single grades or blends, cut rag or whole leaf, including Virginia and/or Burley and/or Oriental.
[0139] In some embodiments the one or more other functional materials may comprise one or more of pH regulators, coloring agents, preservatives, binders, fillers, stabilizers, and/or antioxidants.
[0140] In some cases, the amorphous solid may additionally comprise an emulsifying agent, which emulsified molten flavor during manufacture. For example, the amorphous solid may comprise from about 5 wt % to about 15 wt % of an emulsifying agent (calculated on a dry weight basis), suitably about 10 wt %. The emulsifying agent may comprise acacia gum.
[0141] In some embodiments, the amorphous solid is a hydrogel and comprises less than about 20 wt % of water calculated on a wet weight basis. In some cases, the hydrogel may comprise less than about 15 wt %, 12 wt % or 10 wt % of water calculated on a wet weight basis. In some cases, the hydrogel may comprise at least about 1 wt %, 2 wt % or at least about 5 wt % of water (WWB).
[0142] The amorphous solid may have any suitable water content, such as from 1 wt % to 15 wt %. Suitably, the water content of the amorphous solid is from about 5 wt %, 7 wt % or 9 wt % to about 15 wt %, 13 wt % or 11 wt % (WWB), most suitably about 10 wt % . . . . The water content of the amorphous solid may, for example, be determined by Karl-Fischer-titration or Gas Chromatography with Thermal Conductivity Detector (GC-TCD).
[0143] In some cases, the amorphous solid may consist essentially of, or consist of a gelling agent, water, an aerosol generating agent, a flavor, and optionally an active substance.
[0144] In some cases, the amorphous solid may consist essentially of, or consist of a gelling agent, water, an aerosol generating agent, a flavor, and optionally a tobacco material and/or a nicotine source.
[0145] In examples, the amorphous solid consists essentially of, or consists of a gelling agent, aerosol generating agent, active substance, and water. In examples, the amorphous solid consists essentially of, or consists of a gelling agent, aerosol generating agent, and water.
[0146] In examples, the amorphous solid does not comprise a flavorant; in particular examples, the amorphous solid does not comprise an active substance.
[0147] In some embodiments the aerosol generating material comprises an amorphous solid, the amorphous solid comprising: [0148] 1-60 wt % of a gelling agent; [0149] 0.1-50 wt % of an aerosol generating agent; and [0150] 0.1-80 wt % of a flavor;
wherein these weights are calculated on a dry weight basis
[0151] In some embodiments, the amorphous solid comprises 1-80 wt % of a flavor (dry weight basis).
[0152] In some embodiments, the amorphous solid comprising: [0153] 1-50 wt % of a gelling agent; [0154] 0.1-50 wt % of an aerosol generating agent; and [0155] 30-60 wt % of a flavor;

wherein these weights are calculated on a dry weight basis.
[0156] In alternative embodiments of the aerosol generating material, the aerosol generating material comprises an amorphous solid, the amorphous solid comprising: [0157] 1-60 wt % of a gelling agent; [0158] 5-60 wt % of an aerosol generating agent; and [0159] 10-60 wt % of a tobacco extract;
wherein these weights are calculated on a dry weight basis.
[0160] In some embodiments, the amorphous solid comprises: [0161] 1-60 wt % of a gelling agent; [0162] 20-60 wt % of an aerosol generating agent; and [0163] 10-60 wt % of a tobacco extract;
wherein these weights are calculated on a dry weight basis.
[0164] In some embodiments, the amorphous solid comprises 20-35 wt % of the gelling agent; 10-25 wt % of the aerosol-former material; 5-25 wt % of the filler comprising fibres; and 35-50 wt % of the flavorant and/or active substance.
[0165] In some cases, the amorphous solid may consist essentially of, or consist of a gelling agent, an aerosol generating agent a tobacco extract, water, and optionally a flavor. In some cases, the amorphous solid may consist essentially of, or consist of glycerol, alginates and/or pectins, a tobacco extract and water.
[0166] In some embodiments, the amorphous solid may have the following composition (DWB): gelling agent (preferably comprising alginate) in an amount of from about 5 wt % to about 40 wt %, or about 10 wt % to 30 wt %, or about 15 wt % to about 25 wt %; tobacco extract in an amount of from about 30 wt % to about 60 wt %, or from about 40 wt % to 55 wt %, or from about 45 wt % to about 50 wt %; aerosol generating agent (preferably comprising glycerol) in an amount of from about 10 wt % to about 50 wt %, or from about 20 wt % to about 40 wt %, or from about 25 wt % to about 35 wt % (DWB).
[0167] In one embodiment, the amorphous solid comprises about 20 wt % alginate gelling agent, about 48 wt % Virginia tobacco extract and about 32 wt % glycerol (DWB).
[0168] The “thickness” of the amorphous solid describes the shortest distance between a first surface and a second surface. In embodiments where the amorphous solid is in the form of a sheet, the thickness of the amorphous solid is the shortest distance between a first planar surface of the sheet and a second planar surface of the sheet which opposes the first planar surface of the sheet.
[0169] In some cases, the aerosol-forming amorphous solid layer has a thickness of about 0.015 mm to about 1.5 mm, suitably about 0.05 mm to about 1.5 mm or 0.05 mm to about 1.0 mm. Suitably, the thickness may be in the range of from about 0.1 mm or 0.15 mm to about 1.0 mm, 0.5 mm or 0.3 mm.
[0170] In some cases, the amorphous solid may have a thickness of about 0.015 mm to about 1.0 mm. Suitably, the thickness may be in the range of about 0.05 mm, 0.1 mm or 0.15 mm to about 0.5 mm or 0.3 mm.
[0171] A material having a thickness of 0.2 mm is particularly suitable. The amorphous solid may comprise more than one layer, and the thickness described herein refers to the aggregate thickness of those layers.
[0172] It has been that if the aerosol-generating material or amorphous solid is too thick, then heating efficiency is compromised. This adversely affects the power consumption in use. Conversely, if the aerosol-generating material or amorphous solid is too thin, it is difficult to manufacture and handle; a very thin material is harder to cast and may be fragile, compromising aerosol formation in use.
[0173] The thickness stipulated herein is a mean thickness for the material. In some cases, the amorphous solid thickness may vary by no more than 25%, 20%, 15%, 10%, 5% or 1%.
[0174] In some examples, the amorphous solid in sheet form may have a tensile strength of from around 200 N/m to around 900 N/m. In some examples, such as where the amorphous solid does not comprise a filler, the amorphous solid may have a tensile strength of from 200 N/m to 400 N/m, or 200 N/m to 300 N/m, or about 250 N/m.

[0175] Such tensile strengths may be particularly suitable for embodiments wherein the aerosol generating material is formed as a sheet and then shredded and incorporated into an aerosol generating article. In some examples, such as where the amorphous solid comprises a filler, the amorphous solid may have a tensile strength of from 600 N/m to 900 N/m, or from 700 N/m to 900 N/m, or around 800 N/m. Such tensile strengths may be particularly suitable for embodiments wherein the aerosol generating material is included in an aerosol generating article/assembly as a rolled sheet, suitably in the form of a tube.
[0176] In some examples, the amorphous solid in sheet form may have a tensile strength of from around 200 N/m to around 2600 N/m. In some examples, the amorphous solid may have a tensile strength of from 600 N/m to 2000 N/m, or from 700 N/m to 1500 N/m, or around 1000 N/m. Such tensile strengths may be particularly suitable for embodiments wherein the aerosol-generating material comprising the amorphous solid is formed and incorporated into an aerosol-generating consumable as a sheet.
[0177] The aerosol generating material comprising the amorphous solid may have any suitable area density, such as from 30 g/m.sup.2 to 120 g/m.sup.2. In some cases, the sheet may have a mass per unit area of 80-120 g/m.sup.2, or from about 70 to 110 g/m.sup.2, or particularly from about 90 to 110 g/m.sup.2, or suitably about 100 g/m.sup.2 (so that it has a similar density to cut rag tobacco and a mixture of these substances will not readily separate). In some cases, the sheet may have a mass per unit area of about 30 to 70 g/m.sup.2, 40 to 60 g/m.sup.2, or 25-60 g/m.sup.2 and may be used to wrap an aerosolizable material such as tobacco.
[0178] All percentages by weight described herein (denoted wt %) are calculated on a dry weight basis, unless explicitly stated otherwise. All weight ratios are also calculated on a dry weight basis. A weight quoted on a dry weight basis refers to the whole of the extract or slurry or material, other than the water, and may include components which by themselves are liquid at room temperature and pressure, such as glycerol. Conversely, a weight percentage quoted on a wet weight basis refers to all components, including water.
[0179] The amorphous solid may comprise a colorant. The addition of a colorant may alter the visual appearance of the amorphous solid. The presence of colorant in the amorphous solid may enhance the visual appearance of the amorphous solid and the aerosol-generating material. By adding a colorant to the amorphous solid, the amorphous solid may be color-matched to other components of the aerosol-generating material or to other components of an article comprising the amorphous solid.
[0180] A variety of colorants may be used depending on the desired color of the amorphous solid. The color of amorphous solid may be, for example, white, green, red, purple, blue, brown or black. Other colors are also envisaged. Natural or synthetic colorants, such as natural or synthetic dyes, food-grade colorants and pharmaceutical-grade colorants may be used. In certain embodiments, the colorant is caramel, which may confer the amorphous solid with a brown appearance. In such embodiments, the color of the amorphous solid may be similar to the color of other components (such as tobacco material) in an aerosol-generating material comprising the amorphous solid. In some embodiments, the addition of a colorant to the amorphous solid renders it visually indistinguishable from other components in the aerosol-generating material.
[0181] The colorant may be incorporated during the formation of the amorphous solid (e.g. when forming a slurry comprising the materials that form the amorphous solid) or it may be applied to the amorphous solid after its formation (e.g. by spraying it onto the amorphous solid).
[0182] In some embodiments of any of the above embodiments talcum powder, calcium carbonate powder or other powder is applied to the exposed surface of at least one discrete portion of aerosol-generating material. This may reduce the level of tackiness or adhesion of the aerosol-generating material.
[0183] In some embodiments the one or more other functional materials may comprise one or more of pH regulators, coloring agents, preservatives, binders, fillers, stabilizers, and/or antioxidants.

[0184] In the following discussions of the accompanying drawings, where the same element is present in one or more embodiments the same reference numeral is used for that element throughout, where there are similar elements similar reference numerals (the same numeral plus a multiple of 100) are used.
[0185] With reference to FIG. **1**, an aerosol provision device **2** comprises a casing **4** within which is located a heater assembly **6**. The heater assembly **6** is comprised of a heating chamber **8** and a heater **10**. The heater **10** can be an electrical resistance heater or a magnetic field generator for use with a susceptor.
[0186] The heating chamber **8** defines a mouth **12** at a first end of the heating chamber **8**. At the opposite end of the heating chamber **8** is an aperture **14**. The aperture **14** is in fluid communication with a mouth piece **16** via a conduit **18**.
[0187] Also located within the casing **4** is a controller **20** which is in electronic communication with and controls the functioning of the heater **10**. The controller **20** may include a memory (not shown) within which one or more tables relating to the operation of the heater **10** may be stored. The heater **10** and controller **20** are powered by a power source **22**. The power source **22** is a rechargeable battery. In other embodiments the power source may be other appropriate sources of electrical power.
[0188] The aerosol provision device **2** is suitable for use with a consumable **24**. The consumable **24** is comprised of one or more discrete portions of aerosol-generating material **26** supported on first surface **30** of a support **28**. The discrete portions of aerosol-generating material **26** are supported on the support **28** in a square grid pattern. Other, non-illustrated embodiments of the consumable **24** may include more or less discrete portions of aerosol-generating material **26** than shown in FIG. **1**, including a single portion of aerosol-generating material **26**, and those portions may be distributed on the surface of the support **28** in any pattern. The discrete portions of aerosol-generating material **26** are shown to have an approximately square shape in FIG. **1**, they may, in other embodiments, be of other shapes.
[0189] With reference to FIGS. **2** and **4**, the support **28** is comprised of a laminate of a support substrate **34** and a susceptor substrate **26**. Supported on both the first and second surfaces **30**, **32** of the support **28** are discrete portions of aerosol-generating material **26**. The discrete portions of aerosol-generating material **26** supported on the first surface **30** of the support and the discrete portions of aerosol-generating material **26** supported on the second surface **32** of the support are so positioned that they correspond with each other. That is when viewed from a position perpendicular to one of the first and second surfaces **30**, **32**, the discrete portions of aerosol-generating material **26** on the closer of the first and second surfaces overlie the discrete portions of aerosol-generating material **26** on the further of the first and second surfaces.
[0190] Extending through the support **28** and, where the support supports the discrete portions of aerosol-generating material **26**, the aerosol-generating material **26** are one or more perforations **38**. For reasons of visual clarity in FIGS. **2** and **4**, not all of the perforations **38** are labelled. Those perforations **38** are of sufficient size to permit the flow of aerosol along the perforations between one side of the consumable **24** and the other side. In some embodiments the cross-section of the perforations **38** have a cross-sectional area of at least 0.01 mm.sup.2, at least 0.05 mm.sup.2, at least 0.1 mm.sup.2, at least 0.5 mm.sup.2, at least 1 mm.sup.2, at least 2 mm.sup.2, or at least 3 mm.sup.2.
[0191] The perforations are, as may be seen in FIG. **4**, arranged around and through the illustrated discrete portion of aerosol-generating material **26**. The same arrangement of perforations is present in association with each of the discrete portions of aerosol-generating material **26**.
[0192] With further reference to FIGS. **2** and **4**, the support substrate **34** is a layer of card. In other non-illustrated embodiments, the support substrate may be other materials, for example polyether ether ketone (PEEK). The susceptor substrate **36** is formed from an aluminium foil. In other non-illustrated examples, the susceptor **36** may be an alternative metal foil or a thin layer of a material

that will undergo inductive heating when exposed to a varying magnetic field.
[0193] With reference to FIGS. **3** and **4**, the support **28** is comprised of a laminate of a support substrate **34** and a susceptor substrate **26**. Supported on the first surface **30** of the support **28** are discrete portions of aerosol-generating material **26**.
[0194] Extending through the support **28** and, where the support supports the discrete portions of aerosol-generating material **26**, the aerosol-generating material **26** are perforations **38**. For reasons of visual clarity in FIGS. **3** and **4**, not all of the perforations **38** are labelled. Those perforations **38** are of sufficient size to permit the flow of aerosol along the perforations between one side of the consumable **24** and the other side. In some embodiments the cross-section of the perforations **38** is greater than 1 mm.sup.2, greater than 2 mm.sup.2, of greater than 3 mm.sup.2.
[0195] The perforations are, as may be seen in FIG. **4**, arranged around and through the illustrated discrete portion of aerosol-generating material **26**. The same arrangement of perforations is present in association with each of the discrete portions of aerosol-generating material **26**.
[0196] With further reference to FIGS. **3** and **4**, the support substrate **34** is a layer of card. In other non-illustrated embodiments, the support substrate may be other materials, for example polyether ether ketone (PEEK). The susceptor substrate **36** is formed from an aluminium foil. In other non-illustrated examples, the susceptor **36** may be an alternative metal foil or a thin layer of a material that will undergo inductive heating when exposed to a varying magnetic field.
[0197] With reference to FIGS. **5** and **7**, the support **228** is comprised of a susceptor **226**. Supported on both the first and second surfaces **30**, **32** of the susceptor **226** are discrete portions of aerosol-generating material **26**.
[0198] Extending through the support **228** are perforations **238**. For reasons of visual clarity in FIGS. **5** and **7**, not all of the perforations **238** are labelled. Those perforations are of sufficient size to permit the flow of aerosol along the perforations between one side of the consumable **224** and the other side. In some embodiments the cross-section of the perforations **238** is greater than 1 mm.sup.2, greater than 2 mm.sup.2, of greater than 3 mm.sup.2.
[0199] The perforations **238** are, as may be seen in FIG. **7**, arranged around and under the illustrated discrete portion of aerosol-generating material **26**. The same arrangement of perforations is present in association with each of the discrete portions of aerosol-generating material **26**.
[0200] With further reference to FIGS. **5** and **7**, the susceptor **236** is formed from an aluminium foil. In other non-illustrated examples, the susceptor **36** may be an alternative metal foil or a thin layer of a material that will undergo inductive heating when exposed to a varying magnetic field.
[0201] With reference to FIGS. **6** and **7**, the support **228** is comprised of a susceptor **226**. Supported on the first surface **30** of the susceptor **226** are discrete portions of aerosol-generating material **26**.
[0202] Extending through the support **228** are perforations **238**. For reasons of visual clarity in FIGS. **6** and **7**, not all of the perforations **238** are labelled. Those perforations are of sufficient size to permit the flow of aerosol along the perforations between one side of the consumable **224** and the other side. In some embodiments the cross-section of the perforations **238** have a cross-sectional area of at least 0.01 mm.sup.2, at least 0.05 mm.sup.2, at least 0.1 mm.sup.2, at least 0.5 mm.sup.2, at least 1 mm.sup.2, at least 2 mm.sup.2, or at least 3 mm.sup.2.
[0203] The perforations **238** are, as may be seen in FIG. **7**, arranged around and under the illustrated discrete portion of aerosol-generating material **26**. The same arrangement of perforations is present in association with each of the discrete portions of aerosol-generating material **26**.
[0204] With further reference to FIGS. **5** and **7**, the susceptor **236** is formed from an aluminium foil. In other non-illustrated examples, the susceptor **36** may be an alternative metal foil or a thin layer of a material that will undergo inductive heating when exposed to a varying magnetic field.
[0205] The various embodiments described herein are presented only to assist in understanding and teaching the claimed features. These embodiments are provided as a representative sample of embodiments only, and are not exhaustive and/or exclusive. It is to be understood that advantages,

embodiments, examples, functions, features, structures, and/or other aspects described herein are not to be considered limitations on the scope of the invention as defined by the claims or limitations on equivalents to the claims, and that other embodiments may be utilized and modifications may be made without departing from the scope of the claimed invention. Various embodiments of the invention may suitably comprise, consist of, or consist essentially of, appropriate combinations of the disclosed elements, components, features, parts, steps, means, etc, other than those specifically described herein. In addition, this disclosure may include other inventions not presently claimed, but which may be claimed in future.

Claims

1. A consumable for use with an aerosol provision device, in which the consumable comprises a support, an aerosol-generating material, and one or more perforations, in which the perforations are configured to allow the passage of heat or aerosol along the perforation.
2. A consumable according to claim 1 in which the support supports the aerosol-generating material on a surface of the support.
3. A consumable according to claim 2 in which the support further supports an aerosol-generating material on a second surface of the support.
4. A consumable according to claim 2 in which at least some of the aerosol-generating material supported on the first surface of the support is supported as one or more discrete portions of aerosol-generating material.
5. A consumable according to claim 3 in which at least some of the aerosol-generating material supported on the second surface of the support is supported as one or more discrete portions of aerosol-generating material.
6. A consumable according to claim 5 in which the number of discrete portions of aerosol-generating material on the first surface corresponds to a number of discrete portions on the second surface, and the positions of the discrete portions on the first surface of the support substantially corresponds to the positions of the discrete portions supported on the second surface of the support.
7. (canceled)
8. (canceled)
9. A consumable according to claim 1 in which one or more of the perforations have at least one open end which opens through a surface of the support, aerosol-generating material, or any other element of the consumable and the open end is defined by that surface.
10. A consumable according to claim 1 in which one or more of the perforations have at least one blind end which is closed by the support, by the aerosol-generating material, or by any other element of the consumable.
11. A consumable according to claim 1 in which one or more of the perforations extend at least partially through the support.
12. A consumable according to claim 1 in which one or more of the perforations extend at least partially through an aerosol-generating material.
13. A consumable according to claim 1 in which the support comprises an impermeable material.
14. (canceled)
15. A consumable according to claim 13 in which the impermeable material is an aluminium foil.
16. A consumable according to claim 13 in which the impermeable material is a susceptor.
17. A consumable according to claim 13 in which the impermeable material is comprised of two or more discrete portions.
18. A consumable according to claim 17 in which the discrete portions of impermeable material correspond in number or location to one or more discrete portions of aerosol-generating material.
19. A consumable according to claim 18 in which each discrete portion of aerosol-generating material is supported on the surface of a discrete portion of impermeable material.

20. A consumable according to claim 13 in which one or more of the perforations have an open end which opens through a surface of the impermeable material.
21. A consumable according to claim 13 in which one or more of the perforations have at least one blind end which is closed by the impermeable material.
22. A consumable according to claim 13 in which one or more of the perforations extend at least partially through the impermeable material.
23. A consumable according to claim 1 in which the position of one or more of the perforations is determined by the position of the aerosol-generating material supported on one or both of a first and a second surface of the support.
24. (canceled)
25. (canceled)
26. (canceled)
27. (canceled)
28. (canceled)
29. (canceled)