Introduction to CSS for Paged Media

Antenna House, Inc.

Introduction

CSS is widely used in browsers, editors, and other applications. CSS is used not only for web design but also as the stylesheet specification for a wide range of printing applications as well as for electronic paged media delivered as PDF.

CSS (Cascading Style Sheets) Level 1 became a W3C Recommendation in 1996. CSS 2 became a W3C Recommendation in 1998, and CSS 2.1 (Cascading Style Sheets Level 2 Revision 1), in 2011. As of early 2018, CSS 2.2 is currently under development.

CSS post-Level 2 is popularly known as CSS 3, but there will not be a single, monolithic CSS Level 3 specification. CSS beyond CSS Level 2 has been broken into multiple modules that each define a part of CSS. These modules are numbered individually. The first versions of modules that build on CSS Level 2 are denoted as Level 3, and each may be superseded a Level 4 version. For example, CSS Color Level 3 replaces several sections of CSS Level 2, and CSS Color Level 4, which is currently in development, will eventually replace CSS Color Level 3. Modules that do not build on CSS Level 2 features start at Level 1: for example, CSS Multi-Column Layout Level 1. There will not be a CSS Level 4 or beyond.

Individual modules are in varying stages of development and varying levels of stability. The stability levels for all W3C specifications range from Working Draft to Recommendation. The CSS Working Group maintains a separate stability categorization for its specifications that ranges from Rewriting and Exploring through to Stable and Completed.

The CSS Working Group compiles yearly snapshots of the current state of CSS at that point in time. CSS Snapshot 2017[1)] lists both Recommendation and Candidate Recommendation specifications as comprising the official definition of CSS as of 2017 (even though the document defines Candidate Recommendation as the test phase of a W3C specification).

CSS 2.1 (and CSS 2.2) provides only minimal support for paged media output, and its page layout features are not powerful enough. CSS 3, although still under development by the W3C, defines many of the features that are necessary for professional quality formatting, including: advanced page layouts; multiple columns; vertical writing; hyphenation; and multilingual

1) https://www.w3.org/TR/css-2017/

character layout. Antenna House Formatter provides additional features for optimal formatting, including: custom-developed MathML 3 and SVG rendering; baseline grids; PANTONE® spot colors; and additional properties for controlling Japanese layout.

Using CSS in paged media design for XML and HTML is not yet common but its use is expected to increase as the development of CSS 3 progresses. This tutorial aims to make CSS for Paged Media easy to understand.

Audience

Many people are familiar with CSS in the browser: some are very familiar, but others, not so much. Fewer people, however, are as familiar with using CSS for paged media.

Introduction to CSS for Paged Media is intended for you if you know CSS but have never written CSS for print media. You should already be familiar with CSS syntax and with using common properties such as 'border', 'padding', 'font-size', and so on. This tutorial does cover these, but not in great detail.

If you are already familiar with most aspects of CSS but not with paged media, then Chapter 11, Color Specification, Chapter 16, PDF Bookmarks, Chapter 18, Page Setting, Chapter 19, Headers and Footers, and Chapter 20, PDF Output will be the most useful chapters to you.

Since this is just an introduction to CSS for paged media, it does not attempt to cover every property, selector, rule, or function of either CSS or of Antenna House Formatter. For more information on the full range of what is available to you, please consult the CSS specifications as well as the Online Manual for your version of Antenna House Formatter.

Conventions used in this tutorial

- Property descriptions may include:
  - Initial value
  - Elements to which the property applies
  - Whether or not the property is inherited
  - Explanatory text
  - List of allowed values

Incrementing Counters : ‘counter-increment’ property

●Initial value : none ●Applies to : all elements ●Inherited : no

Use the ‘counter-increment’ property to increase the specified counter value.

- none : Does not do count.
- Counter Name : Increases the specified counter value by one.
- Counter name, space, and integers : Increases the counter value with a specified number.

- The CSS level of a property or feature is indicated as follows:
  1. Defined by CSS 2.1: no mark
  2. Defined by CSS 3: 
  3. Antenna House Formatter extension: 

  CSS 3 is under development, so CSS 3 specifications may change in the future. CSS 3 properties can be used with or without an `-ah-` prefix. Antenna House Formatter extension properties will not operate properly unless you include the `-ah-` prefix. (From here on, Antenna House Formatter is abbreviated as AH Formatter).
- Emphasized text is shown as **bold text with a yellow background**.
- Samples of styled text are enclosed in a box:

Optional title

Number of this page = 3
Total number of pages in this document = 140

- Blocks of sample markup or sample CSS are shown in monospace text:

```
<p>Number of this page = <span style="content: counter(page)"></span>
</p>
<p>Total number of pages in this document=
  <span style="content: counter(pages)">
</span></p>
```

Table of Contents

Chapter 1
Web and Paged Media

1.1 @media Rule

An '@media' rule delimits a set of CSS style sheet rules specific to a target medium. Specify `@media print` for rules specific to paged media and `@media screen` for rules specific to screen display.[2)]

```
@media print {        /* applies to paged media */
  body {
    margin: 0;
    font-size: 10pt }
  }
@media screen {         /* applies to screen display */
  body {
    margin: 10%;
    font-size: 12px }
  }

body {                  /* applies to all media */
  font-family: sans-serif;
}
```

1.2 Specifying a Print Style Sheet

1.2.1 <style> Element

A <style> element contains style information for the document. In HTML 4.01, <style> may only appear inside <head>. In HTML 5, <style> may also be used in the body of the document.

```
<style type="text/css" media="print">
…
</style>
```

2) Since AH Formatter is print formatting software, it does not apply `@media screen` rules for the GUI screen but does apply `@media print` rules.

1.2.2 @import Rule

A print-only style sheet can be created in another CSS file by including it with '@import'.

```
@import url("PrintOnly.css") print; /* PrintOnly.css printing */
```

1.2.3 Media attribute of <style> and <link> elements

Specifying print as the media attribute value links the print style sheet with the <style> or <link> element.

```
<link rel="stylesheet" type="text/css" media="print" href="foo.css">
```

1.3 Differences Between Screen and Print

1.3.1 Design approach

Screen display and printing require different approaches to designing the layout.

The size and aspect ratio of a screen display may change depending on the display environment, so it is hard to know how to accurately specify the size and arrangement of the layout target. The style specification should consider using relative dimensions to accommodate various environments.

In printing, there is an expectation that formatted objects are arranged neatly on fixed-sized paper, therefore, the layout specification should precisely control the layout by specifying absolute dimensions for the size and position of the formatting objects starting with the size of its characters.

1.3.2 Breaks

Breaks happen in both paged and unpaged documents. For example, text is broken into lines, and the text in a block that has 'column-count' greater than 1 may be broken into columns. However, and unsurprisingly, breaks are more common, and more of a concern, when a run of text is also broken across pages. There are properties for forcing or avoiding breaks within or between elements. Additionally, the 'widows' and 'orphans' properties control the minimum number of lines of text before or after a break in a block of text.

1.3.3 Floats

In unpaged media, a box can float to the left or right. In paged media, it can also float to the top or bottom of the page (and AH Formatter implements more detailed control over floats). Items that you might float include graphics, sidebars, and footnotes.

1.3.4 Navigation

Paged media (i.e., books) have well-developed conventions for navigating between pages.

Pages are typically numbered, and, often, the frontmatter is numbered in a different style and sequence to the main text.

The page number and, often, the book, chapter or even section title may appear at the periphery of the page. Dictionaries have their own conventions for indicating the first and last entries on each page. CSS defines 16 regions around the edge of the page for presenting this sort of information.

The table of contents (or tables of contents) and index facilitate non-sequential access.

A chapter (or other significant division) will may start on a right-hand page (for left-to-right writing mode documents), and the chapter start may have a different appearance to other pages (and possibly different headers and footers).

1.3.5 Left and right pages

A document that is printed on both sides of the page and bound into a book-like form (even a document that is duplex-printed on an office printer and placed in a folder) will form two-page spreads with a left-hand and a right-hand page. Also, because the document is bound, as you leaf through the document, it is easier to see the details near the outer edges of the pages than at inner edges of the pages near the binding. Thirdly, the sequential reading order of the pages makes it easy to think of two-sided leaf of the document as having a 'front' and a 'back' side.

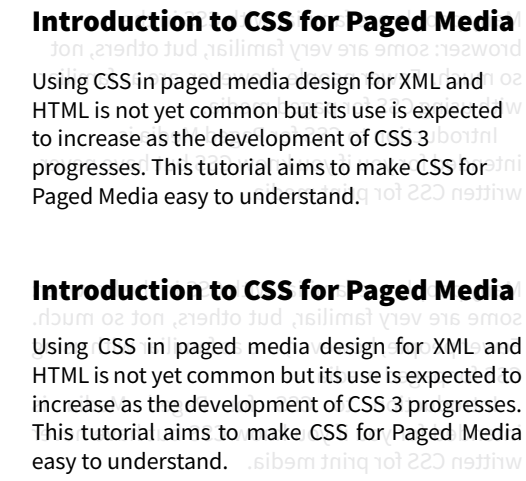
All of these aspects can affect the page design. For example, chapter openings are typically (but not exclusively) on the right-hand of a spread, since that is the 'front' side of a leaf. Page numbers and any other navigation aids on a page are more likely to be on or near the outer edge of each page so they can be seen more easily when leafing through the document. Thinking of the document as a sequence of two-page spreads also raises questions of whether the facing pages should be symmetrical around the gutter and whether items such as graphics can span across the two pages.

1.3.6 The printed book

Several things should be considered for a document that is to be printed rather than only viewed on screen.

There may be constraints on the page size. A document that is meant to be printed by the end user may be sized to suit the paper size of an office printer: Letter size in the USA; A4 in most of the rest of the world; or A4 or JIS-B5 in Japan. A car handbook, on the other hand, is conventionally a convenient size for a car glove compartment. Trade paperbacks have a range of conventional sizes, and choosing an unconventional page size could affect the sales of a book.

If the paper is not sufficiently opaque, the text on the opposite side of the paper may show through. The effect is made worse if the text on each side of the paper is not aligned.



Effect of show-through with non-aligned and aligned text

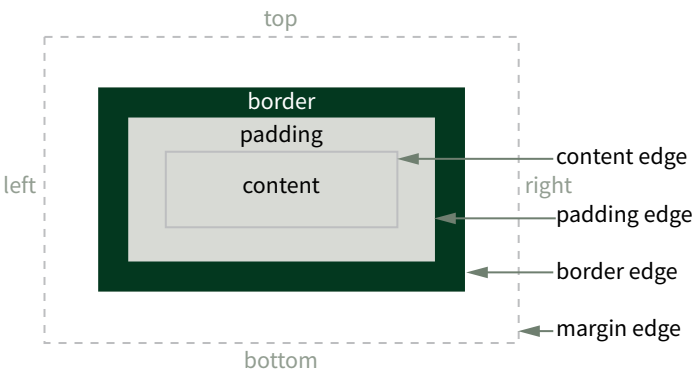
Graphics, and other design elements, that extend to the edge of the page may need to be printed so they extend past the edge of the page. If they don't extend past the edge of the page, then any inaccuracy when trimming the page to its correct size after printing and binding could result in a white strip between the graphic and the edge of the page. Conversely, the graphic should not have significant details close to the edge of page in case the trimming takes off too much rather than too little.

Even the binding method may need to be considered when designing the book. Perfect binding or a wire binding may reduce the visible or usable area of the gutter between pages. If the pages of a book are gathered into signatures and then trimmed, the pages in the middle of the signature may have more trimmed from their fore-edge than is trimmed from the pages on the outside of the signature.

Chapter 2
Box Layout

2.1 Box Model

In CSS, everything is a box. The tree of elements and text that makes up the document is transformed into a tree of boxes. Some elements generate multiple boxes (for example, an <li>), and some generate none (for example, elements such as <col> or any element with `display: none;`). The broadest classification of boxes is that there are block-level boxes, line boxes, and inline-level boxes. A block-level box contains, such as a paragraph, either other block-level boxes or it contains line boxes. When, for example, a paragraph contains text plus a list, one or more anonymous boxes are created around the line boxes for the text so that no box contains both block-level boxes and line boxes. A line box contains one or more inline-level boxes, since every change of font or style generates a separate inline-level box.

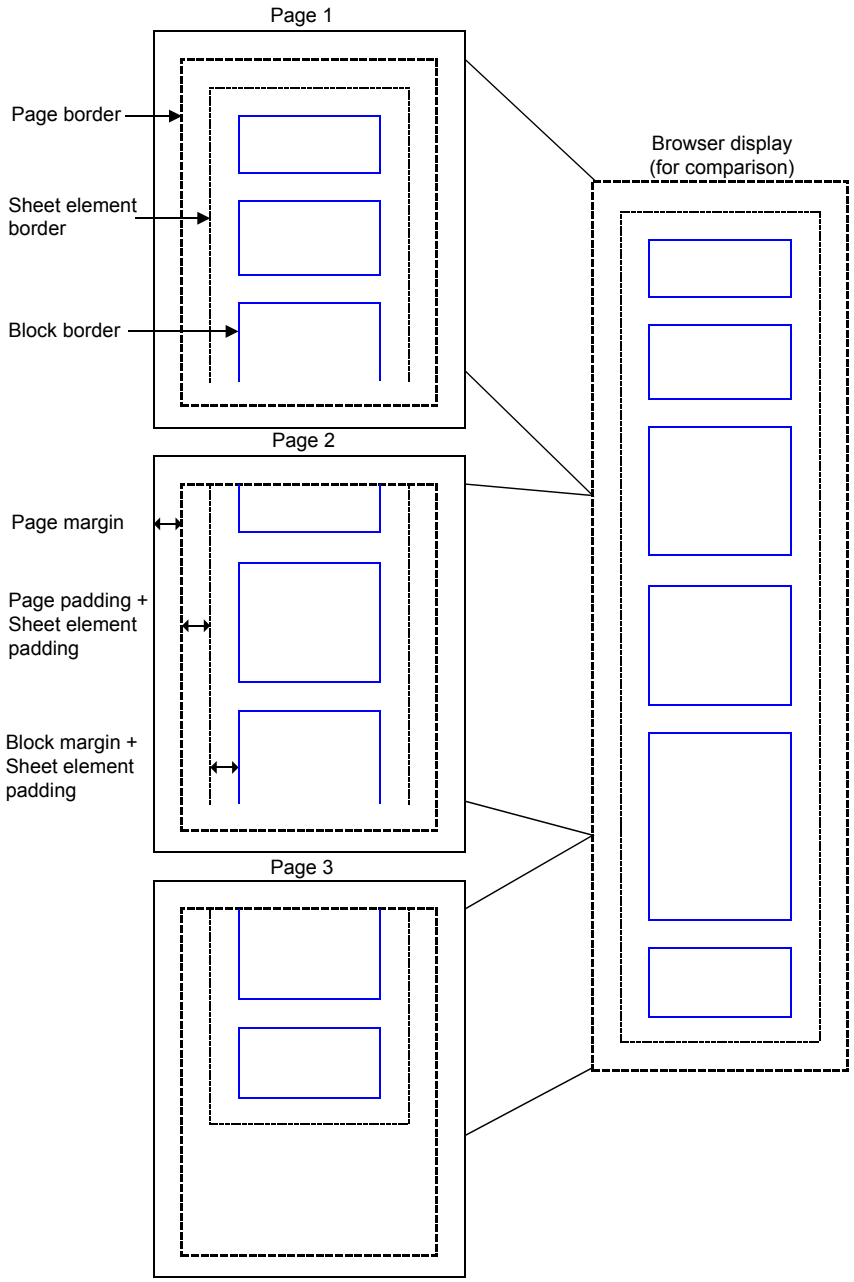


Areas and edges of a typical box

Every box has a content area, and the bounds of the content area are the content edge. The padding area is around the content area, and it is bounded by the padding edge. Similarly, the border surrounds the padding, and the margin surrounds the border. Some boxes have zero-width padding, border, or margin on one or more sides, either because of the CSS definition of the areas generated for a box type or because the corresponding properties are set to zero.

2.2 Box Display and Printing

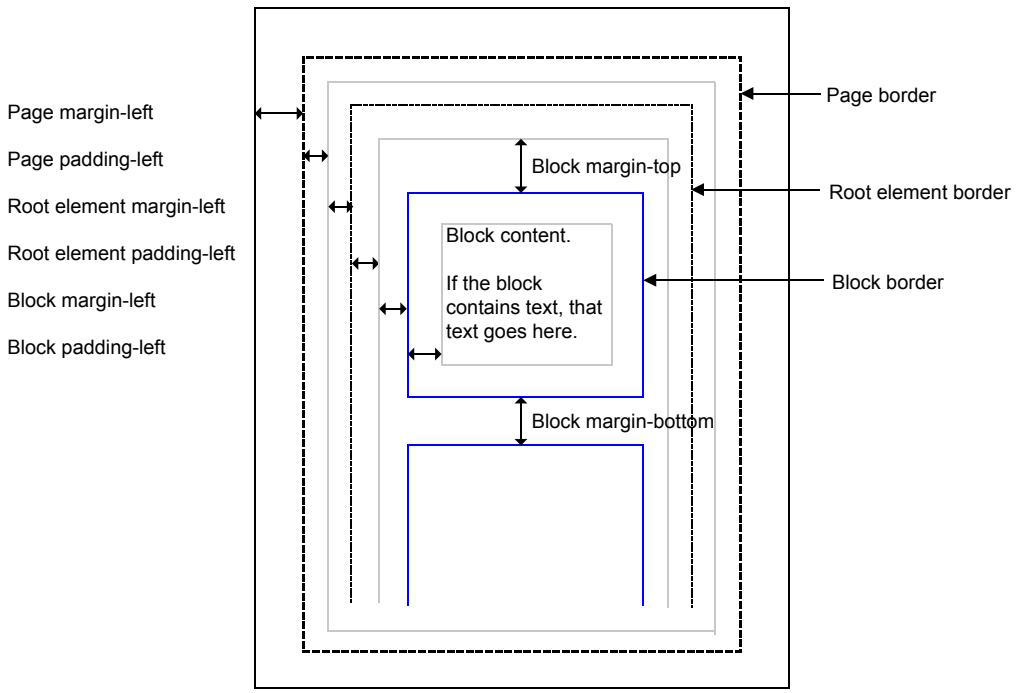
In CSS, formatting objects such as text, images, and tables are arranged as boxes. Boxes are laid out in a hierarchical structure starting with a box containing the lowest character string up to a box at the top of the root element. When the output destination is the screen, the root element box is displayed on the screen. If the output destination is a paged media, set the page template in the page box and place another box on the page.



Interaction between box screen display and printing

2.3 Box Arrangement

Boxes other than tables have a content area, surrounded by padding, border, and margin areas. Layout characteristics are specified according to their specific properties. When the hierarchical structure is laid out as page box, root element box, and block box, the content, padding, and border are arranged as shown in the figure below. For information on tables, please refer to "Chapter 10, Tables."



Box Arrangement

2.4 Box Dimensions

The size of the box is the sum of the specific values of the content width, height, padding, border, and margin.

2.4.1 Content width : 'width' property

●Initial value : auto ●Applies to : all elements[3] ●Inherited : no

Specifies content width.

3) The inline element width including table rows, strings, etc, is not applicable because it is set automatically. It does apply to image elements of inline elements. The same applies to min-width and max-width properties.

2.4.2 Content minimum width : ‘min-width’ property

●Initial value : 0 ●Applies to : all elements ●Inherited : no

2.4.3 Content maximum width : ‘max-width’ property

●Initial value : none ●Applies to : all elements ●Inherited : no

2.4.4 Content height : ‘height’ property

●Initial value : auto ●Applies to : all elements[4] ●Inherited : no

Specifies content height.

2.4.5 Content minimum height : ‘min-height’ property

●Initial value : 0 ●Applies to : all elements ●Inherited : no

2.4.6 Content maximum height : ‘max-height’ property

●Initial value : none ●Applies to : all elements ●Inherited : no

2.4.7 Padding width : ‘padding’ property

●Initial value : 0 ●Applies to : all elements[5] ●Inherited : no

Specifies the padding width to ‘padding-top’, ‘padding-bottom’, ‘padding-left’, and ‘padding-right’. Allows you to simultaneously specify padding for four sides.

2.4.8 Border width (thickness) : ‘border-width’ property

●Initial value : 0 ●Applies to : all elements ●Inherited : no

Specifies the border width of the top and bottom and left and right to border-top-width, border-bottom-width, border-left-width, border-right-width. Allows you to simultaneously specify the border-width for four sides.

Specifies color with ‘border-color’ and line type (style) with ‘border-style’ for border.

Simultaneously specifies the border width, color, and line type of the top and bottom and left and right with ‘border-top’, ‘border-bottom’, ‘border-left’, and ‘border-right’. Allows you to simultaneously specify the four sides of width, color, and line type with ‘border’.

Please refer to “Chapter 3, Background Decoration” for details on how to specify width, color, or line type of a border.

4) The inline element height including table columns, character strings, etc, is not applicable because it is set automatically. It does apply to the image of inline elements.
5) Not applicable to table rows, columns, table headers, or footers.

2.4.9 Margin thickness : ‘margin’ property

●Initial value : 0 ●Applies to : Most elements ●Inherited : no

Specifies the thickness of the top and bottom and left and right margins for ‘margin-top’, ‘margin-bottom’, ‘margin-left’, and ‘margin-right’. Simultaneously allows you to specify the margin for four sides.

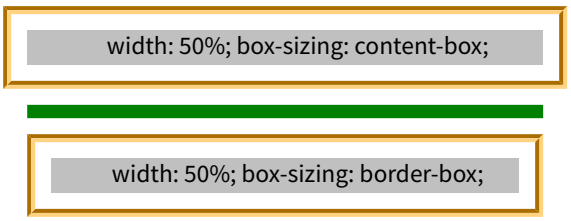
The margin value may be negative. The edge with a negative margin extends out from the containing box.

2.4.10 Changing the box model : ‘box-sizing’ property

●Initial value : content-box ●Applies to : All elements that accept width or height ●Inherited : no

Specifies whether any padding and border are drawn inside or outside the specified width and height. Does not affect the ‘auto’ value of the ‘width’ and ‘height’ properties.

- content-box : the specified width and height apply to the content box of the element.
- border-box : the specified width and height apply to the border box of the element.




```
<div style="width: 50%; box-sizing: content-box; …">
  <p style="background-color: silver; text-align: center">…</p></div>
<p style="border-top: thick solid green; width: 50%; …"/>
<div style="width: 50%; box-sizing: border-box; …">
  <p style="background-color: silver; text-align: center">…</p></div>
```

Chapter 3
Background Decoration

3.1 Border and background

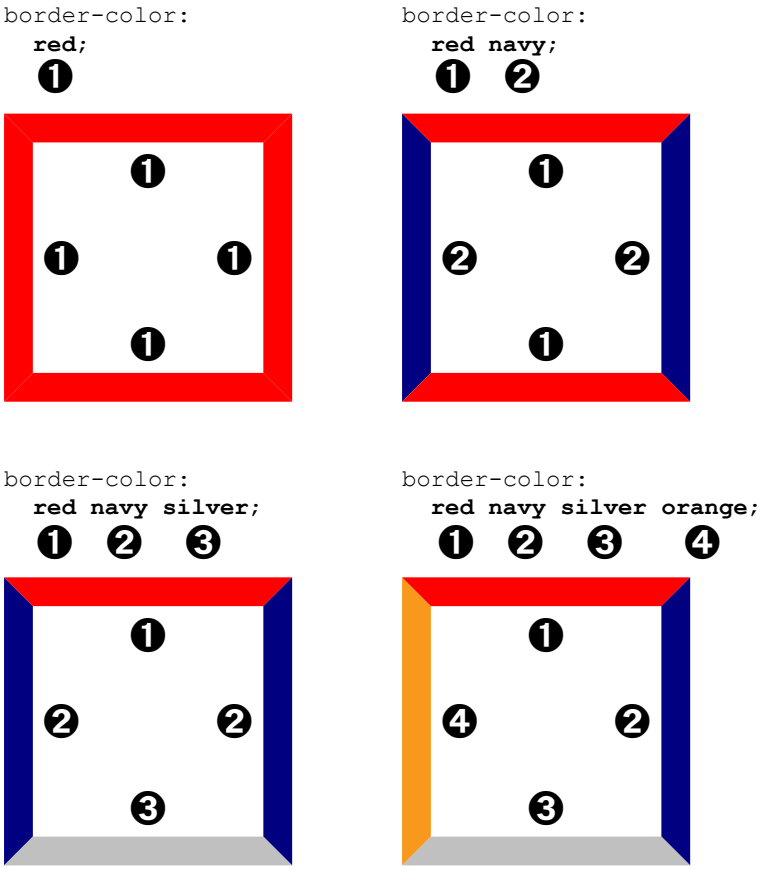
Any object[6] can specify its border using the border-* properties. These set the line type (style), thickness, color, and rounded corner as well as adding shadows to the borders. Additionally, 'background-color' sets the background color of the object.

The border-* properties are shorthands for setting one of the style, etc., for all four borders at once. The 'border' property is a shorthand for setting the style, width, and color for all four borders. There are also properties for setting the style, width, and color of one border as well as for setting one of the style, etc., for one border only.

The border-* properties can have one to four component values. The values are set on the different sides as shown in the 'border-color' example below.

- One value: applies to top, bottom, left, and right sides.
- Two values : first value applies to top and bottom sides; second value applies to left and right sides.
- Three values : first value applies to top side, second value to left and right sides, and third value to bottom side.
- Four values : the values apply to top, right, bottom, and left sides, respectively.

6) Any element, such as <p>, that can generate a box.



3.2 Border Style : 'border-style' property

- Initial value : see individual properties
- Applies to : all elements
- Inherited : no

One to four component values set the border styles for all four sides.
The following border style values may be used.

none : No borders. (thickness = 0)

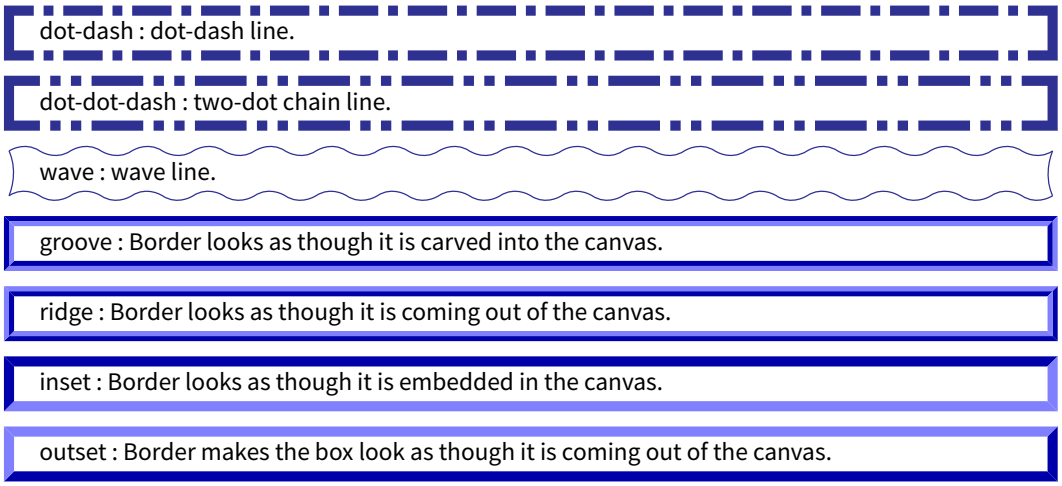
hidden : Hides border.

solid : solid line.

double : double line.

dotted : dotted line.

dashed : dashed line.



The individual border style properties are ‘border-top-style’, ‘border-right-style’, ‘border-bottom-style’, and ‘border-left-style’.

3.3 Border Thickness : ‘border-width’ property

●Initial value : see individual properties ●Applies to : all elements ●Inherited : no
One to four component values set the border widths for all four sides.

- thin : a thin border.
- medium : a medium border
- thick : a thick border.
- <length> : an explicit length. Cannot be negative.

The individual border width properties are ‘border-top-width’, ‘border-right-width’, ‘border-bottom-width’, and ‘border-left-width’.

3.4 Border Color : ‘border-color’ property

●Initial value : see individual properties ●Applies to : all elements ●Inherited : no
One to four component values set the border color for all four sides.

- <color> : a color. See Chapter 11, Color Specification (page 59) for details.
- transparent : the border is transparent, though it may have width.

The individual border color properties are ‘border-top-color’, ‘border-right-color’, ‘border-bottom-color’, and ‘border-left-color’.

3.5 Per-side Border Properties : border-top/border-right/border-bottom/border-left properties

●Initial value : see individual properties ●Applies to : all elements ●Inherited : no
Each property specifies the width, style, and color of the top, right, bottom, or left border of a box.

3.6 Border Shorthand : 'border' property

●Initial value : see individual properties ●Applies to : all elements ●Inherited : no
Specifies the width, style, and color of all four borders of a box.

3.7 Rounded Corners : 'border-radius' property

●Initial value : 0 ●Applies to : all elements ●Inherited : no
Specify '-ah-border-radius' property to make the border corners .

```
<p style="border-radius: 18pt; /* rounded corner radius */
          border: solid green;
          padding: 6pt">Border-radius…
```

Specifies Border-radius (rounding rule).

The radii of each corner can be set individually using 'border-top-left-radius', 'border-top-right-radius', 'border-bottom-left-radius', and 'border-bottom-right-radius'.

```
<p style="border-top-left-radius: 2mm;      /* top-left */
          border-top-right-radius: 5mm;       /* top-right */
          border-bottom-right-radius: 2cm 1cm; /* bottom-right (horizontal
and vertical direction)  */
          border-bottom-left-radius: 4cm 2cm;  /* bottom-left (horizontal
and vertical direction)  */
          border: thin solid;
          background-color: lime;
          padding: 5mm">…
```

Radii of each of the four corners can be set individually. Rounded corners can also be set as an ellipse.

3.8 Box Shadow : 'box-shadow' property

●Initial value : none ●Applies to : all elements ●Inherited : no

Adds a shadow to a box when 'box-shadow' property is specified with the horizontal and vertical shadow length and shadow color.

```
<p style="box-shadow: 8pt 6pt silver;
          border: solid 1pt black; padding: 6pt">…
```

Sets Box-shadow (Shadowed boxes).

```
<p style="-ah-box-shadow: -8pt -6pt orange, 8pt 6pt blue;
          -ah-border-radius: 10pt; padding: 6pt">…
```

Multiple shadows can be specified. 'border-radius' also affects 'box-shadow'.

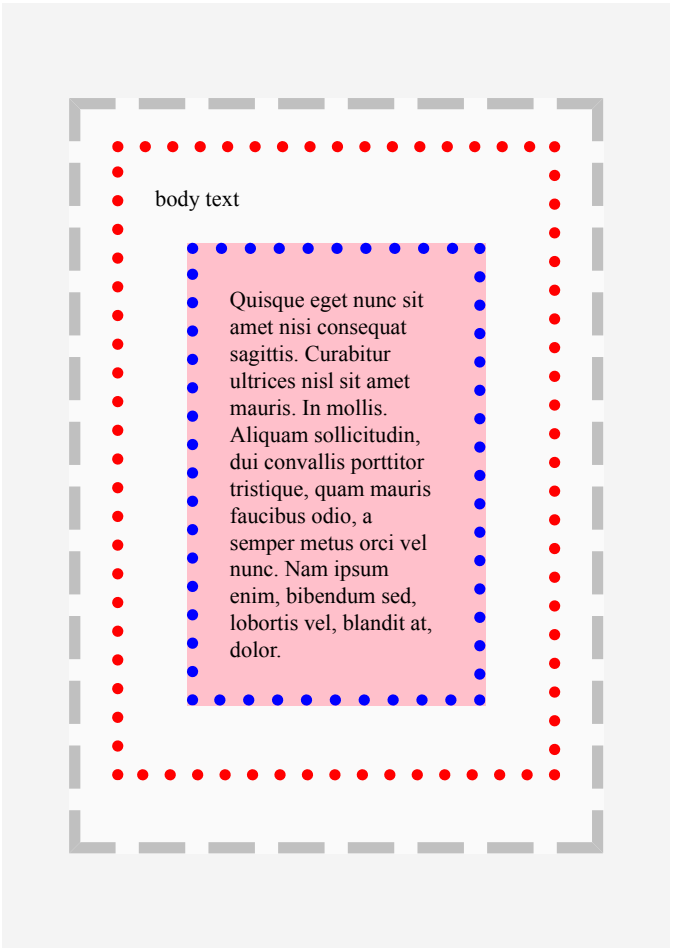
3.9 Background Color : 'background-color' property

●Initial value : transparent ●Applies to : all elements ●Inherited : no

Use 'background-color' property to set background color. The initial value, transparent, lets the contents of the parent element (underlying colors) show through.

Background color applies to the content, padding, and border of an ordinary box model. Margins are always transparent and the background color does not apply.

- The background color is applied to the entire surface of a page box.
- With respect to boxes of root elements, the background color is applied to content, padding, border, and margin.



Range of applications for background color

Chapter 4
Paragraph Setting

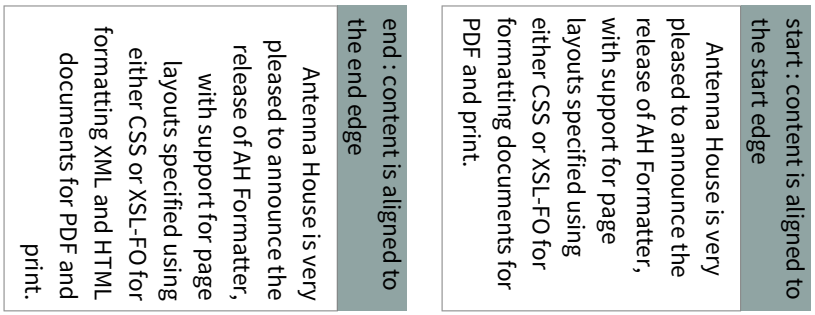
4.1 Alignment

4.1.1 Alignment : 'text-align' property

●Initial value : depends on characters display direction ●Applies to : block elements
●Inherited : yes
Aligns text in the block level element to left, right, center, and justify text,respectively.

left : Content is aligned to the left.
Antenna House is very pleased to announce the release of AH Formatter, with support for page layouts specified using either CSS or XSL-FO for formatting XML and HTML documents for PDF and print.
right : Content is aligned to the right.
Antenna House is very pleased to announce the release of AH Formatter, with support for page layouts specified using either CSS or XSL-FO for formatting XML and HTML documents for PDF and print.
center : Content is centered within the line box.
Antenna House is very pleased to announce the release of AH Formatter, with support for page layouts specified using either CSS or XSL-FO for formatting XML and HTML documents for PDF and print.
justify : Content is justified to fill the line box.
Antenna House is very pleased to announce the release of AH Formatter, with support for page layouts specified using either CSS or XSL-FO for formatting XML and HTML documents for PDF and print.

The 'text-align' property, start and end values are extended from CSS 3. When -ah-text-align: start or -ah-text-align: end; is vertical text specified, it is aligned to the top or bottom.

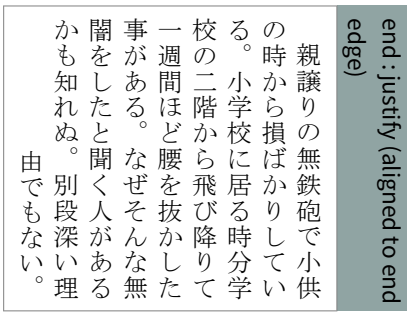


4.1.2 Alignment (justify and text-align-last setting) : 'text-align-last' property

●Initial value : start ●Applies to : all elements ●Inherited : yes

Arranges the text in all elements according to justify. For vertical writing, align text to the top and bottom edge, and align left, right, and center to both ends.

text-align-last: left (aligned to the left)
Antenna House is very pleased to announce the release of AH Formatter, with support for page layouts specified using either CSS or XSL-FO for formatting XML and HTML documents for PDF and print.
test-align-last: right (aligned to the right)
Antenna House is very pleased to announce the release of AH Formatter, with support for page layouts specified using either CSS or XSL-FO for formatting XML and HTML documents for PDF and print.
text-align-last: center (aligned to the center)
Antenna House is very pleased to announce the release of AH Formatter, with support for page layouts specified using either CSS or XSL-FO for formatting XML and HTML documents for PDF and print.
text-align-last: justify (aligned to both ends)
Antenna House is very pleased to announce the release of AH Formatter, with support for page layouts specified using either CSS or XSL-FO for formatting XML and HTML documents for PDF and print.



4.1.3 Line height with superscripts/subscripts : '-ah-line-height-shift-adjustment' property

●Initial value : consider-shifts ●Applies to : inline-level elements ●Inherited : yes

Line stacking can be irregular when lines contain superscripts and subscripts. Specify `-ah-line-height-shift-adjustment: disregard-shifts` to stop superscripts and subscripts from influencing the line stacking. However, line stacking can still change for images, fonts with different character baseline positions (such as mixed Japanese and European text), and large letters.

- consider-shifts : Shifted position of characters is used for determining line-height.
- disregard-shifts : Unshifted position of characters is used for determining line-height.

Without -ah-line-height-shift-adjustment: disregard-shifts;

Line stacking can be irregular when lines contain superscripts ABC and subscripts abc. Specify `-ah-line-height-shift-adjustment: disregard-shifts` to stop superscripts and subscripts from influencing the line stacking. However, line stacking can still change for images, fonts with different character baseline positions (such as mixed Japanese and European text), and large letters.

With -ah-line-height-shift-adjustment: disregard-shifts;

Line stacking can be irregular when lines contain superscripts ABC and subscripts abc. Specify `-ah-line-height-shift-adjustment: disregard-shifts` to stop superscripts and subscripts from influencing the line stacking. However, line stacking can still change for images, fonts with different character baseline positions (such as mixed Japanese and European text), and large letters.

4.1.4 Line stacking : '-ah-line-stacking-strategy' property

●Initial value : line-height ●Applies to : block elements ●Inherited : yes

When a line contains a mixture of large letters, superscripts and subscripts, and images, or fonts with different character baseline positions (such as mixed Japanese and European text), line stacking depends on the characters that each line contains. As a result, line stacking becomes irregular. Specifying '-ah-line-stacking-strategy: font-height;' will make line stacking uniform.

- line-height : CSS-style line box stacking with half-leading included in line-area.
- font-height : Line-area is based on font of block-area; equal baseline-to-baseline spacing.
- max-height : Line-area is minimum required to enclose inline areas; constant space between line-areas.

Without -ah-line-stacking-strategy: font-height;

When a line contains a mixture of large letters, superscripts ABC and subscripts abc, and images, or fonts with different character baseline positions (such as mixed Japanese and European text), line stacking depends on the characters that each line contains. As a result, line stacking becomes irregular. Specifying `-ah-line-stacking-strategy: font-height;` will make line stacking uniform.

With -ah-line-stacking-strategy: font-height;

When a line contains a mixture of large letters, superscripts ABC and subscripts abc, and images, or fonts with different character baseline positions (such as mixed Japanese and European text), line stacking depends on the characters that each line contains. As a result, line stacking becomes irregular. Specifying `-ah-line-stacking-strategy: font-height;` will make line stacking uniform.

4.2 Baseline grid[6)]

'-ah-line-stacking-strategy' affects the lines within a single block. It does not, however, affect line stacking across multiple blocks. Line areas across multiple blocks can be aligned to a consistent line spacing by using the '-ah-baseline-grid' property.

Some line areas, however, will not align with the baseline grid that is used for running text. These include:

- Headings are frequently in a larger font size than running text. It is sometimes possible to maintain consistent line spacing for running text by carefully setting the 'margin-top' and 'margin-bottom' of each level of heading so that each heading occupies the same height as an integral number of lines. However, that can fail when a heading extends over more than one line or a heading is immediately followed by another heading.
- Graphics are seldom the height of an integer number of lines.
- Borders and padding on table cells can affect the regular line spacing of table text.

Blocks that have content that does not fit with the baseline grid can have the entire block aligned with the grid by using the '-ah-baseline-block-snap' property.

6) The baseline grid feature is not available in AH Formatter Lite.

Without baseline grid

Preamble

Whereas recognition of the inherent dignity and of the equal and inalienable rights of all members of the human family is the foundation of freedom, justice and peace in the world,

Whereas disregard and contempt for human rights have resulted in barbarous acts which have outraged the conscience of mankind, and the advent of a world in which human beings shall enjoy freedom of speech and belief and freedom from fear and want has been proclaimed as the highest aspiration of the common people,

Whereas it is essential, if man is not to be compelled to have recourse, as a last resort, to rebellion against tyranny and oppression, that human rights should be protected by the rule of law,

With baseline grid

Preamble

Whereas recognition of the inherent dignity and of the equal and inalienable rights of all members of the human family is the foundation of freedom, justice and peace in the world,

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Whereas it is essential, if man is not to be compelled to have recourse, as a last resort, to rebellion against tyranny and oppression, that human rights should be protected by the rule of law,

4.2.1 Setting the baseline grid : '-ah-baseline-grid' property

●Initial value : normal ●Applies to : block containers ●Inherited : no

Sets or clears the baseline grid. The line areas that are within an area in which a baseline grid is set are aligned with baselines on the baseline grid.

- normal : Neither sets nor clears the baseline grid.
- none : Clears the baseline grid and the content will not align with a baseline grid.
- new : Sets a new baseline grid.
- root : Sets the baseline grid defined by the root element.

4.2.2 Aligning blocks to the baseline grid : '-ah-baseline-block-snap' property

●Initial value : auto border-box ●Applies to : block-level elements with 'baseline-grid: new' or 'baseline-grid: none' ●Inherited : no

Specifies how to align blocks other than normal line boxes, such as headings, figures and tables, to the baseline grid.

4.3 Leader : ‘leader()’ function

With the ‘leader()’ function, a leader (such as dots) can be added, for example, between the title page and page number in the table of contents and align the page number to the right.

Any of the following may be used as leaders: dotted, solid, space, or characters.

- leader(dotted) .... leader(dotted)
- leader(solid) ____ leader(solid)
- leader(space) leader(space)
- leader("*-") *- leader("*-")

Using space as a leader is the same as the right indent tab.

Quadratic formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ (1)

4

4.4 Hyphenation

4.4.1 Hyphenation : ‘hyphens’ property

●Initial value : manual ●Applies to : all elements ●Inherited : yes

AH Formatter provides extended features for hyphenation of more than forty languages. It has a built-in dictionary so that you do not need to provide one. If you want to hyphenate words that are not in the built-in dictionary, you can add them to the exception dictionary. Soft hyphens (U+00AD) can be explicitly inserted inside a word to allow hyphenation.

- none : Disable both hyphenation and soft hyphen.
- manual : Disable hyphenation and enable soft hyphens.
- auto : Enable both hyphenation and soft hyphens.

Set ‘hyphens’ property to ‘auto’ to enable hyphenation. The hyphenation process performs hyphenation for each language determined by a language-appropriate hyphenation resource, and in this example, `xml:lang` is specified.

```
.Hyphenated {
  -ah-hyphens: auto;
}
<div class="Hyphenated" xml:lang="en">
  <p>CSS is widely used in browsers, editors, and other …
```

CSS is widely used in browsers, editors, and other applications. CSS is used not only for "Web design" but also as the stylesheet specification for a wide range of printing applications as well as for electronic paged media delivered as PDF.

CSS 2.1 (and CSS 2.2) provides only minimal support for paged media output, and its page layout features are not powerful enough. CSS 3, although still under development by the W3C, defines many of the features that are necessary for professional quality formatting, including: advanced page layouts; multiple columns; vertical writing; hyphenation; and multilingual character layout. Antenna House Formatter provides additional features for optimal formatting, including: custom-developed MathML 3 and SVG rendering; baseline grids; PANTONE® spot colors; and additional properties for controlling Japanese layout.

When hyphenation is enabled for body text, it is usually a good idea to disable it in headings and possibly also in other contexts where added hyphens could detract from the appearance of the text. For example, in captions, table headers, or even all table text.

```
body:lang(en) {
 hyphens: auto;
}

h1, h2, h3, h4, h5, h6 {
 hyphens: manual;
}
```


4.4.2 Minimum number of characters : 'hyphenate-before' property

●Initial value : auto ●Applies to : all elements ●Inherited : yes

Specifies the minimum number of characters in a hyphenated word before the hyphenation character with a default value of 2.

For example, the six-letter word 'hyphen' can be hyphenated as 'hy-phen'. If hyphenate-before: 3; is specified, the number of characters before the word break is less than three letters, so the word 'hyphen' is not hyphenated.

4.4.3 Minimum number of characters : 'hyphenate-after' property

●Initial value : auto ●Applies to : all elements ●Inherited : yes

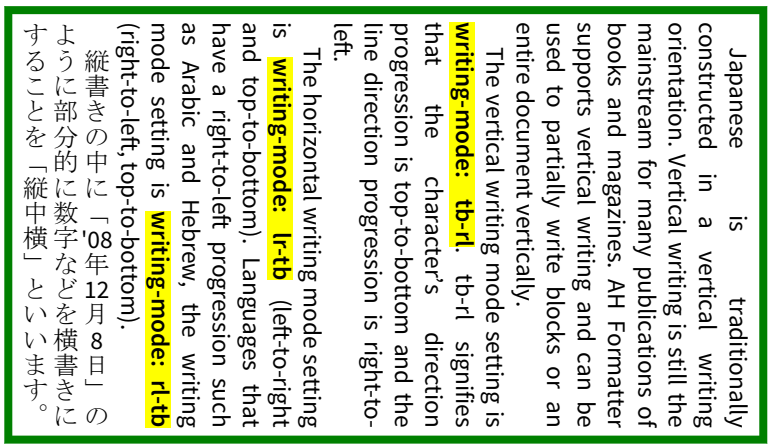
Specifies the minimum number of characters in a hyphenated word after the hyphenation character with a default value of 2.

For example, the six-letter word 'hyphen' can be hyphenated as 'hy-phen'. If `hyphenate-after: 5;` is specified, the number of characters after the word break is less than five letters, so the word 'hyphen' is not hyphenated.

4.5 Block Vertical Writing : writing-mode: tb-rl

Specifying `writing-mode: tb-rl;` on the block element sets vertical writing orientation for the blocks. In block vertical writing, the page progression direction remains left to right as in horizontal writing.

```
div.VerticalTextBlock {
  writing-mode: tb-rl;  /* vertical writing */
  height: 16em;              /* number of characters in a line */
  padding: 3pt; border: ridge green;
}
```



Chapter 5
Multiple Columns

5.1 Column count : 'column-count' property

●Initial value : auto ●Applies to : block elements ●Inherited : no
Specifies the number of columns of a block element.

Sets column-count: 2 for the block. Also specifies column-gap and column-rule.

```
div.MultiCol {
  column-count: 2;
  column-gap: 5mm;
  column-rule: dotted green 1mm;
}
```

An alternative method for specifying multiple columns is to set column-width instead of column-count. The number of columns will be set automatically based on the column width and the overall width of the page.

column-rule is a shorthand for properties that can be set individually as follows:

```
  column-rule-style: dotted;
  column-rule-color: green;
  column-rule-width: 1mm;
```

5.2 Column width : 'column-width' property

●Initial value : auto ●Applies to : block elements ●Inherited : no
Specifies the width of columns in multi-column elements.

Sets column-width: 12em for the block. Also specifies column-gap and column-rule.

```
div.MultiColW {
  column-width: 12em;
  column-gap: 1em;
  column-rule:
     solid 1pt;
}
```

An alternative method for specifying multiple columns is to set column-count instead of column-width.

5.3 Column number or width : ‘columns’ property

This is a shorthand property for setting ‘column-width’ and ‘column-count’. Omitted values are set to their initial values.

5.4 Column span : ‘column-span’ property

●Initial value : none ●Applies to : block elements, except floating and absolutely positioned elements ●Inherited : no

Specifies the number of columns that an element spans.

- none : The element does not span multiple columns.
- all : The element spans across all columns.

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5.5 Column gap : ‘column-gap’ property

●Initial value : normal ●Applies to : multi-column elements ●Inherited : no

Specifies the width of the column gap.

5.6 Column rule : ‘column-rule’ property

●Initial value : see individual properties ●Applies to : multi-column elements ●Inherited : no

Specifies column rule width, line type, and color.

5.7 Column rule style : ‘column-rule-style’ property

●Initial value : none ●Applies to : multi-column elements ●Inherited : no

Specifies the column rule style. Column rule style can be set as follows:

- solid : solid line.
- double : double line.

- dotted : dotted line.
- dashed : dashed line.
- dot-dash : dot-dash line.
- dot-dot-dash : two-dot chain line.
- wave : wave line.

5.8 Column rule width : ‘column-rule-width’ property

●Initial value : medium ●Applies to : multi-column elements ●Inherited : no
Specifies column rule width.

5.9 Column rule color : ‘column-rule-color’ property

●Initial value : current color property ●Applies to : multi-column elements ●Inherited : no
Specifies column rule color.

5.10 Column rule length : ‘-ah-column-rule-length’ property

●Initial value : 100% ●Applies to : multi-column elements ●Inherited : no
Specifies the length of the column rule.

column-rule-length: 60% centers a rule 60% of the height of the column vertically within the column.

```
div.MultiCol {
  column-rule-length: 60%;
}
```

5.11 Column rule alignment : ‘-ah-column-rule-align’ property

●Initial value : center ●Applies to : multi-column elements ●Inherited : no
Specifies the vertical alignment of the column rule within the column.

- before : Align top of column rule with top of column.
- center : Center column rule within column height.
- after : Align bottom of column rule with bottom of column.

-ah-column-rule-length: 60% plus -ah-column-rule-align: after aligns a rule 60% of the height of the column with the bottom of the column.

```
div.MultiCol {
  -ah-column-rule-length: 60%;
  -ah-column-rule-align: after;
}
```

5.12 Column rule display : '-ah-column-rule-display' property

●Initial value : gap ●Applies to : multi-column elements ●Inherited : no
Specifies the vertical displayment of the column rule within the column.

- gap : Display a rule only between existing columns.
- end : Display a rule at the end side of each existing column.
- all : Display rules even between non-existent columns.

-ah-column-rule-display: end displays a rule after each column.

```
div.MultiCol3 {
  -ah-column-rule-display: end;
}
```

Chapter 6
Keeps and Breaks

Paged media is, obviously, divided into pages. CSS provides multiple properties for controlling whether the content of an element should be kept together on one page and whether there should or should not be a page break before or after the content.

6.1 Control of Page Breaks

6.1.1 Page break : page-break-before/page-break-after property

●Initial value : auto ●Applies to : block elements ●Inherited : no

- auto : Neither force nor forbid a page break.
- always : Always force a page break.
- avoid : Avoid a page break.
- left : Force one or two page breaks so the next page is a left-hand page.
- right : Force one or two page breaks so the next page is a right-hand page.

```
/* forced page break before top header (h1) */
h1 {
  page-break-before: always;
}
```

```
/* insert break page after this block */
div.Ending {
  page-break-after: always;
}
```

Setting the value to 'avoid' prohibits page breaks before or after the specified element.

```
/* avoid page breaks immediate after top headers (h1~h6) */
h1, h2, h3, h4, h5, h6 {
  page-break-after: avoid
}
```

6.1.2 Prohibit page break : ‘page-break-inside’ property

●Initial value : auto ●Applies to : block elements ●Inherited : yes
Setting the value to avoid, prohibits page breaks within the specified element.

- auto : Neither force nor forbid a page break.
- avoid : Avoid a page break.

```
/* avoid page breaks in this block */
div.NoBreak {
  page-break-inside: avoid;
}
```

6.1.3 Pages starting from either the left or right

The first page of a chapter can be set to start either on the right or left. Blank pages are inserted if necessary.

```
/*insert page break so that h2 is always kept on the right. */
h2 {
  page-break-before: right;
}
```

6.2 Minimum lines before/after a page break : ‘orphans’/‘widows’ property

●Initial value : 2 ●Applies to : block elements ●Inherited : yes
‘orphans’ specifies the minimum number of lines of a paragraph that must be left at the bottom of a page. ‘widows’ specifies the minimum number of lines that must be left at the top of a page.

- <integer> : Minimum number of lines before or after a page break.

Orphan and widow lines

Chapter 7
Character Setting

7.1 Font Setting

7.1.1 Font : 'font' property

●Initial value : see individual properties ●Applies to : all elements ●Inherited : yes

This is a shorthand property for setting 'font-style', 'font-variant', 'font-weight', 'font-size', 'line-height', and 'font-family'.

Font properties are first reset to their initial value. Those properties that are given explicit values in the font shorthand property are set to those values. The 'font' property is set in the following order.

1. 'font-style', 'font-variant', and 'font-weight' values may be omitted or may appear in any order.
2. The 'font-size' value cannot be omitted.
3. The 'line-height' value is optional. font-size and line-height values are separated by '/': for example, `9.5pt/13pt`.
4. 'font-family' cannot be omitted. Multiple font families can be set separated by commas.

```
/* document title*/
.CoverPage h1 {
  font: bold 30pt Meiryo, sans-serif;
  text-align: center;
}
```

7.1.2 Font size : 'font-size' property

●Initial value : medium ●Applies to : all elements ●Inherited : yes

Specifies the size of the font.

```
/* Text */
body {
  font-size: 12pt;
  line-height: 1.5;
```

```
  font-family: Tahoma, "MS Gothic", sans-serif;
}
```

7.1.3 Font type : 'font-family' property

●Initial value : depends on user agent[7] ●Applies to : all elements ●Inherited : yes

Specifies the type of font. May be a font name or keyword. Generic font family keywords are defined as follows:

- sans-serif : Plain font, such as Helvetica, that tends to have stroke endings with little or no ornamentation. A Gothic Japanese font is a sans-serif font.
- serif : Font, such as Times, that tends to have a finishing stroke with flared or tapered ends. A Mincho Japanese font is a serif font.
- monospace : A monospaced font. This is a font that has glyphs with the same fixed width.
- fantasy : A decorative font.
- cursive : A cursive font with either joining strokes or cursive characteristics.

If the font name contains spaces, such as "Times New Roman", enclose the name in double or single quotation marks.

Multiple fonts can be set separated by commas. Fonts available in the user environment are chosen in order of their appearance. AH Formatter divides the character strings for each type of script and assigns them from the fonts first specified in script units. Japanese fonts support the Latin script and if, for example, you specify `font-family: "MS Gothic", Helvetica`, this results in "MS Gothic" being used for the Latin script as well as Japanese[8]. Specifying a Latin font at the beginning, as shown in the following example, results in using Helvetica before MS Gothic.

```
font-family: Helvetica, "MS Gothic", san-serif;
```

When a specific font might not be present on the system, it is advisable to include a generic font family, such as 'serif' or 'sans-serif', as the last font family in the list.

7.1.4 Font weight : 'font-weight' property

●Initial value : normal ●Applies to : all elements ●Inherited : yes

Specifies font weight.

- normal : standard (equivalent to 400).
- bold: bold (equivalent to 700).
- lighter : The next lighter font weight (subtracts 100).
- bolder : The next darker font weight (adds 100).
- Assigned values : 100, 200, 300, 400, 500, 600, 700, 800, 900. From 100, the thinnest, to 900, the thickest.

7) The initial value of 'serif' can be changed.
8) To select this font, the method of inspecting whether a font has glyphs for each single character has to change.

7.1.5 Italic/Oblique Type : 'font-style' property

●Initial value : normal ●Applies to : all elements ●Inherited : yes

Specifies fonts as italic or oblique.

- normal : standard ("upright").
- italic : italic type
- oblique : slanted

An 'italic' font is designed with a diagonal slant but 'oblique' is a normal font with a slant applied. If 'italic' is given but there is no italic type in the specified font, it will still display a slanted font.

AH Formatter will treat characters as italic even if 'oblique' is specified.[9)]

7.1.6 Small Capitals and Font Features : 'font-variant' property

●Initial value : normal ●Applies to : all elements ●Inherited : yes

Specifies use of a small capitals font. Affects only lower-case letters.

- normal : standard (Does nothing).
- small-caps : Use small capitals.
- <keyword> : There are a large number of other keywords, such as 'oldstyle-nums', that correspond to OpenType features.

Small capitals will be simulated if the font does not support them. A font may implement only a subset of the other OpenType features.

Note that "Old style" numbers, if available, are a better match than lining numbers for use with small capitals.

SMALL CAPS 1234

```
.small-caps {
  font-variant: small-caps oldstyle-nums;
}
```

7.2 Additional Fonts : @font-face rule

Allows additional fonts without altering your AH Formatter settings and without installing the font in your operating system. The following descriptors are allowed:

- font-family : Name to use in CSS font family name matching. Overrides family name from font data.

9) Processing with oblique will be revised in future AH Formatter versions.

- src : Location of font resource.[10] May be an alias of an existing local font.
- font-style : Optional font weight characteristic to use when matching fonts. Use the same values as the 'font-weight' property except that the 'bolder' and 'lighter' relative keywords are not allowed. The default value is 'normal'.

The Quick Brown Fox

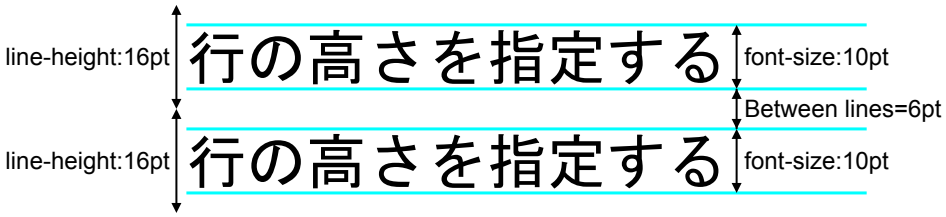
```
@font-face {
  font-family: font-face-example;
  src: url(UglyQua.ttf);
}

p { font-family: font-face-example; }
```

7.3 Line Height : 'line-height' property

●Initial value : normal ●Applies to : all elements ●Inherited : yes

Specifies the height of the line box. normal is the default line-height; AH Formatter initially sets the line-height to 1.2[11].

If a numerical value is specified, the line-height is the value multiplied by the font size. If a value of 1.5 is specified, it will be the same as specifying the line-height as 150% or 1.5em. However, when a numerical value is specified and the line height is inherited, only the number is inherited. If the font size changes, then the line-height will also change accordingly.



Line-height and space between lines

7.4 Vertical Alignment : 'vertical-align' property

●Initial value : baseline ●Applies to : inline-level and table cell elements ●Inherited : no

Vertical alignment, such as superscripts and subscripts, can be specified.

- normal : standard alignment

10) AH Formatter currently only supports a single resource.
11) The initial value of 1.2 can be changed.

- baseline : Align to the baseline of the parent element.
- sub : subscript.
- super : superscript.
- top : Align to the top edge.
- text-top : Align to the top edge of the text.
- middle : Align to center.
- bottom : Align to bottom edge.
- text-bottom : Align to the bottom edge of the text.
- percentage : Sets the value as a percentage of the line height.
- Assigned values : Specifies units to values.

7.5 Underlines, Overlines, and Line-throughs

7.5.1 Text decoration shorthand : 'text-decoration'

●Initial value : none ●Applies to : all elements ●Inherited : no

Specifies the type, color, and style of underline, overline, and strike-through text decorations. 'text-decoration' is a shorthand for setting ''text-decoration-line', text-decoration-color', and 'text-decoration-style' in one declaration. A 'text-decoration' property that sets only the 'text-decoration-line' component is backwards-compatible with CSS 2.

```
span {
  text-decoration: underline dotted cmyk(0,1,1,0); /* dotted red underline */
}
```

7.5.2 Text decoration lines : text-decoration-line

●Initial value : none ●Applies to : all elements ●Inherited : no

Specifies underlines, overlines, and lines-through to the text. When setting more than one value at the same time, specify them in any order separated by spaces.

- none : Adds no text decoration.
- underline : Each line is underlined.
- overline : Each line has a line above it.
- line-through : Each line of text has a line through the middle.

```
/*Chapter heading */
.Chapter h2 {
  text-decoration-line: underline overline;
}
```

7.5.3 Line type : 'text-decoration-style' property

●Initial value : solid ●Applies to : all elements ●Inherited : no

Specifies different types of underlines, overlines, and line-throughs.

- solid : solid line.
- double : double line.
- dotted : dotted line.
- dashed : dashed line.
- dot-dash : dot-dash line.
- dot-dot-dash : two-dot chain line.
- wave : wave line.

```
span.solid {
  text-decoration-style: solid;         /* make the line style solid */
}
span.wave {
  text-decoration-style: wave;          /* make the line style wavy */
}

solid : <span class="solid">solid line</span>
wave : <span class="wave">wavy line</span>
```

7.5.4 Line color : 'text-decoration-color' property

●Initial value : current color ●Applies to : all elements ●Inherited : no

Specifies the color of underlines, overlines, and line-through text decorations.

```
span {
  text-decoration-color: cmyk(0,1,1,0);  /* make line color red */
}
```

7.5.5 Line width : '-ah-text-line-width' property

●Initial value : auto ●Applies to : all elements ●Inherited : no

Specifies the line width for underlines, overlines, and line-throughs.

Chapter 8
MathML and SVG Graphics

8.1 MathML

A custom-developed engine for Mathematical Markup Language (MathML) 2.0 Second Edition by the W3C is a standard feature of AH Formatter. For that reason, it is possible to render formulas in high resolution in PDF.[12)]

For more information on using MathML, please see the MathML book published by Antenna House at http://www.antenna.co.jp/AHF/ahf_publication/index.html#MathML.

MathML Formatting Examples

If the quadratic formula $ax^2 + bx + c = 0$ produces a solution $D = b^2 - 4ac$,

If $D \geqq 0$, then $x = \dfrac{-b \pm \sqrt{D}}{2a}$

and if $D < 0$, then the solution produces no real numbers.

```
<p>If the quadratic formula
<m:math xmlns:m="http://www.w3.org/1998/Math/MathML"
    xml:lang="en">
 <m:mstyle displaystyle="true" scriptminsize="1pt"
      scriptsizemultiplier="0.6">
  <m:mrow>
   <m:msup>
    <m:mrow>
     <m:mi>a</m:mi>
     <m:mo>&#x2062;</m:mo>
     <m:mi>x</m:mi>
    </m:mrow>
    <m:mn>2</m:mn>
   </m:msup>
…
produces a solution,
…
```

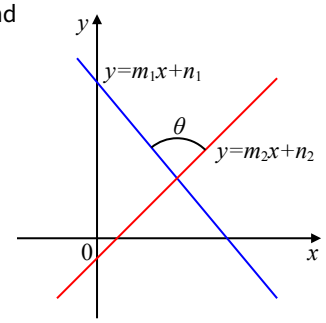
12) AH Formatter Lite users must purchase 'AH Formatter MathML Option' separately.

MathML Formatting Examples

If the equation for two straight lines are $y = m_1x + n_1$ and $y = m_2x + n_2$

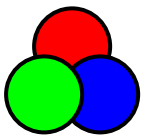
then angle θ formed by the two straight lines is:

$$\tan\theta = \pm\frac{m_2 - m_1}{1 + m_2m_1} \quad (0° \leqq \theta < 180°)$$



8.2 SVG Graphics

AH Formatter implements W3C Scalable Vector Graphics (SVG) 1.1 and supports the display of SVG images with a custom-developed engine. For that reason, it is possible to include high resolution SVG images in PDF.

SVG vector graphics  can be embedded.

```
<p>SVG vector graphics
  <s:svg xmlns:s="http://www.w3.org/2000/svg" width="70" height="65"
    viewBox="0 0 70 65">
   <s:g fill-opacity=".5" stroke="black" stroke-width="2">
     <s:circle cx="35" cy="20" r="19" fill="red"/>…
   </s:g>
 </s:svg>
can be embedded.</p>
```

SVG Examples

Chapter 9
Image Positioning

9.1 Inline Image

Use the inline <img> and <object> image elements to place an inline image in a sentence.

Inline Image

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AH Formatter features support for PDF/UA and improved CGM rendering. It also includes support for MathML V3.0, layered PDFs, enhanced support for embedding multimedia and numerous extensions.

```
<p style="text-indent: 0">Antenna House<img src="images/logo-antenna.svg"
alt="AH logo" style="height: 9pt;" /> Formatter is the most powerful XSL-FO
software and CSS document formatting software on the market. To meet your needs,
we have expanded AH Formatter to support more than 70 languages. …
```

9.2 Display Format : 'display' property

●Initial value : inline ●Applies to : all elements ●Inherited : no

Use the 'display' property to control how an element is displayed.

Inline element <img> and <object> are displayed as a block when display: block; is specified. The 'display' property changes only the display format of the element, not its role.

- block : Generate a block box.
- inline-block : Generate an inline-level block container.
- inline : Generate one or more inline boxes.
- list-item : Generate a principal box and a marker box.
- none : Cause the element to not appear.

- table, inline-table, table-row-group, table-column, table-column-group, table-header-group, table-footer-group, table-row, table-cell, and table-caption : Behave like a table element. See Chapter 10, Tables.

An inline image set with display: block;

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AH Formatter

features support for PDF/UA and improved CGM rendering. It also includes support for MathML V3.0, layered PDFs, enhanced support for embedding multimedia and numerous extensions.

```
<p>Antenna House<img src="images/logo-antenna.svg" alt="AH logo" style="display:
block; height: 9pt;" /> Formatter is the most powerful XSL-FO software and CSS
document formatting software on the market. To meet your needs, we have expanded
AH Formatter to support more than 70 languages.</p> …
```

9.3 Positioning as a Float : ‘float’ property

●Initial value : none ●Applies to : all elements ●Inherited : no

Use the ‘float’ property to float the image and set it to float either to the left, right, or not at all. The adjacent element wraps around the other side of the element with the ‘float’ property.

left-aligned image float: left;


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AH Formatter features support for PDF/UA and improved CGM rendering. It also includes support for MathML V3.0, layered PDFs, enhanced support for embedding multimedia and numerous extensions.

```
<p style="text-indent: 0">
<img src="images/logo-antenna.svg" style="float:left; height:3em;
margin-left: 9pt" />Antenna House Formatter is the most powerful XSL-FO software
and CSS document formatting software on the market. To meet your needs, we have
expanded AH Formatter to support more than 70 languages.
…
```

Right-aligned image: `float: right;`

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AH Formatter features support for PDF/UA and improved CGM rendering. It also includes support for MathML V3.0, layered PDFs, enhanced support for embedding multimedia and numerous extensions.

```
<p style="text-indent: 0">
<img src="images/logo-antenna.svg" style="float:right; height:3em;
margin-right: 9pt" />Antenna House Formatter is the most powerful XSL-FO software
and CSS document formatting software on the market. To meet your needs, we have
expanded AH Formatter to support more than 70 languages.
…
```

Text as well as images can be floated[13].

left-aligned text `float: left;`

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Right-aligned text: `float: right;`

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9.4 Float Position: 'float' property

- Initial value : none
- Applies to : all elements
- Inherited : no

9.4.1 Page float : float: top page/float: bottom page

In the existing HTML and CSS layouts, it is common to use `float: left;` and `float: right;` to align images and characters to the left and right of the body text. Page floats extend this to the vertical direction.

`float: top page;` positions a block at the top of the page. `float: bottom page;` places a block at the end of the page.

Two page float examples are shown at both the top and bottom of this page. [14]

13) It is not common to indent right after a display heading, but indentation is done here for comparison with the right-aligned float.

14) Or on the next page if there is not enough space available on this page.

This is at the top of the page. Specified by **float: top page**.

This is the second top float for the page. Specified by **float: top page**.

```
<div style="float: top page; border: ridge maroon; padding: 3pt;
margin-bottom: 1em;">
<p>This is the top page. Specified by <b>float: top page</b>. </p>
</div>
<div style="float: bottom page; border: ridge green; padding: 3pt;
margin-top: 1em;">
<p>This is the bottom page. Specified by <b>float: bottom page</b>. </p>
</div>
```

9.4.2 Column float : float: top/float: bottom

float: top; positions the block at the top of the column. float: bottom; positions the block at the bottom of the column.

This is the top of the column. Specified by **float: top**.

Whereas recognition of the inherent dignity and of the equal and inalienable rights of all members of the human family is the foundation of freedom, justice and peace in the world,

Whereas disregard and contempt for human rights have resulted in barbarous acts which have outraged the conscience of mankind, and the advent of a world in which human beings shall enjoy freedom of speech and belief and freedom from fear and want has been proclaimed as the highest aspiration of the common people,

Whereas it is essential, if man is not to be compelled to have recourse, as a last resort, to rebellion against tyranny and oppression, that human rights should be protected by the rule of law,

This is the bottom of the column. Specified by **float: bottom**.

```
<p>Whereas recognition of the inherent dignity and…</p>
<div style="float: top; border: ridge orange; padding: 3pt;">
<p>This is the top of the column. Specified by </p><p><b>float: top</b>. </p>
</div>
<p>Whereas disregard and contempt for human rights have…</p>
<div style="float: bottom; border: ridge lime; padding: 3pt">
<p>This is the bottom of the column. Specified by </p><p><b>float: bottom</b>.
 </p>
```

This is the second bottom float for the page. Specified by **float: bottom page**.

This is the end of the page. Specified by **float: bottom page**.

```
</div>
<p>Whereas it is essential, if man is not to be compelled…</p>
```

9.4.3 Inside, outside and alternate float : float: inside/float: outside/float: alternate

float: inside; positions the block at the left side on a right-hand page or on the right side on a left-hand page.

Whereas recognition of the inherent dignity and of the equal and inalienable rights of all members of the human family is the foundation of freedom, justice and peace in the world,

float: inside

Whereas disregard and contempt for human rights have resulted in barbarous acts which have outraged the conscience of mankind, and the advent of a world in which human beings shall enjoy freedom of speech and belief and freedom from fear and want has been proclaimed as the highest aspiration of the common people,

float: inside

Whereas it is essential, if man is not to be compelled to have recourse, as a last resort, to rebellion against tyranny and oppression, that human rights should be protected by the rule of law,

float: outside; positions the block at the right side on a right-hand page or on the left side on a left-hand page.

Whereas recognition of the inherent dignity and of the equal and inalienable rights of all members of the human family is the foundation of freedom, justice and peace in the world,

Whereas disregard and contempt for human rights have

float: outside

resulted in barbarous acts which have outraged the conscience of mankind, and the advent of a world in which human beings shall enjoy freedom of speech and belief and freedom from fear and want has been proclaimed as the highest aspiration of the common people,

Whereas it is essential, if

float: outside

man is not to be compelled to have recourse, as a last resort, to rebellion against tyranny and oppression, that human rights should be protected by the rule of law,

`float: center;` positions the block at the center of the column.

Whereas recognition of the inherent dignity and of the equal and inalienable rights of all members of the human family is the foundation of freedom, justice and peace in the world,

float: center

Whereas disregard and contempt for human rights have resulted in barbarous acts which have outraged the conscience of mankind, and the advent of a world in which human beings shall enjoy freedom of speech and belief and freedom from fear and want has been proclaimed as the highest aspiration of the common people,

float: center

Whereas it is essential, if man is not to be compelled to have recourse, as a last resort, to rebellion against tyranny and oppression, that human rights should be protected by the rule of law,

`float: start;` positions the block on the start side. This is the same as left in horizontal left-to-right writing mode.

Whereas recognition of the inherent dignity and of the equal and inalienable rights of all members of the human family is the foundation of freedom, justice and peace in the world,

float: start

Whereas disregard and contempt for human rights have resulted in barbarous acts which have outraged the conscience of mankind, and the advent of a world in which human beings shall enjoy freedom of speech and belief and freedom from fear and want has been proclaimed as the highest aspiration of the common people,

float: start

Whereas it is essential, if man is not to be compelled to have recourse, as a last resort, to rebellion against tyranny and oppression, that human rights should be protected by the rule of law,

It is the same as right in horizontal right-to-left writing mode.

ואיל והכרה בכבוד הטבעי אשר לכל בני משפחת האדם ובזכויותיהם השוות והבלתי נפקעות הוא יסוד החופש, הצדק והשלום בעולם.

float: start

הואיל והזלזול בזכויות האדם וביזוין הבשילו מעשים פראיים שפגעו קשה במצפונה של האנושות; ובנין עולם, שבו ייהנו כל יצורי אנוש מחירות הדיבור והאמונה ומן החירות מפחד וממחסור, הוכרז כראש שאיפותיו של כל אדם.

float: start

הואיל והכרח חיוני הוא שזכויות האדם תהיינה מוגנות בכוח שלטונו של החוק, שלא יהא האדם אנוס, כמפלט אחרון, להשליך את יהבו על מרידה בעריצות ובדיכוי.

`float: end;` positions the block on the end side. This is the same as 'right' in horizontal left-to-right writing mode.

Whereas recognition of the inherent dignity and of the equal and inalienable rights of all members of the human family is the foundation of freedom, justice and peace in the world,

Whereas disregard and contempt for human rights have resulted in barbarous acts which have outraged the conscience of mankind, and the advent of a world in which human beings shall enjoy freedom of speech and belief and freedom from fear and want has been proclaimed as the highest aspiration of the common people,

Whereas it is essential, if man is not to be compelled to have recourse, as a last resort, to rebellion against tyranny and oppression, that human rights should be protected by the rule of law,

float: end

It is the same as left in horizontal right-to-left writing mode.

מחירות הדיבור והאמונה ומן החירות מפחד וממחסור, הוכרז כראש שאיפותיו של כל אדם.

הואיל והכרח חיוני הוא שזכויות האדם תהיינה מוגנות בכוח שלטונו של החוק, שלא יהא האדם אנוס, כמפלט אחרון, להשליך את יהבו על מרידה בעריצות ובדיכוי.

ואיל והכרה בכבוד הטבעי אשר לכל בני משפחת האדם ובזכויותיהם השוות והבלתי נפקעות הוא יסוד החופש, הצדק והשלום בעולם.

הואיל והזלזול בזכויות האדם וביזוין הבשילו מעשים פראיים שפגעו קשה במצפונה של האנושות; ובנין עולם, שבו ייהנו כל יצורי אנוש

float: end

`float: alternate;` positions a block in the first column as if end is specified, a block in the last column as if start is specified, and a block in any other column as if center is specified.

Whereas recognition of the inherent dignity and of the equal and inalienable rights of all members of the human family is the foundation of freedom, justice and peace in the world,

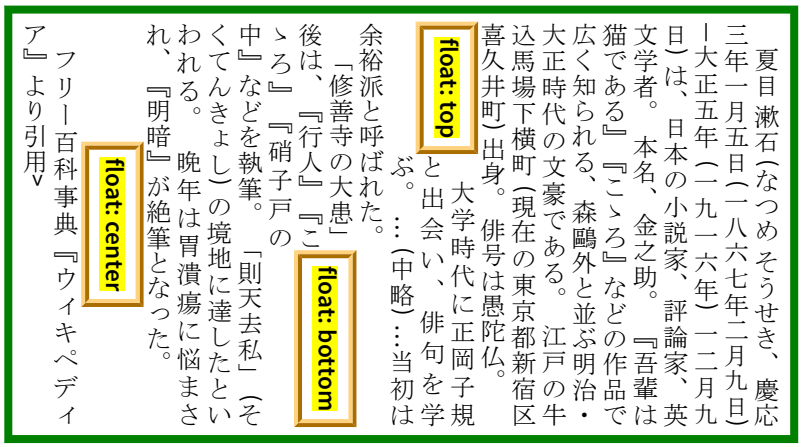
Whereas disregard and contempt for human rights have resulted in barbarous acts which have outraged the conscience of mankind, and the advent of a world in which human beings shall enjoy freedom of speech and belief and freedom from fear and want has been proclaimed as the highest aspiration of the common people,

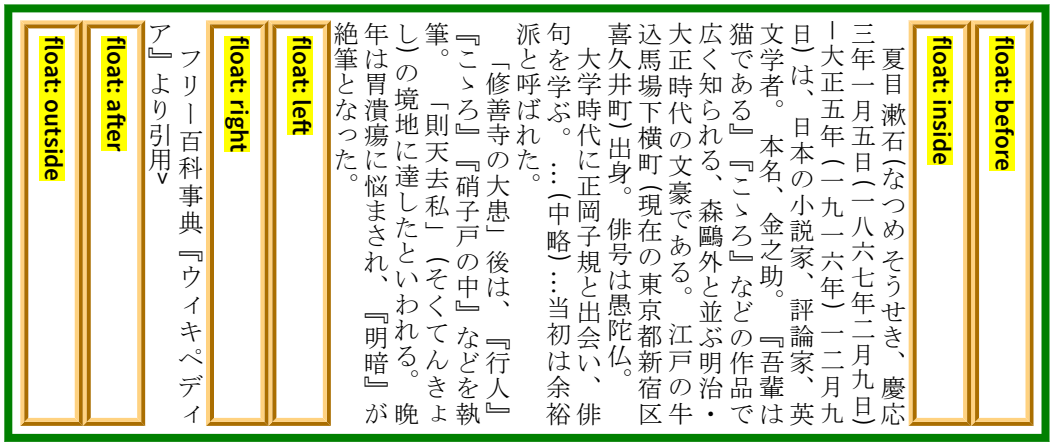
Whereas it is essential, if man is not to be compelled to have recourse, as a last resort, to rebellion against tyranny and oppression, that human rights should be protected by the rule of law,

float: alternate

float: alternate

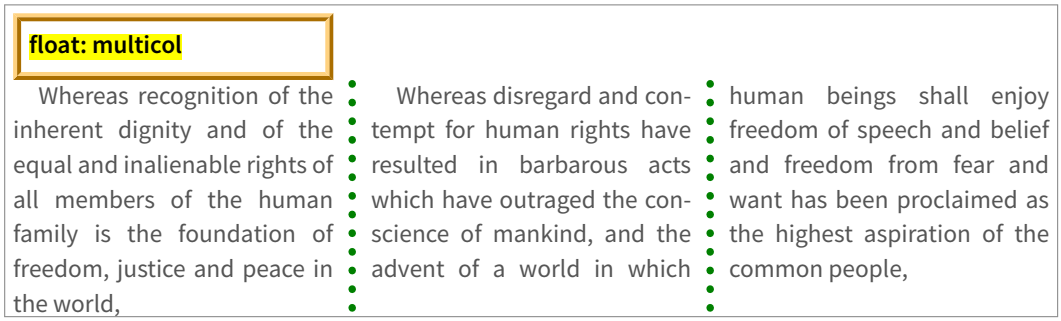
9.4.4 Float in vertical writing : float: top/float: bottom/float: alternate





9.4.5 Multi-column float : float: multicol

`float: multicol;` allows the float to span multiple columns plus the gaps between the columns. The 'gr' length unit denotes the width of either a column or column gap. *n* columns has a width of (2*n* - 1)gr. 'gr' lengths may be non-integer.



9.5 Controlling Flow Next to floats : ‘clear’ property

●Initial value : none ●Applies to : block elements ●Inherited : no

Use the ‘clear’ property to control the flow of floats to the right or left sides of a specified block.

- none: Floats are not positioned and computes a 'clearance' of an element.
- left : Requires the top border edge of a box be below the bottom outer edge of any left-floating boxes.
- right : Requires the top border edge of a box be below the bottom outer edge of any right-floating boxes.
- both : Requires the top border edge of a box be below the bottom outer edge of any left-floating and right-floating boxes.

Chapter 10
Tables

10.1 How to Create Tables

The CSS table model is based on the HTML4 table model. When using CSS with a document language that does not have table elements, you can map document elements to 'display' property values that correspond to the HTML4 table elements.

display Property	HTML Element
table	TABLE
inline-table	TABLE
table-row	TR
table-row-group	TBODY
table-header-group	THEAD
table-footer-group	TFOOT
table-column	COL
table-column-group	COLGROUP
table-cell	TD, TH
table-caption	CAPTION

Mapping elements to table-related 'display' values is so generally useful that CSS stylesheets for HTML, such as `html.css` distributed with AH Formatter, map HTML table elements to the 'display' values that are defined to display like that same element:

```
table       { display: table }
tr          { display: table-row }
thead       { display: table-header-group }
tbody       { display: table-row-group }
tfoot       { display: table-footer-group }
```

```
col          { display: table-column }
colgroup     { display: table-column-group }
td, th       { display: table-cell }
caption      { display: table-caption }
```

You can display your XML as a table by associating XML elements with the 'display' property values that represent table elements.

```
<DATA>
  <STACK>
    <ROW><CELL>row 1 column 1</CELL><CELL>row 1 column 2</CELL></ROW>
    <ROW><CELL>row 2 column 1</CELL></ROW>
    <ROW><CELL>row 3 column 1</CELL></ROW>
  </STACK>
</DATA>
```

```
DATA {
  display: block;
  margin: 20%;
}
STACK {
  display: table;
  border-collapse: collapse;
}
ROW  {
  display: table-row;
}
CELL {
  display: table-cell;
  padding: 10pt;
  font-weight: bolder;
  border: solid thin;
}
```


row 1 column 1	**row 1 column 2**
row 2 column 1	
row 3 column 1	

XML displayed as table

10.2 Applying a Basic Character Property of a Box to a Table

The dimensions of a CSS box are determined by the characteristic properties of its margin, border, padding, content width, and height. Tables are slightly different; the following properties apply.

Properties that apply to table elements

display Property	margin	border	padding	width	height
table	Yes	Yes	Yes	Yes	Yes
inline-table	Yes	Yes	Yes	Yes	Yes
table-row		Yes			Yes
table-row-group		Yes			Yes
table-header-group		Yes		Yes	Yes
table-footer-group		Yes		Yes	Yes
table-column		Yes		Yes	
table-column-group		Yes		Yes	
table-cell		Yes	Yes	Yes	Yes
table-caption	Yes	Yes	Yes	Yes	Yes

- Table padding applies only with `border-collapse: separate;`
- The width of a table is the space between the inner side of the left and right padding when `border-collapse: separate;` it becomes the space between the center of the left and right border when `border-collapse: collapse`.
- Border properties on 'table-column', 'table-column-group', 'table-row', and 'table-row-group' apply only when `border-collapse: collapse;`.
- The width properties of 'table-column' and 'table-column-group' specify the minimum width of a column.

10.3 Table Border Model

10.3.1 Whether or not to separate the border : border-collapse

●Initial value : separate ●Applies to : table elements ●Inherited : yes

Specifies whether to treat the borders around each CSS table cell individually.

- collapse : Merge the borders of adjacent cells.
- separate : Treat borders of adjacent cells separately.

10.3.2 Spaces between borders : border-spacing

●Initial value : 0 ●Applies to : table elements ●Inherited : yes

Specifies the space (white space) between the borders of adjacent cells when `border-collapse: separate;`.

```
table {
  padding: 5mm;
  border: solid 2mm gray;
  border-collapse: separate;
  border-spacing: 2mm;
}

th, td {
  padding: 2mm;
  border: solid 2mm silver;
}
```

An example of the above specification can be seen below.

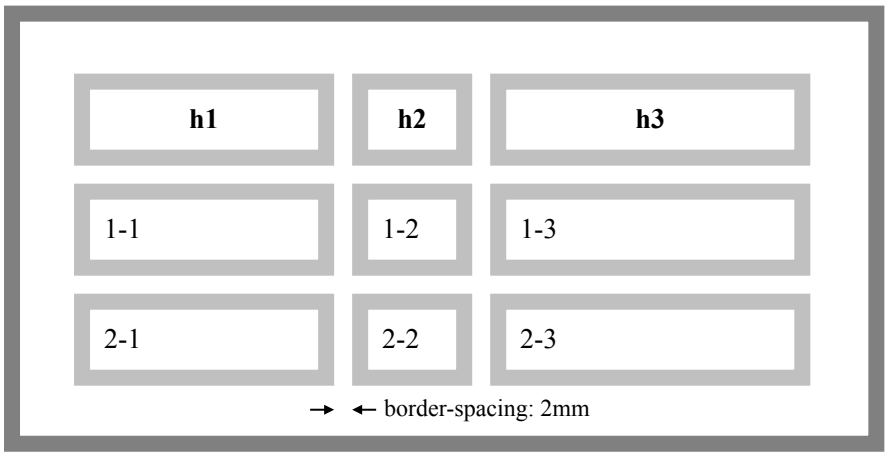


Table with `border-collapse: separate;`

```
table {
  padding: 5mm;
  border: solid 2mm gray;
  border-collapse: collapse;
}

th, td {
  padding: 2mm;
  border: solid 2mm silver;
}
```

An example of the above specification can be seen below. This time, the table padding disappears. Since the table and cell borders are the same width, priority is given to the next item, and the border of the box generated by table is overwritten by the cell border.

h1	h2	h3
1-1	1-2	1-3
2-1	2-2	2-3

Table with `border-collapse: collapse;`

10.3.3 Border priority

As in the previous example, `border-collapse: collapse;` combines the adjacent borders together. This time, the border style priority is the following.

- `border-style: hidden;` has the highest priority.
- `border-style: none;` has the lowest priority.
- Wide borders have higher priority than narrow borders.
- Borders with the same width are prioritized according to the style of the border in descending order as follows:
  1. 'double'
  2. 'solid'
  3. 'dashed'
  4. 'dotted'
  5. 'ridge'
  6. 'outset'
  7. 'groove'
  8. 'inset'

  'double' is the highest priority, and 'inset' is the lowest.
- Borders differing only in color are prioritized according to the 'display' type of the element in descending order as follows:
  1. table-cell
  2. table-row
  3. table-row-group
  4. table-column
  5. table-column-group
  6. table

  'table' has the lowest priority.
- In horizontal writing, if the element types are the same and have line types of the same property, the further it is to the left, the higher its priority.

10.4 Determining Table and Column Width : 'table-layout' property

●Initial value : auto ●Applies to : table elements ●Inherited : no

Specifying 'table-layout' property determines the width of the table columns.

- auto : Automatically calculates the width of table columns and lays out the table.
- fixed : Lays out tables based on the fixed values of table and column widths.

When the value is 'auto', table width depends on its content. The minimum width of a column can be specified by the 'width' property of the column element[15], but the program automatically determines the width for other columns from the cell contents and the width of the entire table.

`table-layout: fixed;` determines the width of the table and does not depend on the contents of the cell. If the table-layout width is not specified, it becomes the width of the block that contains the table. The width of each column is determined as follows:

- If the column width is specified by the 'width' property value of the column element, that column has the same value.
- Otherwise, the 'width' property value of the cell in the first row sets the column width.
- The remaining width, (table width from an entire table minus the specified column widths) is evenly allocated to any remaining columns.


```
table {
  table-layout: fixed;
  …
}

col.first {
  width: 10em;
}
```

10.5 Align Table to Center

Specifies margin-left: auto; and margin-right: auto; to center the entire table.

```
table {
  margin-left: auto;
  margin-right: auto;
  …
}
```

15) Equivalent to HTML `col` element

10.6 Table Caption Position : ‘caption-side’ property

●Initial value: top ●Applies to : caption elements ●Inherited : yes
Use the ‘caption-side’ property to specify the position of the table caption.

- top : Displays the caption above the table.
- bottom : Displays the caption below the table.

Caption positioned above the table

Product Introduction

Option name	Product content
SVG option	This is an option for SVG output.
Barcode option	Provides several style sheets for printing barcodes and barcode fonts.

```
table {
  caption-side: top;
  …
}
```

Caption positioned below the table

Option name	Product content
SVG option	This is an option for SVG output.
Barcode option	Provides several style sheets for printing barcodes and barcode fonts.

Product Introduction

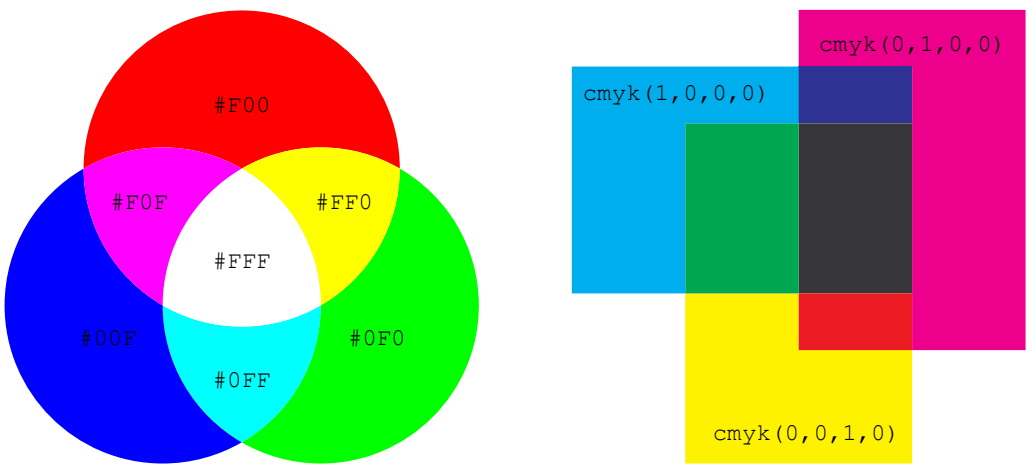
```
table {
  caption-side: bottom;
  …
}
```

Chapter 11
Color Specification

11.1 Printing color

When you use CSS with your browser, the colors that you see are from the display emitting light. When the red, green, and blue primary colors combine to make a color, they are additive: the more of each component there is, the lighter the color. Which is why #FFF is white (or why white is #FFF, depending on your perspective).

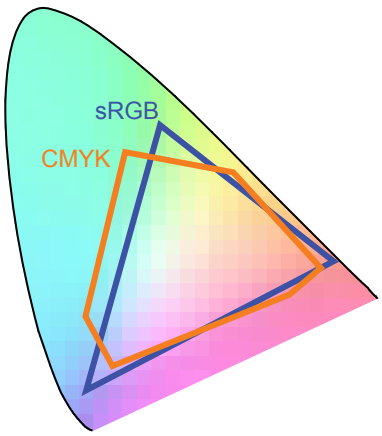
Conversely, when you print, the colors that you see are from the light that is reflected from the printed surface. When the cyan, magenta, and yellow primaries combine to make a color, they are subtractive: the more of each component there is, the darker the color. `cmyk(1, 1, 1, 0)` should give black, but in practice, it's closer to a muddy brown. That's one reason why black is added as the fourth color.[4] Using black ink is also less expensive than using a triple quantity of colored inks. Text is typically printed solely in black to avoid problems if the other three inks are not perfectly aligned. A 'richer' black, which might be used for example in a graphic, can be made by applying solid black over one or more other colors.



RGB and CMY

4) The 'K' in 'CMYK' is from the black printing plate being the 'key' plate against which the other plates are aligned.

The relationship between RGB and CMY was first demonstrated by James Clerk Maxwell around 1860. Put simply, the printing primaries are the secondary colors of the transmitted light primaries, and vice-versa: cyan is blue plus green, or white minus red, and similarly for magenta and yellow. However, as the following figure shows, CMYK printing inks do not have the same gamut (i.e., color range) as the sRGB color space that is used for RGB colors on the web, and neither covers the full gamut of visible light.



sRGB and CMYK gamuts

These differences between sRGB and CMYK might affect your use of color. Every device or process for printing that you encounter will have a way of representing RGB colors using CMYK, but that is usually by shifting colors so that out-of-gamut colors can be printed (and shifting nearly out-of-gamut colors so they do not look the same as the shifted colors). If your paged media will mostly be viewed on screen, possibly with some local printing by end users, then RGB colors may be best. However, if your paged media will be commercially printed, discuss with your printer whether to use RGB or CMYK for images, etc., and who will do the final conversion to CMYK. Preparing images for commercial printing is a complex subject that is beyond the scope of this tutorial.

11.2 Text Color : 'color' property

●Initial value : black[5] ●Applies to : all elements ●Inherited : yes

Use the 'color' property to specify the foreground color of text and border colors. RGB is most commonly used for specifying colors and has three components: red, yellow, and blue. CMYK are used for print only and has four components: cyan, magenta, yellow, and black. International Color Consortium (ICC) color profiles map between a device-independent color space and the capabilities of a device. RGB and ICC colors are converted to CMYK when printing, although they may be retained as RGB or ICC colors in the PDF or other files produced by AH Formatter.

Color can have the following values:

5) The Initial value black can be changed.

- #RGB : Specifies R, G, or B with a one-digit hexadecimal number each. (#5F0 = #55FF00)
- #RRGGBB : Specifies R, G, or B with a two-digit hexadecimal number each.
- rgb(255,0,0) : From the left, specifies R, G, and B with integer values ranging from 0 to 255.
- rgb(100%,0%,0%) : From the left, specifies R, G, and B with values ranging from 0% to 100%.
- black (and other colors) : Specifies a color keyword. AH Formatter supports the extended color keywords defined in CSS Color Module Level 3.
- cmyk() : Specifies a CMYK color for four-color process printing. 
- device-cmyk() : Same as cmyk().
- rgb-icc() : Specifies a color in a defined color space.[6] Takes a variable number of arguments (see below). 

```
em { color: #F00; }              /* #RGB */
em { color: #FF0000; }           /* #RRGGBB */
em { color: rgb(255, 0, 0); }    /* integer range 0-255 */
em { color: rgb(100%, 0%, 0%); } /* 0%-100% */
em { color: red; }               /* color keyword */
em { color: cmyk(0, 0.9922, 1, 0);      /* 0.0-1.0 */
em { color: cmyk(0%, 99.22%, 100%, 0%); /* 0%-100% */
em { color: rgb-icc(#CMYK, 0, 0.9922, 1, 0); /* Profile dependent */
```

Basic Color Keywords

aqua	aqua	#00FFFF	black	black	#000000	blue	blue	#0000FF
fuchsia	fuchsia	#FF00FF	gray	gray	#808080	green	green	#008000
lime	lime	#00FF00	maroon	maroon	#800000	navy	navy	#000080
olive	olive	#808000	purple	purple	#800080	red	red	#FF0000
silver	silver	#C0C0C0	teal	teal	#008080	orange	orange	#FFA500
white	white	#FFFFFF	yellow	yellow	#FFFF00			

11.2.1 CMYK colors

CMYK colors may be specified with or without a fallback RGB color for use with media that do not support CMYK. When the fallback RGB color is not provided, it is calculated from the CMYK color.

- cmyk(<C>, <M>, <Y>, <K>) : CMYK color with Cyan, Magenta, Yellow, and Black components.
- device-cmyk(<C>, <M>, <Y>, <K>) : Equivalent defined by GCPM.
- rgb-icc(#CMYK, <C>, <M>, <Y>, <K>) : Equivalent.
- rgb-icc(<R>, <G>, <B>, #CMYK, <C>, <M>, <Y>, <K>) : CMYK color with fallback RGB color.

```
em { color: cmyk(0, 0.9922, 1, 0)          /* 0.0-1.0 */
em { color: cmyk(0%, 99.22%, 100%, 0%)     /* 0%-100% */
em { color: device-cmyk(0, 0.9922, 1, 0)   /* 0.0-1.0 only */
em { color: rgb-icc(#CMYK, 0, 0.9922, 1, 0)      /* 0.0-1.0 */
em { color: rgb-icc(#CMYK, 0%, 99.22%, 100%, 0%) /* 0%-100% */
```

6) 'rgb-icc()' is defined in XSL 1.1 and implemented for CSS by AH Formatter.

```
em { color: rgb-icc(255, 0, 0, #CMYK, 0, 0.9922, 1, 0)      /* RGB 0-255 */
em { color: rgb-icc(1.0, 0, 0, #CMYK, 0%, 99.22%, 100%, 0%) /* RGB 0.0-1.0 */
```

11.2.2 Opacity

RGB and CMYK colors can also be specified with an 'alpha' component specifying the opacity of the color. It is not possible to use an 'alpha' component with a named color.

```
em { color: #F008; }             /* #RGBA */
em { color: #FF000088; }         /* #RRGGBBAA */
em { color: rgba(255, 0, 0, 0.5); }    /* Opacity 0.0-1.0 */
em { color: rgba(255, 0, 0, 50%); }    /* Opacity 0%-100% */
em { color: rgba(100%, 0%, 0%, 0.5); } /* Opacity 0.0-1.0 */
em { color: rgba(100%, 0%, 0%, 50%); } /* Opacity 0%-100% */
em { color: cmyka(0, 0.9922, 1, 0, 0.5) /* Opacity 0.0-1.0 */
em { color: cmyka(0, 0.9922, 1, 0, 50%) /* Opacity 0%-100% */
em { color: cmyka(0%, 99.22%, 100%, 0%, 0.5) /* Opacity 0.0-1.0 */
em { color: cmyka(0%, 99.22%, 100%, 0%, 50%) /* Opacity 0%-100% */
```

Opacity

#F00F	#F00E	#F00D	#F00C	#F00B	#F00A	#F009	#F008
#F007	#F006	#F005	#F004	#F003	#F002	#F001	#F000

11.2.3 'rgb-icc()'

The 'rgb-icc()' color function provides additional ways to specify colors, including:

- rgb-icc(#CMYK, 0.5, 0.5, 0.5, 0) : CMYK color.
- rgb-icc(#Grayscale, 0.5) : Grayscale
- rgb-icc(#Separation, 'Name') : Spot color.
- rgb-icc(#Registration) : Print with the same intensity on all separations.
- rgb-icc(#Separation, 'All') : Same as rgb-icc(#Registration).

11.2.4 Grayscale

Grayscale (monochrome) colors can be specified with rgb-icc(#Grayscale, <Scale>), optionally with extra parameters specifying a fallback RGB color for use with devices that cannot display the grayscale color.

```
em { color: rgb-icc(#Grayscale, 0.5); }  /* 0.0 (black) to 1.0 (white) */
em { color: rgb-icc(#Grayscale, 50%); }  /* 0% (black) to 100% (white) */
em { color: rgb-icc(128, 128, 128, #Grayscale, 0.5); }  /* RGB fallback color */
em { color: rgb-icc(50%, 50%, 50%, #Grayscale, 0.5); }  /* RGB fallback color */
```

Grayscale scale values

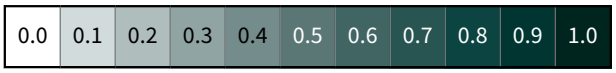
0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0

11.2.5 PANTONE® spot colors

When you have the AH Formatter PANTONE® Option[7] you can specify more than 1,000 PANTONE® colors by name and have them print as a spot color or be converted into the correct RGB or CMYK for rendering or printing.

```
em { color: rgb-icc(#Separation, 'PANTONE 627 PC', 1.0); } /* Name and tint */
em { color: rgb-icc(#Separation, 'PANTONE 627 PC', 0.5); } /* Tint 0.0 to 1.0 */
em { color: rgb-icc(#Separation, 'PANTONE 627 PC', 50%); } /* Tint 0% to 100% */
em { color: rgb-icc(#Separation, 'PANTONE 627 PC'); }      /* Assume 1.0 tint */
em { color: rgb-icc(#Separation, 'PANTONE 627 PC', 1, 90%, 0%, 75%, 83%); }
                                                          /* CMYK equivalent. */
em { color: rgb-icc(0, 91, 25, #Separation, 'PANTONE 627 PC'); }
                                                           /* RGB equivalent. */
em { color: rgb-icc(0, 91, 25, #Separation, 'PANTONE 627 PC', 1,
                    90%, 0%, 75%, 83%); }   /* Both RGB and CMYK equivalents. */
```

Tint levels



When the formatted document is commercially printed, each PANTONE® color can have a separate printing with the specific ink for that PANTONE® color. The grayscale levels on the separation for each PANTONE® color correspond to the level of tint to apply.

Greyscale levels on the separation correspond to the level of tint to apply

7) The 'AH Formatter PANTONE® Option' must be purchased separately.

11.2.6 Other spot colors

Spot colors can be used without the AH Formatter PANTONE® Option. However, it is necessary to provide one or both of the equivalent RGB and CMYK colors for use with media that does not support separations for spot colors. If either of the RGB or CMYK equivalent is omitted, it is calculated from the components of the other equivalent color.

- rgb-icc(<R>, <G>, <B>, #Separation, <Name>, <Tint, <C>, <M>, <Y>, <K>) : Spot color with name, tint, and both CMYK and RGB fallback colors.
- rgb-icc(<R>, <G>, <B>, #Separation, <Name>, <Tint) : Spot color with name, tint, and RGB fallback color.
- rgb-icc(<R>, <G>, <B>, #Separation, <Name>, <Tint) : Spot color with name and RGB fallback color.
- rgb-icc(#Separation, <Name>, <Tint, <C>, <M>, <Y>, <K>) : Spot color with name, tint, and CMYK fallback color.

Similarly to PANTONE® colors, when the formatted document is commercially printed, each CMYK spot color can have a separate printing with the specific ink for that color. The grayscale levels in the separation for each color correspond to the level of tint to apply.

Chapter 12
Counters

12.1 Numbering Chapters and Sections

Use the ‘counter-increment’, ‘counter-reset’, and ‘content’ properties to automatically assign a series of numbers to chapter and section elements.

Use the counter name as the value of the ‘counter-increment’ and ‘counter-reset’ properties. Specifying a counter name for the ‘content’ property allows the value of the counter to be inserted in the ::before or ::after pseudo-elements. The counter’s value increases each time an element applies ‘counter-increment’ and resets when ‘counter-reset’ is applied.

```
body {
  counter-reset: ChapterNo;          /* reset chapter number counter */
}
h1:before {
  counter-increment: ChapterNo;      /* add 1 to chapter number counter */
  /* Insert 'n' before chapter header  (h1)  */
  content: "Chapter" counter(ChapterNo) ":  ";
}
h1 {
  /* set h1:before and Chapter of h1 */
  string-set: Chapter content(before) content();
  counter-reset: SectionNo;          /* reset section number counter */
}
h2:before {
  counter-increment: SectionNo;      /* add 1 to section counter */
  /* insert 'n.m' before section header  (h2)  */
  content: counter(ChapterNo) "." counter(SectionNo) " ";
}
h2 {
  /* set h2:before and Section of h2 */
  string-set: Section content(before) content();
}
@page :left {
  @top-left {                        /* insert section title in the running
                                        head on the left page */
    content: string(Chapter);
  }
}
@page :right {
  @top-right {                       /* insert section title in the running
```

```
                                        head on the right page */
    content: string(Section);
  }
}
```

12.2 Inserting Characters : 'content' property

●Initial value : normal ●Applies to : In CSS2.1 ::before and ::after pseudo-elements. (In CSS 3, applies to all elements) ●Inherited : no

Use 'content' property to insert a string just before or after an element. With CSS 3, you can also use it to specify a string as the content of the element.

- normal : Does not insert characters.
- none : Does not insert characters. (Behaves the same as normal).
- string : String to be inserted is written with double or single quotes.
- url() : Specifies the URL of an image file. The content of an element can be made into an image if `content: url(image.png);` is specified.
- attr() : The specified attribute value becomes the 'content' property value.
- counter() : Inserts a counter value.
- open-quote : Inserts the first pair of quotes from the 'quotes' property before the element.
- close-quote : Inserts the second pair of quotes from the 'quotes' property after the element.
- no-open-quote : Does not display a quotation mark but increases the level of nesting of the 'quotes' property by one.
- no-close-quote : Does not display a quotation mark but decreases the level of the nesting of the 'quotes' property by one.

```
.Chapter h2:before {
  content: "Chapter " counter(ChapterNo) ". ";
}
```

For the 'content()' function that is used with the 'string-set' property, see 19.2.2 , Variable strings : 'string-set' property (page 104)

12.3 Incrementing Counters : 'counter-increment' property

●Initial value : none ●Applies to : all elements ●Inherited : no

Use the 'counter-increment' property to increase the specified counter value.

- none : Does not do count.
- Counter Name : Increases the specified counter value by one.
- Counter name, space, and integers : Increases the counter value with a specified number.

```
.Chapter h2 {
  …
```

```
  counter-increment: ChapterNo;
  …
}
```

12.4 Counter Reset : 'counter-reset' property

●Initial value : none ●Applies to : all elements ●Inherited : no

Use 'counter-reset' property to reset the specified counter value.

- none : Does not reset count.
- Counter name : Sets the specified counter value to zero.
- Counter name, integer : Sets the counter value to the specified number.

```
.Chapter h2 {
  …
  counter-reset: SectionNo;
  …
}
```

12.5 Page counter

Use the 'counter()' function to find the current page and the total number of pages.

Current page : **counter(page)**

Total number of pages : **counter(pages)**

> Number of this page = 67
> Total number of pages in this document = 140

```
<p>Number of this page = <span style="content: counter(page)"></span></p>
<p>Total number of pages in this document=<span style="content: counter(pages)">
</span></p>
```

'counter()' has an optional second argument specifying the counter style. If that is omitted, it defaults to 'decimal'.

> Number of this page = lxvii
> Total number of pages in this document = CXL

```
<p>Number of this page =
  <span style="content: counter(page, lower-roman)"></span></p>
<p>Total number of pages in this document=
  <span style="content: counter(pages, upper-roman)"></span></p>
```

Chapter 13
Lists

There is not a ‘display’ property value to make an element display as a list. However, `display: list-item;` does cause an element to generate a list item. List items each have a marker, which is the bullet, number, or other mark that identifies the list item. In CSS 2, the formatting of the marker is specified using the the ‘list-style-type’, ‘list-style-image’, ‘list-style-position’, and ‘list-style’ properties. CSS 3 adds the ::marker pseudo-element so that the list item marker can be styled with the full range of CSS properties and values. The ‘list-style-type’ and ‘list-style-image’ properties set the default contents of the ::marker pseudo-element.

13.1 List item marker image : ‘list-style-image’ property

●Initial value : none ●Applies to : list items ●Inherited : yes

Specifies an image to use as the default contents of the list item marker. If ‘list-style-image’ is ‘none’ or the image is invalid, the default contents are given by ‘list-style-type’ instead.

- none : No image.
- <image> : Image to use as the default contents.

13.2 List item marker type : ‘list-style-type’ property

●Initial value : disc ●Applies to : list items ●Inherited : yes

Specifies the default contents of the list item marker when ‘list-style-image’ is ‘none’ or the image is invalid. Otherwise, it is ignored.

- none : The default contents are ‘none’.
- <counter-style> : The default contents are that counter style.
- <string> : The string is used as the default contents.

13.3 List item marker position : ‘list-style-position’ property

●Initial value : outside ●Applies to : list items ●Inherited : yes

‘list-item-position’ helps to control the position of the list item marker.

- inside : The marker pseudo-element is placed inline immediately before where the ::before pseudo-element would be placed.
- outside : As ‘inside’, plus the ‘position’ property on the marker computes to ‘marker’.

13.4 List item marker shorthand : ‘list-style’ property

●Initial value : see individual properties ●Applies to : list items ●Inherited : see individual properties

‘list-item’ is a shorthand for setting ‘list-style-type’, ‘list-style-image’, and ‘list-style-position’.

```
ul.References li {
  list-style: check;
  line-height: 1.1;
}
```


13.5 List item marker : ::marker pseudo-element

::marker can be styled with the full range of CSS properties and values. The default contents are defined by the ‘list-style-image’ and ‘list-style-type’ properties, but that can be overridden by setting the ‘content’ property of the ::marker.

13.6 Counter styles

A “counter style” is the definition and/or implementation of the sequence of numbers, letters, and/or symbols to use to represent a numbering sequence. CSS 1 defined a handful of counter styles based on what HTML traditionally allowed on lists. CSS Counter Styles Level 3 defines the ‘@counter-style;’ rule, which provides a mechanism for defining custom counter styles, plus it defines a number of counter styles that should all (eventually) be expected to be built into browsers.

The core of a CSS 3 counter style is that it attaches a name to an algorithm for generating string representations of integer counter values. A counter style may also include properties indicating a prefix and/or suffix to add to the generated values, additional strings to indicate negative numbers, etc. The counter style can be used in the ‘list-style-type’ and in the ‘counter()’ and ‘counters()’ functions.

The following example shows a ‘my-cjk-decimal’ counter style that is a copy of the ‘cjk-decimal’ counter style from CSS Counter Styles Level 3. As the name suggests, the counter style uses the

ideographs for zero to nine to represent decimal numbers. The numbers are followed by an ideographic comma suffix. The counter style is used when numbering the items in an <ol>.

```
@counter-style my-cjk-decimal {
  system: numeric;
  range: 0 infinite;
  symbols: \3007  \4E00  \4E8C  \4E09  \56DB  \4E94  \516D  \4E03  \516B  \4E5D;
  /* 〇 一 二 三 四 五 六 七 八 九 */
  suffix: "\3001";
  /* "、" */
}
ol.my-cjk-decimal li { list-style-type: my-cjk-decimal;  }
…
<ol class="my-cjk-decimal">
  <li title="1">一</li>
  <li title="2">二</li>
</ol>
```

List with ‘my-cjk-decimal’ counter style

一、 一
二、 二

13.7 Defining Custom Counter Styles : @counter-style rule

Allows definition of a custom counter style. The general form of an ‘@counter-style’ rule is:

```
@counter-style <counter-style-name> { <declaration-list> }
```

Counter style names are case-sensitive, However, the names of counter styles that are predefined in CSS Counter Styles Level 3 are matched case insensitively. A counter style name cannot match “none”, and “decimal” and “disc” cannot be defined as counter style names.

The following descriptors are allowed in the declaration list:

- system : Specifies which algorithm to use to construct the counter’s representation.
- negative : Defines how to alter the representation when the value is negative.
- prefix : Specifies a symbol that is prepended to the marker representation.
- suffix : Specifies a suffix that is appended to the marker representation.
- range : Defines the ranges over which the counter style is defined.
- pad : Specifies a symbol with which to pad counter representations that are not a minimum number of grapheme clusters.
- fallback : Fallback counter style to be used when the current counter style cannot create a representation.
- symbols : Symbols to be used by the marker-construction algorithm.
- additive-symbols : Symbols to be used by an additive marker-construction algorithm.

- speak-as : Describes how to synthesize the spoken form of a counter.[8)]

13.7.1 Counter algorithm : ‘system’ descriptor

●Initial value : symbolic

Specifies which algorithm to use to construct the counter’s representation.

- cyclic : Cycle repeatedly through provided symbols.
- numeric : Interpret the list of counter symbols as digits in a numbering system.
- alphabetic : Interpret the list of symbols as digits to an alphabetic numbering system.
- symbolic : Cycle repeatedly through provided symbols and, on each successive pass, double, triple, etc. the symbols.
- additive : Symbols represent weighted values, and the value of the number is obtained by adding symbols.
- fixed <integer>? : Run through the counter symbols once then fall back to another counter style. <integer>, if present, sets the first symbol value, otherwise the first symbol value is 1.
- extends <counter-style-name> : Use the same algorithm as the specified counter style name.

13.7.2 Formatting negative values : ‘negative’ descriptor

●Initial value : "\2D" ("-" hyphen-minus)

Defines how to alter the representation when the value is negative. The value is one or two symbols. When the value is negative, the first symbol is prepended to the representation and the second symbol, if present, is appended to the representation.

13.7.3 Symbols before the marker : ‘prefix’ descriptor

●Initial value : "" (the empty string)

Specifies a symbol that is prepended to the marker representation. The prefix comes before any negative sign.

13.7.4 Symbols after the marker : ‘suffix’ descriptor

●Initial value : "\2E\20" ("." full stop followed by a space)

Specifies a symbol that is appended to the marker representation. The prefix comes after any negative sign.

13.7.5 Range of a counter : ‘range’ descriptor

●Initial value : auto

Defines the ranges over which the counter style is defined. The value is either ‘auto’ or a comma-separated list of lower and upper bounds of effective ranges. When the value is ‘auto’, the range is predetermined based on the ‘system’ value. If the counter style is used to represent a value outside of its ranges, the counter style instead uses its fallback counter style.

8) Not implemented by AH Formatter.

13.7.6 Minimum counter width : ‘pad’ descriptor

●Initial value : 0 ""

Specifies a symbol with which to pad counter representations that are not a minimum number of grapheme clusters. The value is an integer and a symbol. When the represention has fewer grapheme clusters than the integer value, the representation is padded with symbol. Representations that are longer than minimum are not padded.

13.7.7 Fallback counter style : ‘fallback’ descriptor

●Initial value : decimal

Specifies a fallback counter style to be used when the current counter style cannot create a representation.

13.7.8 Symbols for counters : ‘symbols’ and ‘additive-symbols’ descriptors

●Initial value : n/a

Specifies the symbols used by the marker construction algorithm. ‘symbols’ is required if ‘system’ is ‘cyclic’, ‘numeric’, ‘alphabetic’, ‘symbolic’, or ‘fixed’, ‘additive-symbols’ is required if ‘system’ is ‘additive’.

13.8 Predefined Counter Styles

CSS Counter Styles Level 3 predefines some counter styles, including some that are noted as commonplace but complicated to represent with ‘@counter-style’. Ready-made Counter Styles, published by the W3C Internationalization Working Group, provides code snippets for user-defined counter styles for numbering systems used by various cultures around the world. For ease of reference, the Ready-made Counter Styles counter styles also duplicates the predefined styles from CSS Counter Styles Level 3.

AH Formatter implements the following predefined styles:[9)]

- numeric
  - arabic-indic
  - bengali
  - binary
  - cambodian
  - cjk-decimal
  - decimal
  - devanagari
  - fullwidth-decimal
  - gujarati
  - gurmukhi
  - kannada
  - khmer
  - lao
  - lepcha
  - lower-hexadecimal
  - malayalam
  - mongolian
  - myanmar
  - new-base-60
  - octal
  - oriya
  - persian
  - shan
  - super-decimal
  - tamil
  - telugu
  - thai
  - tibetan
  - upper-hexadecimal

9) Styles with * are included for backwards-compatibility with an obsolete list-style-type specification.

- alphabetic
  - afar
  - agaw
  - ari
  - blin
  - cjk-earthly-branch
  - cjk-heavenly-stem
  - dizi
  - fullwidth-lower-alpha
  - fullwidth-lower-latin *
  - fullwidth-upper-alpha
  - fullwidth-upper-latin *
  - gedeo
  - gumuz
  - hadiyya
  - harari
  - hindi
  - hiragana
  - hiragana-iroha
  - japanese-formal
  - kaffa
  - katakana
  - katakana-iroha
  - kebena
  - kembata
  - khmer-consonant
  - konso
  - korean-consonant
  - korean-hanja-formal
  - korean-hanja-informal
  - korean-syllable
  - kunama
  - lower-alpha
  - lower-belorussian
  - lower-bulgarian
  - lower-greek
  - lower-latin *
  - lower-macedonian
  - lower-oromo-qubee
  - lower-russian
  - lower-russian-full
  - lower-serbo-croatian
  - lower-ukrainian
  - lower-ukrainian-full
  - meen
  - oromo
  - saho
  - sidama
  - silti
  - thai-alphabetic
  - tigre
  - upper-alpha
  - upper-belorussian
  - upper-bulgarian
  - upper-greek *
  - upper-latin *
  - upper-macedonian
  - upper-oromo-qubee
  - upper-russian
  - upper-russian-full
  - upper-serbo-croatian
  - upper-ukrainian
  - upper-ukrainian-full
  - wolaita
  - yemsa
- additive
  - ancient-tamil
  - armenian
  - georgian
  - greek
  - hebrew
  - japanese-informal
  - korean-hangul-formal
  - lower-armenian
  - lower-roman
  - simple-lower-roman
  - simple-upper-roman
  - upper-armenian
  - upper-roman
- symbolic
  - lower-alpha-symbolic
  - upper-alpha-symbolic
- fixed
  - circled-decimal
  - circled-ideograph
  - circled-katakana
  - circled-korean-consonant
  - circled-korean-syllable
  - circled-lower-latin
  - circled-upper-latin
  - decimal-leading-zero
  - dotted-decimal
  - double-circled-decimal
  - filled-circled-decimal
  - fullwidth-lower-roman
  - fullwidth-upper-roman
  - parenthesized-decimal
  - parenthesized-hangul-consonant
  - parenthesized-hangul-syllable
  - parenthesized-ideograph
  - parenthesized-lower-latin
  - persian-abjad
  - persian-alphabetic
- cyclic
  - box *
  - check *
  - circle
  - diamond *
  - disc
  - hyphen *

- square

- complex
  - ethiopic-numeric
  - kansuji[10)]
  - simp-chinese-formal
  - simp-chinese-informal
  - trad-chinese-formal
  - trad-chinese-informal

10) Converted using '-ah-kansuji-style'. This feature is not available in AH Formatter Lite.

Chapter 14
Cross-References

14.1 Counter Reference : ‘target-counter()’ function

Use the ‘target-counter()’ function to automatically add a reference to chapter and/or page number. See Chapter 12, Counters (page 65) for details.

Cross-references using the ‘target-counter()’ function operate as follows:

1. In the CSS style sheet, specify a string that is to be inserted as the content of the ::before or ::after pseudo-element.
2. With ‘target-counter()’, the variable specified in the ‘target-counter()’ function can be inserted using the ‘content’ property. To insert a literal string, put double or single quotation marks around the string. Also, separate it from the ‘target-counter()’ function with spaces.
3. Insert an <a> element as an anchor inside the sentence source reference and specify the cross-reference class name for that class. In addition, specify the source reference ID value in the href attribute.

```
.ChapterRef::before {
  content: "Chapter " target-counter(attr(href url), ChapterNo) ". ";
}
.PageRef::after {
  content: "(page " target-counter(attr(href url), page) ")";
}
…
Refer to <a class="ChapterRef PageRef" href="#Counters"> Counter </a>
```

14.2 Text Contents Reference : ‘target-text()’ function

Use the ‘target-text()’ function to display a textual reference as the source reference.

Cross-references using the ‘target-text()’ function operate as follows:

1. Specify a character string to be inserted into the source reference in the CSS file.
2. A variable counter specified in ‘target-text()’ function can be inserted using the ‘content’ property and the ‘target-text()’ function.

3. Insert an <a> element as an anchor inside the sentence source reference and specify the cross-reference class name for that class. In addition, specify the source reference ID value in the href attribute.
4. The character string in the anchor element replaces the reference string.

Example : “Chapter 14, Cross-References”
Referenced title replaces ‘This chapter’.

```
.TitleRef {
  content: target-text(attr(href url), before) ", "
           target-text(attr(href url), content);
}
…
Example <p> : “<a class="TitleRef" href="#CrossRef">This chapter</a>”</p>
<p>Referenced title replaces ‘This chapter’.</p>
```

14.3 Creating a Table of Contents

A table of contents can be created with the ‘target-counter()’ function which can refer to chapter and page numbers.

An Example of Table of Contents


```
.TOC a::before { /* add chapter number to the table of contents */
  content: "Chapter " target-counter(attr(href url), ChapterNo) ". ";
}
.TOC a::after { /* add page number to the table of contents */
  content: leader(dotted) " " target-counter(attr(href url), page);
}
…
<div class="TOC">
  <ul>
    <li class="TocLevel1"><a href="#WebvsPrint">Web and Paged Media</a></li>
    <li class="TocLevel1"><a href="#BoxModel">Box Layout</a></li>
    <li class="TocLevel1"><a href="#ObjectDecorate">Background Decoration</a></li>
  </ul>
</div>
```

Chapter 15
Footnotes and Sidenotes

15.1 Footnote Setting : float: footnote

When `float: footnote;` is specified for the 'float' property, the contents will become a footnote[11].

```
<style>
.Footnote { float: footnote; }
</style>

If footnote is specified as the <p>float value, the contents of that element
will be footnotes <span class="Footnote"> and the footnote will be placed at
the bottom of the page. </span>
becomes </p>.
```

15.2 Footnote Style : @footnote rule

Use the '@footnote' rule in the '@page' rule to set the footnote area by drawing a ruled line above the footnote area.

```
@page {
  @footnote {
    float: bottom page; /* the footnote area is placed as a float at the
bottom of the page */
    border-top: thin solid black; /*set a ruled line above the footnote area */
    border-length: 30%;           /* set the length of the ruled line  (30% of
the page area width) */
    padding-top: 0.5em;
  }
}
```

11) The arrangement of the footnotes will be written on the bottom of the page using `float: page bottom;` property from 4.4.1 page float. Use the '@footnote' rule in the '@page' rule to set the footnote area. Use the pseudo-elements ::footnote-call and ::footnote-marker to set the footnote number format.

15.3 Footnote Number : ::footnote-call/::footnote-marker pseudo-elements

Use ::footnote-call and ::footnote-marker to set the footnote number. The “footnote” counter is incremented each time that a footnote is generated.

```
::footnote-call { /*footnote call */
  content: "(" counter(footnote) ")"; font-size: 6pt; vertical-align: super;
}
::footnote-marker { /* footnote number */
  content: "(" counter(footnote) ")"; font-size: 6pt; vertical-align: super;
}
```

15.4 Sidenote Setting : float: sidenote

When float: sidenote; is specified for the ‘float’ property, the contents will become a sidenote. The arrangement of the sidenotes will be written on the bottom of the page using `float: page bottom;` property from 4.4.1 page float. Use the ‘@sidenote’ rule in the ‘@page’ rule to set the sidenote area. Use the pseudo-elements ::sidenote-call and ::sidenote-marker to set the sidenote number format.

Quisque suscipit ante vel eros. Whereas recognition of the inherent dignity and of the equal and inalienable rights of all members of the human family is the foundation of freedom, justice and peace in the world,

```
span.sidenote {
  float: sidenote;
}
```

15.5 Sidenote Style : @sidenote rule

Use the ‘@sidenote’ rule in the ‘@page’ rule to set the position and extent of a sidenote area.

```
@page {
  @sidenote {
    float: outside;
    clear: both;
    width: 20%;
  }
}
```

Chapter 16

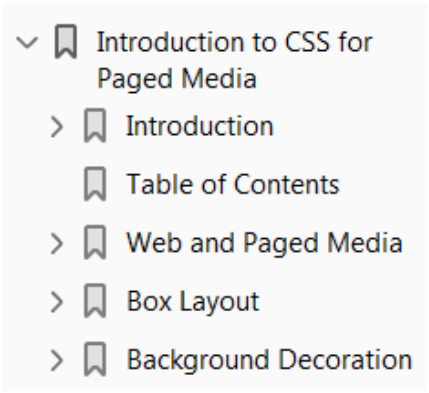
PDF Bookmarks

PDF bookmarks can be created.

16.1 Bookmark Level : ‘bookmark-level’ property

●Initial value : none ●Applies to : all elements ●Inherited : no

Sets bookmark level. Corresponds to the <h1>–<h6> headings in HTML.



16.2 Bookmark Label : ‘bookmark-label’ property

●Initial value : all elements ●Applies to : all elements ●Inherited : no

Sets bookmark label. When the bookmark label is none, the element contents become the bookmark label.

16.3 Bookmark State : ‘bookmark-state’ property

●Initial value : open ●Applies to : block elements ●Inherited : no

Bookmarks are specified as either open or closed. If bookmark-state: closed;, the bookmark is closed.

```
/* Bookmarks */
h1 { bookmark-level: 1; }
h2 { bookmark-level: 2; bookmark-state: closed; }
h3 { bookmark-level: 3; bookmark-state: closed; }
h4 { bookmark-level: 4; bookmark-state: closed; }
h5,h6 { bookmark-level: none; }
```

Chapter 17
Japanese Text Composition

17.1 Fixed Trimming of Start and End Line Punctuation - Paragraph Start Line Indent

The basic style setting for Japanese text composition is that a fullwidth punctuation character is trimmed if it appears at the start/end of a line and/or adjacent to another fullwidth punctuation character and the start indent of a new paragraph is1em.

- Line start punctuation : Trims fullwidth punctuation glyphs.
- Line end punctuation : Trims the blank half of fullwidth punctuation glyphs.
- First line indent of a new paragraph : Indents 1em at the first line of a new paragraph.

```
body {  /* setup for Japanese document composition */
  punctuation-trim: start end adjacent;
  -ah-text-justify-trim: punctuation;
  text-autospace: ideograph-numeric ideograph-alpha;
  -ah-text-autospace-width: 25%;
  hanging-punctuation: none;
}
p {     /* paragraph */
  text-align: justify;  /* line end align */
  text-indent: 1em;     /* set 1em for first line indent in a paragraph */
  margin: 0;            /* no margin between paragraphs */
}
```

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「修善寺の大患」後は、『行人』『こゝろ』『硝子戸の中』などを執筆。「則天去私」（そくてんきょし）の境地に達したといわれる。晩年は胃潰瘍に悩まされ、『明暗』が絶筆となった。

フリー百科事典『ウィキペディア』より引用

17.2 Fullwidth Punctuation Trimming : 'punctuation-trim' property

●Initial value : none ●Applies to : block elements ●Inherited : yes

Specifies whether to treat fullwidth punctuation at the start or end of a line.

- none : Punctuation characters are not trimmed.
- start : Punctuation characters (open parenthesis, etc.) at the start of a line are trimmed.
- end : When text-align: right and text-align: justify (or text-align-last: justify) are specified, fullwidth punctuation glyphs (closing parenthesis, etc.) at the end of a sentence are forcibly treated as halfwidth.
- allow-end : When text-align: right and text-align: justify (or text-align-last: justify) are specified, fullwidth punctuation glyphs (closing brackets, etc.) at the end of a sentence are treated as fullwidth if the text fits into one line; the characters are treated as if text does not fit into one line.
- end-except-fullstop : Behaves the same as the end value except for the following two characters.
  - U+3002 = "。 "
  - U+FF0E = ". "
- adjacent : In Japanese, the space between a fullwidth punctuation glyph and a fullwidth character is trimmed. Spaces to be treated are the following. Fullwidth punctuations glyphs and fullwidth closing parentheses are treated the same way.
  - Between fullwidth closing parenthesis and fullwidth opening parenthesis.
  - Between fullwidth closing parenthesis and fullwidth closing parenthesis.
  - Between fullwidth closing parenthesis and fullwidth middle dots.
  - Between fullwidth opening parenthesis and fullwidth opening parenthesis.
  - Between fullwidth middle dots and fullwidth opening parenthesis.
- all : Trim all parentheses, middle dots, fullwidth punctuation and treat them as halfwidth.

```
/* fullwidth punctuation character is trimmed at the start or end of a
   line, or adjacent to another fullwidth punctuation character */
punctuation-trim: start end adjacent;
```

「《約物〔やくもの〕》、つまり『括弧』・『句読点』の類 (たぐい) です。」

When successive punctuation (punctuation marks and brackets) glyphs come at the start or end of a line, the fullwidth characters are trimmed, improving its appearance.

「《約物〔やくもの〕》、つまり『括弧』・『句読点』の類 (たぐい) です。」

The example above shows when punctuation trim is deactivated. (Specify punctuation-trim: none;)

17.3 Additional Compression : '-ah-text-justify-trim' property

●Initial value : none ●Applies to : all elements ●Inherited : yes

Specifies different ways of handling Japanese text compression. Trim the spaces as specified so that the text fits into a line.

- none : Do not trim Japanese text.
- punctuation : Trim fullwidth parentheses, middle dots, and punctuation glyphs.
- punctuation-except-fullstop : Behaves the same as the punctuation value except for the following two characters.
  - U+3002 = "。 "
  - U+FF0E = ". "
- kana : Trim the Hiragana and Katakana glyphs just a little bit.

```
/* punctuation trimming allowed for adjusting lines */
-ah-text-justify-trim: punctuation;
```

Automatically reverts the punctuation glyphs that were trimmed (before fullwidth opening parentheses and after fullwidth closing parentheses and punctuation marks), to fullwidth so the text fills the line, as described in the previous section.

17.4 Adding Space : 'text-autospace' property

●Initial value : none ●Applies to : block elements ●Inherited : yes

Specifies whether or not to add space between ideographic glyphs in Japanese.

- none : No extra space is added.
- ideograph-numeric : Adds a space between Kana/Kanji and Western letters.
- ideograph-alpha : Adds a space between Kana/Kanji and Western alphabetic characters.
- ideograph-parenthesis : Adds a space between Kana/Kanji and Western brackets. However, no extra space is added between Kana/Kanji and Western closing brackets or between Western opening brackets and Kana/Kanji.
- ideograph-punctuation : Adds a space between Kana/Kanji and Western punctuation. Adds a space between periods and Kana/Kanji, but does not add space between Kana/Kanji and periods. The same goes for commas.
- auto : Dependent on the system setting. Depending on the system setting, it is regarded as none or ideograph-numeric ideograph-alpha.

```
/* Add space between kanji, kana, and numbers and between kanji, kana, and
Western texts */
text-autospace: ideograph-numeric ideograph-alpha;
```

「日本語にも global にも 100%を目指す AH Formatter です」

Therefore, if a mixture of Western texts and Arabic numerals are included in Japanese sentences, a little bit of space is added between them to make it easier to read.

「日本語にもglobalにも100%を目指すAH Formatterです」

For comparison, the following example shows that setting `text-autospace: none;`, spacing between Japanese letters and alphabets will be de-activated.

17.5 Amount of Space Between Japanese and Western Texts : '-ah-text-autospace-width' property

●Initial value : 25%　●Applies to : block elements　●Inherited : yes

Specifies the amount of space between Japanese and Western text in Japanese.

```
/* specifies mount of space between Japanese and Western texts */
-ah-text-autospace-width: 25%;  /* Initial value */
```

17.6 Hanging Punctuation : 'hanging-punctuation' property

●Initial value : none　●Applies to : block elements　●Inherited : yes

Specifies whether to hang punctuation marks at the start or at the end of a line.

- none : Does not hang punctuation marks at the start or at the end of a line.
- start : Hangs punctuation marks at the start of a line. If the character to be hung appears at the start of a line, it is forced to hang.
- first : Behaves as the start value but only for the first line of a paragraph.
- force-end : Hangs punctuation marks at the end of the line. If text-align: right or text-align: justify (or text-align-last: justify) is specified and the character that can be hung appears at the end of a line, it is forced to hang. If anything else is specified for text-align, it is naturally hung.
- allow-end : Hangs punctuation marks at the end of a line. If text-align: right or text-align: justify (or text-align-last: justify) is specified and the character to be hung appears at the end of the line; it is not hung if the text fits into one line. It is hung if the text doest not fit into one line. If anything else is specified for text-align, it is naturally hung.
- last : Behaves as the force-end value but only for the last line of a paragraph.

Punctuation marks allowed to hang are as follows:

- force-end, allow-end
  Japanese or Simplified Chinese
  - U+3001 = "、"
  - U+3002 = "。"
  - U+FF0C = "，"

- U+FF0E = ". "

Traditional Chinese

- U+FE50
- U+FE51
- U+FE52
- U+FF64

Other languages

- Same as the last value

- last

  quotation marks, closing parentheses, periods, commas, and hyphens

- start, first

  quotation marks, closing parentheses, and bullet

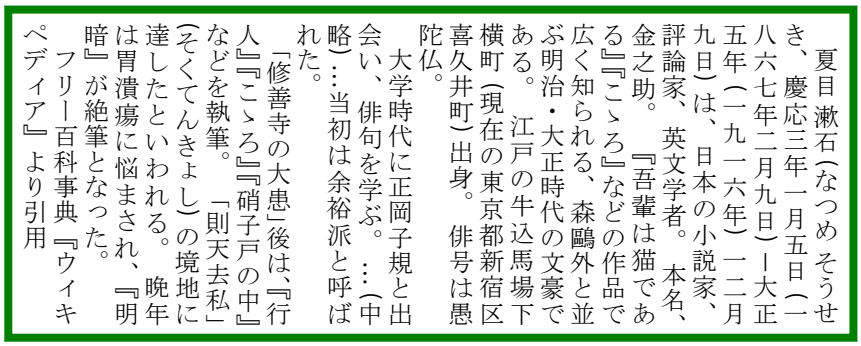
```
/* specifies whether to hang punctuation marks at the start or at the end
   of a line. */
hanging-punctuation: none;  /* Initial value */
```

17.7 Trimming Line Start Punctuation - Fullwidth/Halfwidth Line End Punctuation - First Line Indent of a New Paragraph

Allows trimming of line start punctuation, fullwidth and halfwidth line end punctuation, and indents the first line of a new paragraph 1em.

- Line start punctuation : Trim fullwidth punctuation glyphs.
- Line end punctuation : Trim fullwidth and halfwidth punctuation marks.
- First line indent of a new paragraph : Indent 1em at the first line of a new paragraph.

```
body {  /* setup for Japanese document composition */
  punctuation-trim: start allow-end adjacent;
  -ah-text-justify-trim: punctuation;
  text-autospace: ideograph-numeric ideograph-alpha;
  -ah-text-autospace-width: 25%;
  hanging-punctuation: none;
}
p {     /* paragraph */
  text-align: justify;  /* line end align */
  text-indent: 1em;     /* set 1em for first line indent in a paragraph */
  margin: 0;            /* no margin between paragraphs */
}
```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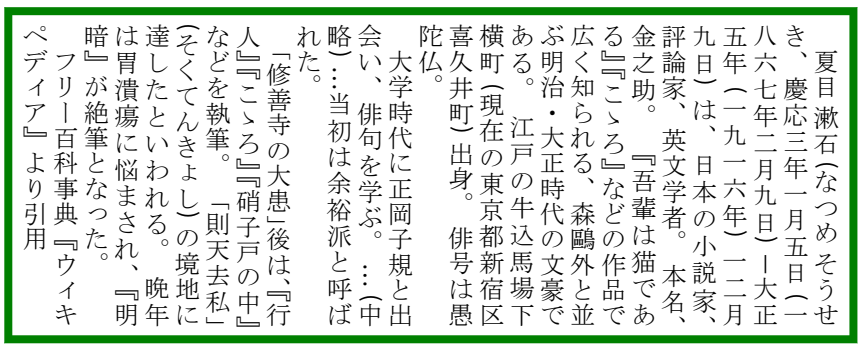
フリー百科事典『ウィキペディア』より引用

17.8 Trimming Line Start Punctuation - Fullwidth Line End Punctuation - First Line Indent of a New Paragraph.

Trim line start punctuation - Fullwidth line end punctuation only - Indent the start of a line 1em.

- Line start punctuation : Trim fullwidth punctuation glyphs.
- Line end punctuation : Trim fullwidth punctuation glyphs, others are assumed trimmed.
- First line indent of a new paragraph : Indent 1em at the first line of a new paragraph.


```
body {  /* setup for Japanese document composition */
  punctuation-trim: start end-except-fullstop adjacent;
  -ah-text-justify-trim: punctuation;
  text-autospace: ideograph-numeric ideograph-alpha;
  -ah-text-autospace-width: 25%;
  hanging-punctuation: none;
}
p {     /* paragraph */
  text-align: justify;  /* line end align */
  text-indent: 1em;     /* set 1em for first line indent in a paragraph */
  margin: 0;            /* no margin between paragraphs */
}
```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フリー百科事典『ウィキペディア』より引用

17.9 Trimming Line Start and Line End Punctuation - First Line Indent of a New Paragraph

Trim line start punctuation - Trim line end punctuation - Indent opening parentheses at the beginning of the paragraph by 0.5 em.

- Line start punctuation : Trim fullwidth punctuation glyphs.
- Line end punctuation : Trim the blank half of fullwidth punctuation glyphs.
- First line indentation : Indent 1em at the first line of a new paragraph and indent punctuation 0.5em.

```
body {  /* setup for Japanese document composition */
  punctuation-trim: start end adjacent;
  -ah-text-justify-trim: punctuation;
  text-autospace: ideograph-numeric ideograph-alpha;
  -ah-text-autospace-width: 25%;
  hanging-punctuation: first;
}
p {     /* paragraph */
  text-align: justify;  /* line end align */
  text-indent: 1em;     /* set 1em for first line indent in a paragraph */
  margin: 0;            /* no margin between paragraphs */
}
```

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17.10 Horizontal-in-Vertical Composition (TATECHUYOKO)

Specifies words in the horizontal orientation within a vertical writing mode. (Numbers, etc. in a vertical line are written in a horizontal orientation).

```
/* horizontal-in-vertical composition */
span.TateChuYoko {
  display: inline-block; /* create a small block in the middle of a row */
  writing-mode: lr-tb;   /* set this small block in horizontal orientation*/
  text-align: center;    /* align text to center */
  text-indent: 0;        /* do not add text indent (erase text-indents from
                            the paragraph p) */
  line-height: 1;        /* set line gap not to overlap above and below
```

```
                              TATECHUYOKO (horizontal-in-vertical composition)
                            */
}

<div class="VerticalTextBlock">
  …
  <p>縦書きの中に「<span class="TateChuYoko">'08</span>年
  <span class="TateChuYoko">12</span>月<span class="TateChuYoko">8</span>日」
  のように部分的に数字などを横書きにすることを「縦中横」といいます。 </p>
</div>
```

縦書きの中に「'08年12月8日」のように部分的に数字などを横書きにすることを「縦中横」といいます。

17.11 Ruby and Emphasis Marks

In XHTML, when using the <ruby> element, emphasis marks can be applied to the ruby characters (Furigana). Specify the base character (characters that are to be applied with ruby) with the <rb> element and specify the ruby characters (the contents of the ruby) with <rt> element.

An example of the ruby application using CSS is shown below. Use '-ah-margin-before' in vertical and horizontal writing modes.

```
<p><ruby><rb>吾輩</rb><rp>(</rp><rt>わがはい</rt><rp>)</rp></ruby>は猫である。
</p>
<p>名前はまだ無い。どこで生れたかとんと<ruby><rb>見当</rb><rp>(</rp><rt>けんとう
</rt><rp>)</rp></ruby>がつかぬ。</p>
```

Horizontal Writing Mode

吾輩(わがはい)は猫である。

名前はまだ無い。どこで生れたかとんと見当(けんとう)がつかぬ。

Vertical Writing Mode

吾輩(わがはい)は猫である。名前はまだ無い。どこで生れたかとんと見当(けんとう)がつかぬ。

Use middle dots and punctuations as emphasis marks for ruby characters. The <ruby> element setting changes when using emphasis marks.

```
/* emphasis mark */
ruby.kenten {
  -ah-margin-before: -0.7em;
}
ruby.kenten > rt {
  font-size: 70%;
}

<p>横書きでは、<ruby class="kenten"><rb>圏</rb><rp>(</rp><rt>・</rt><rp>)</rp>
</ruby><ruby class="kenten"><rb>点</rb><rp>(</rp><rt>・</rt><rp>)</rp></ruby>
は、ルビ文字に中点を使います。</p>
```

横書きでは、圏点は、ルビ文字に中点を使います。

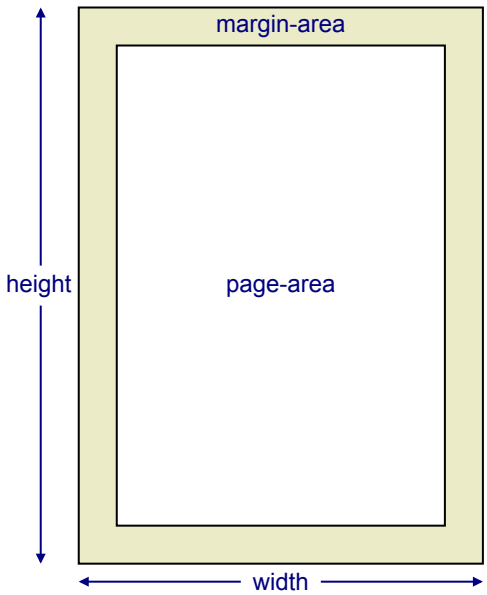
17.12 Japanese Fonts

Example of Japanese font as shown below:

- Ryumin R font-family: "A-OTF Ryumin Pro R-KL", serif;
- Gothic BBB- Medium font-family: "A-OTF Gothic BBB-Medium Pro Medium", sans-serif;
- Shin Go B font-family: "A-OTF Shin Go Pro B", sans-serif;
- Midashi Go MB31 font-family: "A-OTF Midashi Go MB31 Pro MB31", sans-serif;
- Midashi Min MA31 font-family: "A-OTF Midashi Min MA31 Pro MA31", serif;

Chapter 18

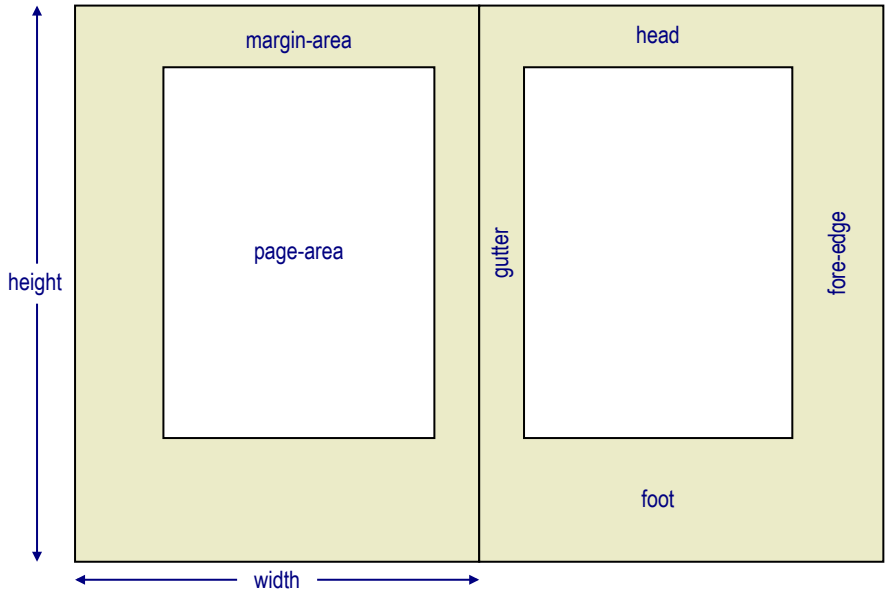
Page Setting



Page and Margin Area

18.1 Western Page Design

Western page design tradition places the page area above the center of the page, since the optical center of the page is considered to be above the geometric center. The gutter margin is traditionally narrower than the fore-edge margin. This is to make it easier for the eye to move from one page to the other. The wider fore-edge allows room for the thumbs to hold the page. The two gutter margins, taken together, balance the wider fore-edge margin. The height of the page area matches the width of the page.



Traditional Western page design

In practice, page designs vary quite a lot. The printed 'page' now includes package inserts for medications, marketing brochures, children's books, parts catalogs, and much more besides. The economics of printing or the need to print on A4 or Letter size paper on an office printer can influence the page design. Assymetric page design, where the page area has the same position on facing pages, was once a radical idea but now is not uncommon. Furthermore, novels, in particular, are often sold in multiple editions with different page sizes that each reuse the same page areas with reduced margins.

18.2 Japanese Page Design

Japanese can be formatted either with horizontal lines of text and pages progressing from left to right or with vertical lines of text and pages progressing from right to left. Some formatted documents mix the two. Different types of publication are predominately one writing mode or the other: for example, government documentation and educational materials both predominately use horizontal text, whereas novels predominately use vertical text.

For both writing modes, the page area is typically centered on the page media and has proportions similar to the proportions of the media. The best line length is around 52 characters per line for vertical text and around 40 characters per line for horizontal text.

In Japanese text composition, it is common to set the width of the page area in fullwidth characters. Using em for the 'width' property in the '@page' rule sets the width in characters. Setting the left and right margin values to auto aligns the page area in the center of the page.

```
@page {
 size: A4;
 width: 43em;        /* set width of page area to 43 em */
 margin-top: 30mm;
 margin-bottom: 30mm;
 margin-left: auto;  /* position page area in the center of the page */
 margin-right: auto;
}
```

18.3 @page Rule

'@page' rule sets basic settings such as page size, margin, page header, and page footer.

```
@page {
  size:   A4;
  margin: 25mm;
  @top-center {
    content: "Sample";
  }
  @bottom-center {
    content: counter(page);
  }
}
```

18.4 Page Size : 'size' property

Specify the width and height of the page with the 'size' property.

```
@page {
  size: 210mm 297mm; ; /* ISO/JIS A4 */
}
```

```
@page {
  size: 4in 6in;
}
```

Defined page names such as 'A5', 'A4', 'A3', 'B5', 'B4', 'JIS-B5', 'JIS-B4', 'letter', 'legal', and 'ledger' can be used for 'size' property[2].

```
@page {
  size: A4; /* ISO/JIS A4 (210mm×297mm) */
}
```

```
@page {
  size: B5; /* ISO B5 (176mm×250mm) */
}
```

2) The 'size' property uses the names defined in the ISO Standard and, since the dimensions of the ISO B series and JIS B series are different, 'JIS-B5' and 'JIS-B4' are added as Antenna House extensions that are not yet in a published CSS Working Draft.

```
@page {
  size: JIS-B5; /* JIS B5 (182mm×257mm) */
}
```

Landscape orientation can be specified with the keyword ‘landscape’.

```
@page {
  size: A4 landscape;   /* A4 landscape (297mm×210mm) */
}
```

18.5 Margin : ‘margin’ property

●Initial value : See individual properties ●Applies to : all elements ●Inherited : no

The ‘margin’ property is a shorthand for ‘margin-top’, ‘margin-bottom’, ‘margin-left’, and ‘margin-right’.

- When there is one value : the margin value applies to (up, down, left, right).
- When there are two values : the margin values apply to (top, bottom) and (left, right).
- When there are three values : the margin values apply to top, left/right, and bottom.
- When there are four values : the margin values apply to top, right, bottom, left.

Specify page margins with the ‘margin’ property on a ‘@page’ rule.

```
@page {
   margin: 10%;   /* Top, bottom, left, right margins each take up 10% of the
page width */
}
```

```
@page {
   /* Top/bottom margins are set to 2cm and left/right are set to 3 cm */
   margin-top: 2cm;
   margin-bottom: 2cm;
   margin-left: 3cm;
   margin-right: 3cm;
}
```

If not specified, the initial value of margin-* is zero[3]. margin-* specified on the (X)HTML body element is taken inside the page area. If margin-* is specified for both ‘@page’ and html (including body element) elements in (X)HTML, the margins will be added together.

18.6 Named Page : ‘page’ property

●Initial value : auto ●Applies to : boxes that create class 1 break points ●Inherited : no

Several types of named ‘@page’ rules can be created, and the ‘page’ property enables switching between them within one document.

3) In AH Formatter, the initial value can be set to any value. Since the default value is set to 2 cm, the initial value will not be zero.

```
@page Landscape {   /* "Landscape" named page */
  size: A4 landscape;
}
@page Portrait {    /* "Portrait" named page */
  size: A4;
}
table.WideTable {
  page: Landscape;  /* place a large table on the side of a "Landscape" page */
}
html {
  page: Portrait;   /* Use a "Portrait" page as the default */
}
```

```
<p>Portrait page</p>

<table class="WideTable" border="1" style="width:100%">
<tr>
<td>1</td>
…
<td>18</td>
</tr>
</table>
```

page property selects name page

18.7 Constraining The Number of Pages : '-ah-force-page-count' property

●Initial value : auto ●Applies to : CSS '@page' without any selectors[4] ●Inherited : no

Imposes a constraint on the total number of pages for the document. If the constraint is not satisfied, an additional page (or additional pages) will be added at the end of the pages. Reasons for constraining the number of page include: an office document printed on both sides of the paper may need an even number of pages; a document printed as a booklet may need a multiple of four pages; or a document printed by a commercial printer may be printed with 8, 16, 32, or 64 pages on one sheet of paper that is then folded and trimmed to become part of a book.

4) This restriction may be removed in a future AH Formatter version.

- auto : Do not force any page count.
- even : Force an even number of pages.
- odd : Force an odd number of pages.
- doubly-even : Force a doubly-even (multiple of four) number of pages.
- doubly-even-document : Force a doubly-even (multiple of four) number of pages.
- end-on-even : Force the last page to be an even page.
- end-on-doubly-even : Force the last page to be a doubly-even page.
- end-on-odd : Force the last page to be an odd page.
- even-document : Force the last page to be an odd page.
- doubly-even-document : Force the last page to be a doubly-even page.
- odd-document : Force the last page to be an odd page.
- [end-on | document] <number> [<number>] : Force the number of pages to be a multiple of the first number plus the second number, if present.[5)]
- no-force : Do not force either an even number or an odd number of pages.

For example, if the document would generate 5 pages:

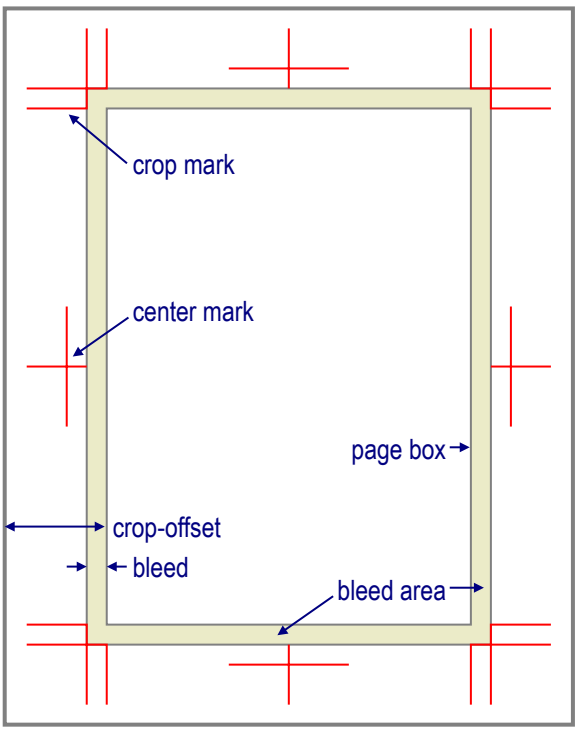
- -ah-force-page-count: even;
  Equivalent to -ah-force-page-count: 2;.
- -ah-force-page-count: odd;
  Equivalent to -ah-force-page-count: 2 1;.
- -ah-force-page-count: doubly-even;
  Equivalent to -ah-force-page-count: 4;.
- -ah-force-page-count: end-on-doubly-even;
  Equivalent to -ah-force-page-count: end-on 4;.
- -ah-force-page-count: end-on 2;
  Total number of pages is 6 with 1 blank page.
- -ah-force-page-count: end-on 4;
  Total number of pages is 8 with 3 blank page.
- -ah-force-page-count: end-on 4 1;
  Total number of pages is 5 with 0 blank pages.
- -ah-force-page-count: end-on 4 3;
  Total number of pages is 7 with 2 blank pages.
- -ah-force-page-count: end-on 6 5;
  Total number of pages is 5 with 0 blank pages.
- -ah-force-page-count: end-on 6 4;
  Total number of pages is 10 with 5 blank pages.

5) This feature is not available in AH Formatter Lite.

18.8 Crop and Registration Marks[6)]

An '@page' rule defines a page box, but the page box may be printed on a page sheet that is larger than the page box. A common reason for this is so images and other content can extend up to the edge of the page box. A physical device such as a printer typically has a non-printable area around the edge of the page sheet where it is not capable of printing reliably, if at all. Printing the page box on a larger page sheet then trimming the page sheet to the size of the page box avoids problems with the non-printable area. Extending images, etc., into the bleed area outside the page box avoids problems if the trimming to size is inaccurate.

Crop and registration marks are printed outside the page box and are used as guides when trimming the page sheet to size and for checking that content printed on both sides of a duplex sheet is aligned correctly. Other information that may be printed outside the page box includes color bars for checking color fidelity and information identifying the page, its containing document, its version number, etc.



Crop mark terms

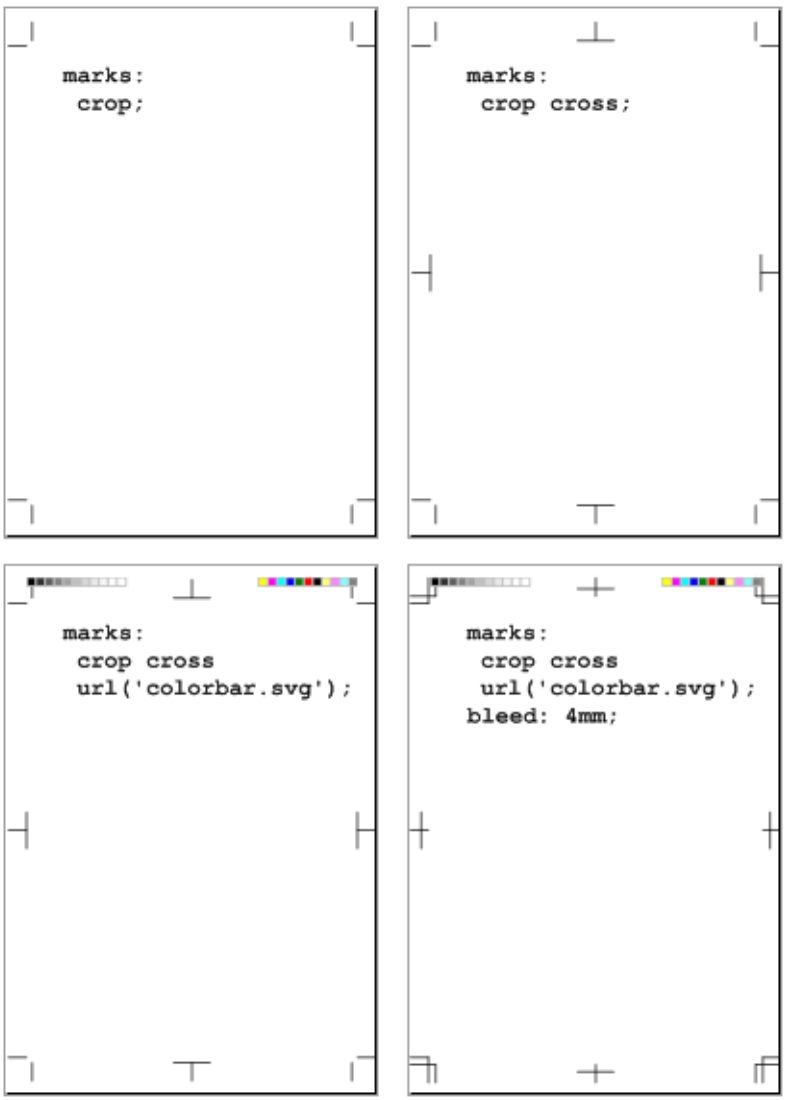
18.8.1 Printer marks display : 'marks' property

●Initial value : none ●Applies to : CSS '@page' ●Inherited : no

Specifies whether to print crop marks when printing.

6) The crop mark feature is not available in AH Formatter Lite.

- crop : Outputs crop marks.
- cross : Outputs cross marks and registration marks.
- <uri-specification> : Location of an SVG, or similar, image representing custom printer marks, color bars, etc. Multiple images can be specified.



Cross marks and crop marks

You can output crop marks at the four corners and/or cross marks at the centers of the four sides of the page box. Crop marks indicate the alignment for cutting to the finished size, and cross marks can help with registration for multi-color printing as well as for registration between the front and

back of a duplex sheet. You can also or alternatively output custom printer marks by specifying the location of one or more external images.

The printer marks feature is not available in AH Formatter Lite.

```
@page {
  size: B5; /* ISO B5 (176mm 250mm) */
  margin: 28mm 21.325mm;
  marks: crop cross;    /* printer marks to display */
  -ah-crop-offset: 14mm;    /* distance from the page box edge to the
                               page sheet edge */
  -ah-printer-marks-line-color: auto;    /* printer marks line color */
  -ah-printer-marks-line-length: 10mm;   /* printer marks line length  */
  -ah-printer-marks-line-width: 0.12mm;  /* printer marks line width */
  bleed: 3mm;      /* page bleed length */
}
```

18.8.2 Printer marks visibility : '-ah-crop-area-visibility' property

●Initial value : hidden ●Applies to : CSS '@page' ●Inherited : no

Specifies whether to display the area that extends beyond the finished page size.

- hidden : Crop area is hidden.
- visible : Crop area is visible.

18.8.3 Printer marks line color : '-ah-printer-marks-line-color' property

●Initial value : auto ●Applies to : CSS '@page' ●Inherited : no

Specifies the line color of printer marks.When the value is set to auto, the registration color is used.

18.8.4 Printer marks line length : '-ah-printer-marks-line-length' property

●Initial value : auto ●Applies to : CSS '@page' ●Inherited : no

Specifies the line length of printer marks. When the value is set to auto, the length is dependent on the system setting. The printer mark default length is 10mm, but this can be adjusted.

18.8.5 Printer marks line width : '-ah-printer-marks-line-width' property

●Initial value : auto ●Applies to : CSS '@page' ●Inherited : no

Specifies the line width of printer marks. When the value is set to auto, the length is dependent on the system setting. The printer mark default width is 0.2pt, but this can be adjusted.

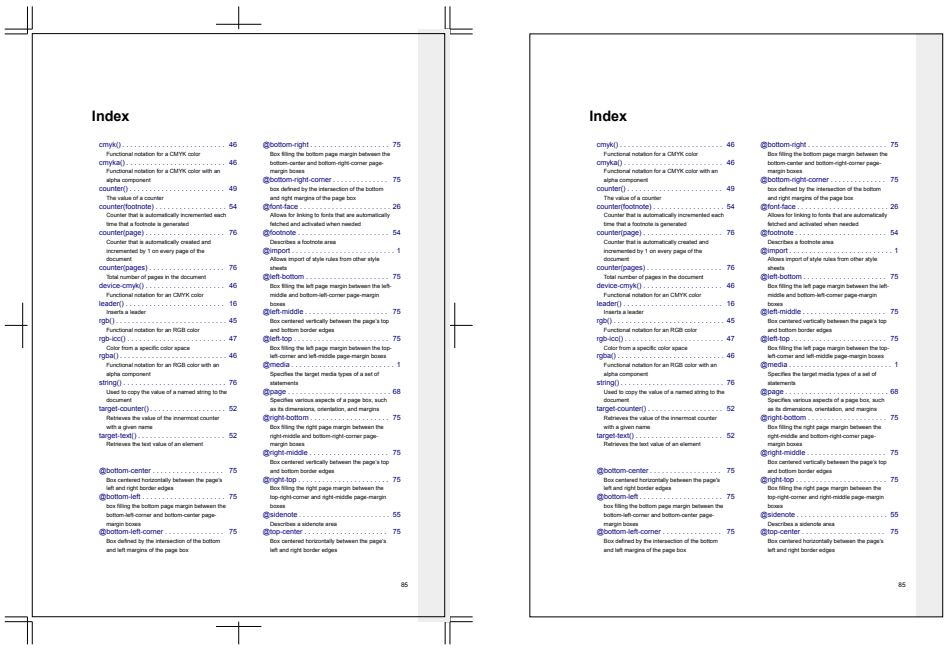
18.8.6 Distance from the end to the trim size of the output medium : -ah-crop-offset property

●Initial value : 0 ●Applied to : CSS '@page' ●Inherited : no

Specifies the distance from the physical end to the trim size of the output medium.

18.9 Page bleed area[7)]

A graphic, or similar, may *bleed off* (or be *bled-out* from) the cut edge of the page. Extending an image to the edge of the page is often a useful effect. If the image extends just to the edge of the trimmed page, inaccurate trimming could leave a white area along the outer edge of the image. Extending the image past the edge of the page then trimming to size avoids problems from inaccuracy when trimming.



Page bleed

18.9.1 Bleed region width : 'bleed' property

●Initial value : 0 ●Applied to : CSS '@page' ●Inherited : no

Specifies the width of the bleed region for trimming. The bleed region is taken outside the page box. By specifying a negative value to the margin box margin, the range of the block can be extended to the bleed region.

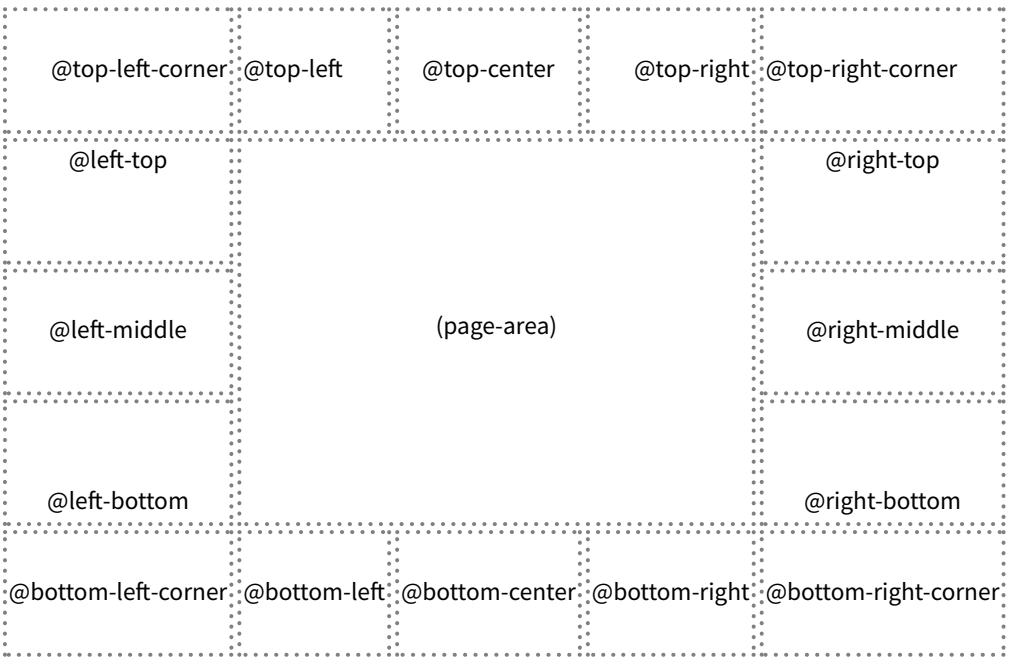
7) The page bleed feature is not available in AH Formatter Lite.

Chapter 19
Headers and Footers

19.1 Margin Box

The page header and page footer are assigned to margin box areas around the page.

Margin boxes are named according to their position around the page, as follows: '@top-left', '@top-center', '@top-right', '@bottom-left', '@bottom-center', and '@bottom-right'.



Location of each margin box

```
@page {
  @top-right {        /* page header */
    content: "Sample";
  }
  @bottom-center {    /* page footer */
```

```
    content: counter(page);
  }
}
```

19.2 Running Headers and Page Numbers

19.2.1 Running header setting : 'string-set' property and 'string()' function

Character strings from the headings in the main body can be displayed in the page header.

```
@page {
  @top-left {
    content: string(Chapter);
  }
}

h1 { string-set: Chapter content(); }
```

19.2.2 Variable strings : 'string-set' property

●Initial value : none ●Applies to : all elements, but not pseudo-elements ●Inherited : no

Use the 'string-set' property to make a named variable for a string.

The string-set value is pairs of a variable name and followed by the content list stored in the named string. Strings defined with a string-set value are referenced as `content: string(Chapter);` in running headers.

The content list may be one or more of the following, in any order:

- <string> : a string.
- <counter()> : a 'counter()' function. See Chapter 12, Counters (page 65) for details.
- <counters()> : a 'counters()' function.
- <content()> : a 'content()' function. Allowed values are:
  - content() : string value of the element.
  - content(before) : string value of the ::before pseudo-element.
  - content(after) : string value of the ::after pseudo-element.
  - content(first-letter) : first letter of the element.
- attr(<attr-name>) : string value of the attribute <attr-name>.
- -ah-attr-from(<from-name>, <attr-name> <type-or-unit>? [, <fallback>]?) : string value of the attribute <attr-name> on the ancestor <from-name> element.

```
h1 {
  /*set contents of h1:before and h1 in Chapter content(before) content()*/
  string-set: Chapter content(before) content();
}
```

19.2.3 'string()'

Used to copy the value of a named string into the document.

Strings defined with a string-set value are referenced as content: string(Chapter); in running headers.

The required first value is the name of the string.

```
@top-right {   /* Title in right-hand page header. */
  content: string(Chapter);
}
```

If multiple elements on one page each set the value of a named string, then the named string may have several values on that page. The optional second argument of 'string()' specifies which of the possible values to use:

- start : use the named string's entry value for that page.
- first : if there are any assignments on the page, use the value of the first assignment, otherwise use the start value.
- last : use the named string's exit value for the page.
- first-except : similar to first except that the empty string is used on the page where the value is assigned.

```
@page Index:right {
  @top-left {
    content: string(IndexTerm, first);
  }

  @top-right {
    content: string(IndexTerm, last);
  }
}
```


19.2.4 Move elements to header/footer : 'running()' position value

Use `position: running(name);` to make an element available for display in a margin box. The name argument is the name by which the element is referred to in 'element()' functions.

An element with `position: running(name);` is not shown in its natural place: it is treated as if `display: none;` had been set.

```
p.Title {
    position: running(Title);
    text-indent: 0;
}
```

19.2.5 Insert a running element: 'element()'

Used to copy a running element into a margin box.

Elements taken out of their natural place using `position: running(name);` are referenced as `content: element(name);` in running headers. A running element can hold one element, including its pseudo-elements and its descendants.

The required first value is the name of the running element. Unlike 'string()', 'element()' cannot be combined with any other values.

```
@top-left {   /* Title in left-hand page header. */
  content: element(Title);
}
```

A running element inherits through its normal place in the document.

If multiple elements on one page each set the value of a running element, then the running element may have several values on that page. The optional second argument of 'element()' specifies which of the possible values to use:

- start : use the running element's entry value for that page.
- first : if there are any assignments on the page, use the value of the first assignment, otherwise use the start value.
- last : use the running element's exit value for the page.
- first-except : similar to first except that the empty string is used on the page where the value is assigned.

19.2.6 Page number : counter(page)

'counter(page)' is used for generating page numbers[8].

```
@page {
  @top-right {
    content: "Page " counter(page);
  }
}
```

19.2.7 Total pages : counter(pages)

Total pages can be output together with the current page number, for example "Page 118 of 140".

```
@page {
  @top-right {
    content: "Page " counter(page physical) " of " counter(pages);
  }
}
```

19.3 Left and Right Page Headers: :left and :right

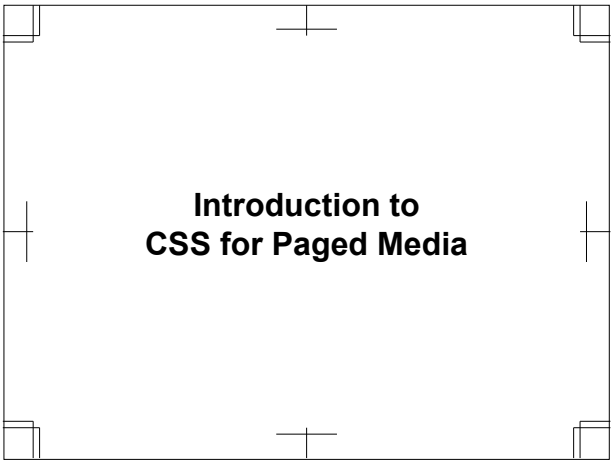
In the left and right page, you can set left and right margins and page number as well as headers[9]. These may be different again for the first page. You can also hide the titles and page number from the left-hand side of the left pages and the right-hand side of the right pages when it is the first page.

When used together with named pages, the style of the left and right pages and the first page of each named page can be specified.

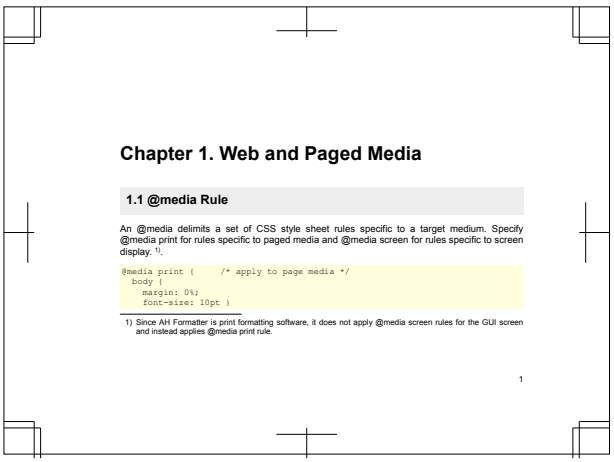
8) 'counter()' was defined by CSS 2.1, but in CSS 3, a preassigned counter for page numbers is introduced in the page context.
9) Use string(Title) and string(Chapter), see "19.2.2 , Variable strings : 'string-set' property

```
@page Chapter:left {     /* left page setting */
  margin-left: 23mm;
  margin-right: 27mm;

  @top-left {     /* book title in the running head of the left page */
    content: string(Title);
  }
  @bottom-left {  /* page number */
    content: counter(page);
  }
}

@page Chapter:right {    /* right page setting */
  margin-left: 27mm;
  margin-right: 23mm;

  @top-right {    /* section title in the running head of the right page */
    content: string(Section);
  }
  @bottom-right { /* page number */
    content: counter(page);
  }
}

@page Chapter:first {    /* setting of the first page of a  Chapter */
  /* hide page header */
  @top-right { content: none }
  @top-left  { content: none }
}
```

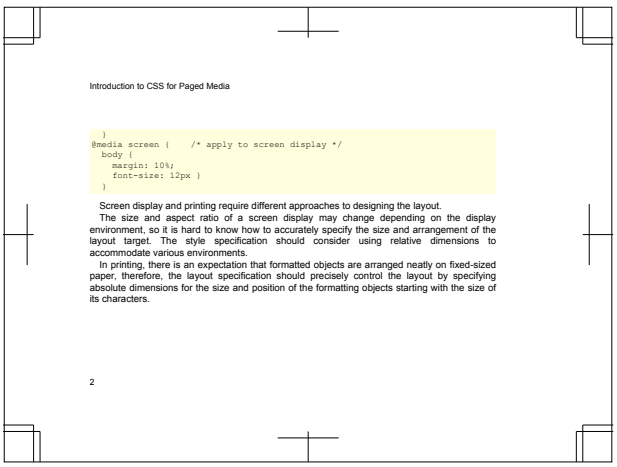
First Page



Right Page



Left Page



19.4 Last and only pages: :last and :only

AH Formatter also implements :last and :only pseudo-classes for making page selectors that match on the last and only pages, respectively, of the document.

19.5 Progression Direction : 'writing-mode' property

●Initial value : lr-tb ●Applies to : all elements ●Inherited : yes

Specify **writing-mode** on the root element to set the character, line, and page progression direction of the entire document. The Initial value is **writing-mode: lr-tb** (left-to-right, top-to-bottom): the character progression direction is from left to right, the line and block progression directions are from top to bottom, and the pages go from left to right[2].

To set documents in Japanese vertical writing mode, specify **writing-mode: tb-rl**: The character progression direction is from top-to-bottom, line and block from right-to-left, and pages from right to left.

- lr-tb : Writing mode progression direction is from left to right, the line and block from top to bottom. Used in conventional horizontal writing.
- rl-tb : Writing mode progression direction is from right to left, the line and block from top to bottom. Used in right to left languages such as Arabic and Hebrew.
- tb-rl : Writing mode progression direction is from top to bottom, the line and block from right to left. Used in vertical writing such as Japanese.

```
body {
  writing-mode: tb-rl;  /* vertical writing */
}
```


2) The writing-mode on the root element is inherited by the page box, and is then inherited by the margin box.

Chapter 20
PDF Output

PDF (Portable Document Format) is the most popular ouput format for paged media. AH Formatter provides multiple extensions for taking advantage of PDF features.

20.1 PDF versions

The PDF specification has gone through multiple versions since its first version was published in 1993. Each release has added new features. All non-deprecated features in a PDF version are also included in subsequent versions. A PDF file includes a header identifying the PDF version to which it conforms. A PDF reader will attempt to read any PDF file, even if the file's version is more recent than the version that the reader implements.

PDF specification versions

Version	Year	Acrobat Reader version
1.3	2000	4.0
1.4	2001	5.0
1.5	2003	6.0
1.6	2004	7.0
1.7	2008	8
2.0	2017	–

There are also specialized subsets of PDF that have been standardized by ISO. Some of these have multiple versions that are based on different PDF versions.[3)]

- PDF/X : "PDF for Exchange".
- PDF/A : "PDF for Archiving".
- PDF/E : "PDF for Engineering".

3) AH Formatter does not generate either PDF/E or PDF/VT.

- PDF/VT : “PDF for exchange of variable data and transactional (VT) printing”.
- PDF/UA : “PDF for Universal Accessibility”.

20.2 Tagged PDF

“Tagged PDF” is not a separate PDF specification. It refers to PDF that includes additional information about the logical structure of the document. Tagged PDF was first defined in PDF 1.4.

The text, graphics and images in Tagged PDF can be extracted and reused for other purposes, for example, to make content accessible to users with visual impairments. PDF/UA files are Tagged PDF files that also conform to additional requirements.

AH Formatter embeds PDF tags (StructElem) for HTML/CSS elements and pseudo-elements as shown in the following table:

HTML element	PDF element
html	Document
div	Div
h1	H1
h2	H2
h3	H3
h4	H4
h5	H5
h6	H6
p	P
ul	L
ol	L
li	LI
li::marker	Lbl
dl	L
dt	Lbl
dd	LBody

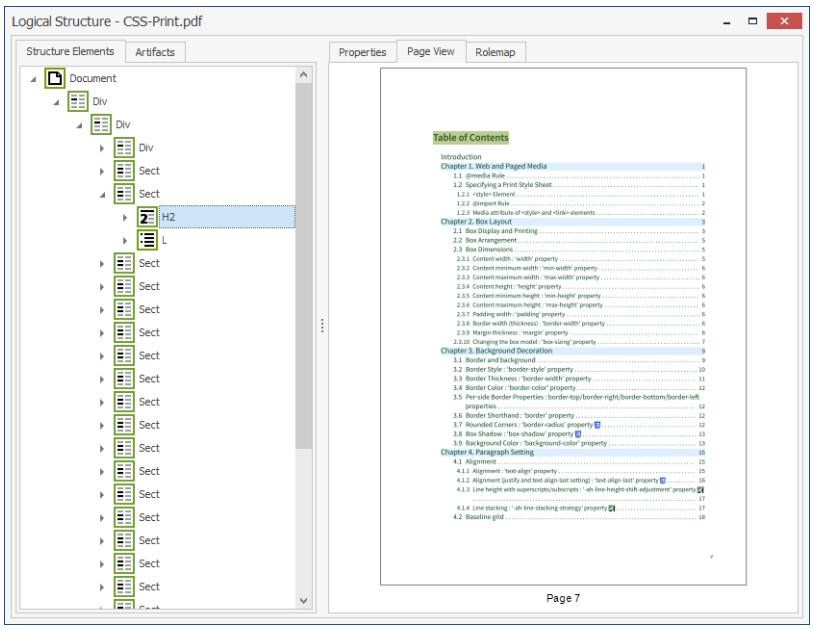
HTML element	PDF element
blockquote	BlockQuote
caption	Caption
table	Table
tr	TR
td	TD
th	TH
thead	THead
tfoot	TFoot
tbody	TBody
ruby	Ruby
rb	RB
rt	RT
span	Span
img	Figure
a[href]	Link
other block elements	Div
other inline elements	Span

20.2.1 Custom PDF Tag name : '-ah-pdftag' property

●Initial value : Empty string ●Applied to : all elements ●Inherited : no

String to use as the PDF Tag name for the current element when generating Tagged PDF. If the provided name is not one of the standard PDF Tag names, the role map in the generated PDF will include a mapping from the name to the default PDF Tag name that AH Formatter would generate for the current element. If the provided name is one of the standard PDF Tag names, the name will be used as-is.

```
div.TOC {
  page-break-before: right;
  page: TOC;
  -ah-pdftag: 'Sect';
}
```



 is tagged as 'Sect' in the PDF

20.3 PDF/X

PDF/X, defined in ISO 15930, is a subset of PDF that is intended for prepress graphics exchange.[4] The intention is that all of the information required for printing is included in the PDF file. AH Formatter supports multiple PDF/X variants:

- PDF/X-1a:2001 (ISO 15930-1:2001)
  Based on PDF 1.3.

4) PDF/X output is not available with AH Formatter Lite.

- PDF/X-3:2002 (ISO 15930-3:2002)
  Based on PDF 1.3.
- PDF/X-1a:2003 (ISO 15930-4:2003)
  A subset of PDF/X-3:2003 that is based on PDF 1.4.
- PDF/X-2:2003 (ISO 15930-5:2003)
  A superset of PDF/X-3:2003 that is based on PDF 1.4.
- PDF/X-3:2003 (ISO 15930-6:2003)
  Based on PDF 1.4.
- PDF/X-4:2010 (ISO 15930-7:2008)
  Based on PDF 1.6.

The following shows the main features for the PDF/X variants.

Requirement	PDF/X-1a	PDF/X-2	PDF/X-3	PDF/X-4
All fonts must be embedded	yes	yes	yes	yes
The output intent must be specified	yes	yes	yes	yes
ICC profiles specified as the output intent must be embedded	no	no	no	yes
Supports CMYK, Spot color	yes	yes	yes	yes
Supports Grayscale	yes	yes	yes	yes
Supports RGB	no	yes	yes	yes
Supports transparency	no	no	no	yes
Supports PDFs with encryption; setting of password, the restriction for printing and the restriction for changing must not be done	no	no	no	no
PDF can contain links or annotations, etc. in the print area	no	no	no	no

20.4 PDF/A

PDF/X, defined in ISO 19005, is a subset of PDF that is intended for long-term preservation of electronic documents.[5)]

5) PDF/A output is not available with AH Formatter Lite.

Features of supported PDF/X variants

Requirement	PDF/A-1a	PDF/A-1b	PDF/A-2a	PDF/A-2b	PDF/A-2u	PDF/A-3a	PDF/A-3b	PDF/A-3u
All fonts must be embedded	yes	yes	yes	yes	yes	yes	yes	yes
ICC profiles must be embedded	yes	yes	yes	yes	yes	yes	yes	yes
Files must be tagged	yes	no	yes	no	no	yes	no	no
Files must include XMP metadata	yes	yes	yes	yes	yes	yes	yes	yes
Files may include encryption	no	no	no	no	no	no	no	no
Files may include LZW Compression	no	no	no	no	no	no	no	no
Files may include Transparent images	no	no	yes	yes	yes	yes	yes	yes
Files may refer to the external content	no	no	no	no	no	no	no	no
Files may include JavaScript	no	no	no	no	no	no	no	no
Unicode must be used for text	no	no	yes	no	yes	yes	no	yes
Any files other than PDF/A can be embedded	no	no	no	no	no	yes	yes	yes

20.5 PDF/UA

PDF/UA, defined by ISO 14289-1, is the specification intended for improving the accessibility of PDF based on the ISO 32000-1 (PDF 1.7) specification.[6)]

The main features of PDF/UA are:

- Contents must be tagged in logical reading order.
- Meaningful graphics, annotations and numerical formulas must include alternate text descriptions.

6) PDF/UA output is not available with AH Formatter Lite.

Alternate text descriptions for graphics or numerical formulas can be specified by the '-ah-alttext' property, links can be specified by the '-ah-annotation-contents' property.

- Security settings must allow assistive technology to have access to the content.
- Including bookmarks in the PDF/UA is recommended.
- Annotations, links and multimedia may be included.
- The language of the document must be specified.
- All fonts must be embedded.

20.5.1 Matterhorn Protocol

The Matterhorn Protocol, published by the PDF Association, is a checklist of all the ways that it is possible for a PDF to not conform to PDF/UA. The Matterhorn Protocol document[7] consists of 31 Checkpoints comprised of 136 Failure Conditions. Some failure conditions can be checked programmatically, but others require human review.

Checkpoint 15: Tables

Index	Failure Condition	Section	Type	How	See
15 -001	A row has a header cell, but that header cell is not tagged as a header.	UA1:7.5-1	Object	Human	-
15 -002	A column has a header cell, but that header cell is not tagged as a header.	UA1:7.5-1	Object	Human	-
15 -003	In a table not organized with Headers attributes and IDs, a TH cell does not contain a Scope attribute.	UA1:7.5-2	Object	Machine	-
15 -004	Content is tagged as a table for information that is not organized in rows and columns.	UA1:7.5-3	Object	Human	-
15 -005	A given cell's header cannot be unambiguously determined.	UA1:7.5-2	Object	Human	01-006

Matterhorn Protocol failure conditions for tables

20.5.2 PAC 3 PDF/UA checker

PDF Accessibility Checker 3 (PAC 3)[8] by Access For All is a freeware utility for Windows that checks PDF files for PDF/UA conformance. The program implements the Matterhorn Protocol checks. When you open a PDF file in PAC 3, the program runs its checks and shows a summary of the results. Since there is no interactive checking, the program can only warn about some of the failure conditions that require human checking. Unfortunately, the program also has some bugs in its checking.

7) https://www.pdfa.org/publication/the-matterhorn-protocol-1-02/
8) http://www.access-for-all.ch/en/pdf-lab/536-pdf-accessibility-checker-pac-3.html

PAC 3 PDF/UA checker

20.6 Document properties

This extension uses custom <meta> elements, for example:

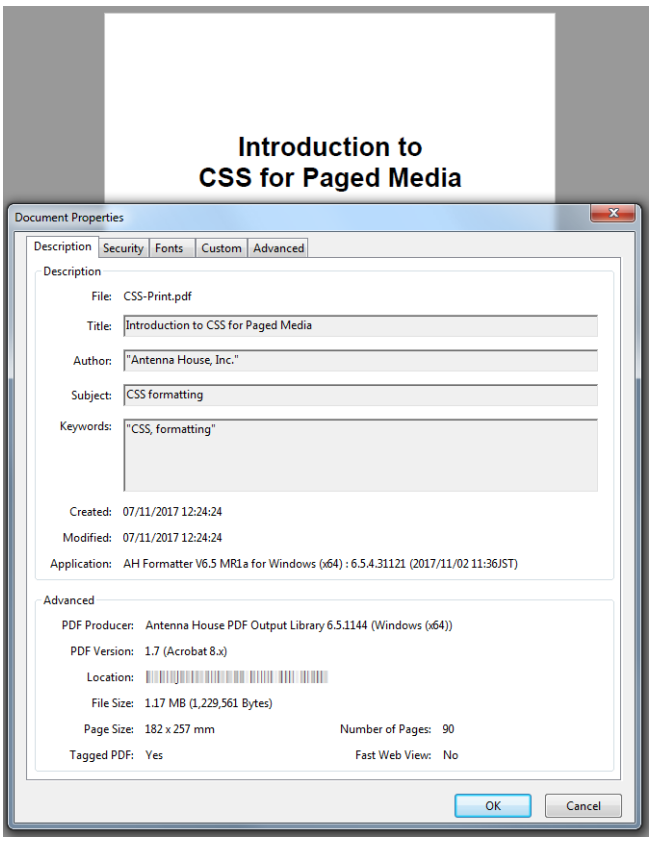
```
<meta name="document-title" content="The document title"/>
<meta name="subject" content="The document subject"/>
<meta name="author" content="The author"/>
<meta name="keywords" content="Comma, separated, keywords, list"/>
…
```

<meta> with the following 'name' values provide information that is stored in the document catalog in the PDF.[9)]

- document-title : Title of the document.
- subject : Subject of the document.
- author : Name of the person who created the document.
- author-title : Title or some other information about the author.
- description-writer : Author of the document description.
- keywords : Comma-separated list of keywords.
- copyright-status : Copyright status. Must be 'Unknown', 'Copyrighted', or 'PublicDomain'.
- copyright-notice : Copyright information.

9) 'author-title', 'description-writer', 'copyright-status', 'copyright-notice', 'copyright-info-url', and 'xmp' are not available with AH Formatter Lite.

- copyright-info-url : URL of the copyright information.
- xmp : URL of an XMP containing property information.



Document properties shown by Acrobat Reader

20.6.1 Extensible Metadata Platform (XMP)

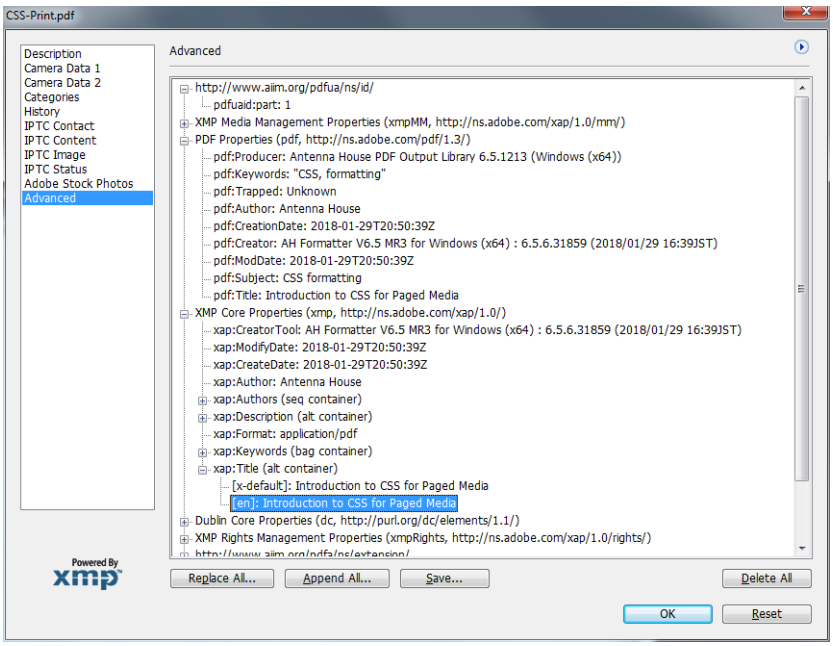
XMP is a standard XML format for representing metadata about a file or image. It was originally developed by Adobe, and it is now also ISO 16684-1:2012. Because there is a standard, the XMP, for example, that is embedded in a photo taken by a digital camera can be altered or augmented by the photo-editing program that edits the image. Also, for example, the XMP from every image in a PDF file could be included in the XMP that is embedded in the PDF file.

The XMP standard itself is based, in part, on other metadata standards such as Dublin Core and RDF.

Any XMP file that passes the sanity check implemented in AH Formatter may be embedded in the PDF that AH Formatter generates.

A portion of the XMP extracted from a PDF file is shown below, and the following figure shows the same XMP as presented by Acrobat.

```
<?xpacket begin="ï»¿" id="W5M0MpCehiHzreSzNTczkc9d"?>
<x:xmpmeta xmlns:x="adobe:ns:meta/">
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#">
<rdf:Description rdf:about=""
   xmlns:pdfuaid="http://www.aiim.org/pdfua/ns/id/">
<pdfuaid:part>1</pdfuaid:part>
</rdf:Description>
<rdf:Description rdf:about=""
   xmlns:xmpMM="http://ns.adobe.com/xap/1.0/mm/">
<xmpMM:DocumentID>uuid:3927056E-B834-D04A-A255-AF8CBE218E59</xmpMM:DocumentID>
<xmpMM:VersionID>1</xmpMM:VersionID>
<xmpMM:RenditionClass>default</xmpMM:RenditionClass>
</rdf:Description>
<rdf:Description rdf:about="" xmlns:pdf="http://ns.adobe.com/pdf/1.3/">
<pdf:Producer>Antenna House PDF Output Library 6.5.1213
(Windows (x64))</pdf:Producer>
<pdf:Keywords>CSS, formatting</pdf:Keywords>
…
```



XMP properties viewed in Acrobat

20.7 Page display

<meta> with the following ‘name’ values control how the PDF is displayed in a reader. Unless otherwise noted, the allowed content values are ‘true’ and ‘false’, and the default if the <meta> is omitted is ‘false’.

- pagemode : What is displayed when the document is opened. Must be UseNone, UseOutlines, UseThumbs, FullScreen or UseOC.
- pagelayout : Page layout when the document is opened. Must be SinglePage, OneColumn, TwoColumnLeft, TwoColumnRight, TwoPageLeft or TwoPageRight.
- hidetoolbar : Whether to hide the toolbar when the document is opened.
- hidemenubar : Whether to hide the menu bar when the document is opened.
- hidewindowui : Whether to hide user interface (UI) elements such as a scroll bar when the document is opened.
- fitwindow : Whether, when the document is opened, to change the size of the document window to fit the page size.
- centerwindow : Whether to position the document's window in the center of the screen when the document is opened.
- displaydoctitle : Whether the window's title bar should display the document title.
- openaction : Either the destination within the document at which the document is to be opened or a JavaScript program to execute when the document is opened.

References

So far, this tutorial has briefly introduced the practical uses of CSS page composition. AH Formatter currently implements the following related specifications:

- ✓ **CSS 2.1 (CSS Level 2 Revision 1)** . . . . . W3C Candidate Recommendation https://www.w3.org/TR/CSS21/
- ✓ **CSS 3 Backgrounds and Borders** . . . . . Working Draft https://www.w3.org/TR/css3-background/
- ✓ **CSS 3 GCPM (Generated Content for Paged Media)** . . . . . Working Draft https://www.w3.org/TR/css3-gcpm/ . . . . . Editor's Draft http://dev.w3.org/csswg/css3-gcpm/
- ✓ **CSS 3 Multi-column layout** . . . . . Working Draft https://www.w3.org/TR/css3-multicol/
- ✓ **CSS 3 Paged Media** . . . . . Final Draft https://www.w3.org/TR/css3-page/
- ✓ **CSS 3 Lists** . . . . . Working Draft https://www.w3.org/TR/css3-lists/
- ✓ **CSS 3 Text** . . . . . Working Draft https://www.w3.org/TR/css3-text/ . . . . . Editor's Draft http://dev.w3.org/csswg/css3-text/
- ✓ **CSS 3 Text Layout** . . . . . Editor's Draft http://dev.w3.org/csswg/css3-text-layout/
- ✓ **CSS 3 Namespaces** . . . . . W3C Candidate Recommendation https://www.w3.org/TR/css3-namespace/
- ✓ **CSS Color Module Level 3** . . . . . W3C Recommendation https://www.w3.org/TR/css3-color/
- ✓ **CSS Counter Styles Level 3** . . . . . W3C Working Draft https://www.w3.org/TR/css-counter-styles-3/
- ✓ **CSS Fonts Module Level 3** . . . . W3C Candidate Recommendation https://www.w3.org/TR/css-fonts-3/
- ✓ **HTML 5 — A Vocabulary and Associated APIs for HTML and XHTML** . . . . . W3C Recommendation https://www.w3.org/TR/html5/
- ✓ **ISO 16684-1:2012, Graphic technology -- Extensible metadata platform (XMP) specification -- Part 1: Data model, serialization and core properties** . . . . . ISO Standard https://www.iso.org/standard/57421.html
- ✓ **Ready-made Counter Styles** . . . . . W3C Working Group Note http://www.w3.org/TR/predefined-counter-styles/
- ✓ **Requirements for Japanese Text Layout** . . . W3C Working Group Note http://www.w3.org/TR/jlreq/
- ✓ **Requirements for Latin Text Layout and Pagination** . . . . . W3C Working Draft https://www.w3.org/TR/dpub-latinreq/
- ✓ **Selectors Level 3** . . . . . W3C Recommendation https://www.w3.org/TR/css3-selectors/

AH Formatter can also format using XSL-FO:

- ✓ **Extensible Stylesheet Language (XSL) Version 1.1** . . . . . W3C Recommendation https://www.w3.org/TR/xsl/

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Introduction to CSS for Paged Media

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Author Antenna House, Inc.

Publisher Antenna House, Inc.

3844 Kennett Pike, Suite 200
Greenville, DE 19807
USA
Telephone +1 302-427-2456
sales@antennahouse.com

Website http://www.antennahouse.com/

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