



Council of the European Union
General Secretariat

Brussels, 28 March 2023

Interinstitutional files:
2022/0432 (COD)

WK 4187/2023 INIT

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WORKING DOCUMENT

From:	European Commission
To:	Delegations
N° prev. doc.:	CM 2193/23, ST 16258/22 + ADD 1 -8
Subject:	Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures - Considerations for the legibility of labels for chemicals - Non-Paper by the Commission

Considerations for the legibility of labels for chemicals

1. Introduction

The absence of rules in CLP on the font size for the labelling of chemicals has been identified as an obstacle to enforce legibility requirements. It was found that font sizes are often too small to be legible, even for persons with average eyesight. This undermines the efforts to communicate safety information to the user and protecting human health and the environment. The use of small fonts is widespread, even in cases where there would otherwise be sufficient space on the label.

This document outlines some basic typographic and legibility considerations to facilitate the drafting of rules in CLP or related guidance that are fulfilling the objective of labelling, are clear and enforceable.

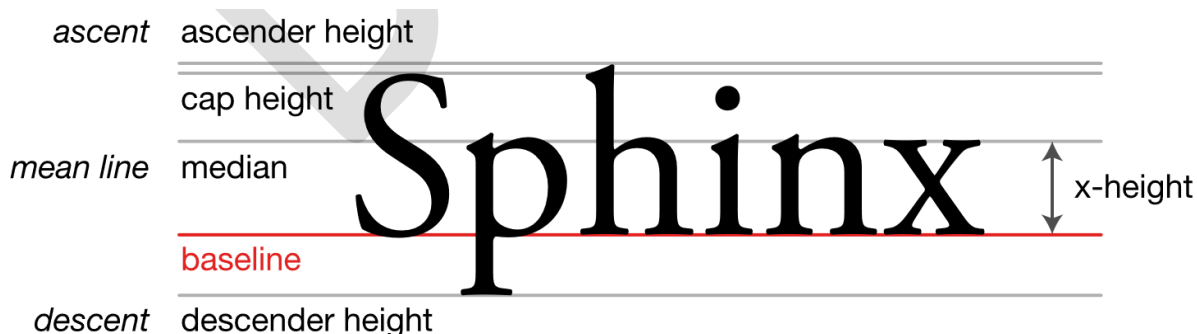
2. Typographic principles

In typography, there are various sizes that can be measured to determine the height of a font, for example:

1. Font size (total height of the font)
2. Cap height (height of the capital letter)
3. X-height (height of the small letter x in a font)

Figure 1¹ depicts some basic metrics in typography.

Figure 1: metrics in typography



¹ By Max Naylor - Own work, Public Domain, <https://commons.wikimedia.org/w/index.php?curid=2138205>

There are several factors that influence the legibility of a text, such as the:

- font size and design
- print quality
- line spacing
- line length
- letter spacing
- stroke width
- contrast between print and background
- alphabet (e.g., Latin vs. Cyrillic vs. Arabic script)
- distance from the text
- environment (e.g., illumination)

3. Current situation and identified problems.

Currently CLP does not specify the exact size of the letters of the signal words, hazard statements, precautionary statements, and any supplemental information. It is up to the supplier to determine the size of the letters that allows the label elements to be easily read. However, ECHA guidance² indicates that the minimum letter size of 1.2 mm ('x-height') can be used as a reference.

It has been identified that a small font size and insufficient contrast are common problems that prevent users from reading the information. Therefore, to improve the observed deficiencies it appears meaningful to set out minimum requirements at least for those parameters.

Amongst others, due to the variety in the sizes and shapes of packaging, it is probably not meaningful to regulate all the factors that influence legibility. This leaves flexibility to the duty holder to find the best solution for the situation at hand. However, future guidance could elaborate further on those factors.

4. How to regulate?

The Commission proposal suggests:

- setting minimum font sizes in relation to the packaging size, thus also in relation to the distance in which labels are read,
- requiring a white background to address contrast issues,
- specifying that the typeface should be without serifs to improve the sharpness of the print,
- requiring a minimum line spacing of 120% to improve legibility,
- indicating that letter spacing needs to be set in a way that the text is legible.

The proposal does not set rules for the use of a particular font or a font colour as those factors were not identified as common problems.

Although it is not explicitly indicated in the Commission proposal, the set font sizes refer to the total font height. Regulating the total font height may have some disadvantages and not be clear enough

² https://echa.europa.eu/documents/10162/2324906/clp_labelling_en.pdf

to ensure legibility. The legibility of a text is primarily influenced by the size of the minuscule letters (i.e., the x-height). Setting a total font size would allow the use of typescripts where the capital letters are very large, whereas the minuscules are too small to be read. The same situation could occur if the cap height was used to regulate the font size. It appears more meaningful to regulate the x-height. This would correspond to the current ECHA guidance. More, importantly, x-height is also used as a concept in Regulation No 1169/2011 on the provision of food information to consumers³. It is, therefore, a concept that is already familiar to enforcement authorities.

Regulation (EU) No 1169/2011

Article 13(2) of Regulation (EU) No 1169/2011 sets an x-height of 1,2 mm as minimum requirement.

Article 13(2) 2. Without prejudice to specific Union provisions applicable to particular foods, when appearing on the package or on the label attached thereto, the mandatory particulars listed in Article 9(1) shall be printed on the package or on the label in such a way as to ensure clear legibility, in characters using a font size where the x-height, as defined in Annex IV, is equal to or greater than 1,2 mm.

The x-height is defined in Annex IV of Regulation (EU) No 1169/2011 as follows:

x-height



Legend

1	Ascender line
2	Cap line
3	Mean line
4	Baseline
5	Descender line
6	x-height
7	Font size

³ <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32011R1169>

Article 2(m) of Regulation (EU) No 1169/2011 defines legibility:

‘legibility’ means the physical appearance of information, by means of which the information is visually accessible to the general population and which is determined by various elements, inter alia, font size, letter spacing, spacing between lines, stroke width, type colour, typeface, width-height ratio of the letters, the surface of the material and significant contrast between the print and the background;

Examples of font sizes currently used on labels

A small, non-representative field research showed that household chemicals available in Belgian supermarkets typically use fonts with an x-high of 1,2 or below. Table 1 shows examples of font sizes that were observed.

Important note!

Standard text processing software, such as Microsoft Word, and standard home or office printers and displays are usually not designed to allow for an exact reproduction of font sizes. Print shops use specialised tools to ensure the proper size of the printed output.

Therefore, all examples of sizes shown in this document hereafter are only approximations and when printed by using standard home or office equipment, they may vary in their actual size. The purpose of the examples is to provide a general impression, not an accurate depiction.

Table 1: font height often used on labels

x-height	Example
< 1 mm	This is a text using a line spacing of 120% and an x-height of approximately <1mm. This corresponds approximately to a font size of 6pt in Microsoft Word, a cap height of 2,8 pt or 1mm. This is a text using a line spacing of 120% and an x-height of <1mm. This corresponds approximately to a font size of 6pt in Microsoft Word, a cap height of 2,8 pt or 1mm. This is a text using a line spacing of 120% and an x-height of <1mm. This corresponds approximately to a font size of 6pt in Microsoft Word, a cap height of 2,8 pt or 1mm. This is a text using a line spacing of 120% and an x-height of <1mm. This
1,2 mm	This is a text using a line spacing of 120% and an x-height of approximately 1,2 mm. This corresponds approximately to a font size of 8 pt in Microsoft word and a cap height of 4,5 pt or 1,6 mm. This is a text using a line spacing of 120% and an x-height of 1,2 mm. This corresponds approximately to a font size of 8 pt in Microsoft Word and a cap height of 4,5 pt or 1,6 mm. This is a text using a line spacing of 120% and an x-height

It is immediately evident that the font height is significantly smaller than text that we typically consider legible, e.g., in letters, books or advertising, even though the examples use a line spacing of 120% which is not necessarily the case on the labels.

As the current practice was identified as being too small, the minimum font height must, consequently, be larger than an x-height- of 1,2 mm.

Commission proposal

Table 2 depicts the font heights used in the Commission proposal, albeit translated into x-height instead of using pt as unit. In case of doubt (e.g., due to rounding) a smaller x-height is used compared to the pt height indicated in the proposal.

Table 2: font heights proposed by the Commission

Packaging size and x-height (total height in pt)	Example
<3 L 1,4 mm (8pt)	This is text using a line spacing of 120% and an x-height of approximately 1,4mm. This corresponds approximately to a font size of 9pt in Microsoft Word and a cap height of. 5,4pt or 1,9 mm. This is text using a line spacing of 120% and an x-height of approximately 1,4mm. This corresponds approximately to a font size of 9pt in Microsoft Word and a cap height of. 5,4pt or 1,9 mm. This
>3 and <50 L 1,8 mm (12pt)	This is text using a line spacing of 120% and an x-height of approximately 1,8 mm. This corresponds approximately to a font size of 11 pt in Microsoft Word and a cap height of 6,2 pt or 2,2 mm. This is text using a line spacing of 120% and an x-height of approximately 1,8 mm. This corresponds approximately to a font size
>50 and <500 L 2,4mm (16pt)	This is text using line spacing of 120% and an x-height of approx. 2,4 mm. This corresponds approximately to a font size of 14pt in Microsoft Word and a cap height of 8,5pt or 3,0 mm. This is text using line spacing of 120% and an x-height of approximately
>500 L 4,0mm (20pt)	This is text using a line spacing of 120% and an x-height- of approx. 4,0 mm. This corresponds approx. to a font size of 18 pt in Microsoft Word and a cap height of 11,3 pt or 4,0 mm. This is text

The varying font heights for the different packaging sizes are owed to the fact that the labels on larger packaging are typically read from a larger distance, hence requiring a larger x-height to remain

legible. Small containers of <3L can easily be moved closer to the eye. This becomes increasingly difficult with increasing packaging size. Goods may be stored high on a shelf. Also, in case of an accident, it may not be possible to get close enough to the container to read a small print label. To simulate the impact, try reading the text in a 100% size setting from a larger distance and see which size you can still read from a distance. Consider also that light conditions may not be optimal.

Mindful of the space limitations of packaging with <3 L, compared to the current ECHA guidance, the proposed increase in x-height is moderate but having impact. On packaging >3 L space limitations should usually no longer play a noteworthy role for the CLP label.

5. Legibility in special situations

The Commission proposal includes several special situations where the provisions laid down above may not work and where the proposal did not include specific instructions for the font sizes. This includes the:

- digital label
- labels at the pump of filling stations
- labels on refill stations
- labels on small packaging
- advertising and sales offer

Digital label

It can probably be assumed that a digital label will be read in a distance comparable to a label on a packaging <3L. The text on the display could thus appear in an x-height of 1,4 mm when the zoom is set on 100%. The x-height can increase or decrease in accordance to the zoom setting set by the user.

Labels on the pump at filling stations

Pumps for hazardous substances and mixtures, such as fuels, at filling stations are currently not subject to any exemptions from the labelling requirements. While fuels are the most prominent case of such mixtures, the following also applies to any other substance or mixture that falls within this scenario. The fuel reservoir and in extension as its visible part, the pump needs to be labelled like any other container holding a hazardous substance or mixture. However, in the scenario of fuel pumps there isn't the usual inner or outer packaging which makes the practical application of the labelling requirements less evident. While Article 29 in principle provides for the possibility to derogate from labelling obligations where hazardous substances or mixtures are delivered in bulk, no such derogation exists for fuels.



Where fuels are pumped directly into a receptacle that is an integral part of a vehicle (e.g., a fuel tank of a car or boat), there is, under normal circumstances and within the parameters of intended use, no risk of noteworthy exposure. Hazards for the environment are limited by the structural requirements applicable to filling stations. This reduced risk at filling stations provides the basis for a derogation. The Commission proposal, therefore, includes a derogation that allows for a simplified labelling on the fuel pump. The derogation also applies to other hazardous substances and mixtures provided in an equivalent way at filling stations (e.g., AdBlue).

Labels on pumps at filling stations will probably be read from a distance of 1-2 meters. Therefore, an x-high of 2,4 mm could be appropriate. To ensure that the label remains legible, it would have to be placed on a visible place on the fuel pump. Where feasible, on eye level.

For labels on the pump at a filling station, the indication of the nominal quantity would not be necessary. One label can cover several fuel types as long as the all the concerned product identifiers are indicated, and all the other label elements are identical. All other safety aspects related to the design and use of fuel pumps are already ensured by the applicable product legislation.

It is important to note that this labelling derogation is for the dispensing vessel, i.e., the pump, and not applicable to the receptacle. The receptacle remains subject to the relevant labelling requirements. For the receptacle, e.g., a jerrycan, the reduced risk cannot be assumed, hence the need for the regular labelling.

Labels on refill stations

Refill stations can come in a variety of designs and can be manual or automated. Typically, refill stations use containers as a reservoir with a size of >3 L and < 50L. A font size in line with the relevant size of the reservoir container is, therefore, appropriate for any label on the refill station. The label should be placed in proximity to the outlet, so that no confusion is possible as to what label applies to which outlet. Alternatively, the label can also be placed next to the button or pump mechanism that activates the filling process for that particular product. If the label on the reservoir container is legible for the user of the refill station, an additional label on the refill station itself should not be needed.

Where the refill is organised in a way that pre-labelled empty containers are put at the disposal of the client and no other containers are allowed, the label on the container with a font size in accordance to the size of the container (i.e., typically <3L) suffices. This is equivalent to the scenario how a consumer finds a prefilled packaging on the shelf.





Labels on small packaging

For small packaging below 125 mL, the proposal does not prescribe a particular font height for the inner packaging, other than the need for the label to be legible. These products should usually be accompanied with an outer packaging (or a tie-on-tag) with the full set of labelling information with an x-height of at least 1,4 mm. Prescribing a particular font height for small inner packaging may make it technically impossible to provide important safety information on the inner packaging. It is considered more valuable to have safety information on the inner packaging even if it may be on the small side. Therefore, the current requirements are not changed.



Advertising and sales offers

In most cases printed advertising or sales offers for hazardous substances or mixtures will be in newspapers, magazines, or on websites. Printed media are usually read at a short distance. A minimum x-height of 1,4 mm should, therefore, normally suffice.

For advertising and sales offers that are presented online the considerations above for the digital label should normally be applicable.

Special considerations will be required for larger scale printed advertising such as posters or billboards. For advertising on television not only typographic considerations play a role but also the duration during which the necessary elements are being presented. For advertising that is broadcasted only by audio, the communication of the relevant elements would have to be done by other means than typography. The current text of CLP does not consider those forms of advertising, and no specific rules are included in the Commission proposal either as this was not pointed out as being a particular problem. However, for these specific forms of advertising guidance could be developed to address these situations. Generally speaking, inspiration can be taken from the rules applicable to the advertising of other regulated products such as tobacco or pharmaceuticals.