

Summary

The "*Official Journal of the European Union*" published the new EN ISO 20471:2013 standard on 28th June 2013, officially replacing at the same time the existing standard EN 471:2003+A1:2007.

EN ISO 20471:2013 specifies requirements for high visibility clothing which is capable of visually signalling the user's presence. The high visibility clothing is intended to provide conspicuity of the wearer in any light condition when viewed by operators of vehicles or other mechanized equipment during daylight conditions and under illumination of headlights in the dark. Performance requirements are included for colour and retroreflection as well as for the minimum areas and for the placement of the materials in protective clothing.

The following information summarizes some notable changes in the new standard, however not all changes are listed. You should obtain a copy of the standard and refer to it for more detailed information. Copies of the new standard are available for purchase from <http://www.iso.org/iso/home.html>.

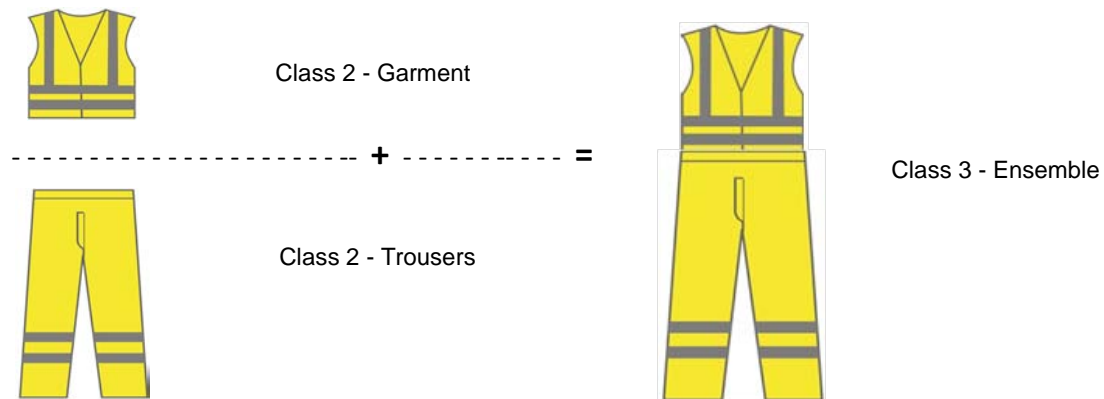
Principle Changes

Title

- The title of the new standard "High visibility clothing - Test methods and requirements" removes the previous distinction between professional and non-professional use and the new standard is concerned with risk assessment and risk analysis for the selection of the correct visibility clothing for high risk scenarios. Annex A (informative) defines the various factors that need to be taken into account when conducting such an analysis.

Garment Design/Ensemble

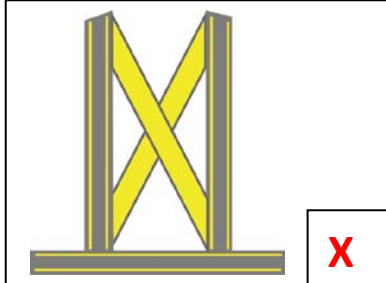
- The design requirements set out in the standard EN ISO 20471:2013 maintains a three-class system for garments, which is based on minimum areas of visible high-visibility materials present in a garment, whereby class 3 garments provide the highest level of conspicuity. The standard also permits this performance class to be met by specifying a single garment or an ensemble – for instance, a class 2 jacket and a class 2 pair of trousers might be combined and certified as a class 3 ensemble. Where an ensemble is specified, this will be deemed to meet the requirements of the standard only when the supplier provides clear instructions on how the classification has been achieved.



- A class 3 garment is required to cover the torso and have sleeves with reflective bands or/and trouser legs with reflective bands.
- The area of background or retroreflective material that is covered by badges logos, lettering etc shall be excluded from the calculation of the required minimum area (unless these additions meet the requirements).

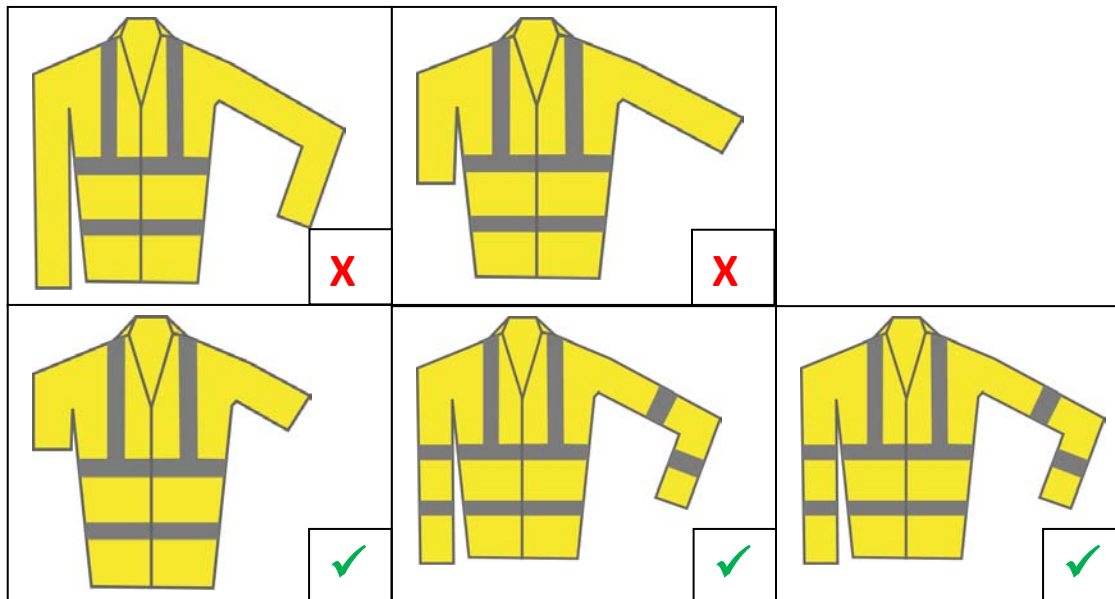
Harnesses

- Harnesses are excluded from the scope of the new standard and cannot be certified as meeting EN ISO 20471:2013.



Specific design requirements

- Section 4.2 "Specific design requirements" has been completely revised. A new requirement is that background (fluorescent) material must encircle all relevant parts (torso, arms and legs as appropriate) with a minimum width of 50mm. Allowable gaps for fastening systems and seams remains the same as is the maximum angle for torso and leg bands (20°). Some changes in the design specifications include:
 - **Garments only covering the torso – for example, vests and tabards**
Retroreflective strips are not counted when considering the need for background material to encircle the torso. The background material shall maintain a minimum width of 50 mm i.e. there must be at least 50 mm of background material below the armholes.
 - **Garments covering the torso and arms – such as jackets, shirts, coats and t-shirts**
If a sleeve blocks a clear view of a horizontal band on the torso, then the sleeve should be surrounded by a reflective band. If a sleeve blocks a clear view of two horizontal bands on the torso, then the sleeve must be surrounded by two reflective bands with at least 50 mm from each other, with the lower band at least 50 mm from the end of the sleeve. For jackets with removable sleeves, the sleeves must be fluorescent and contain retroreflective bands.



- **Garments covering legs – for instance, waistband and bib and brace trousers, and shorts**
Bib & Brace trousers can no longer meet Class 3 as they do not cover the torso. They no longer need to have a torso band.
- **Garments covering torso and legs – including coveralls without sleeves**
- **Garments covering torso, arms and legs – for example, coveralls with sleeves.**

Background (Fluorescent Material) requirements

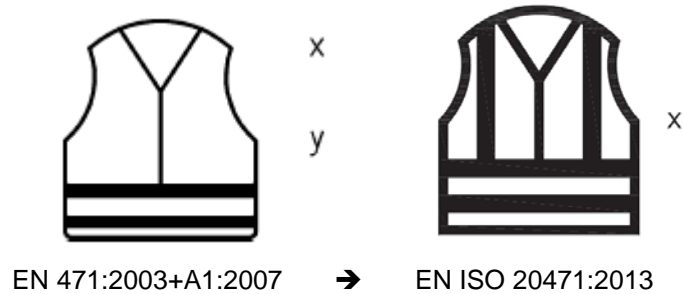
- The standard has been revised to include colour measurement of background material and combined performance material after the maximum number of repeat washing/drying cycles stated by the manufacturer. If no maximum number is given, the fabric is tested after 5 cleaning cycles.
- The tensile strength and burst strength requirement for certain fabrics has been reduced while there has been a change in the test method for tear strength of coated and laminated fabrics and thus these will need to be retested.
- Non water-proof garments that are not waistcoats or tabards must be tested for thermal resistance on garment assemblies that have water vapour resistance values in excess of 5 m² Pa/W.
- Colour fastness to perspiration has been increased from grade 3 to grade 4 for staining for both background and non-fluorescent materials.
- Non fluorescent outer materials must also meet the mechanical requirements.

Retroreflective material requirements

- EN 471 Level 1 separate performance material requirements have been removed. The minimum performance requirement for separate performance material is the same as the former EN 471 requirement for level 2 retroreflective materials. In assessing the retro-reflective performance of materials, the method requires materials to be assessed on the poorest performing segment of a tape.
- The retroreflective tape must be tested after being subjected to the maximum number of washing **and** drying cycles stated by the manufacturer rather than washing with a final dry as in EN 471.
- The manufacturer can now specify the washing process and temperature for testing however the care label must reflect this.

Marking

- Only one number is required beside the pictogram which is the class of the garment.
- The maximum number of cleaning cycles must be stated on the label but only if it declared in the user information. The maximum number must relate to the high-visibility material with the lowest level of cleaning performance (per the testing carried out on the fluorescent material and reflective material)



User Information

- Where a maximum number of cleaning cycles is declared in the user information, it must be accompanied by a sentence stating that it is not the only factor related to the lifetime of the garment.
- If it is not declared then it must be accompanied by a sentence stating that the garment has been tested after 5 washes.

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