

CTL Provisional DECISION SHEET (PDSH)

Standard(s) (incl. year)	Subclause(s)	Tracking No.	Publication date
IEC 60695-10-2:2014	4, 5, 8, Figure 2	PDSH 0391E	2024-01-09
Category			
Various			
Subject	Keywords	Developed by	To be approved
Ball pressure test	<ul style="list-style-type: none"> - Heating oven - Test apparatus setup - Diameter of indentation 	WG2, WG4	2024 CTL Plenary Meeting
Question			
To define the “best practice” test procedure for the ball pressure test based on the requirements of the standard.			
Decision			
<p>DSH 0391E is an update to DSH 0391D and DSH 2075.</p> <p><u>Heating oven</u></p> <p>IEC 60216-4-1 is a standard providing requirements for ovens for aging tests and requires forced gas ventilation. As the ball pressure test is not considered to be an ageing test, such forced gas ventilation is not required and should not be confused with forced convection. For the purpose of ball pressure testing, chambers with or without forced convection may be used, provided all other requirements are fulfilled.</p> <p><u>Test apparatus setup</u></p> <p>Following clause 5.2 of the standard and considering the note there, a separate thermocouple on or right below the surface of the test specimen support and as close as practical to the test sample shall be used to check that the temperature of the test specimen support does not significantly deviate from the test temperature.</p> <p>In addition, the measurement of the air temperature shall be as close as possible to the test specimen.</p> <p><u>Diameter of indentation</u></p> <p>The indent is the portion having been in contact with the ball of the ball pressure test device itself. Any other deformation is disregarded. The indent can therefore not exceed 5 mm.</p> <p>For more distinctive observation the following procedure may be applied:</p> <ul style="list-style-type: none"> - before carrying out the test, sand the surface with sanding paper, - colour the surface in contrast to the material, - remove the colour from the surface. <p>Colour traces should remain within the grooves of the sanding but vanish from the smooth surface created by the ball pressure test device.</p> <p>In case of non-round indentations obtained, the maximum difference between the longest and shortest measurement should not exceed 0,2 mm. In cases where > 0,2 mm difference between diameters is observed, the test shall be repeated. Where a large difference in diameters continues to</p>			

be observed, the non-round nature of the indentation shall be reported with the result. In case of non-round indentation obtained, the biggest diameter measurement observed is reported.

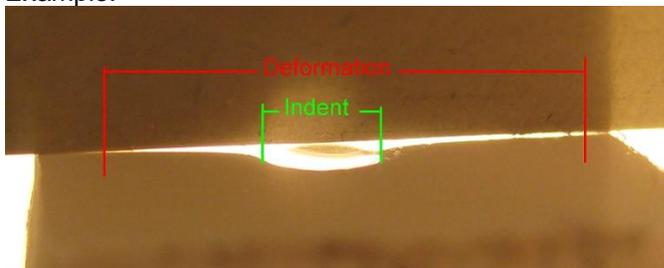
Where the product standard contains requirements differing from or conflicting with IEC 60695-10-2 or this decision sheet, these product standard requirements override the requirements of IEC 60695-10-2 and this decision sheet.

Explanatory notes

The interpretations and suggestions are a continuity of earlier versions of IEC 60695-10-2 and Decision Sheets 0391D and DSH 2075. The foreword of IEC 60695-10-2:2014 does not state that the interpretation of the indent has been changed significantly to earlier versions of the standard.

A) Some laboratories interpret the text “the largest distance that can be measured across the indentation” as a deformation of the material in complete. This is against Figure 2 using an optical measuring instrument of clause 5.4.

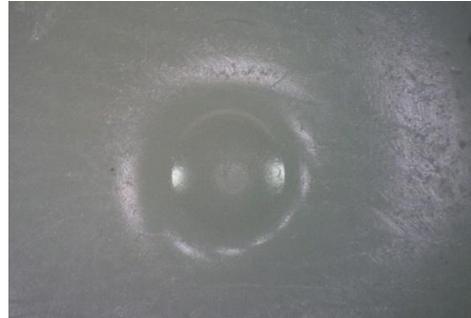
Example:



Indent as in Figure 2:



Deformation made visible with further light source:



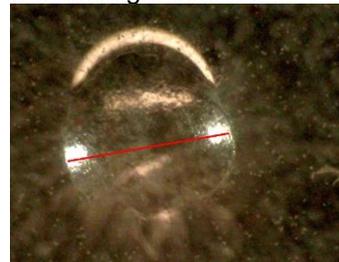
The indent diameter result is based on material properties only, not surface structure. Several tests have resulted in the observation that in nearly all cases the surface of the indent is smooth and reflects light (see 5.4). If the surface of glare material is made rough before the test by sanding, the edge to be observed appears more distinct.

Example (clear polycarbonate):

Unsuitable light source:



Suitable light source:



Sanded before test:



Having sanded the material, applied a contrast colour (see NOTE 3 of cl. 8.5) and removing it has been found helpful as well.

Example (white material, sanded before test):

Unsuitable light source:



Suitable light source:



Coloured and removed colour:



It must be noted that any procedure making the indent visible after the ball pressure test must be possible to make within 3 minutes including the measurement itself (see cl. 8.4 b).

Cross-sectioning as per NOTE 2 in cl. 8.5 is not a standard method as it does not support the required the diameter measurement by an optical device specified in cl. 5.4 and according to cl. 8.4 b) and Figure 2.

B) The standard indicates in cl. 8.5 that “dimension d shall exclude any upward deformation”. The indent itself has only a downward deformation (see A above). It is unclear how to exclude “any” upward deformation.

Example:



The indent – following A above - can be easily found, however, the upward deformation is not visible with the required diameter measurement by an optical device specified in cl. 5.4 according to cl. 8.4 b) including Figure 2:

