INTERNATIONAL STANDARD

ISO 6520-2

First edition
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Welding and allied processes — Classification of geometric imperfections in metallic materials —

Part 2: Welding with pressure

Soudage et techniques connexes — Classification des défauts géométriques dans les soudures des matières métalliques —

Partie 2: Soudage avec pression

Reference number
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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.ch
Web www.iso.ch

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 6520 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 6520-2 was prepared by the European Committee for Standardization (CEN) in collaboration with Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 7, *Representation and terms*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Throughout the text of this document, read "...this European Standard..." to mean "...this International Standard...".

ISO 6520 consists of the following parts, under the general title *Welding and allied processes — Classification of geometric imperfections in metallic materials*:

— *Part 1:Fusion welding*

— *Part 2:Welding with pressure*

Annex A of this part of ISO 6520 is for information only.

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Foreword

The text of EN ISO 6520-2:2001 has been prepared by Technical Committee CEN/TC 121 "Welding", the secretariat of which is held by DS, in collaboration with Technical Committee ISO/TC 44 "Welding and allied processes".

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2002, and conflicting national standards shall be withdrawn at the latest by June 2002.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard collects and classifies the possible imperfections in welds made with pressure. A uniform designation is specified. Only the type, shape and dimensions of the different imperfections caused by welding with pressure are included. Metallurgical deviations are not taken into account. Imperfections produced other than by the welding operation, for example additional stresses, loads or environmental factors are not covered by this standard.

Information concerning the consequences of the mentioned imperfections and the use of particular structures is not given because this depends on the specific requirements of the joint.

2 Normative references

This European standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN ISO 6520-1 Welding and allied processes - Classification of geometric imperfections in metallic materials - Part 1: Fusion welding (ISO 6520-1:1998)

3 Classification

The imperfections are classified into the following six groups:

P1 - Cracks
P2 - Cavities
P3 - Solid inclusions
P4 - Lack of fusion
P5 - Imperfect shape
P6 - Any other imperfections not included in groups P1 to P5

The letter ‘P’ stands for welding with pressure.

As regards Table 1 it has to be noted that:

a) column 1 gives a three figure reference number for each principal imperfection and a four or five figure number for each sub term;

b) column 2 gives the designation or name of each imperfection in English, French and German;

c) columns 3 to 5 give the explanations in English, French and German where necessary;

d) column 6 provides, where necessary, illustrations for supplementary explanations.

The numbering system shall follow that used in accordance with EN ISO 6520-1.

Table A.1 gives guidance on the welding processes where the imperfections listed in this part of EN ISO 6250 may occur.

Table 1 – Classification

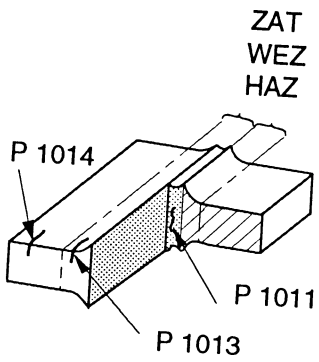
Reference Référence Nummer	Designation Désignation Benennung	Explanation English	Commentaires Français	Erklärung Deutsch	Illustrations Illustrations Darstellung
1	2	3	4	5	6
Group No.1 Cracks; Groupe n° 1 Fissures; Gruppe 1 Risse					
P 100	Crack Fissure Riß	A discontinuity produced by a local rupture which can arise from the effect of cooling or stresses.	Discontinuité pouvant se produire en cours de refroidissement ou sous l'effet de contraintes.	Örtliche Werkstofftrennung, die durch Vorgänge beim Abkühlen oder durch Spannungen entstehen kann.	
P 1001	Micro-crack Microfissure Mikroriß	A crack usually only visible under a microscope.	Fissure généralement visible seulement au microscope.	Ein Riß, der üblicherweise nur unter einem Mikroskop sichtbar ist.	
P 101 P 1011 P 1013 P 1014	Longitudinal crack Fissure longitudinale Längsriß	A crack substantially parallel to the axis of the weld. It maycan be situated: in the weld, in the heat affected zone (HAZ), in the unaffected parent metal.	Fissure sensiblement parallèle à l'axe de la soudure. Elle peut se situer : dans la soudure, dans la zone thermiquement affectée (ZAT), dans le métal de base.	Riß in Richtung der Schweißnaht verlaufend. Er kann liegen: in der Schweißnaht, in der Wärmeeinflußzone (WEZ), im unbeeinflußten Grundwerkstoff.	

Table 1 – Classification (continued)

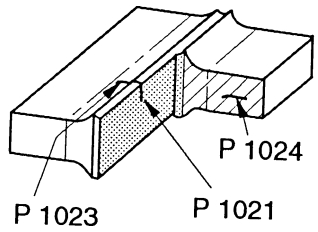
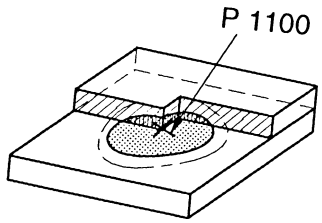
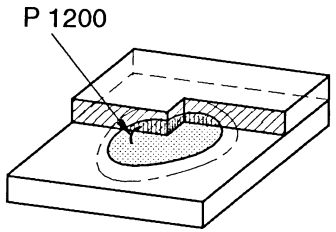
Reference Référence Nummer	Designation Désignation Benennung	Explanation English	Commentaires Français	Erklärung Deutsch	Illustrations Illustrations Darstellung
1	2	3	4	5	6
P 102 P 1021 P 1023 P 1024	Transverse crack Fissure transversale Querriß	A crack substantially transverse to the axis of the weld. It may be situated: in the weld, in the HAZ, in the unaffected parent metal.	Fissure sensiblement perpendiculaire à l'axe de la soudure. Elle peut se situer : dans la soudure, dans la ZAT, dans le métal de base.	Riß, quer zur Schweißnaht verlaufend. Er kann liegen: in der Schweißnaht, in der WEZ, im unbeeinflußten Grundwerkstoff.	
P 1100	Star-crack Fissure rayonnante (au centre du noyau) Riß in Linsenmitte	Multiple cracks radiating from a common central point and usually contained within the nugget.	Fissures multiples issues d'un même point, généralement situées dans les limites du noyau.	Riß, vielfach sternförmig von einer Stelle ausgehend.	
P 1200	Crack at the edge of the nugget Fissure au bord du noyau Riß am Linsenrand	Crack, often in the shape of a comma, which can extend into the HAZ.	Fissure, souvent en forme de virgule, se prolongeant jusque dans la ZAT.	Riß, vielfach kommaförmig, u.U. bis in die WEZ verlaufend.	

Table 1 – Classification (continued)

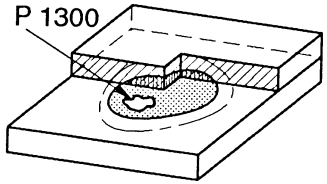
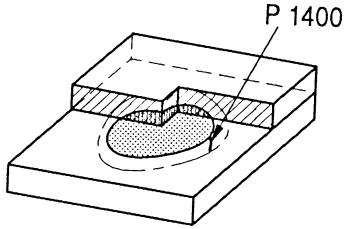
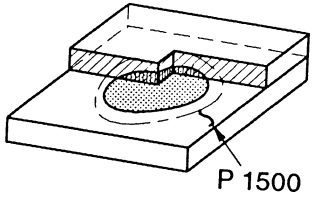
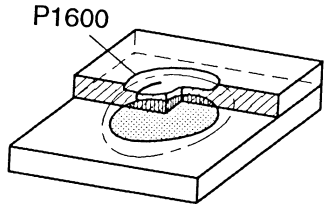
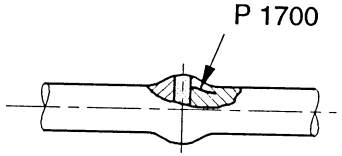
Reference Référence Nummer	Designation Désignation Benennung	Explanation English	Commentaires Français	Erklärung Deutsch	Illustrations Illustrations Darstellung
1	2	3	4	5	6
P 1300	Crack in the joining plane Fissure dans le plan de joint Riß in der Verbindungsebene	Cracks usually directed to the edge of the nugget.	Fissure généralement orientée vers le bord du noyau.	Riß, üblicherweise zum Linsenrand gerichtet.	
P 1400	Crack in the heat affected zone (HAZ) Fissure dans la zone thermiquement affectée (ZAT) Riß in der Wärmeeinflußzone (WEZ)	***see column 2***	***voir colonne 2***	***siehe Spalte 2***	
P 1500	Crack in the (unaffected) parent metal Fissure dans le métal de base Riß im unbeeinflußten Grundwerkstoff	***see column 2***	***voir colonne 2***	***siehe Spalte 2***	

Table 1 – Classification (continued)

Reference Référence Nummer	Designation Désignation Benennung	Explanation English	Commentaires Français	Erklärung Deutsch	Illustrations Illustrations Darstellung
1	2	3	4	5	6
P 1600	Surface breaking crack Fissure débouchante Oberflächenriß	Crack, open at the surface, found in the weld zone.	Fissure située dans la zone fondue et débouchant en surface.	Zur Werkstückoberfläche offener Riß in der Schweiß-zone.	
P 1700	“Hook” crack Fissure en forme de virgule Hakenriß	Crack in the area of the upset metal often starting from inclusions.	Fissure située dans le métal refoulé et souvent issue d’inclusions.	Riß im Bereich des Stauch-wulstes, häufig von Einschlüssen ausgehend.	
Group No.2 Cavities; Groupe n° 2 Cavités; Gruppe 2 Hohlräume					
P 200	Cavity Cavité Hohlraum	***see column 2***	***voir colonne 2***	***siehe Spalte 2***	
P 201	Gas cavity Soufflure Gaseinschluß	A cavity formed by entrapped gas in the nugget, in the weld or in the heat affected zone (HAZ).	Cavité formée par du (ou des) gaz emprisonné(s) dans le noyau, située dans la soudure ou dans la zone thermiquement affectée (ZAT).	Gasgefüllter Hohlraum in der Linse, in der Schweißnaht oder in der Wärmeeinflußzone (WEZ).	