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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 19418-2003

**Arc-welded joints in steel -- Guidance on quality levels for
imperfections
(English Translation)**

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Foreword

This Standard is identical to international standard ISO 5817:1992 "Arc-welded joints in steel - Guidance on quality levels for imperfections".

Annex A of this Standard is informative.

This Standard was proposed by China Machinery Industry Federation.

This Standard shall be under the jurisdiction of National Technical Committee on Welding of Standardization Administration of China.

The drafting organization of this Standard. Harbin Welding Institute.

Main drafter of this Standard. Piao Dongguang.

Arc-welded joints in steel - Guidance on quality levels for imperfections

1 Scope

This Standard provides guidance on levels of imperfections in arc-welded joints in steel. The levels refer to production quality and not to the fitness-for-purpose (see 3.1) of the product manufactured.

This Standard applies to

- the following welding processes and their defined sub-processes in accordance with GB/T 5185.

15 plasma arc welding;

- manual, mechanized and automatic processes;
- all welding positions;
- butt welds, fillet welds and branch connections;
- materials in the thickness range 3 mm to 63 mm.

Metallurgical aspects, e.g. grain size, hardness, are not covered by this Standard.

2 Normative references

The following standards contain the provisions which, through reference in this Standard, constitute the provisions of this Standard. For dated references, subsequent amendments (excluding corrections) or revisions do not apply to this Standard. However, the parties who enter into agreement based on this Standard are encouraged to investigate whether the latest versions of these documents are applicable. For undated reference documents, the latest versions apply to this Standard.

GB/T 324 Weld symbolic representation on drawings (eqv ISO 2553)

GB/T 3375 Welding terminology

GB/T 5185 Welding and allied processes - Nomenclature of processes and reference numbers (eqv ISO 4063)

GB/T 6417 Classification and explanation of imperfections in fusion welded joints (eqv ISO 6520)

3 Terms and definitions

For the purposes of this Standard, the following terms and definitions apply.

3.1 fitness-for-purpose

a product is fit for its intended purpose when it functions satisfactorily in service during its stipulated lifetime.

3.2.1 fillet weld thickness (nominal throat thickness), a

height of the largest isosceles triangle that can be inscribed in the weld section

3.2.2 butt weld thickness, s

minimum distance from the surface of the part to the bottom of the penetration, which cannot be greater than the thickness of the thinner of the parts

3.3 short imperfection

one or more imperfections of total length not greater than 25 mm in any 100 mm length of the weld or a maximum of 25 % of the weld length for a weld shorter than 100 mm

3.4 long imperfection

one or more imperfections of total length greater than 25 mm in any 100 mm length of the weld or a minimum of 25 % of the weld length for a weld shorter than 100 mm

3.5 projected area

Table 1 (continued)

No. Imperfection designation

GB/T 6417

reference Remarks

Limits for imperfections for quality levels

Moderate

Intermediate

Stringent

4 Localized

(clustered)

porosity

2013 The total pore area within the cluster should be summed and

calculated as a percentage of the greater of the two areas. an envelope surrounding all the pores or a circle with a diameter corresponding to the weld width.

The permitted porous area should be local. The possibility of masking other imperfections should be taken into consideration.

The following conditions and limits for imperfections shall be fulfilled.

a) Maximum dimension of the summation of the projected or surface crack area of the imperfection

16%

8% 4%

b) Maximum dimension of a single pore for

- butt welds

- fillet welds

$d \leq 0.5 s$

$d \leq 0.5 a$

$d \leq 0.4 s$

$d \leq 0.4 a$

$d \leq 0.3 s$

$d \leq 0.3 a$

c) Maximum dimension for localized clustered porosity 4 mm 3 mm 2 mm

5 Elongated

cavities,

wormholes

Long imperfections for

- butt welds

- fillet welds