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**General requirements for surface condition of hot-rolled
sections**

热轧型钢表面质量一般要求

(ISO 20723:2004, Structural steels - Surface condition of hot-rolled sections -
Delivery requirements, MOD)

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Foreword

This document was drafted in accordance with the rules given in GB/T 1.1-2020 "Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents".

The revision of the document adopts ISO 20723:2004 "Structural steels - Surface condition of hot-rolled sections - Delivery requirements".

Compared with ISO 20723:2004, there are many structural adjustments in this document. See Annex A for a list of structural numbering comparisons between the two documents.

Compared with ISO 20723:2004, this document has many technical differences. A single vertical line (|) is used to mark the outer margin of the terms involved. See Annex B for a list of these technical differences and their causes.

The following editorial changes are made to this document:

- Delete Annex A of ISO 20723:2004.

Attention is drawn to the possibility that some elements of this document may be the subject of patent rights. The issuing authority shall not be held responsible for identifying any or all such patent rights.

This document was proposed by China Iron and Steel Association.

This document shall be under the jurisdiction of National Technical Committee on Steel of Standardization Administration of China (SAC/TC 183).

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General requirements for surface condition of hot-rolled sections

1 Scope

This document specifies the surface condition classification, measurement rules, grinding requirements, repair welding and its inspection rules, numerical rounding off for hot-rolled sections.

This document applies to the surface condition of hot-rolled H-beam and split T-beam, hot-rolled equilateral angle steel, hot-rolled unequal angle steel, hot-rolled L-beam, hot-rolled I-beam, hot-rolled channel steel sections (hereinafter referred to as section), of which the nominal thickness is 3mm ~ 160mm. The surface includes all surfaces except the rolled edge.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

YB/T 081, *Rule for rounding off of numerical values and judgement of testing values for technical standards of metallurgy*

3 Terms and definitions

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

3.1 imperfections

Except for cracks, scabs, folds, delamination and cracks, surface discontinuities whose depth and (or) area are not greater than the specified limit value.

3.2 defects

Cracks, scabs, folds, delamination and splits, as well as surface discontinuities with depth and/or area greater than specified thresholds.

3.3 area of check

The area where the defect (under) is located.

processing, and the defect is caused by the manufacturer, the manufacturer is allowed to re-delivery after grinding or welding according to the requirements of this document.

5.1.4 If this document is quoted in the contract or in the product standard, but the surface condition category and level of the product are not specified, it shall be regarded as Category A Level 1.

5.2 Determination of depth and affected area of surface discontinuities

5.2.1 Depth determination

Depths of representative surface discontinuities shall be determined, if necessary, in order to distinguish surface discontinuities from imperfections and defects. The measurement shall be carried out from the surface of the product. Depth is measured after grinding to remove representative surface discontinuities.

5.2.2 Determination of affected area

If necessary, the affected area of the surface discontinuity shall be determined according to the following provisions.

- a) For isolated surface discontinuities, draw a continuous line along the perimeter of the surface discontinuity at a distance of 20mm from it. Then draw a rectangle 20mm from the edge of the discontinuous defect to determine the affected area, as shown in Figure 1. If the surface discontinuity is less than 20mm from the rolling edge of the section, the rolling edge of the section shall prevail.
- b) For aggregated surface discontinuities, draw a continuous line along the periphery of the group of surface discontinuities at a distance of 20mm from it. Then draw a rectangle 20mm away from the discontinuous line of this group of surfaces. If the surface discontinuity of this group is less than 20mm from the rolling edge of the section, the rolling edge of the section shall prevail, as shown in Figure 2.
- c) For striped surface discontinuities, draw a rectangle. The distance between the four sides of the rectangle is 20mm from the edge of the discontinuous defect. If this group of surface discontinuities is less than 20mm from the edge of the section, the rolling edge of the section shall prevail, as shown in Figure 3.
- d) The surface discontinuity of a strip shall be at least 10 times its greatest width. Multiple surface discontinuities whose edges are not more than 40mm apart shall be regarded as one aggregated surface discontinuity (including aggregated surface discontinuities and striped surface discontinuities).

grinding wheel grinding before welding repair. The bottom of the part where the defect is removed shall be smooth and free of sharp corners. The parts to be welded shall be free of grease or other organic substances, water, rust and so on.

7.2.1.5 Appropriate welding rods and welding repair processes shall be used according to the designation of steel.

7.2.1.6 Use suitable methods such as grinding wheel to grind the welding repair. Remove the protruding metal. Make weld repairs flush and smooth with the rolled surface. It shall not be fixed-point continuous grinding. Make the surface bluish.

7.2.1.7 There shall be no undercuts and weld bumps on the welded outer edge of the section. The weld wave height of the reinforced weld shall be at least 1.5mm higher than the original rolling surface. Then use mechanical methods such as shoveling or grinding wheels to clean up the weld wave of the strengthening weld. The thickness of the ground area after treatment shall ensure the minimum thickness of the section.

7.2.2 Welding repair quality inspection

7.2.2.1 Visually inspect the shape of the weld repair. Weld repairs and heat-affected areas shall be smooth and beautiful. There shall be no defects such as surface cracks, undercuts, pores and slag inclusions visible to the naked eye. If there are surface defects, the defects shall be carefully cleaned up and then welded again. The number of reworks at the same part of the welding repair shall not exceed 2 times.

7.2.2.2 Weld repairs shall be flush with the rolled surface. After the welding seam and welding wave are cleaned, the same height as the original rolling surface shall be guaranteed. However, there may be a protrusion of no more than 0.2mm at the welding repair.

7.2.2.3 Welding repairs and heat-affected zones shall be inspected by methods such as ultrasonic, X-ray, magnetic particle inspection or dye penetration. When the user does not specify the method, it is up to the manufacturer to decide. The inspection shall be carried out after welding repair for more than 48h. There shall be no remaining fine cracks. If there is, it shall be carefully cleaned and then welded again.

7.2.2.4 Detailed records shall be made for each weld repair. The content generally includes: the batch number, steel type, and specification of the section to be repaired by welding; the type and location of surface defects; whether to take preheating and slow cooling measures; the brand and specification of the welding rod; inspector's name (signature); welding repair date.

7.2.3 Contract

Upon mutual agreement, the manufacturer shall provide a welding report, including size, location and welding conditions.

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