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# No. 12 Guidelines for Surface Finish of Hot Rolled Steel Plates and Wide Flats

(1983)

## 1. Scope

These guidelines give some criteria recommended for the surface finish for hull structural steel plates and wide flats in accordance with requirement W11 as well as the treatment of imperfections and defects which may occasionally occur on the surfaces of these products. They do not cover quality requirements for the edges.

At the individual Classification Society's discretion these guidelines may also be applied to other steel grades.

### Note

The criteria contained herein have been based on the consideration that surface imperfections and defects on hull steels may impair the proper coating of tanks and hulls and this may reduce the corrosion resistance.

Moreover, they may increase the frictional resistance of the hull and thereby impair the economy of the service. Surface defects may also adversely affect the strength of the structure. Special provisions with respect to the surface finish are therefore deemed necessary.

## 2. Manufacturer's Responsibility

The responsibility for the required surface finish rests with the manufacturer of the material, who is to take the necessary precautions and to inspect the products prior to delivery. At that stage, however, rolling or heat treatment scale may conceal surface discontinuities. If, during the subsequent descaling or working operations, the material is found to be defective, the Surveyor may require materials to be repaired or rejected.

## 3. Acceptance Criteria

### 3.1 General Surface Finish

All products must have a workmanlike finish and must be free from defects and imperfections which may impair their proper workability and use. This may, however, include some discontinuities of a harmless nature, minor imperfections, e.g. pittings, rolled-in scale, indentations, roll marks, scratches and grooves which cannot be avoided completely despite proper manufacturing and which will not be objected to provided they do not exceed the acceptable limits contained herein.

### 3.2 Imperfections



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Notwithstanding this, the products may have imperfections exceeding the discontinuities inherent to the manufacturing process, as defined under item 3.1. In such cases, limits for their acceptability are to be agreed with the Classification Society, taking the end use of the product into consideration.

3.3 Defects

Cracks, shells, sand patches and sharp edged seams are always considered defects which would impair the end use of the product and which require rejection or repair, irrespective of their size and number. The same applies to other imperfections exceeding the acceptable limits.

**4. Repair Procedures**

4.1 Grinding

4.1.1 Grinding may be applied provided:

- (a) the nominal product thickness will not be reduced by more than 7% or 3 mm, whichever is the less
- (b) each single ground area does not exceed 0,25 m<sup>2</sup> and
- (c) all ground areas do not exceed 2% of the total surface in question.

Ground areas lying in a distance less than their average breadth to each other are to be regarded as one single area.

4.1.2 Ground areas lying opposite each other on both surfaces must not decrease the product thickness by values exceeding the limits as stated under 4.1.1.

4.1.3 The defects or unacceptable imperfections are to be completely removed by grinding.

The ground areas must have smooth transitions to the surrounding surface of the product. Complete elimination of the defects may be verified by a magnetic particle or dye penetrant test procedure at the Surveyor's discretion.

4.1.4 Where necessary, the entire surface may be ground to a depth as given by the under thickness tolerances of the product.

4.2 Welding Repair

Local defects which cannot be repaired by grinding as stated under 4.1 may be repaired with the Surveyor's consent by chipping and/or grinding followed by welding subject to the following conditions:

4.2.1 Any single welded area shall not exceed 0,125 m<sup>2</sup> and the sum of all areas shall not exceed 2% of the surface side in question.

The distance between two welded areas shall not be less than their average width.

4.2.2 The weld preparation must not reduce the thickness of the product below 80% of the nominal thickness. For occasional defects with depths exceeding the 80% limit, special consideration at the Surveyor's discretion will be necessary.

4.2.3 The repair shall be carried out by qualified welders using an approved procedure for the appropriate steel grade. The electrodes shall be of low hydrogen type and must be dried in accordance with the manufacturer's requirements and protected against rehumidification before and during welding.

