

# W13 Thickness tolerances of steel plates and wide flats

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 (Rev.1  
 1989)  
 (Rev.2  
 1992)  
 (Rev.3  
 1995)  
 (Rev.4  
 Oct 2009)  
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 Feb 2012)  
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 (Rev.7  
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## W13.1 Scope

W13.1.1 These requirements apply to the tolerance on thickness of steel plates and wide flats with widths of 600 mm or greater (hereinafter referred to as: product or products) with thicknesses of 5 mm and over, covering the following steel grades:

- (i) Normal and higher strength hull structural steels according to UR W11
- (ii) High strength steels for welded structures according to UR W16
- (iii) Steels for machinery structures in accordance with the individual Rules of Classification Societies

The thickness tolerances for products below 5 mm are to be in accordance with a national or international standard, e.g. Class B of ISO 7452:2013. However, the minus tolerance shall not exceed 0.3mm.

### NOTE:

Tolerances for length, width, flatness and over thickness may be taken from national or international standards.

W13.1.2 These requirements do not apply to products intended for the construction of lifting appliances which are subject to decision by the Classification Society.

W13.1.3 These requirements do not apply to products intended for the construction of boilers, pressure vessels and independent tanks, e.g. for the transportation of liquefied gases or chemicals.

### Note:

1. Rev.4 of this UR is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2011 and when the application for certification of steel plates is dated on or after 1 January 2011.
2. The “contracted for construction” date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of “contract for construction”, refer to IACS Procedural Requirement (PR)No. 29.
3. Rev.5 of this UR is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2013 and when the application for certification of steel plates is dated on or after 1 January 2013.
4. Rev.6 of this UR is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 July 2019.
5. Rev.7 of this UR is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2023.

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W13.1.4 Class C of ISO 7452:2013 or equivalent according to national or international standards may be applied in lieu of W13.3, in which case the requirements in W13.4 and W13.5 need not be applied.

Additionally, if Class C of ISO 7452:2013 is applied, it is required that the steel mill demonstrates to the satisfaction of the Classification Society that the number of measurements and measurement distribution is appropriate to establish that the mother plates produced are at or above the specified nominal thickness.

### W13.2 Responsibility

W13.2.1 The responsibility for verification and maintenance of the production within the required tolerances rests with the manufacturer. The Surveyor may require to witness some measurements.

W13.2.2 The responsibility for storage and maintenance of the delivered product(s) with acceptable level of surface conditions rests with the fabricator before the products are used in fabrication.

### W13.3 Thickness tolerances

W13.3.1 The tolerances on thickness of a given product are defined as:

- Minus tolerance is the lower limit of the acceptable range below the nominal thickness.
- Plus tolerance is the upper limit of the acceptable range above the nominal thickness.

#### NOTE:

Nominal thickness is stated by the purchaser at the time of enquiry and order.

W13.3.2 The minus tolerance on nominal thickness of products in accordance with UR W11 and UR W16 is 0.3 mm irrespective of nominal thickness.

W13.3.3 The minus tolerances for products for machinery structures are to be in accordance with Table 1.

**Table 1 Minus tolerances on nominal thickness for products for machinery structures**

Nominal thickness (t) (mm)	Minus tolerance on nominal thickness (mm)
$3 \leq t < 5$	-0.3
$5 \leq t < 8$	-0.4
$8 \leq t < 15$	-0.5
$15 \leq t < 25$	-0.6
$25 \leq t < 40$	-0.7
$40 \leq t < 80$	-0.9
$80 \leq t < 150$	-1.1
$150 \leq t < 250$	-1.2
$t \geq 250$	-1.3

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W13.3.4 The tolerances on nominal thickness are not applicable to areas repaired by grinding. For areas repaired by grinding the IACS UR W11 7.4.1 requirements are to be applied, unless stricter requirements as per a recognized standard are considered by the Classification Society or purchaser.

W13.3.5 The plus tolerances on nominal thickness are to be in accordance with a recognized national or international standard unless required otherwise by the Classification Society or purchaser.

**W13.4 Average thickness**

W13.4.1 The average thickness of products is defined as the arithmetic mean of the measurements made in accordance with the requirements of W13.5.

W13.4.2 The average thickness of products in accordance with URs W11 or W16 is not to be less than the nominal thickness.

**W13.5 Thickness measurements**

W13.5.1 The thickness is to be measured at locations of products as defined in Annex.

W13.5.2 Automated method or manual method is applied to the thickness measurements.

W13.5.3 The procedure and the records of measurements are to be made available to the Surveyor and copies provided on request.

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## ANNEX: Thickness Measuring Locations

### A.1 Scope of application

This Annex applies to the thickness measuring locations for the thickness tolerance and the average thickness of the product.

### A.2 Measuring locations

At least two lines among Line 1, Line 2 or Line 3 as shown in Figure A.1, are to be selected for the thickness measurements and at least three points on each selected line as shown in Figure A.1 are to be selected for thickness measurement. If more than three points are taken on each line the number of points shall be equal on each line.

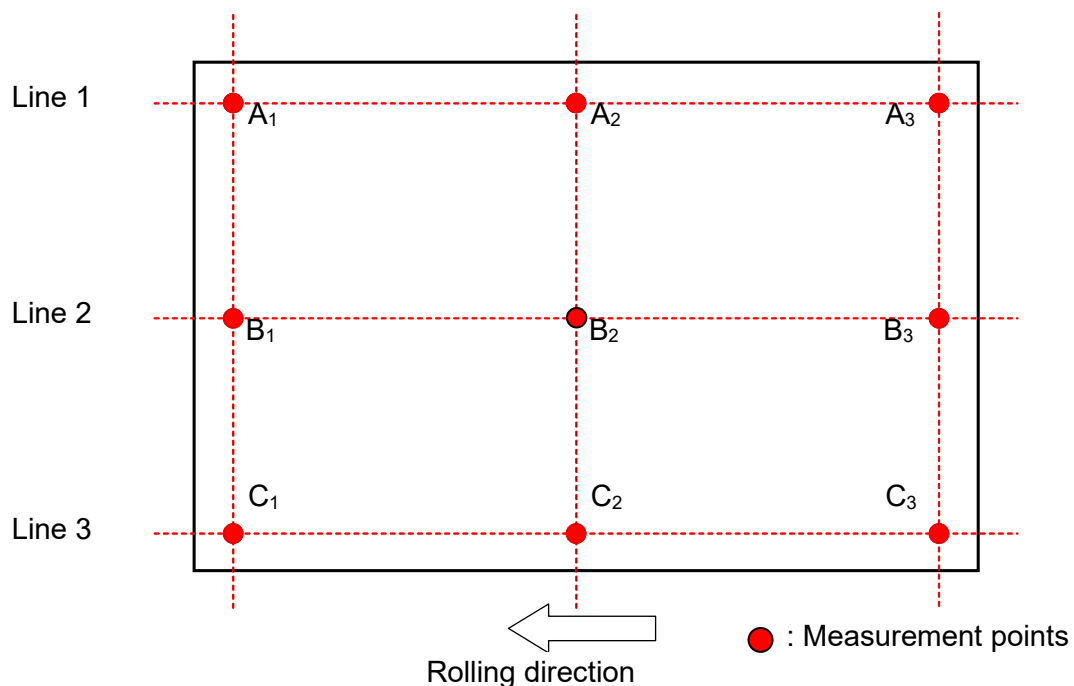
#### NOTE:

The measurement locations apply to a product rolled directly from one slab or steel ingot even if the product is to be later cut by the manufacturer. Examples of the original measurements relative to later cut products are shown in Figure A.2. It is to be noted that the examples shown are not representative of all possible cutting scenarios.

For automated methods, the measuring points at sides are to be located not less than 10 mm but not greater than 300 mm from the transverse or longitudinal edges of the product.

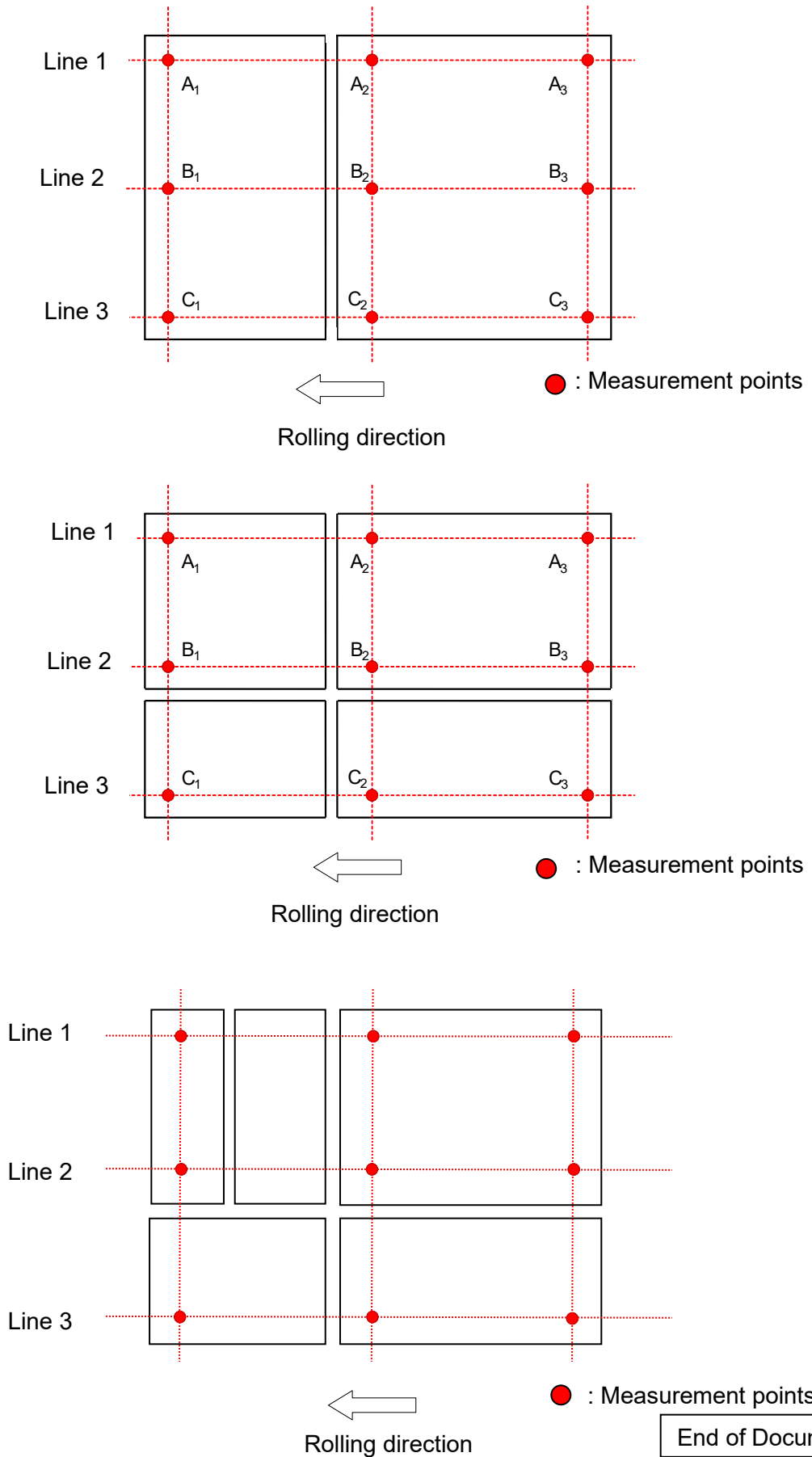
For manual methods, the measuring points at sides are to be located not less than 10 mm but not greater than 100 mm from the transverse or longitudinal edges of the product.

**Figure A.1 - Locations of Thickness Measuring Points for the Original Steel Plates**



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Figure A.2 - Locations of Thickness Measuring Points for the Cut Steel Products



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