Tolerances for Cold-Rolled Wide Stainless Steel Strip
(EN 10259)

With the publication of EN 10259 in May 1997, there now exists a complete set of Europe-wide dimensional tolerance standards for flat rolled stainless products, as follows:

- **EN 10029**: Hot rolled steel plates 3mm thick or above – Tolerances on dimensions shape and mass (i.e. quarto plate)
- **EN 10048**: Hot rolled narrow steel strip – Tolerances on dimensions and shape (i.e. hot rolled narrow strip)
- **EN 10051**: Continuously hot rolled uncoated plate, sheet and strip of non-alloy and alloy steels – Tolerances on dimensions and shape (i.e. continuously hot rolled strip)
- **EN 10258**: Cold rolled stainless steel narrow strip and cut lengths – Tolerances on dimensions and shape (i.e. cold rolled narrow strip)
- **EN 10259**: Cold rolled stainless steel wide strip and plate/sheet – Tolerances on dimensions and shape (i.e. cold rolled wide strip)

This set of standards is part of the ongoing process of replacing member state national standards, as part of developing the European Union single market. British Standards replaced were unusual in having the dimensional tolerance requirements within each product standard, whereas the EN tolerance standards apply to all appropriate product standards and will be referenced there.

Table 1 shows a list of some of the existing and proposed product standards to which EN 10259 can be applied.

*This Information Sheet is only intended to be an outline and is not intended, nor should be used as a substitute for the standards discussed*
Specific Features of EN 10259 Tolerances

Thickness Tolerance

Preferred thicknesses are shown and are intended to indicate which gauges are more likely to be available on an ex-stock basis from suppliers. Buyers of other thicknesses may be required to purchase full coil weight quantities.

Compared with the British Standard tolerances, EN 10259 has the following differences:

1. Tolerances are given up to 6.5mm thick, rather than finishing below 3.0mm.
2. There is a ‘normal’ tolerance and also a ‘special’ tolerance at some thicknesses and widths. The ‘special’ range is about 70% of the normal range, and also symmetrical about the nominal. The British Standards have only one range.
3. In EN 10259, the range varies a little across 3 groups of ordered widths, whereas the old BS tolerances did not vary with the width.
4. The new ‘normal’ ranges are close to the BS ranges.
5. Purchasers who wish to order ‘special’ thickness tolerances should enquire about their availability with the supplier. There may be some restrictions associated with these tolerances.

Width Tolerance

Width tolerances are all positive, unlike the standards replaced that had equal plus and minus tolerances. EN 10259 has both "normal" and "special" ranges, the special tolerances being closest to those in the standards replaced, so if the "old" width tolerances are required, then the EN10259 special tolerances should be specified.

Length Tolerance

Length tolerances also have both "normal" and "special" tolerance ranges. "Special" tolerance should be specifically requested. Each range is proportional to the length of the sheet or cut length, with a minimum tolerance at 2000mm length. Unlike the old standards, these tolerances apply for any length that can be supplied, and across the whole thickness range.

Flatness and Edge Waviness Tolerances

In contrast to the standards replaced, EN 10259 introduces tolerances for flatness of sheet, plate and cut lengths, with both a "normal" and "special" range. There is a larger tolerance range above 3000mm lengths. This greater tolerance applies also to strip, for which there is also a limitation of edge waviness.
Out-Of-Squareness and Edge Camber

EN 10259 and the old British Standards take different approaches. The old standards specified that the nominal rectangular ordered dimensions (the ‘ordered format’) must be capable of being inscribed within the actual pieces supplied. EN 10259 allows this as an option, which may be specifically requested. If requested the tolerances on width, length, out-of-square and edge camber can be re-negotiated.

However, as the principal method of control, the EN defines the limit of out-of-squareness in two alternative ways, either through the difference in diagonal lengths, or by a direct measurement of the deviation from rectangular shape.

In a similar way, the EN defines limiting edge camber of sheets, plates and cut lengths, measured over either a 1000mm or 2000mm length. The old standards did not specify edge camber limits.

Measurement Methods

The EN is more precise in that measurement instructions are given for each parameter. In most cases, this documents what has been done for some time.

Ordering Steel using EN 10259

The new standard sets out a concise and logical way of defining your requirements with respect to dimensions and is recommended as it ensures that nothing is left out.

The same general method appears in all European standards, the steps involved being defined below, followed by some examples (Table numbers are those in the actual standard)

1. Although it does not say so in the standard, the first item is the weight or number of pieces required e.g. 100 sheets or 3 tonnes.
2. Type of product means: - wide strip, slit strip, plates, sheet or cut lengths.
3. Next comes the number of this standard – EN 10259.
4. Next is the nominal thickness in mm remembering that thickness tolerances given in table 1 are equally +/-.
5. If special thickness tolerances are required (Table 1), on material less than 2mm thick, indicate this using "S", otherwise the material will be supplied to normal thickness tolerances.
6. The nominal width in mm is next, remembering that all width tolerances are positive, unless specially agreed otherwise.
7. If special width tolerances are required (Table 2), on material no wider than 600mm, indicate this using "S" after the width, otherwise normal width tolerances will be used.
8. For plates, sheets and cut lengths, next put the nominal length in mm, remembering that all length tolerances are positive.
9. If special length tolerances are required (Table 3) indicate this using "S", otherwise normal length tolerances will be used.

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10. If special flatness tolerances are required, as described in clause 10, indicate this using "FS", otherwise normal tolerance will be supplied.

11. Finally, add any extra dimensional requirements, before describing the steel grade and finish, certification and any other technical requirements. It is suggested that the EN 10088 steel number be used, rather than the name, when ordering, as this is more widely used & understood.

An example of the "order" format is: -

**10 tonnes of wide strip EN 10259-1,20x1250**
**Steel EN 10088-2-1.4301+2B**
When specifying 10 tonnes of wide strip, with nominal thickness 1.20mm and normal thickness tolerance, nominal width 1250mm in steel with name X5CrNi18-10 and number 1.4301 and process route 2B, all as specified in EN 10088-2.

**Advantages of the EN tolerance standards**

EN 10259 has the following benefits over the previous requirements in the obsolete standards BS 1501-3 and BS 1449-2

1. It quite clearly applies to all product forms cut from cold rolled wide strip i.e. strip rolled to a width of 600mm or more. It therefore covers wide strip, sheet, plate, slit strip and cut lengths of whatever final width or length.

2. It clearly does not apply to cold rolled narrow strip or products cut from narrow strip, with a rolling width of less than 600mm, for which EN 10258 exists. This narrow strip is also called precision strip.

3. It recognises that cold rolled products are now available up to 6.5mm thick and 2100mm wide.

4. Although the European and British definition of the boundary between ‘plate’ and ‘sheet’ is at 3mm, the tables cover the whole range, and don’t depend on this distinction.

5. It includes systematic requirements for flatness, out-of-squareness and edge camber.

6. It describes the measurement method(s) for each parameter.

7. For most parameters, there is a ‘normal’ requirement, plus alternative ‘special’ requirement.

8. Widespread adoption of this standard throughout Europe will enable producers to manufacture in a more consistent way, giving greater flexibility to supply across Europe, leading to shorter lead times with lower stocks, but faster, more flexible response.

9. Dimensional standardisation will help satisfy customers throughout Europe.

10. The standard offers a concise method of defining purchase requirements, so reducing the risk of doubt or confusion.

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### Table 1 - Product Standards which Reference EN 10259

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<thead>
<tr>
<th>General purposes product standards</th>
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<tbody>
<tr>
<td>EN 10088-2</td>
<td>Stainless Steels – Part 2 Technical delivery conditions for sheet/plate and strip for general purposes</td>
</tr>
<tr>
<td>EN 10095</td>
<td>Heat resisting steel and nickel alloys (‘stainless’ steels and nickel alloys)</td>
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<td>prEN 10302</td>
<td>Creep resisting steels and nickel alloys</td>
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<th>Pressure Purposes Product Standards</th>
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<tr>
<td>EN 10028-1</td>
<td>Flat products made of steel for pressure purposes – Part 1: General requirements</td>
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<tr>
<td>EN 10028-7</td>
<td>Flat products made of steel for pressure purposes – Part 7: Stainless Steels (includes plates, hot and cold rolled sheet/plate and strip)</td>
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</tbody>
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This Information Sheet is an update of BSSA Information Sheet No.8

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