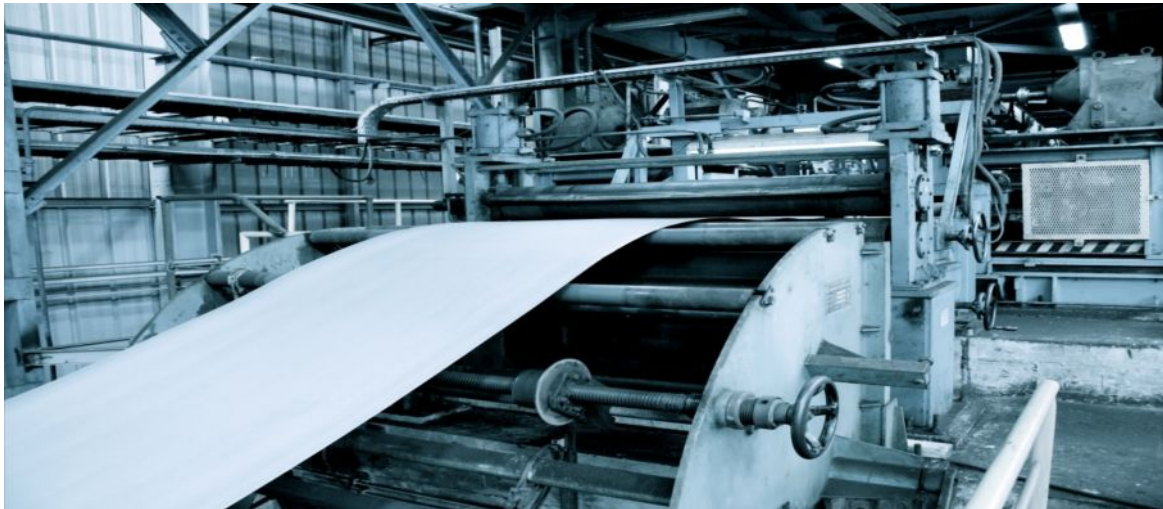


## Pickling Plant :



- This process consists in the chemical treatment of steel sheets, which involves removing the surface layer of oxide (calamine) resulting from the metallurgical process during hot rolling. The standards of the pickling line are:

|              | <b>Thickness</b> | <b>Width</b>  | <b>Inner diameter</b> | <b>Max. weight</b> |
|--------------|------------------|---------------|-----------------------|--------------------|
| <b>Line1</b> | 1.45 – 4.5 mm    | 600 – 1300 mm | 610 mm                | 25 T               |
| <b>Line2</b> | 1.00 – 4.50 mm   | 600 – 1500 mm | 610 mm                | 30 T               |

Specifications of the hot-rolled sheet or pickled sheet

### a - Definition and applications

The hot-rolled sheet not being manufactured by Maghreb Steel are sold in their state. No transformation in the product quality is made by Maghreb Steel. The sheet can be cut lengthwise and widthwise according to the customer's needs.

### b - References standards and equivalence systems

| <b>Norms</b>                | <b>EN 10111 (98)</b> | <b>NFA 36301</b> | <b>DIN1614</b> | <b>JIS G3131</b> | <b>SAE</b> |
|-----------------------------|----------------------|------------------|----------------|------------------|------------|
| <b>Symbolic designation</b> | DD11                 | 1 C              | StW22          | SPHD             | 1010       |
|                             | DD12                 | 2 C              | StW23          | -                | 1008       |
|                             | DD13                 | 3 C              | StW24          | SPHE             | 1006-AK    |

| <b>Norms</b>                | <b>EN 10025(93)/EN10027-1</b> | <b>EN 10027-2</b> | <b>EN 10025 (90)</b> | <b>Allemagne</b> | <b>France</b> |
|-----------------------------|-------------------------------|-------------------|----------------------|------------------|---------------|
| <b>Symbolic designation</b> | S235 JR                       | 1.0035            | Fe 360 B             | Fe 360 B         | E24-2         |

**c - Chemical composition of the casting**

| Shade               | % Max |      |       |       |       |
|---------------------|-------|------|-------|-------|-------|
|                     | C     | Mn   | P     | S     | N2    |
| DD11                | 0.12  | 0.60 | 0.045 | 0.045 | -     |
| DD12                | 0.10  | 0.45 | 0.035 | 0.035 | -     |
| DD13                | 0.08  | 0.40 | 0.030 | 0.030 | -     |
| S235JR/E24-2/ST37-2 | 0.17  | 1.40 | 0.045 | 0.045 | 0.009 |

**d- Mechanical characteristics (Other way)**

| Shade               | Elasticity limit $R_{e\min}$ (N/mm <sup>2</sup> ) |         | Resistance to tension $R_{m\max}$ (N/mm <sup>2</sup> ) |            | Extension to break in min % |               |                  |                  |                      |
|---------------------|---|---------|--|------------|-----------------------------|---------------|------------------|------------------|----------------------|
|                     |   |         |  |            | A80                         |               |                  |                  | $L_0=5.65\sqrt{S_0}$ |
|                     | $1.5 \leq e < 2$                                  | 2 à 8   | $e < 3$  | $e \geq 3$ | $e = 1.5$                   | $1.5 < e < 2$ | $2 \leq e < 2.5$ | $2.5 \leq e < 3$ | $e \geq 3$           |
| DD11                | 170-360   | 170-340 | 440  |            | 23                          |               | 24               |                  | 28                   |
| DD12                | 170-340   | 170-320 | 440  |            | 25                          |               | 26               |                  | 30                   |
| DD14                | 170-310   | 170-310 | 440  |            | 28                          |               | 29               |                  | 33                   |
| S235JR/E24-2/St37-2 | 235   | 235     | 360-510  | 340-470    | 18                          | 19            | 20               | 21               | 26                   |

**e- Production and dimensional tolerances table according to EN 10051/91**

| Thickness tolerances (mm)<br>(for the manufactured products according to the norme EN10111) |             |                                |                    |
|---|-------------|--------------------------------|--------------------|
| Nominal Thickness   |             | Tolerance for nominal width of |                    |
|   |             | $\leq 1200$                    | $> 1200 \leq 1500$ |
|   | $\leq 2,00$ | $\pm 0,13$                     | $\pm 0,14$         |
| $> 2,00$  | $> 2,50$    | $\pm 0,14$                     | $\pm 0,16$         |
| $> 2,50$  | $> 3,00$    | $\pm 0,15$                     | $\pm 0,17$         |
| $> 3,00$  | $> 4,00$    | $\pm 0,17$                     | $\pm 0,18$         |

|       |       |       |       |                            |                        |          |              |                         |
|-------|-------|-------|-------|----------------------------|------------------------|----------|--------------|-------------------------|
| >4,00 | >5,00 | ±0,18 | ±0,20 | <b>Nominal length (mm)</b> | <b>Tolerances (mm)</b> |          |              |                         |
| >5,00 | >6,00 | ±0,20 | ±0,21 |                            | Tighted                |          | Standardized |                         |
| >6,00 | >8,00 | ±0,22 | ±0,23 |                            | In less                | Moreover | In less      | Moreover                |
|       |       |       |       |                            | < 2000                 | 0        | +2           | 0                       |
|       |       |       |       | > 2000                     | 0                      | +3       | 0            | +0.005 x Nominal length |

|                            |                        |          |              |          |
|----------------------------|------------------------|----------|--------------|----------|
| <b>Nominal length (mm)</b> | <b>Tolerances (mm)</b> |          |              |          |
|                            | Cut edges              |          | Rives brutes |          |
|                            | In less                | Moreover | In less      | Moreover |
| ≥600≤1200                  | 0                      | +3       | 0            | +20      |
| >1200≤1500                 | 0                      | +5       | 0            | +20      |

#### f- Specifics tolerances

Thickness difference acceptable within the same coil(EN 10051/91).

|                               |  |             |               |
|-------------------------------|--|-------------|---------------|
| <b>Nominal Thickness (mm)</b> | <b>Thickness difference acceptable within the same coil (mm)</b> |             |               |
|                               | ≤ 1200   | <1200≤ 1500 | < 1500 < 2200 |
| ≤ 2.0                         | 0.20   | 0.24        | 0.28          |
| < 2.0 ≤ 3.0                   | 0.22   | 0.27        | 0.33          |
| < 3.0 ≤ 4.0                   | 0.28   | 0.32        | 0.40          |
| < 4.0 ≤ 8.0                   | 0.28   | 0.32        | 0.40          |

Planeity: if convened at the time of the bid or order.

| <b>EN 10051/91</b>            |                           |                                   |
|-------------------------------|---------------------------|-----------------------------------|
| <b>Nominal Thickness (mm)</b> | <b>Nominal width (mm)</b> | <b>Tolerance of Planeity (mm)</b> |
| ≤ 2.00                        | ≤ 1200                    | 18                                |
|                               | <1200≤ 1500               | 20                                |
|                               | > 1500                    | 25                                |
| > 2.00 ≤ 2.50                 | ≤ 1200                    | 15                                |
|                               | < 1200 ≤ 1500             | 18                                |
|                               | > 1500                    | 23                                |
| ≥ 2.50                        | -                         | Non applicable                    |

#### Squaring

$u \leq 1\%$  of the actual thickness of the sheet.

u: squaring defect is the orthogonal projection of a transversal strand over a longitudinal one.

## Edge straightness

| Straightness defect (mm)                  |           |                     |
|---|-----------|---------------------|
| Length $\geq$ 5000mm & width $\geq$ 600mm |           | Length < 5000mm     |
| Brut edges                                | Cut edges | 0.5 x Actual length |
| 20  | 15        |                     |

## Coils diameters tolerances

| Inner diameter (mm) |                | Exterior diameter (mm) |                | Telescopicity (mm) |
|---------------------|----------------|------------------------|----------------|--------------------|
| Inferior limit      | Inferior limit | Inferior limit         | Superior limit |                    |
| 730                 | 860            | 1,000                  | 2,000          | 50                 |

All these products may be delivered:

In coils

In cut sheet loads

In strips and bands

Maghreb Steel plants are equipped in such a manner to meet the specific orders not listed in the production table.

### g- Technological characteristics

The purchaser must imperatively indicate in his order the desired specifications. Failing that, Maghreb Steel shall make delivery according to its standard manufacturing.

### Other requirements

Hot-rolled products or hot-rolled pickled products maybe delivered with cut or non-cut edges, according to the order.

### h-Surface condition

Some pores, slight smuts, small mandarin marks, slight coloration and some rippled or damaged edges are accepted. Besides, the purchaser accepts a percentage more important of surface defects for coil delivery in comparison with cut sheet delivery.