

Hot- and cold-rolled HQ1500-UC

Ultra high-strength after hot forming enabling weight reduction of complex parts

HQ1500-UC is an uncoated ultra high-strength steel designed for the hot forming process. It combines the 1500 MPa strength with excellent shape accuracy offering real opportunities for weight reduction through downgauging when compared to conventional HSLA grades. Additional benefits of using HQ1500-UC are good repeatability in long production runs when compared with cold press forming.

Mechanical properties

The mechanical properties of the uncoated product before and after hot forming are shown in the table below:

| Grade | Substrate | Test direction | As delivered | | | | Hot formed | | | | |
|---|-------------|----------------|------------------|------------------|-------------------------|----------|------------|----------------|------------------|-------------------------|----------|
| | | | Yield strength | Tensile strength | Elongation | n-value | r-value | Yield strength | Tensile strength | Elongation | |
| | | | $R_{p0.2}$ (MPa) | R_m (MPa) | $L_0 = 80\text{mm}$ (%) | | | $R_{p0.2}$ | R_m (MPa) | $L_0 = 80\text{mm}$ (%) | |
| Tata Steel specification | Hot-rolled | T | ≥ 320 | ≥ 500 | ≥ 15 | | | | 1000-1250 | 1300-1700 | ≥ 5 |
| Typical Tata Steel HQ1500-UC properties | | T | 350-450 | 520-650 | > 17 | > 0.15 | 0.90-1.0 | | 1023-1105 | 1420-1650 | 5-7 |
| Tata Steel specification | Cold-rolled | T | ≥ 300 | 500-600 | ≥ 20 | | | | 1000-1250 | 1300-1700 | ≥ 5 |
| Typical Tata Steel HQ1500-UC properties | | T | 340-440 | 500-580 | > 21 | > 0.15 | 0.90-1.0 | | 1025-1100 | 1420-1650 | 5-7 |

The index of elongation (A_{80}) indicates the original thickness length used expressed in millimetres e.g. 80mm

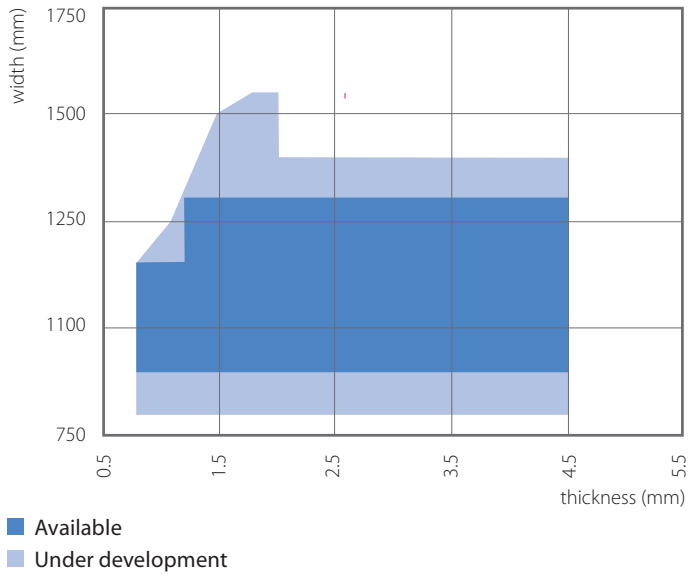
Chemical composition

The chemical composition fits with the Euronorm specification for 20MnB5, as well as the more demanding specifications required by the major automotive manufacturers.

| Grade | C | | Mn | | Si | | P | | S | | Al | | Cr | | Ti | | B | |
|---------------------------------------|------|------|------|------|------|------|------|-------|-------|-------|------|------|------|------|------|------|--------|--------|
| | min. | max. | min. | max. | min. | max. | min. | max. | min. | max. | min. | max. | min. | max. | min. | max. | min. | max. |
| Tata Steel specification | 0.20 | 0.25 | 1.1 | 1.3 | 0.2 | 0.3 | | 0.02 | | 0.010 | 0.02 | 0.06 | 0.1 | 0.3 | 0.02 | 0.04 | 0.002 | 0.0035 |
| Typical Tata Steel product properties | 0.22 | | 1.2 | | 0.24 | | 0.01 | | 0.005 | | 0.04 | | 0.2 | | 0.03 | | 0.003 | |
| EN 10083 20MnB5 | 0.17 | 0.23 | 1.10 | 1.40 | - | 0.4 | - | 0.025 | - | 0.035 | - | - | - | - | - | - | 0.0008 | 0.005 |

Values provided in mass percentages

Dimensional window of hot- and cold-rolled HQ1500-UC



Please refer to Tata Steel or your local sales representative for dimensions which fall outside of the above matrix.

Our material experts are there to support the deployment of our products in your specific application area. Our online material database Aurora Online provides our customers with comprehensive datasheets and ready to run input decks.

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