

Domex 960

Hot rolled ultra high strength structural steel.

Thickness 5 and 6 mm

Product

Domex 960 is a thermomechanical rolled ultra high strength steel with minimum yield strength of 960 MPa.

Applications

Domex 960 is developed with weight sensitive load carrying structures in mind. The material shows its true value in applications where the strength of the material can be used to increase the payload, or reduce the weight of the application itself. Typical applications are cranes, lifting devices and other structures having very high demands on low weight.

Mechanical properties

| Yield Strength $R_{p0.2}$ MPa (N/mm ²) min | Ultimate Tensile Strength R_m MPa (N/mm ²) min | Elongation A_5 % min |
|--|--|------------------------------|
| 960 | 980 | 8 |

The mechanical properties are tested along the rolling direction.

Testing

The testing of the material conforms to EN 10149.

Delivery conditions

Domex 960 is delivered thermomechanical rolled and quenched.

Dimensions

Domex 960 is available in the following range of sizes. Other discrete widths are under development.

| Thickness mm | Width mm | Length mm |
|-----------------|-------------|--------------|
| 5,00 | 1500 | 1500 - 13000 |
| 6,00 | 1500 | 1500 - 13000 |

Cut-to-length with mill edge only.

Impact toughness

The impact toughness is tested as Charpy V-notch test, with both longitudinal and transverse test pieces. The test is carried out in accordance with EN 10045-1, for thicknesses from 6 mm and upward.

| Thickness mm | Test temperature Degrees Celsius | Impact energy min Joule/cm ² |
|-----------------|-------------------------------------|---|
| t < 6 | -40°C | Not impact tested |
| t ≥ 6 | | 34 |

Note: 34 Joule/cm² corresponds to 27 Joule for a full size Charpy V-notch test specimen.

Bending

Minimum permissible inner bending radius is 3,0 x thickness for a 90° bend, for both longitudinal and transverse bending direction. When bending Domex 960 it is important to have a punch radius equal to, or larger than, minimum permissible bending radius.

Heat treatment and fabrication

Domex 960 has obtained its mechanical properties by temperature controlled rolling and is not suited for applications requiring hot working or heat treatments at temperatures above 200°C since the material then may lose its guaranteed properties. The material is not suited for pickling since this may cause hydrogen embrittlement.

Tolerances

The tolerances conform to EN 10051. More narrow tolerances are available on request.

Surface condition

Domex 960 is supplied in as rolled (black) condition.

Chemical composition

| C | Si | Mn | P | S | Al | CEV | CET |
|------|------|------|-------|-------|-------|---------|---------|
| % | % | % | % | % | % | % | % |
| max | max | max | max | max | min | typical | typical |
| 0,15 | 0,50 | 2,10 | 0,020 | 0,010 | 0,015 | 0,44 | 0,29 |

The steel is grain refined.

In addition Nb, V, Cr, Mo, Ni, B, Ti may be used.

$$CEV = C + \frac{Mn}{6} + \frac{Cr+Mo+V}{5} + \frac{Ni+Cu}{15}$$

$$CET = C + \frac{Mn+Mo}{10} + \frac{Cr+Cu}{20} + \frac{Ni}{40}$$

Welding

The low contents of carbon, phosphorus and sulphur enable all conventional welding methods to be readily used for Domex 960.

Domex 960 has low carbon equivalent relative its strength.

As a result of the lean chemistry, no preheating is necessary when welding at room temperature.

To reduce the risk of hydrogen embrittlement, filler materials which give a hydrogen content of maximum 5 ml/100 gram in the weld metal are recommended.

Examples of recommended filler materials are

| MMA Manual metal arc | SAW Submerged arc welding | MIG/MAG Gas metal arc | FCAW Flux cored arc welding |
|-------------------------|------------------------------|--------------------------|--------------------------------|
| AWS: A5.5 E 12018 | AWS: A5.23 F 12AX-EX | AWS: A5.28 ER 1205-X | AWS: A5.29 E 12XT-X |

Note: X stands for one or more characters.

For more detailed information regarding welding, please contact our Knowledge Service Centre.

The particulars in this data sheet are correct at the time of going to print and are intended to give general guidance for the use of the product. Subject to changes arising from continual product development. The information and data must not be regarded as guaranteed values, unless specially confirmed in writing.

Technical service and information

Knowledge Service Center will be pleased to assist with additional information regarding Domex 960 and other products from SSAB Swedish Steel.

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