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DILLIMAX 1100

High strength fine grained structural steel, quenched and tempered

Material data sheet, edition August 2024[1]

DILLIMAX 1100 is a high strength, fine grained and weldable structural steel with a minimum yield strength of 1 100 MPa (160 ksi)[2] in its delivery condition.
DILLIMAX 1100 is preferentially used by the customers for steel components if weight shall be reduced to a considerable extent, e.g. hoisting devices and cranes.

Product description

Designation and range of application

DILLIMAX 1100 can be delivered in thicknesses from 8 (0.3 in.)[2] to 40 mm (1.6 in.)[2] and in the following maximum widths:

Plate thickness t [mm] (in.)[a]	Width [mm] (in.)[a]
8.0 (0.3) ≤ t ≤ 9.5 (0.4)	2 500 (98.4)
9.5 (0.4) < t ≤ 40 (1.6)	3 050 (120.1)

[a] The approximately converted values in brackets are for information only.

Chemical composition

For the ladle analysis, the following maximum values in % are applicable:

C	Si	Mn	P	S	Cr	Ni	Mo	Ti	V+Nb	B
0.23	0.50	1.60	0.018	0.005	2.00	3.5	0.70	0.05	0.10	0.004

The steel is fine grained through sufficient aluminium content.

Indicative values for the carbon equivalent:

Plate thickness t [mm] (in.)[c]	CEV[a] [%]	CET[b] [%]
20	0.66	0.39
30	0.77	0.37

[a] CEV = C + Mn/6 + (Cr+Mo+V)/5 + (Cu+Ni)/15
[b] CET = C + (Mn+Mo)/10 + (Cr+Cu)/20 + Ni/40
[c] The approximately converted values in brackets are for information only.

Delivery condition

The plates are water quenched and tempered.

[1] The current version of this material data sheet can be also found on: www.dillinger.de.
[2] The approximately converted values in brackets are for information only.

Mechanical properties in the delivery condition

Tensile test at ambient temperature - transverse test specimens –

Plate thickness	Tensile strength	Minimum yield strength	Minimum elongation	
t [mm] (in.)[b]	R_m [MPa] (ksi)[b]	R_{eH}[a] [MPa] (ksi)[b]	A_5 [%]	A_{2in}[c] [%]
t ≤ 20 (0.8)	1 200 - 1 500 (175 - 220)	1 100 (160)	10	11
20 (0.8) < t ≤ 40 (1.6)			8	9

[a] If not apparent, the yield strength $R_{p0.2}$ is measured instead.
[b] The approximately converted values in brackets are for information only.
[c] These values apply if tested according to ASTM A370.

Impact test on Charpy-V-specimens

	KV_2 [J] (ft.-lb.)[a] at -40 °C (-40 °F)	
Specimen direction	longitudinal	transverse
DILLIMAX 1100	30 (22)	27 (20)

[a] The approximately converted values in brackets are for information only.

An extra tough grade with guaranteed Charpy values KV_2 at -60 °C (-76 °F) may be agreed on request.
The specified minimum value is the average of 3 tests. One individual value may be below the minimum average value specified, provided that it is not less than 70 % of that value. For plate thicknesses below 12 mm, the test can be carried out on Charpy-V test pieces with reduced width; the minimum width must be 5 mm. The minimum impact value will be decreased proportionally.

Testing

Tensile and impact tests will be performed according to EN 10025-6 once per heat and 60 t. Tests on every heat treatment unit may be possible on request.
The test pieces are taken and prepared according to parts 1 and 6 of EN 10025.
The tensile test is carried out on specimens of gauge length $L_o = 5{,}65 \cdot \sqrt{S_o}$ respectively $L_o = 5 \cdot d_o$, in accordance with EN ISO 6892- 1. Tensile tests according to ASTM A370 may be agreed. The impact test will be carried out on longitudinal Charpy-V-specimens in accordance with EN ISO 148-1 using a 2 mm striker.
Unless otherwise agreed, the test results are documented in an inspection certificate 3.1 in accordance with EN 10204.

Identification

Unless otherwise agreed, the marking is carried out via steel stamps with at least the following information:

- steel grade (e.g. DILLIMAX 1100)
- heat number
- number of mother plate and individual plate
- the manufacturer’s symbol
- inspection representative’s sign

Processing

The entire processing and application techniques are of fundamental importance to the reliability of products made from this steel. The user should ensure that his design, construction and processing methods are aligned with the material, correspond to the state-of-the-art that the fabricator has to comply with and are suitable for the intended use. The customer is responsible for the selection of the material. The recommendations of the EN 1011 (welding) and CEN/TR 10347 (forming) as well as recommendations regarding job safety in accordance with national rules should be observed.
Please refer to the corresponding processing information for more details.

General technical delivery requirements

Unless otherwise agreed, the general technical delivery requirements in accordance with EN 10021 apply.

Tolerances

Unless otherwise agreed, the tolerances will be in accordance with EN 10029, with class A for thickness and table 4, steel group H, for the maximum flatness deviation. Smaller flatness deviations may be possible on request prior to order (see specification DILLIMAX TL for telescopic booms).

Surface Quality

Unless otherwise agreed, the specifications will be in accordance with EN 10163-2, class B3.

Ultrasonic testing

Unless otherwise agreed, DILLIMAX 1100 fulfils the requirements of class S_1E_1 in accordance with EN 10160.

General note

If special requirements, which are not covered in this material data sheet, are to be met by the steel due to its intended use or processing, these requirements are to be agreed before placing the order.
The information in this data sheet is a product description. This data sheet is updated at irregular intervals. The current version is relevant. The latest version is available from the mill or as download at www.dillinger.de.

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