Structural steel	Steel grade		Material No.	Material Specification
	TKS-Short name	EN-Short name		
	TBL PLUS	**-**	**-**	2060
Heavy plate				March 2007

Scope

This Material Specification applies to heavy plate with thicknesses up to 12 mm, made of the fine-grain structural steel TBL PLUS. For plate thicknesses above 12 mm special agreements are necessary.

Application

The steel may be used for welded constructions of different types. The chemical composition and the microstructure of the steel are well suited for applications where resistance against abrasive wear is essential. The steel ca be used for example in concrete mixer lorries. If necessary, wear parts can be partly or completely hardened. For information about the heat treatment process our technical experts are at the disposal of the purchaser.

The entire processing technique is of fundamental importance for the good performance of the products made of this steel. The processor must assure himself, that his methods of calculation, designing and working conform with the material to be used, meet the latest requirements of technical progress, and are suited to the proposed application. Due consideration must be given to relevant construction specifications.

The selection of the material is left up to the purchaser.

Chemical composition (heat analysis, %)

C	Si	Mn	P	S	Cr	B
0.31 - 0.38	≤ 0.40	1.20 - 1.50	≤ 0.040	≤ 0.030	≤ 0.50	0.0008 - 0.0040

The steel has a fine-grained microstructure. Nitrogen is absorbed to form nitrides.

Delivery condition

Normalised or normalised rolled

Properties typical of 8 mm plate thickness [1)]

Yield strength (MPa) [2)]	: 420
Tensile strength (MPa)	: 620
Elongation at fracture A (%)	: 18

[1)] The values are valid for the delivery condition.

[2)] 1 MPa = 1 N/mm^2

Number of tests

Test unit is maximum 40 t from each heat. On every test unit one tensile test shall be performed.

Processing

The steel is suitable for hot forming as well as for machining. In the delivery condition cold forming is possible only conditionally. If more than a slight cold forming is planned, the steel must be normalised before forming. Considering the carbon content, welding and thermal cutting is possible appropriate to the well known methods.

The instructions outlined in STAHL-EISEN-Werkstoffblatt 088 (weldable fine-grain structural steels, processing directives, especially for welding) apply equally to this steel.

Recommendations for welding are also given in EN 1011 part 1 and part 2 - Welding, Recommendation for welding of metallic materials -.

For any information beyond the scope of these instructions, in particular that on the first use, our technical experts are at the disposal of the purchaser.

General information

Unless otherwise agreed upon in the order, the delivery will be governed by the conditions outlined in EN 10021.

The admissible tolerances are based on EN 10051 for plates cut from coils and on EN 10029 for four-high mill plates.

The plates will be supplied with a maximum flatness tolerance according to EN 10029, table 4.

For surface quality requirements EN 10163 is applicable.

Publisher`s addresses

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EN Standards	Beuth Verlag GmbH, Postfach, D-10772 Berlin