

WearTuf 450

Revision:03

CHARACTERISTICS

WearTuf 450 is a fully martensitic Q&T abrasion resistant steel having a hardness of average 450 Brinell. WearTuf 450 combines wear resistant properties with excellent weldability and cold forming capability. Due to the high impact toughness, WearTuf 450 offers very good crack integrity.

APPLICATIONS

WearTuf 450 fits a vast number of different applications within earth moving, mining and transport equipment. WearTuf 450 is specially designed for applications focusing on light weight design concepts, such as on and off road dumper and tipper bodies, open top containers, concrete mixer and garbage trucks.

DIMENSIONS

WearTuf 450 is supplied in the thickness range of 3.0 - 60.0 mm and in plate width 900 - 3 100 mm. Supplied plate length from 4 000 to 18 000mm.

CHEMICAL COMPOSITION

Ladle analysis: The steel is grain refined and fully killed, wt%

Thickness (mm)	C max	Si max	Mn max	P max	S max	Cr max	Ni max	Mo max	B max	CEV Typical	CET Typical
3.0 - 12.0	0.20	0.60	1.50	0.025	0.010	0.40	0.10	0.20	0.004	0.42	0.31
12.1 - 25.0	0.22	0.60	1.50	0.025	0.010	0.60	0.20	0.25	0.004	0.50	0.35
25.1 - 35.0	0.22	0.70	1.60	0.025	0.010	1.00	0.25	0.30	0.004	0.59	0.38
35.1 - 60.0	0.23	0.70	1.60	0.025	0.010	1.20	0.70	0.50	0.004	0.69	0.40

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

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

HARDNESS GUARANTEE

Surface hardness: 425 - 475 Brinell

Guaranteed hardness range, measured on a milled surface at a depth of 0.5 - 2.0 mm below the plate surface, according to EN ISO 6506-1.

Min center hardness:

Plate thickness ≤ 20 mm : min 425 Brinell

Plate thickness > 20 mm: 95% of min guaranteed surface hardness (*)

IMPACT TOUGHNESS

Typical 45J/-40°C(-40°F)

The impact toughness is given as absorbed energy at temperature, being the average of three full size Charpy-V test samples in longitudinal direction to rolling, according to EN ISO 148-1. (**)



MECHANICAL PROPERTIES TYPICAL VALUES

Yield strength Rp0.2	Tensile strength Rm	Elongation A5
1100 MPa	1400 MPa	10%

According to EN ISO 6892-1, uniaxial tensile testing is performed in transverse direction to Rolling.

SURFACE CONDITION AND PROPERTIES

The delivered surface finish meets and exceeds that of EN10163-2 Class A, Subclass 3.

The plates will be delivered as painted, using a low zinc silicate corrosion protective shop primer. Plates can also be delivered as unpainted.

ULTRASONIC TESTING

All plates delivered meets the Class E1, S1 requirement, according to EN 10160.

DELIVERY CONDITION

WearTuf 450 is delivered in the as quenched (Q) condition, and when found necessary in the condition of quenched and tempered (QT). The plates are delivered with sheared or thermally cut edges.

TOLERANCES

The thickness tolerances of WearTuf 450 meets and exceeds the thickness tolerance of EN 10029 Class A(**). Tolerances on shape, length and width meets the requirements of EN 10029. Flatness tolerances conforms to EN 10029 Class S or closer. For more information, consult the Leong Jin catalogue: General Product Information.

HEAT TREATMENT

Since the properties in the as delivery condition cannot be retained after exposure at service temperatures above 250°C, WearTuf 450 is not intended for further heat treatment.

PROCESSING PERFORMANCE

More information on the steel processing performance of WearTuf 450 can be found by consulting the WearTuf Technical manuals on 1) Bending, 2) Welding, 3) Cutting and 4) Machining.

(*)The centre of plate hardness is defined as the mean hardness over the plate through thickness centre, corresponding to a width of 25% of the plate thickness.

(**) In plate thickness less than 12 mm, subsize Charpy test samples are used. The specified min value is then proportional to the cross section of the sample. According to EN 10025 -1, impact tests are not required for nominal thickness < 6 mm.

(***) In the range of 4.0 - 12.0 mm the Leong Jin thickness tolerances can be offered.