ABRASERVICE
UK

DILLIDUR 500 V

WATER QUENCHED
WEAR RESISTANT STEEL

— **DILLIDUR 500 V** is a wear resistant steel fine grain treated with an average hardness of 500 HB in delivery condition with mechanical properties obtained by water quenching.

Chemical composition

C	Si	Mn	P	S
≤ 0.30	≤ 0.50	≤ 1.60	≤ 0.025	≤ 0.010

Depending on thickness, the following alloying elements are used singly or in combination for controlling of full hardening:

Mo	Ni	Cr	V	Nb	B
≤ 0.50	≤ 1.00	≤ 1.50	≤ 0.08	≤ 0.05	≤ 0.005

The steel is fully killed and fine-grain treated.
Typical values for the carbon equivalent:

Thickness (mm)	≤ 30	30-70	70-100
CEV|*|	0.46	0.60	0.75

|*| C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15

Mechanical properties in delivery condition (indicative values)

— **Range of application:**
The production range of the **DILLIDUR 500 V** plates is 8 mm (⅓ in) to 100 mm (4 in), other sizes possible on request.

— **Hardness:**
Hardness at room temperature: 500 HB average, 470 - 530 HB for plate thickness ≤ 30 mm and 450 - 530 HB for thicker plates. Hardness tested per heat each 40 tons.

— **Tolerances:**
Comply with the EN 10029 European standards with **class A** for the thickness.

— **Testing:**
Tensile testing on transverse specimens at room temperature (typical values for 20 mm (0.8 in) plate thickness).

UTS (MPa)	YS (MPa)	E (%)
1 650	1 300	8

— **Toughness:**
25 J (18 ft. lb.) at –20 °C (-4 °F)

Processing information

— **Cold forming:**
In spite of its high degree of hardness the steel can be cold formed. Attention should be paid to the fact that with increasing yield strength the required forces for the forming operation also grow, even if the plate thickness remains unchanged. The spring back will also increase. Grinding of the flame cut or sheared edges in the bending area is recomended to avoid crack initiation.

— **Hot forming:**
The steel obtains its hardness by accelerated cooling from the austenitizing temperature: After hot forming the same hardness is only obtained if the steel is quenched again after forming. It has to be expeeted, that the hardness achieved through such a treatment differs from that measured in the delivery condition, because the cooling capacity avaible during production of the plate differs from that avaible in the fabricator's works.

— **Hot forming and heat treatment:**
This steel can be heated up to a temperature of 200 °C without appreciable loss of its hardness and without the need for a new heat treatment. Upon request we can provide the variation of the mechanical characteristics in relation to varying temperatures. Special attention must be paid at temperatures between 300 °C and 450 °C as these temperature could reduce very much the toughness at room temperature.

— **Service:**
Our workshop can offer oxy cutting on **DILLIDUR 450 V** plates, as per your drawings, using our CADCAM. Our sales department is at your service for any quotations and further information.

— **Welding and flame cutting:**
The instructions given in the technical sheet SEW 088 and in the CECA information bulletin nº 2 can be applied, considering the similarity, however taking into consideration the high values of resistance and temperability. For flame cutting, the following minimum preheating temperatures should be observed: 75 °C for plate thicknesses from 25 up to 70 mm. and 125 °C for thicker plates. For manual are welding basic coated rods, having a very low residual moisture should be used. If necessary, drying according to the instruction of manufacturer should be carried out. Additionally the following recomendation are to be considered:

– Generally up to a thickness of 15 mm (0.6 in) the steel can welded without preheating. In order to eliminate the risk of cracking in the welded joint, in cases of high rigidity of structure a preheating temperature of 140 - 190 °C is generally recommended for thicknesses > 15 mm. (0.6 in). A preheating over 200 °C must be avoided, because it would bring a decrease of the hardness (see diagram).

– Weld fillers should be as soft as loading conditions of the construction, and wear and tear of the weld will allow.

— **Machining:**
DILLIDUR 450 V plates can be drilled with High Speed Steel (HSS) drill - more precisely cobalt alloy HSS drill, which have a satisfactory service life if the cutting speed and the drill advance are properly accomodated. Hard metal drills are not required. For grinding and cutting, it is recommended to use tools with a negative cutting edge.

General note

— If further informations are required, please request a copy of our technical guide.

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