



LONG-TERM INVESTMENT WITH WEAR-RESISTANT STEEL

DILLIDUR

DILLINGER HÜTTE GTS



WEAR-RESISTANT STEEL IS A MATTER OF TRUST

Large manufacturers of construction machinery have to work hard to earn their good reputation: exceptional efficiency and long service life of their products are required – along with excellent service. But it is also a well-known fact that valuable equipment is worn out in its rough contact with earth and stone more in the construction industry than in any other field. This is the reason why the quality of excavators, earthmo-

vers or conveying equipment is particularly dependent upon the materials they are made of. Our steels combine properties which in the past were contradictory: high degree of wear resistance with thinner plates and excellent fabrication properties.

Good materials are a prerequisite, but that alone is not enough. The excellent service construction machinery manufacturers offer to their customers hinges

up on the cooperation with their suppliers. Dillinger Hütte GTS as a steel supplier is particularly trusted on that point. From wear plates through to a complete dredger shovel – an ever increasing number of large construction machine manufacturers are deciding to have their wear affected machine parts made of DILLIDUR steels.

Wear plates: Lining of the conveying equipment of a wheeled excavator.





GIVE YOUR DESIGNERS SUPPORT



The wheel loader 990 C from Caterpillar.

Cutting edges of shovels, grabs and scoops are subjected to extreme abrasion wear loading, which “normal” steels can’t withstand in the long term. In such cases, you need a particular microstructure and special hardness. The same situation is encountered with dump trucks or rock conveyers. Until recently, it was quite difficult to subject components such as these to the demands placed on modern machinery. To the dismay of design engineers, conventional wear-resistant steel grades with their complicated processing

instructions didn’t permit sophisticated design.

Modern wear-resistant steels such as DILLIDUR, on the contrary, are hardened by means of a special heat treatment, instead of mere alloying.

This is the reason why DILLIDUR 400 V is not only hard but also tough, even down to low temperatures. Thanks to their low alloy content, these steels are easy to process in spite of their hardness. Design engineers of construction machinery are now at last in a position to do what they always wanted: slim down their design while improving the wear resistance wherever it is necessary. Do your design engineers a favour: let them have DILLIDUR.

Please consider the example of DILLIDUR 400 V

Hardness	370 - 430 HB
Tensile strength R_m	1200 MPa ¹⁾
Yield strength R_{eH}	800 MPa ¹⁾
Elongation A_5	12 % ¹⁾
Notch impact energy A_v	45 J at -20 °C) ²⁾ 30 J at -40 °C) ²⁾

¹⁾ Indicative value at room temperature (plate thickness 20 mm).

²⁾ Indicative value (plate thickness 20 mm), average of 3 Charpy-V-notch longitudinal samples.



HELP YOUR COMPANY SAVE COSTS

Since the service life of every wear part eventually comes to an end, the good processing qualities of DILLIDUR 400 V for example are particularly of advantage for repair work. While in the past, whole structural components had to be replaced, the use of DILLIDUR 400 V now permits the simple repair of only the worn-out sections of

the part. This steel grade is suitable for cold forming, as well as easy to cut and to weld. In many cases, the affected section only has to be burned out and replaced with a new and if necessary, preformed plate. This causes no problem if the welding instructions for DILLIDUR 400 V are observed. These can be found in our brochure “DILLIDUR –

Technical information”. When required, screwed connections can also be simply used, since DILLIDUR 400 V is easy to machine when using appropriate tools. Choosing this steel helps you reduce the downtime and repair costs of your construction machinery.

Processing properties of DILLIDUR 400 V		
Cold forming		
	transverse	parallel
Radius of bend dependent on the direction of the bending line to the rolling direction (t = plate thickness)	> 3t	> 4t
Forming matrix width dependent on the direction of the bending line to the rolling direction (t = plate thickness)	> 10t	> 12t
Welding and cutting		
Welding method	manual electric welding, submerged-arc welding, inert gas welding	
Preheating (welding and cutting)	from 20 mm plate thickness upwards, maximum 200 °C (see “DILLIDUR – Technical Information“)	
Machining		
Drilling and countersinking with HSS and HSS-Co tools; milling and sawing require tools with reversible carbide tips		



THE DILLIDUR RANGE

In addition to DILLIDUR 400 V, we would also like to introduce to you three further steel grades of the DILLIDUR range. DILLIDUR 500 V was developed for the highest wear resistance. Of course, welding and machining operations involve a

little more effort than with the “milder” DILLIDUR 400 V. An interesting inter-mediate is also available: the DILLIDUR 450 V grade. We recommend DILLIDUR 325 L for wear resistant components which must be hot formed or operated at high

temperatures. The properties of all four steels are summarized below. Another product in this range is the unalloyed wear-resistant steel grade DILLIDUR 275 C.

The DILLIDUR range in summary (mechanical properties: indicative values at room temperature)				
DILLIDUR	325 L	400 V	450 V	500 V
Available plate thickness in mm	10 - 50	10 - 150	10 - 100	10 - 100
Delivery condition	normalized	water quenched	water quenched	water quenched
Surface hardness (HB)	325 ¹⁾	370 - 430	420 - 480	470 - 530
Tensile strength R _m in MPa	1000 ¹⁾	1200 ²⁾	1400 ²⁾	1600 ²⁾
Yield strength R _{eH} in MPa	650 ¹⁾	800 ²⁾	950 ²⁾	1100 ²⁾
Elongation A ₅ in %	15 ¹⁾	12 ²⁾	11 ²⁾	9 ²⁾
Notch impact energy in J at -20 °C ³⁾	20 ¹⁾	45 ²⁾	35 ²⁾	25 ²⁾
Carbon equivalent CEV	0.78 ¹⁾	0.37 ²⁾	0.46 ²⁾	0.47 ²⁾
Welding without preheating up to (plate thickness in mm)	10	20	15	10
Cold forming, min. bending radius ⁴⁾	5t (6t)	3t (4t)	5t (6t)	7t (9t)
Cold forming, min. forming matrix width ⁴⁾	14t (16t)	10t (12t)	14t (16t)	16t (20t)
Hot forming	possible	–	–	–

¹⁾ Indicative value for plate thickness 10 mm
²⁾ Indicative value for plate thickness 20 mm
³⁾ Average value of 3 Charpy-V-notch longitudinal samples
⁴⁾ Bending line transverse (parallel) to the rolling direction; t = plate thickness
 $CEV = C + Mn/6 + (Cr+Mo+V)/5 + (Cu+Ni)/15$



AND TO MAKE THINGS EVEN EASIER FOR YOU

Here's an insider tip...

Our brochure "DILLIDUR – Technical information" provides you with data on the processing of DILLIDUR. Further detail can be found in our technical data sheets, which you may order anytime from your steel stockist or on Internet at www.dillinger.de. Should you have any questions regarding the handling of DILLIDUR, you can contact our service fax and email day and night. Please pass these indications on to your engineers:

(+49) 68 31 47 99 21 46

marketing-earth-moving
@dillinger.biz

We'll get back to you promptly.

In this way, the technical experts are in direct contact with each other, enabling you to concentrate fully on your own tasks and responsibilities.

Leave availability concerns up to us

Anyone responsible for the purchasing of wear resistant steel grades wants to be sure that replacement material can be obtained in good time. Please let your engineers know that you can always supply them with DILLIDUR in sufficient quantities. This is provided by

the extensive sales system and the delivery contracts, which Dillinger Hütte GTS has concluded with a multitude of steel stockists – including one not far from your facilities, who can supply you with DILLIDUR even at very short notice. If required, the steel can be supplied cut to-size, shot, blasted, coated and ready to weld.



The Liebherr excavator 992.



WE MAKE THE STEEL

If you wish to order DILLIDUR 400 V or other grades from the DILLIDUR range, or simply want more information about

these materials, then please get in touch with the sales organizations of Dillinger Hütte GTS.

Smaller steel quantities can also be obtained directly from your steel stockist.

Germany

Vertriebsgesellschaft
Dillinger Hütte GTS
Postfach 104927
70043 Stuttgart
Tel: +49 7 11 61 46-300
Fax: +49 7 11 61 46-221

France

DILLING-GTS Ventes
5, rue Luigi Cherubini
93212 la Plaine Saint Denis
Cedex
Tel: +33 1 71 92 16 74
Fax: +33 1 71 92 17 98

For your local representative please contact our coordination office in Dillingen:

Tel: +49 68 31 47 23 85
Fax: +49 68 31 47 99 24 72

This brochure was supplied to you by:

AG der Dillinger Hüttenwerke
Postfach 1580
66748 Dillingen/Saar

e-mail: info@dillinger.biz
<http://www.dillinger.de>

Tel: +49 68 31 47-21 46
Fax: +49 68 31 47-30 89