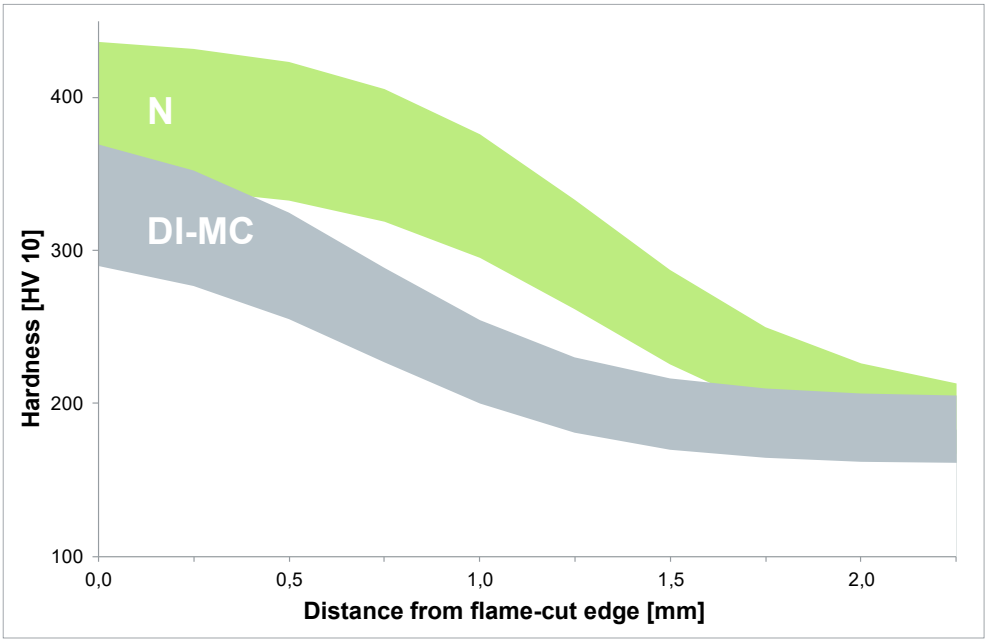
DI-MC
Flame cutting

Thermal cutting

Thermomechanically rolled steels (TM steels) possess a very significant cost cutting potential for the various thermal cutting processes (oxyfuel, plasma and laser cutting). The low carbon and alloying element contents of these steels significantly reduce the risk of overhardening at the cut edges, with the result that cost intensive treatments – such as preheating, heat treatment, or even retrospective machining of the cut edges – can be eliminated.



Hardening of DI-MC 355/S355ML at the cut edge under oxyacetylene cutting, compared to normalized S355N

This graphic demonstrates impressively that, even without any special preheating, Dillinger TM steels fulfil the requirements of EN 1090, Part 2 (Table 10 in EN 1090, Part 2: 2008-12) for maximum hardness at flame cut edges (380 HV 10) after oxyfuel flame cutting. Hardness values may, in general, be higher after plasma and laser cutting than after oxyacetylene flame cutting, due to the slightly higher rates of cooling in these processes. Recommendations on the temperature management for flame cutting can be found in the Dillinger E-Service (see below).

Online Tools

Recommended temperature management for flame cutting

Steeltype: DI-MC

Plate thickness [mm]: 50.0

Please enter the values for the chemical elements

S Sulphur	C Carbon (<= 0.80)	Mn Manganese (<= 2.10)	Mo Molydenum (<= 1.50)
<= 0.025	0.075	1.60	0.014
V Vanadium (<= 0.4)	**Cu Copper (<= 0.80)**	**Cr Chromium (<= 3.00)**	**Ni Nickel (<= 9.50)**
0.001	0.029	0.237	0.052
B Boron (<= 0.0035)			
0.0030			

Preheating temperature or minimum temperature during flame cutting [°C] RT*

*RT= room temperature
The given preheating temperature is recommend in order to avoid cracks after flame cutting. To fulfill the hardness requirements at the flame cutting edges acc. to EN 1090 further measures may be necessary.

Dillinger tests - confirmed by user´s experience - have demonstrated that distortion in Dillinger TM steels is extremely low, even at points of high heat input, such as sharp angles and at cut edges located very close to each other. In cutting of long narrow flame cut components (so-called lamellas), it is state-of-the-art practice to make certain process adjustments in order to avoid distortion. These include, on the one hand, the assurance of symmetrical heat flux by means, for example, of parallel cutting of the lamellas from both sides simultaneously and, on the other hand, the allowance of adequate edge scrap, e.g. a double plate thickness (never less than 50 mm). Anyway, in case of high cut quality requirements, tight tolerance specifications and/or larger wall thicknesses, it is also worthwhile informing Dillinger in advance concerning these fabrication operations, in order that the material production can be adjusted to minimum post cutting distortion by means of appropriate provisions, such as special heat treatment.

Disclaimer

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This processing information 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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