

UDDEHOLM UNIMAX TIG-WELD

Welding of mould steel

Uddeholm Unimax TIG-Weld is a TIG filler rod specially composed as to be compatible with the mould steel Uddeholm Unimax.

Uddeholm Unimax TIG-Weld gives a weld metal identical in composition to Uddeholm Unimax.

UNIMAX TIG-WELD

Diameter		Length	
mm	inch	mm	inch
1.6	0.06	1000	40

Welding of Uddeholm Unimax

General

Good results when welding tool steel can be achieved if proper precautions are taken during welding (elevated working temperature, joint preparation, choice of consumables and welding procedure). If the tool is to be polished or photo-etched, it is necessary to work with a filler material type of matching composition.

Welding method	Gas Tungsten Arc Welding GTAW/TIG
Filler metal	UNIMAX TIG-WELD
Hardness as welded	58–62 HRC

Cleaning of tool

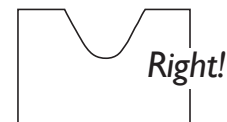
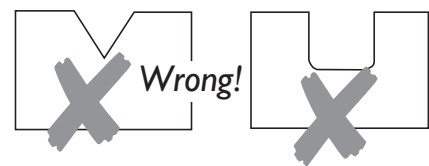
The surfaces in the vicinity of the intended repairs/adjustment areas should be cleaned to base metal prior to welding. Clean the tool carefully with degreasing agent or by grinding. Make sure that the cavity surfaces are protected during welding, especially if these are polished.

Joint preparation

For a satisfactory result, it is imperative that the region to be welded is carefully prepared.

Cracks should be ground out so that the joint bottom is well rounded and such that the sides make an angle of at least 30° to the vertical.

Any damage occurring during welding should be ground down to “sound steel” before re-welding.



Preheating temperature

The temperature of the tool should be maintained constant during the entire welding process. This is best achieved using electrical heating elements. If the tool is preheated in a furnace prior to welding, it is important that the furnace temperature is below 200°C (390°F) when the tool is put in.

	Soft annealed	Hardened
Hardness	185 HB	56–58 HRC
Preheating temperature	200–250°C (390–480°F)	200–250°C (390–480°F)
Max. interpass temperature	350°C (660°F)	350°C (660°F)

This information is based on our present state of knowledge and is intended to provide general notes on our products and their uses. It should not therefore be construed as a warranty of specific properties of the products described or a warranty of fitness for a particular purpose.

Classified according to EU Directive 1999/45/EC For further information see our “Material Safety Data Sheets”.

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Building up the weld

The root runs should be done with low heat input (max. current 120 A).

The first two layers should always be welded with the same low heat input, while a greater heat input can be used for the remaining layers. At least two runs (even for small repairs) are recommended. Do not oscillate.

The transition region between the weld and the base material should be carefully inspected prior to stopping welding. Undercut should be repaired before further processing.

After welding, the final layer of weld metal should be ground away prior to any heat treatment.

If the tool is to be polished or photo-etched TIG welding is to be preferred.

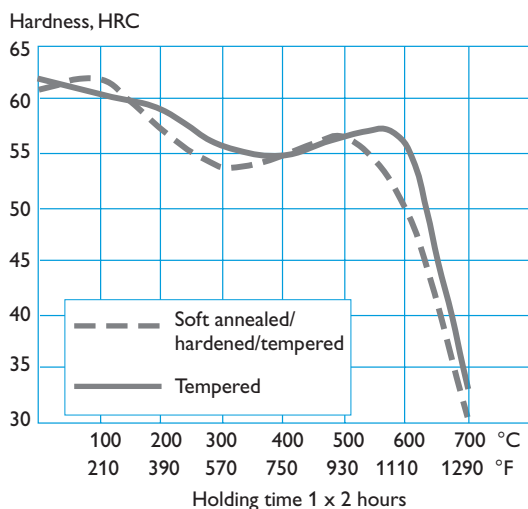
For more detailed information, see the Uddeholm brochure "Welding of Tool Steel".

Post treatment

Condition	Soft annealed	Hardened
Hardness	185 HB	56–58 HRC
Cooling rate	20–40°C/h (35–70°F/h) for the first 2 hours then freely in air <70°C (160°F)	
Heat treatment	Soft anneal Harden Temper	510°C (950°F) 2h

TEMPERING GRAPH FOR THE WELD METAL

Hardness after welding 58–62 HRC.



FURTHER INFORMATION

Please contact your local Uddeholm office for further information on the selection, heat treatment, application and availability of Uddeholm tool steel. For more information, please visit www.uddeholm.com or www.assab.com