

Uddeholm Mirrax TIG-Weld

WELDING OF MOULD STEEL

Mirrax TIG-Weld is a TIG filler rod special composed as to be used for welding of the Uddeholm mould steels Uddeholm Mirrax 40 and Uddeholm Mirrax ESR.

The weld metal is identical in composition to Uddeholm Mirrax 40.

MIRRAX TIG-WELD

Diameter		Length	
mm	inch	mm	inch
1,0	0,04	1000	40
1,6	0,06	1000	40

WELDING OF UDDEHOLM MIRRAX 40 AND UDDEHOLM MIRRAX ESR

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).

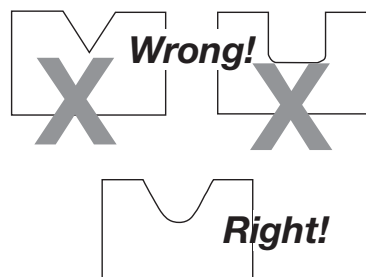
Welding method	Gas Tungsten Arc Welding GTAW/TIG
Filler metal	MIRRAX TIG-WELD
Hardness as welded	53–56 HRC

CLEANING OF TOOL

Clean the tool carefully with degreasing agent or by grinding before welding. The surfaces in the vicinity of the intended repairs/adjustment should be cleaned to base metal prior to doing anything. Make sure that cavity surfaces are well 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

Preheating is recommended at 200–250°C (390–480°F), although very small repairs on edges and corners could be made at room temperature. The temperature should be constant during the entire welding operation. This is best achieved using electrical heating elements. If the tool is preheated in a furnace prior to welding, then it is important that the furnace temperature is below 175°C (350°F) when the tool is put in.

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 for fitness for a particular purpose.

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

Edition: 1, 04.2014

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 temperature in the vicinity of the weld should not exceed 375°C (705°F) (interpass temperature). When passed the risk of distortion increases as well as soft zones around the weld.

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".

FURTHER INFORMATION

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

POST TREATMENT

MIRRAX 40

Condition	Prehardened
Hardness	38–42 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 after welding	Temper 560°C (1040°F), 2 h. Weld metal hardness after tempering 38–42 HRC.

MIRRAX ESR

Condition	Soft annealed	Hardened
Hardness	250 HB	45–52 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	Annealing 700–750°C (1290–1380°F) 5 hours	Tempering 10–20°C (20–40°F) below last temp. temperature

For more detailed information, ask your Uddeholm representative for the brochure "Welding of Tool Steel".