

Uddeholm Corrax®

Welding recommendations

GENERAL

Uddeholm Corrax, is stainless moulds steel and a part of the Uddeholm Stainless Concept The steel has a unique set of properties that makes it the ultimate choice in a large number of demanding applications. Its superior resistance to corrosion combined with a hardness of up to 50 HRC makes it perfectly suited for moulds making

Good results when welding can be achieved if proper precautions are taken (joint preparation, choice of consumables and welding procedure). If the tool is to be polished, it is necessary to use a filler material that has the same chemical composition as the base material.

RECOMMENDED FILLER MATERIAL

Welding Method	Gas Tungsten Arc Welding GTAW (TIG)	Gas Metal Arc Welding GMAW (MIG/MAG)	Shielded Metal Arc Welding SMAW (MMA)	Laser	Comments
Filler material	Corrax TIG Weld TURBALOY 13-8 Mo	Not Recommended	Not Recommended	Mirrax Laser Weld	If the surface are going to be photo-etched Corrax TIG Weld is recommended and TURBALOY 13-8 Mo can be used as an alternative.
	Type AWS ER 312 AWS ER NiCrMo-3				Use soft filler material for buffering layer
Hardness as welded	30 – 35 HRC				

DIMENSIONS FILLER MATERIAL

Type	TIG		Laser
Dia. Ø mm	1.0	1.6	0.2 – 0.6
Dia. Ø Inch	0.040	1/16	0.008 – 0.024
Corrax TIG Weld	X	X	
Turbaloy 13-8 Mo	X	X	
Mirrax Laser Weld			X

PARAMETERS

Condition	Delivery condition 32 – 35 HRC	Aged at 600°C 4h 38 – 40 HRC	Aged at 575°C 2h 45 - 47 HRC	Aged at 525°C 2h 48 - 50 HRC	Comment	
Preheating temperature	Welding can be done at room temperature				When welding in delivery condition and/or severe restraint conditions exist	
Max interpass temperature	300°C 570°F	300°C 570°F	300°C 570°F	300°C 570°F	The temperature of the tool in the vicinity of the weld. When passed there is a risk for distortion of the tool.	
Cooling rate	20 - 40°, 35 - 70°F C/h The first 2 hours then freely in air <70°C, 160°F					
Post treatment	Age to desired hardness	600°C 1110°F 1 h / 4 h	575°C 1 h / 2 h	525°C 975°F 2 h	13-8 Mo	Use the longer holding time before photo-etching
		600°C 1110°F 4 h	575°C 2 h	525°C 975°F 2 h	Corrax	

PROCEDURES

- Clean weld area.
- Do not let the temperature in the vicinity of the weld (the HAZ) increase to more than 300°C / 570°F. There is a risk of lowering (softening) the hardness of the base material or/and cracking in the HAZ. Use temple sticks or other temperature-measuring devices.
- For finishing layers use consumables which give suitable hardness.
- Wait a few minutes between each layer of strings, both for soft and hard filler, in order to let the layer equalize and minimize stresses. Peen to minimize stresses.
- If possible, change welding direction 180° between each layer.
- Cool slowly after welding, 20 - 40°C/h, 35 - 70 °F/h for the first two hours and then freely in air < 70°C / 160°F.
- Age to desired hardness.

Use these guideline recommendations along with
“Welding of Uddeholm Tool Steel” for complete instructions.