Uddeholm Caldie Weld / TIG-Weld

WELDING OF COLD WORK TOOL

Caldie Weld is a basic coated electrode and Caldie TIG-Weld is a TIG filler rod. These have been specially developed to be compatible with the Uddeholm steel grade Caldie.

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

DIMENSIONS

CALDIE WELD

Diameter		Length		Current	Voltage
mm	inch	mm	inch	A (DC+)	V
2,5	0,10	350	14	60–90	23
3,2	0,12	350	14	80–100	23

Redrying temperature 250–300°C (485–570°F) 2–3 hours.

CALDIE TIG-WELD

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

STORAGE OF ELECTRODES

Always keep the electrodes in a thermostatically controlled drying cabinet at 50–150°C (120–300°F) once the package has been opened. The electrodes can be stored unpacked as long as they are kept in the cabinet. Make it a rule that electrodes are clean and dry prior to welding.

WELDING OF UDDEHOLM CALDIE

GENERAL

Good results can be achieved if proper pre-cautions are taken (joint preparation, choice of consumables and welding proce-

Welding method	Gas Tungsten Arc Welding GTAW/TIG	Shielded Metal Arc Welding SMAW/MMA
Filler metal	CALDIE TIG-WELD	CALDIE WELD
Hardness as welded	58–62 HRC	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.

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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 300°C (570°F) when the tool is put in.

	Soft annealed	Hardened
Hardness	215 HB	58–62 HRC
Preheating temperature	200–250°C (390–485°F)	200–250°C (390–485°F)
Max. interpass temperature	400°C (750°F)	400°C (750°F)

Small repairs can be made at room temperature with the TIG-method. For MMA-welding pre-heating is recommended.

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 of the tool in the vicinity of the weld should not exceed 400°C (750°F) (interpass temperature). When passed there could be a risk for distortion of the tool.

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

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

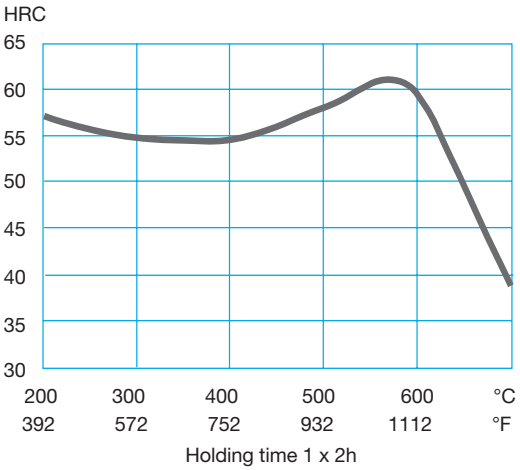
POST TREATMENT

Condition	Soft annealed	Hardened
Hardness	215 HB	58–62 HRC
Cooling rate	20–40°C/h (35–70°F/h) for the first 2–3 hours then freely in air <70°C (160°F)	
Heat treatment	Soft anneal Harden Temper	Temper 10–20°C (20–35°F) below the highest previous tempering temperature

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

TEMPERING GRAPH FOR THE WELD METAL

Hardness as welded 58–62 HRC.



For heat treatment recommendations see the Uddeholm product brochure for Uddeholm Caldie.

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