



Sales Office:

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W.1.2367 VICTORY ESR

Electro-slag-remelting (ESR)

GENERAL:

- hot work tool steel with very good resistance to heat and good hot toughness
- high resistance to temperature fatigue and wear
- well suitable for high uses
- little change in dimension
- nitridable
- well polishable
- isotropic properties compared to conventionally produced steelgrades
- excellent toughness and ductility in all directions

APPLICATIONS:

- Pressure casting tools for light-allow processing
- dies and die inserts for forging presses in steel forming
 - extrusion tools
 - die holders and internal bushes in heavy metal alloys
 - form pressing dies in heavy and light metal processing
- Moulds for:
- tools for die casting (dies, fixed inserts, cores, nozzles, nitrided ejector pins, nitrided shot-sleeves)
 - tools for extrusion (dies, dieholders, liners, dummy blocks)
 - tools for hot pressing (Aluminium, Magnesium, Copper Alloys)
 - moulds for plastics (injection moulds)
 - parts for severe cold punching, scrap shears, hot shearing, shrink rings, wear resisting parts

CHEMICAL ANALYSIS: %

C	Si	Mn	P	S	Cr	Mo	V
0,35 – 0,40	0,30 – 0,50	0,30 – 0,50	≤ 0,015	≤ 0,001	4,8 – 5,2	2,7 – 3,2	0,40 – 0,60

PHYSICAL PROPERTIES:

Coefficient of thermal expansion [10 ⁻⁶ m/(m x K)]	20-100 °C	20-200 °C	20-300 °C	20-400 °C	20-500 °C	20-600 °C	20-700 °C
		11,9	12,5	12,6	12,8	13,1	13,3
Thermal conductivity [W/(m x K)]	20 °C		350 °C		700 °C		
	29,6		34,0		35,4		



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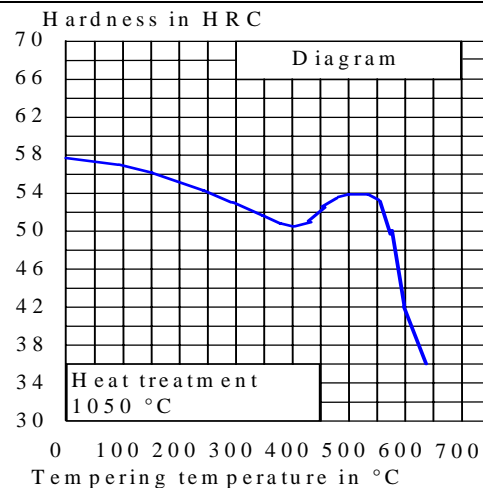
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HEAT TREATMENT:

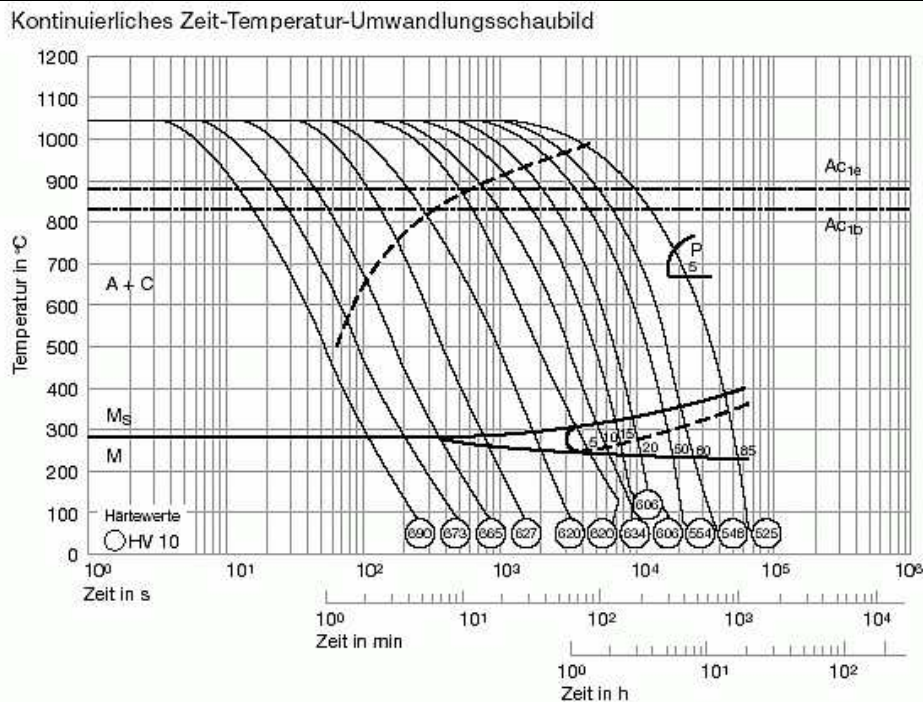
<i>Hot forming</i>	<i>Soft annealing</i>	<i>Hardening</i>	<i>Tempering</i>
1050 - 850 °C	820 - 840 °C	1010 – 1060 °C	500 – 700 °C

TEMPERING DIAGRAM:

values in HRC
tested on samples
dia. 25 x 50 mm long
hardened at 1050 °C in oil



CCT GRAPH:





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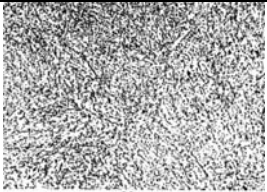
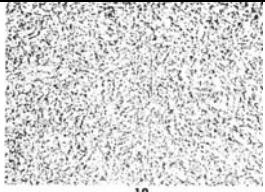
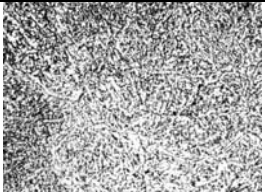
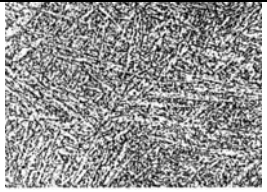
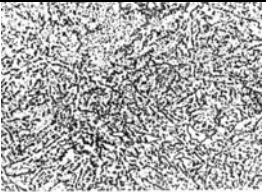

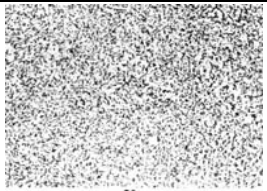
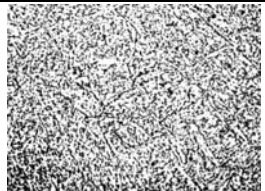
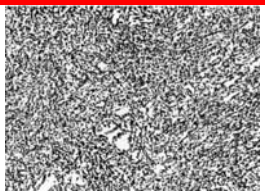
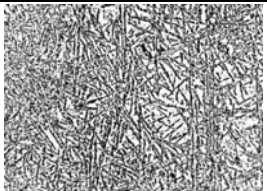
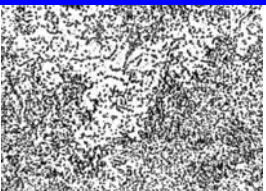
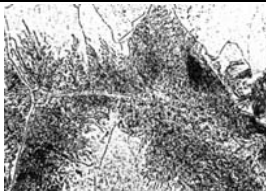
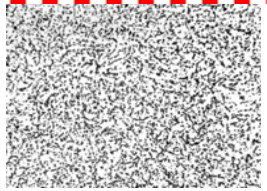
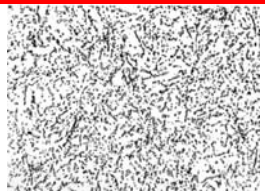


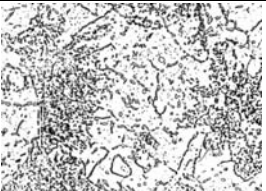
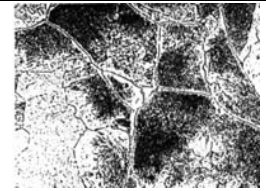
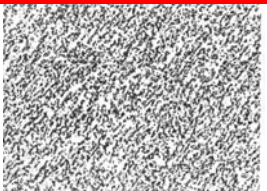
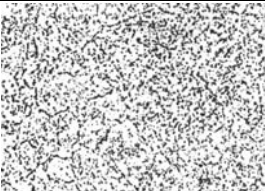




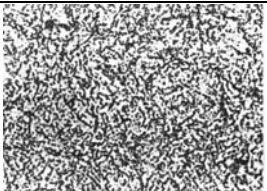
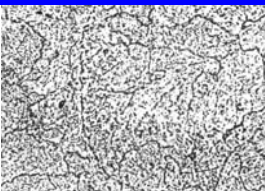
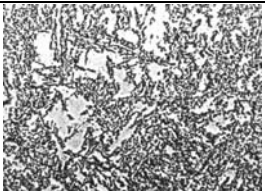



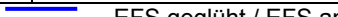
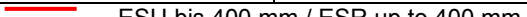
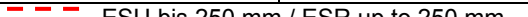
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DELIVERY CONDITION :
Soft annealed, respectively fine structure treated with a hardness of a maximum of 229 HB
SERVICE HARDNESS:
35 - 55 HRC(~1100-1980N/mm ²)
IMPACT STRENGTH:
Unnotched test sample 10x7x55 [mm] VDG M82 Ed.02/1993 or SEP 1614 400 J/cm ² or acc. to your request
ULTRASONIC:
ASTM A388 - FBH max. 3 mm (1/8 inch) or SEP 1921 – test group 3 – class E , e or acc. to your request
CLEANLINESS:
ASTM E45- Method A with type A ≤ 0,5 , B; C and D each ≤ 1 or DIN 50602– K1 ≤ 10 or acc. to your request
STRUCTURE:
fine uniform annealed structure see next page
DELIVERY SIZES:
Rounds – up to 600 mm Blocks – up to 400 mm thickness or acc. to your request

Rating Chart for the Evaluation of Microstructure of Annealed Hot-Work Tool Steel

	GA	GB	GC	GD	GE	GF
1	 GA1	 GB1	 GC1	 GD1	 GE1	 GF1
2	 GA2	 GB2	 GC2	 GD2	 GE2	 GF2
3	 GA3	 GB3	 GC3	 GD3	 GE3	 GF3
4	 GA4	 GB4	 GC4	 GD4	 GE4	 GF4
5	 GA5	 GB5	 GC5	 GD5	 GE5	 GF5
 EFS geglüht / EFS annealed			 ESU bis 400 mm / ESR up to 400 mm		 ESU bis 250 mm / ESR up to 250 mm	