



934B VIP® – Hot working tool steel

Standards:

AISI	Werkstoff no.	EN
AISI H13	1.2344	X40CrMoV5-1

General information

934B VIP®, made in Sweden by Scana Steel Björneborg AB, is a premium quality Cr-Mo-V-alloyed steel which is supplied in annealed (EFS) condition. Scana offers a wide dimensional range and even the largest dimensions show high purity, good homogeneity and extra fine annealed structure.

Chemical Composition (%):

C	Si	Mn	P	S	Cr	Mo	V
0,38	0,80	0,40	≤ 0,020	≤ 0,003	5,00	1,40	1,00

Non metallic inclusion (cleanliness)

Specification according din 50 602 K1

K1 < 10

Microstructure EFS annealed condition:



Delivery condition: EAF, VAD, 3D-forged, EFS treated (extra fine microstructure)

Hardness / Strength: Annealed max 229 HB

Ultrasonic test standard: Acc. to EN 10228-3- E,e

Sizes: Width max 1200 mm; Thickness max 400 mm

Characteristics: Mold steel for hot working and casting tools and plastic mold cavities esp with high hardness (48 - 55 HRC) after vacuum hardening, high cleanliness and extra fine annealed structure, very high hot strength, good machinability- and surface properties, good polishability (A-2), extra high hot wear resistance, for highly stressed hot working tools, good coatable (Cr-plating, PVC, nitriding).

Application: For highly stressed hot working tools as extrusion dies, components for die casting moulds, drop forging dies and dies for forging machines, hot shear tools, mandrels and containers for (light) metal extrusion, moulds for plastic injection when processing of plastics with higher glass fibre content, high polished and extra wear resistant plastic moulds. Generally for plastic molds and tools where high toughness and best surface quality is needed, **934E VIP®**, is to prefer.

Physical properties:

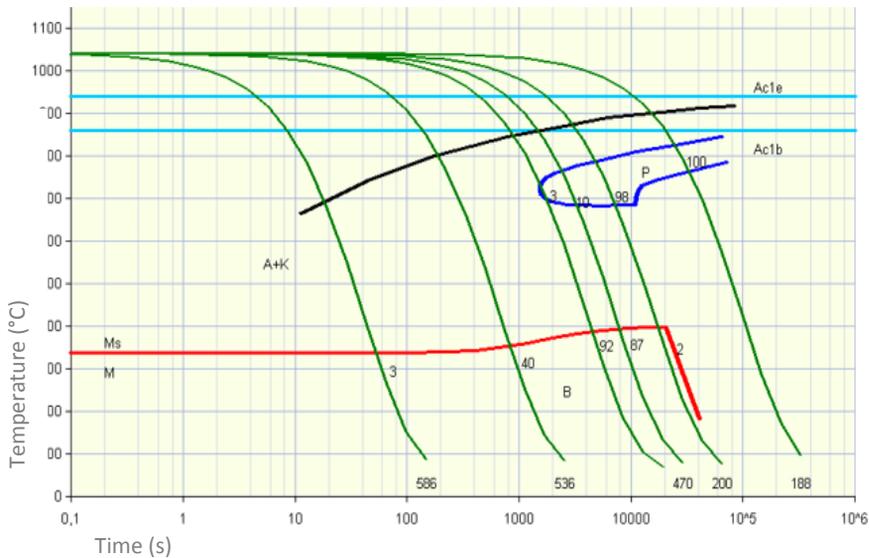
Temp °C	20	200	300	500
Modulus of Elasticity				
GPa	210	198	191	173
Coefficient of linear Expansion				
10 ⁻⁶ m/mK	10,9	11,9	12,4	12,9
Thermal Conductivity				
W/(mK)	24,8	25,5	26,6	28,7

Heat treatment

	Temp. (°C)	Cooling media
Annealing	780-820	air
Hardening	1010-1030	Vacuum (down to 150°C)
Tempering (min. 2x)	see tempering diagram	Cool down on air to 450°C
Stress relieving	530 – 550 (hardened cond.)	Cool down on air to 450°C
Pre-heating for welding	350	Furnace

Note: **934B VIP®**, is delivered in EFS annealed structure. Additional vacuum hardening + double tempering in pre-machined condition (3-5 mm allowance) is necessary. Stress relieving after finish machining and during operation phase can improve life time of the tool.

CCT – diagram (Generated from Dr.Sommer Werstofftechnik HT database)



Tempering - diagram

