Material data sheet

CB 31 SGM

The material CB 31 SGM is a cold rolled stainless steel with martensitic structure. This steel was specially developed with very good spring properties, high ductility and high strength as well as very good weld ability.

The surface is mill finish according to 2B of ASTM with a selected cold rolled temper finish. The surface is smooth and clear, metallically clean, minor surface defects are admissible.

Chemical Composition

Carbon	≤ 0.07	%
Silicon	≤ 1.00	%
Manganese	≤ 1.00	%
Phosphorus	≤ 0.040	%
Sulphur	≤ 0.030	%
Nickel	5.00	%
Chromium	15.00	%

Mechanical Properties

Tensile strength at RT	1 150 [N/mm²]	167 [ksi]
Yield point 0.2 at RT	1 100 [N/mm²]	145 [ksi]
Elongation	7 [%]	
Hardness Vickers HV 10	360	
Rockwell HRC	38	
Fatigue strength at RT	470 [N/mm²]	68 [ksi]
Welding factor	0.95	

Physical Properties

Modulus of elasticity at	20 °C	197 000 [N/mm²]
	100 °C	192 000 [N/mm²]
	200 °C	186 000 [N/mm²]
	300 °C	180 000 [N/mm²]

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	68 °F	28 700 [ksi]
	212 °F	27 900 [ksi]
	392 °F	27 000 [ksi]
	572 °F	26 300 [ksi]
Density	7.80 [kg/dm³]	0.283 [lbs/in³]
Mean thermal expansion coefficient		
	20-100 °C	11.6 *10^{-6} [m/mK]
	20-200 °C	11.7 *10^{-6} [m/mK]
	20-300 °C	11.8 *10^{-6} [m/mK]
	68-212 °F	6.5 [ΔL/L°F * 10^{-6}]
	68-392 °F	6.6 [ΔL/L°F * 10^{-6}]
	68-572 °F	7.7 [ΔL/L°F * 10^{-6}]
Specific Heat at 20 °C	0.46 [J/gK]	0.11 [Btu/lbF]
Thermal conductivity	0-100 °C	18 [W/mK]
	0-400 °C	23 [W/mK]
	32-212 °F	10.3 [Btu/fthF]
	32-752 °F	13.3 [Btu/fthF]
Specific electrical resistance at 20 °C (68 °F)		0.77 [Ωmm²/m]
Permeability H max.	151	
Remanence	0.6 [Wb/m²]	

Temperature Stability

The thermal conductivity of this steel is comparable to the one of austenitic steels, but at the same the thermal expansion is much lower. This makes this steel less sensitive to thermal strain and buckling caused by uneven temperatures. Our CB 31 SGM material incorporates an exceptional corrosion resistance which is comparable to austenitic steel.
At higher temperatures a reduction of tensile strength can be monitored, which reaches a considerable extent at 350°C (662 °F). Therefore, if an operation temperature of more than 350 °C is considered, Contibelt office should be contacted for technical assistance.

We do not recommend the use of this steel grade for use at temperatures below 0°C (32 °F).

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