IPCO 1320C

Micro alloyed dual phase carbon steel belt

12-2020

Belt grade characteristics

PCO 1320C belt grade is a dual phase carbon steel with a 75% martensitic and 25% ferritic matrix. It is characterised by:

- Very good static strength
- Very good fatigue strength
- Very good thermal properties
- Excellent wear resistance
- Good repairability

IPCO 1320C is a carbon steel with a hard, smooth surface and a grey oxide layer, which makes it suitable for any application where there is a low risk of corrosion. Very good thermal properties make it ideal for baking and similar applications. Its low carbon content makes it possible to weld without post-annealing.

Chemical composition (typical), %

C	Si	Mn	Al	Nb
0.15	0.5	1.5	0.04	0.02

Standards

EN	No standard
AISI	No standard

Forms of supply

Belts are delivered, as standard, in a tempered condition and have well-rounded edges. If required, practically any surface finish can be supplied. Perforated belts are also available.

Belts are levelled and straightened to obtain optimum flatness and straightness. They can be supplied in open lengths, with the ends prepared for welding or riveting on site, or in the endless condition with a welded joint.

For tracking, belts can be provided with V-ropes, either rubber or in the form of a specially designed steel spiral. If required, the product side of the belt can be fitted with retaining strips to keep the conveyed material in place, or with transverse flights to prevent material from sliding backwards when the belt is inclined steeply. Different tolerance grades are available to ensure that the best cost alternative can be selected.

Recommendations and advice are available from your local IPCO office.

Mechanical properties

Static strength at 20 °C (68 °F), typical values

Position	Yield strength		Tensile strength		Elongation	Weld factor	Hardness
	MPa	ksi	MPa	ksi	A_5 (%)	R_m/R_m	HV_5
Parent material	1 250	181	1 340	194	5	–	360
Transverse weld (not heat treated)	890	129	1 000	145	4	0.75	*

*See figure on page 2.

Standard strength at elevated temperature

Temperature		Yield strength		Tensile strength		Elongation $A_{11.3}$ (%)
°C	°F	MPa	ksi	MPa	ksi	
100	212	1 140	165	1 290	187	4
200	392	1 140	165	1 260	183	6
300	572	1 080	157	1 220	178	15

IPCO 1320C should not be exposed to temperatures exceeding 300 °C (572 °F) for prolonged periods (a few hours). Material softening occurs at elevated temperatures. We recommend that if an operating temperature of 300 °C (572 °F) or above is considered, your local IPCO office should be contacted for technical assistance.

Impact strength

This belt grade is not recommended for use at low temperature, i.e. operating in freezing conditions.

Fatigue strength

The fatigue limit is defined as the reverse bending stress at which 50% of the test specimen withstands a minimum of 2×10^6 load cycles. These values refer to 20 °C (68 °F), a normal dry atmosphere and a standard prepared specimen. The fatigue limit for the parent material is approximately ± 430 MPa (62 ksi).

Physical properties

Density, ρ, at 20 °C (68 °F)
7 800 kg/m^3, 0.28 lb/in^3

Modulus of elasticity, E, at 20 °C (68 °F)
205 000 MPa (29 700 ksi)

Thermal conductivity, λ

Temp	°C	20	100	200	300
	°F	68	212	392	572
	W/mK	34	36	37	37
	Btu/ft h °F	20	21	21	21

Specific heat capacity, C_p

Temp	°C	20	100	200	300
	°F	68	212	392	572
	kJ/kgK	450	480	520	550
	Btu/lb °F	0.11	0.11	0.12	0.13

Thermal expansion, α

Temp	°C	20 – 100	20 – 200	20 – 300
	°F	68 – 212	68 – 392	68 – 572
	10^{-6}/ °C	11.8	13	14
	10^{-6}/ °F	6.6	7.2	7.8

Resistivity, ρ at 20 °C (68 °F)
0.3 μΩm

Magnetic properties

Remanence, B_r	0.7 Wb/m^2
Coercive force, H_c	< 1 550 A/m
Max relative permeability, μ_r	314

IPCO 1320C has high thermal conductivity and low thermal expansion, which makes it less sensitive to buckling and thermal strain caused by uneven temperatures.

Corrosion resistance

General corrosion
Despite its oxide layer, IPCO 1320C is susceptible to general corrosion in aqueous solutions, especially at low pH values. Increased temperature, flow rate, acidity and the presence of salts increase the corrosion rate. In neutral solutions, ions such as CrO_4^{-2} and NO^{-3} have an inhibiting effect.

Pitting and crevice corrosion
Pitting and crevice corrosion attacks can occur in chloride containing solutions at intermediate pH values, where the general corrosion rate is low.

Stress corrosion cracking
IPCO 1320C is not susceptible to stress corrosion cracking or intercrystalline corrosion attacks.

Hydrogen embrittlement
IPCO 1320C is susceptible to hydrogen embrittlement. If the material is exposed to possible sources of hydrogen embrittlement, a special heat treatment is recommended. Contact your local IPCO office for information.

Welding

Joints with very good strength and toughness can be formed in IPCO 1320C. A suitable fusion welding method is gas-shielded arc welding, with the TIG method as first choice.

If welding wire is used, type should be 1320C. Further information concerning method and equipment etc. required can be obtained from your local IPCO office.

Hardness HV

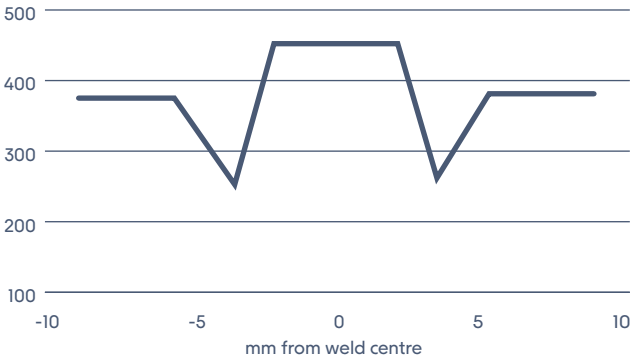

Figure 1. Example of hardness profile across a transverse weld in a IPCO 1320C belt.