



DILVER P1®

DILVER P1® is an iron-nickel-cobalt alloy with a C.T.E. matched to borosilicate glass and ceramics. Typical applications are hybrid circuit casings, transistor and optoelectronic cases and bases, electronic tubes (power, X Rays...), hermetic feedthroughs.

1. CHEMICAL COMPOSITION (Weight %)

Element	Ni	Co	Mn	Si	C	Fe
typical value	29	17	≤0,35	≤0,15	≤0,02	Bal

2. PHYSICAL PROPERTIES

Density (g/cm ³)	Resistivity (μΩ.cm)	Melting T° (°C)	Thermal conductivity (W/m/°C)	Specific heat (J/kg/°C)	Curie T° (°C)
8,25	49	1450	17,5	500	425

3. COEFFICIENT OF THERMAL EXPANSION

Temperature range	+30 to +400 °C	+30 to +450 °C
Average linear C.T.E	4,0 - 5,2 x 10 ⁻⁶ /°C	5,1 - 5,5 x 10 ⁻⁶ /°C

4. MECHANICAL CHARACTERISTICS (typical values)

Material to be tested in accordance with NF EN 10002, NF EN ISO 6507, NFA 04102

Metallurgical State	Hardness (HV)	Yield strength (MPa)	Tensile strength (MPa)	% Elongation	Grain size
Annealed	160	380	540	30	9
Hard	220	680	700	9	

- Annealed temper is recommended for bending, deep drawing and spinning.
- Hard temper is recommended for stamping and slitting.

5. ROUGHNESS-SURFACE

- Typical Ra ≤ 0,15 μm.
- Good surface, free from scratches or oxidation or defects that might be detrimental to use.

6. DIMENSIONS

Thickness (mm)	Thickness tolerance	Width tolerance (mm)			
		$W \leq 100$	$100 < W \leq 150$	$150 < W \leq 300$	$300 < W \leq 610$
$0,1 \leq t \leq 1$	+/- 3 %	+0/+ 0,20	+0/+0,30	+0/+0,40	+0/+0,50
$1 < t \leq 2$	+/- 3 %	+0/+0,40	+0/+0,50	+0/+0,50	+0/+0,60
$2 \leq t \leq 3$	+/- 3 %	+0/+0,60	+0/+0,60	+0/+0,60	+0/+0,70

- Thickness commonly manufactured are 0,11 - 0,20 - 0,254 - 0,3 - 0,381 - 0,5 - 0,6 - 0,75 - 0,8 - 1 - 1,2 - 1,5 - 2 - 3,175 mm.

7. FORM

Temper	Annealed	Hard
Edge burr	≤ 10 % of the thickness	≤ 5 % of the thickness
Edgewise curvature	3 mm/m	3 mm/m

8. PACKAGING

- Packaging must be suitable to prevent the metal from damage during transportation or stocking in normal conditions.

8.1. Coils

Coils weight	Order ≥ 500 kg	Order ≥ 1000 kg	Order ≥ 3000 kg
80% of the delivery	$\geq 0,8$ kg per mm wide	$\geq 1,6$ kg per mm wide	≥ 2 kg per mm wide
20% of the delivery		$\geq 0,75$ kg per mm wide	1 to 2 kg per mm wide
typical weight		2 kg/mm wide	4 to 5 kg per mm wide

- Internal diameter: 400mm with inner core for thicknesses $\leq 0,3$ mm.

8.2. Sheets

Lengths	Tolerance
$1000 \leq \text{mm} \leq 3000$	-0/+5mm

9. CERTIFICATE

- Chemical composition, C.T.E, mechanical properties

10. INTERNATIONAL SPECIFICATIONS

- ASTM F15, DIN 17745, W 1.3981, A 54-301, SEW 385.