

# Technical datasheet DURACON<sup>â</sup> 17A

An age-hardenable contact spring alloy with high strength and good conductivity for connectors, switches, relays, etc.

## Composition

Cobalt	17 wt.%
Nickel	28 wt.%
Iron	balance

## Delivery conditions

- hard (85 % cold worked) ⇒ optional age-hardening by the customer
- heat treated strip material (comparable to mill hardened grades)

## Comparison to other alloys

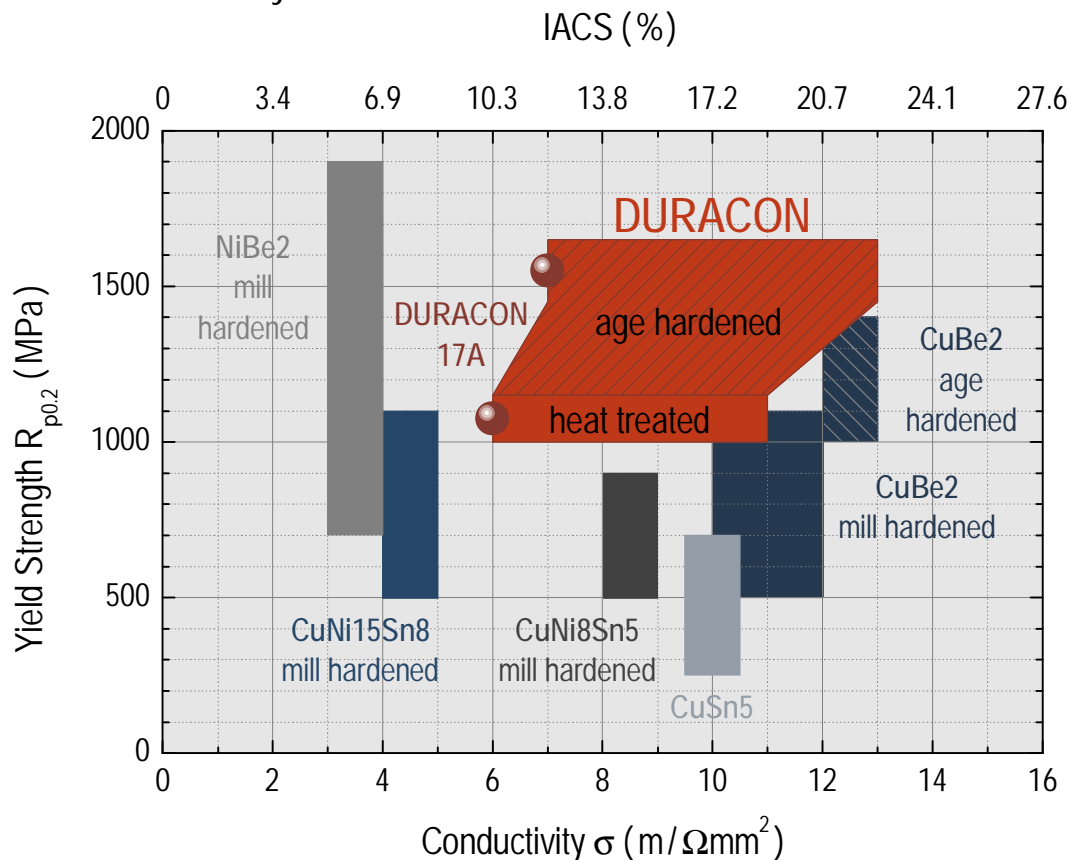


Figure 1: Yield strength  $R_{p0.2}$  versus electrical conductivity  $\sigma$  for different contact alloys. The spheres show the delivery conditions of DURACON 17A within the DURACON family.

## Mechanical properties (typical values)

Property	Unit	Delivery condition		
		Heat treated	Hard (before / after age-hardening*)	
Tensile strength	$R_m$	(MPa)	1150	1150 / 1800
Yield strength	$R_{p0.2}$	(MPa)	1100	1100 / 1650
Bending fatigue strength ( $10^7$ stress cycles)	$\sigma_{bw}$	(MPa)	> 600	> 600 / > 800
Elongation	$A_{L50}$	(%)	1	1 / 2
Hardness	HV		330	330 / 480
Bending radius / thickness ratio ( $\perp$ and $\parallel$ rolling direction, 90 and 180° bending)	r/t		< 0.5	< 0.5 / —

\* depending on the age-hardening temperature and time (see Figure 3).

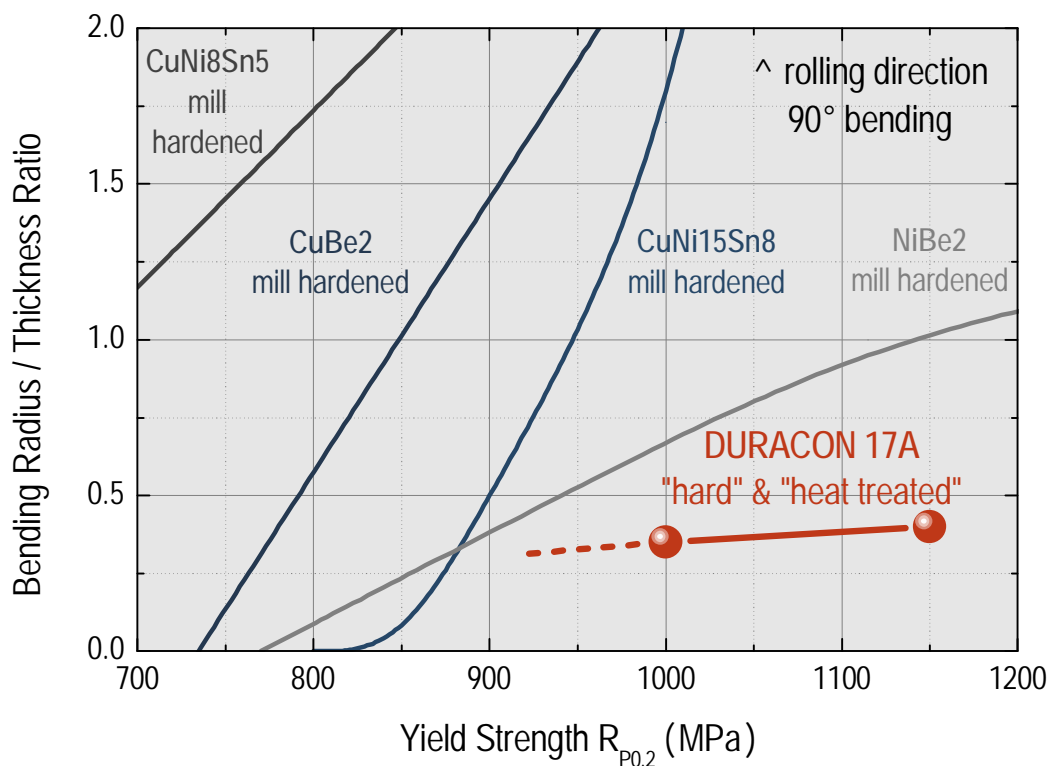


Figure 2: Comparison of bending radius / thickness ratio of DURACON 17A with other alloys. Both delivery conditions ("hard" and "heat treated") show a value below 0.5. This is also valid for bending radii parallel to rolling direction and 180° bending.

## Physical properties (typical values)

Property	Unit	Delivery condition		
		Heat treated	Hard (before / after age-hardening*)	
Density	$\rho$	(g/cm <sup>3</sup> )	8.3	8.3 / 8.3
Thermal expansion coefficient	$\alpha$	(10 <sup>-6</sup> 1/K)	11	11 / 11
Magnetism			ferromagnetic	
Young's Modulus (parallel to rolling direction)**	E	(GPa)	150	150 / 180
Electrical conductivity	$\sigma$	(m/ $\Omega$ mm <sup>2</sup> ) (% IACS)	6 10	6 / 7 10 / 12
Thermal conductivity	$\lambda$	(W/mK)	> 50	> 50 / > 55

\* depending on the age-hardening temperature and time (see Figure 3).

\*\* perpendicular to rolling direction about 20% higher.

## Age-hardening (typical values)

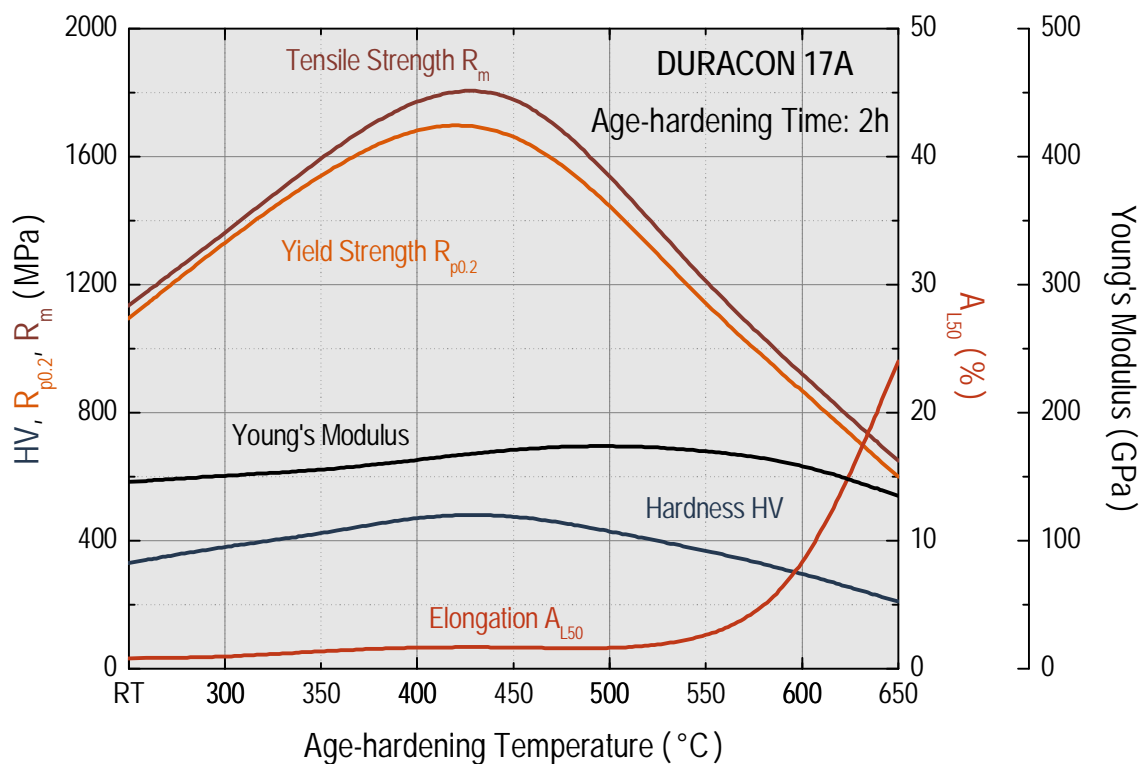


Figure 3: Age-hardening of DURACON 17A for the delivery condition "hard" in dependence on the temperature (2 hours age-hardening time).

## Temperature behaviour (typical values)

500 MPa starting stress, 20 % relaxation offset	Unit	Delivery condition	
		Heat treated	Hard (before / after age hardening*)
Maximum application temperature			
Time 100 h	(°C)	200	135 / 250
Time 1000 h	(°C)	175	120 / 225

\* depending on the age-hardening temperature and time.

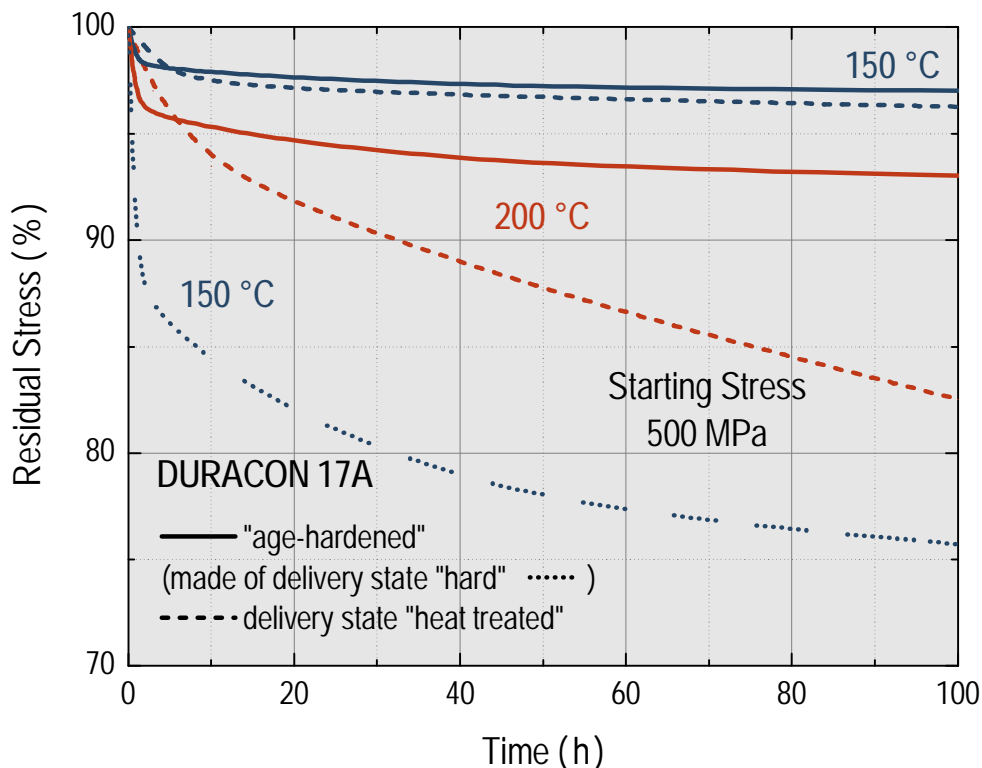


Figure 4: Relaxation behaviour of DURACON 17A at 150 and 200 °C for the conditions "hard" and "heat treated" (delivery states) and "age-hardened" (after annealing of the final parts by the customer).

## Technological properties (delivery conditions "hard" and "heat treated")

- Stamping properties: like CuBe<sub>2</sub>, mill hardened
- Coatability: : better than CuBe<sub>2</sub> (no passive layers, no nickel barrier necessary)
- Corrosion resistance: like NiFe-alloys
- Welding / Brazing conditions: free of Beryllium containing fumes
- Available strip material: thickness: 0.05 – 0.2 mm / width: max. 280 mm