

Abbreviated Name	EN Norm	ASTM / AISI	AFNOR	DIN Abbreviation	ISO	Other
		~ 1095		1.1268+Pb		

20 AP Wire

Chemical Analysis in Mass percentage

C	Mn	Si	S	P	Pb	Fe
1.00	0.40	0.20	0.05	≤ 0.03	0.20	Rest

Diameter 0.02 – 4.00 mm

Application

Sadviks 20 AP is categorized as temperable machining steel. As such, it has little to no alloying components but contains an elevated amount of Sulfur and Lead. Some machining steels also contain bismuth or tellurium. Adding these elements enables higher cutting speeds, while simultaneously optimizing chipping and reducing tool wear. When the amount of lead is between 0.15 and 0.30%, it falls into the category of lead-alloy machining steel. Due to the added lead, processing times can be shortened dramatically and tool service life is optimized. Despite these considerable advantages, lead-alloy machining steels are slowly fading from the market. The material is primarily suited for high precision parts with small diameters and narrow tolerances. As a result, 20 AP is the most commonly used material in Décolletage and is used almost exclusively in the watch and automobile industry. Machining steels alloyed with Sulfur should not be cold-twisted to achieve a tensile strength higher than 1000N/mm². The forming of separations is given at higher mechanical strengths.

Resistance to Corrosion

Non-alloy, temperable machining steels are not naturally corrosion resistant. If resistance to corrosion is desired, a suitable surface finishing process must be carried out.

Thermal Treatment

20 AP can be hardened through the process of Annealing at a temperature of approximately 800 °C, followed by quenching in water or oil. In order to avoid tears in susceptible parts, the quenching mediums can be preheated. The hardened workpieces can then be tempered to achieve the desired hardness.

Weldability

Machining Steel is not suited for welding.

Surface Finish

Drawn	Chemically purged	0.020 – 3.499 mm
Surface Ground	Chemically purged	3.500 – 4.000 mm

Delivery mode

As a ring
On assorted spools
Straightened
Axles

Diameter tolerances

Diameter (mm)	Tolerance (%)	Tolerance (μ)
0.020 – 0.249		± 1.0
0.250 – 0.399		± 1.5
0.400 – 1.500		± 2.0
1.500 – 4.000		± 2.5

Mechanical Properties

Condition at delivery (mm)	Tensile Strength in cold-twisted delivery condition (N/mm^2)
0.005 – 0.019	600 - 1000 (Depends on the Diameter)
0.020 – 0.199	
0.200 – 0.499	
0.500 – 0.999	
1.000 – 1.999	
2.000 – 4.000	

Physical Properties

Density		7.80 g/cm^3
Coefficient of Thermal Expansion	20 °C – 200 °C	12.0 $10^{-6}/\text{K}$ (hardened)
Specific Heat Capacity	20 °C	J/kgK
Thermal Conductivity	20 °C	W/mK
Specific Electric Resistance	20 °C	0.21 $\Omega \text{ mm}^2/\text{m}$ (hardened)
Young's Modulus	20 °C	210.00 GPa

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