Xometry

Datasheet

NAK80

Description

NAK80 steel is a pre-hardened plastic mold steel developed and patented by Daido Steel Co., Ltd. in Japan, with a delivery hardness of HRC 37-43. It offers excellent mirror polishability, good texturability, and outstanding electrical discharge machining (EDM) characteristics. After welding, its hardness can be restored through secondary hardening treatment. This material is suitable for mirror-finished molds, EDM-processed automotive part molds, and precision textured molds. It also performs exceptionally well in applications such as thin sheet stamping, thread rolling, and cold heading.

Features

1. A pre-hardened steel that requires no additional heat treatment (as-delivered condition: age-hardened, HRC37 ~ 42℃);
2. Most suitable pre-hardened steel for mirror-finish polishing;
3. Excellent electrical discharge machining (EDM) characteristics;
4. High-quality surface finish after EDM, which can replace etching texturing;
5. During electrical discharge machining (EDM), the surface hardness does not increase, simplifying subsequent processing steps;
6. Excellent weldability with no surface chipping or hardening, making post-weld processes easier;
7. Outstanding toughness and superior mechanical properties, thus minimizing concerns about cracking or failure.

Note: All material data listed in Xometry's data sheets is sourced from trusted Original Equipment Manufacturers (OEMs), material distributors, and databases.

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Parameters

Component Elements Properties	Metric	English
Aluminum, Al	1.0%	1.0%
Carbon, C	0.15%	0.15%
Copper, Cu	1.0%	1.0%
Iron, Fe	93.05%	93.05%
Manganese, Mn	1.5%	1.5%
Nickel, Ni	3.0%	3.0%
Silicon, Si	0.30%	0.30%

Mechanical Properties	Metric	English
Hardness, Rockwell C	40	40
Tensile Strength, Ultimate	1264 MPa	183400 psi
Tensile Strength, Yield	1018 MPa @Strain 0.2 %	147600 psi ©Strain 0.2 %
Elongation at Break	16.1%	16.1%
Reduction of Area	41.9%	41.9%
Modulus of Elasticity	207 GPa @Temperature 23.0 °C	30000 ksi @Temperature 73.4 °F
Charpy Impact	11.0 J	8.10 ft-lb
	11.5 J	8.50 ft-lb

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