

# HPM<sup>®</sup> 455



## HPM<sup>®</sup> 455 (UNS S45500)

HPM<sup>®</sup> 455 is a precipitation heat treatable martensitic Stainless Steel. The composition provides a good combination of corrosion resistance and heat treated strength favorable for fatigue applications. The material is well suited for demanding spring devices.

### GENERAL INFORMATION

The alloy has reasonably good forming characteristics in the annealed temper considering that it has a hardness of RC30. A significant radius is useful when bending is necessary in a fabrication.

Cold working prior to the precipitation hardening treatment can drive finish strength up to 270,000 PSI (0.2% offset yield strength). The alloy retains a good strength through 800°F (Approx. 70% of room temperature).

Resistance to stress – corrosion cracking is optimized by heat treating at 950°F.

The overall corrosion resistant to normal atmospheric is equal to SS 430 with no staining. The alloy can be welded by resistance and inert gas shielded techniques. It also is suitable for brazing using a flux when possible.

### AVAILABILITY

HPM<sup>®</sup> 455 is available from Hamilton Precision Metals as strip product in thicknesses from 0.001" to 0.020" (0.0254 mm to 0.508 mm) and widths up to 12.0" (304.8 mm). The material conforms to ASTM A693, AMS 5860, and UNS S45500.



## Technical Data

TYPICAL MECHANICAL PROPERTIES <sup>1</sup>			
	ANNEALED	COLD ROLLED	HEAT TREATED
Ultimate Tensile Strength	160,000 PSI	210,000 PSI	260,000 PSI
Yield Strength (0.2% Offset)	130,000 PSI	180,000 PSI	250,000 PSI
Elongation in 2" *	10%	3%	2%
Modulus of Elasticity (Tension)	29 X 10 <sup>6</sup> PSI	-	-
Poisson's Ratio	0.31	-	-

\*The measured elongation will be less as thickness decreases to 0.002" and less.

<sup>1</sup> These values may be adjusted by control of process variables – consult HPM for desired values.

PHYSICAL PROPERTIES <sup>2</sup>	
Density	0.28 lbs/cu.in.
Melting Point (Approx.)	1400°C
Electrical Resistivity @ R.T.	79 Microhm. cm
Temperature Coefficient of Resistivity (25° to 100°C)	650 PPM/°C
Thermal Expansion Coefficient (22° to 93°C)	10.6 X 10 <sup>-6</sup> /°C
Thermal Conductivity @ 100°C	18 W/m · K
Magnetic Attraction	Yes

<sup>2</sup> Typical values to guide alloy selection but are not a guarantee of minimum or maximum.

SS 455 COLD REDUCTION VS. STRENGTH (TYPICAL)				
	U.T.S. (KSI)	2% Y.S. (KSI)	E	Rc
Annealed	158	115	4.8%	32
Skin Pass	160	150	3.1%	33
35%	182	174	2.5%	34
50%	190	180	2.4%	36
60%	195	186	2.4%	38
80%	210	200	2.0%	40

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NOMINAL COMPOSITION	
Chromium	11.6%
Nickel	8.3%
Copper	2.2%
Titanium	1.25%
Columbium/ Tantalum	0.25%
Carbon	0.005%
Iron	Balance