



Republic Engineered Products
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Product Capability Data

Republic Engineered Products has certified systems for the manufacture of steel forging ingots: ISO/TS 16949 Quality Management, ISO 14001 Environmental Management, OHSAS 18001 Environmental, Health and Safety Management.

All material produced is electric furnace melted, ladle refined, slag raked and vacuum degassed, followed by bottom pouring into cylindrical ingots. All ingots receive an appropriate thermal cycle following removal from ingot molds resulting in an ingot surface hardness < 285 BHN and reduced residual ingot stresses.

Heat Size

200 net tons - will produce up to two ingot sizes per heat

Typical Grades/Specifications

AISI/SAE			ASTM A-182	Other ASTM	JIS	Mil-S	DIN	Miscellaneous	
10xx	43xx	86xx	F1	ASTM A-105	SUJ1	Mil-S-18729	13CrMo44	300M	HY-TUFF
11xx	46xx	87xx	F2	ASTM A-335 (P36)	SUJ2	Mil-S-23194	21CrMoV	D6AC	L5
12xx	47xx	88xx	F3V	ASTM A-336	S20C	Mil-S-23284	25CrMo4	EN355B	LF2
13xx	48xx	92xx	F3VCb	ASTM A-350	S48C	Mil-S-46119	40CrMo4	HSLA 80	LF6
15xx	51xx	93xx	F11	ASTM A-508	S53C		42CrMo4	HSLA 100	Nitralloy
33xx	52100	94xx	F12	ASTM A-514	S55C		100Cr6	HY 80	P11
40xx	61xx		F21	ASTM A-588 (Corten)	SCR 420		20MoCr4	HY100	P22
41xx			F22	ASTM A-707	SCM 420		20MnCrS5		S355NL
			F22V		And others		20MnVS6		
			F24				35Mn20Pb		
			F36				17NiCrMo6		
			FR				20NiCrMo2		

Leaded - All AISI/SAE, JIS, and DIN grades are available with lead
 Modifications of these and other grades can be produced to your specifications.

Chemistry

Tight chemistry control provides excellent repeatability to heat treat response, dimensional control and mechanical properties.

Element	Aim%	Max Variation	Element	Aim%	Max Variation	Element	Aim%	Max Variation
Carbon	<0.60	+/- 0.01	Nickel	<2.00	+/- 0.03	Niobium	≤ 0.50	+/- 0.02
	>0.60	+/- 0.02		>2.00 to 4.00	+/- 0.05		>0.50	+/- 0.03
Manganese	<1.50	+/- 0.03	Chromium	>4.00	Not available at this time	Tungsten		Not available at this time
	>1.50	+/- 0.05		<2.00	+/- 0.03		Vanadium	≤ 0.50
Phosphorous*	0.008% max			2.00 - 3.50	+/- 0.05		>0.50	+/- 0.03
Sulfur*	0.001% max			>3.50	Not available at this time	Lead	<0.35	+/- 0.03
Silicon	<0.50	+/- 0.03	Molybdenum	<1.00	+/- 0.01	Hydrogen*	1.5 ppm max in mold	
	>0.50	+/- 0.05		>1.00	+/- 0.03			

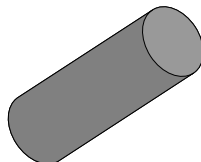
*Lowest values capable (may be higher for certain grades)

Cleanliness

A wide variety of applications are served by Republic Engineered Products; therefore, we review cleanliness requirements case by case.

For all applications:
 Magnetic Particle: AMS 2301 / AMS 2303
 Ultrasonic: 1/8" Flat Bottom Hole

Sizes (Cylindrical Molds)



Mold Diameter (in.)	Area (sq. in.)	Uncropped		Cropped		Ingots for VAR or ESR	
		Length (in.)	Weight (lbs.)	Length (in.)	Weight (lbs.)	Uncropped Weight (lbs.)	Cropped Weight (lbs.)
24	452.4	187	22800	171	21500	22700	21300
29	660.5	187	32500	171	30800	32000	29800
37	1075.2	187	51300	168	47500	51000	44200