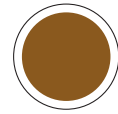


Ameralloy-5[®]

SHOCK RESISTANT STEEL AISI S-5



Color Code:
BROWN



Ameralloy-5 is formulated primarily for use in pneumatic and shock tools, and well suited to shock resistant parts in which a combination of great ductility and hardness is required. Carbon tool steels under Rockwell C 60 cannot compare in shock resistance to the alloyed grades. Ameralloy-5 is normally oil-quenched, particularly when machining intricate parts using Ameralloy-5. Quenching in water produces satisfactory results, but additional care should be taken if the part has drastic sectional changes or sharp corners.

Typical Analysis

- Carbon .60
- Manganese .85
- Vanadium .25
- Silicon 2.00
- Molybdenum .50

Features And Advantages

- Maximum shock resistance for hardness in the range of Rockwell C 58–60
- Good wear resistance
- Oil and water hardening

Heat Treatment

- **Forging** 1850°–1950°F, stop at 1650°F
- **Annealing** 1450°F, furnace-cool. Brinell 229 max.
- **Hardening** 1600°F, oil-quench or water-quench
- **Tempering** 400°–650°F, average hardness after heat treatment Rockwell C 57–61

Applications

- Asphalt cutters
- Beading tools
- Caulking tools
- Moil points
- Pavement breakers
- Pneumatic chipping chisels
- Punches
- Rivet busters
- Rivet sets
- Shear blades

General Instructions

- **Forging** Heat Ameralloy-5 to 1850°–1950°F and do not forge below 1650°F. Ameralloy-5 is subject to decarburization, and therefore should not be held at the forging temperature longer than necessary. After forging, the steel should be cooled slowly in a heat-insulating material such as dry ashes, dry lime, or vermiculite.

- **Annealing** Pack-annealing in sealed containers using inert material is preferable because of the decarburization tendency of this steel. Otherwise, controlled-atmosphere furnaces may be used. Heat slowly to 1450°F, and hold for 1 hour per inch of greatest thickness. To obtain optimal machining properties, Ameralloy-5 should be cooled slowly to 1000°F. Careful annealing should result in a hardness of Brinell 229 max.

- **Hardening** Ameralloy-5 is primarily an oil hardening grade, However, satisfactory results can be achieved with water-quenching when the design is not too intricate. Hardening temperature for both oil- and water-quenching is 1600°F. Holding time at hardening heat should be just sufficient for uniformity of temperature. Holding time should not exceed 1/2 hour per inch of greatest thickness because of the danger of excessive decarburization. Temper immediately after quenching.

Ameralloy-tested hardness and fracture grain ratings for various oil- and water-quenching temperatures. Specimen size 3/4" dia. x 5".

Quenching Temperature (°F)	OIL-QUENCH		WATER-QUENCH	
	Fracture Grain Size	Rockwell C	Fracture Grain Size	Rockwell C
1450°	8	49	8	51
1500°	9½	55	9	59
1550°	9½	61	9½	64
1600°	9½	64	9½	65
1650°	9	63	9½	65

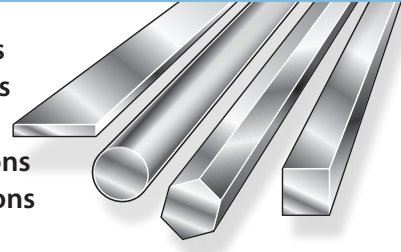
- **Tempering** Temperature should range between 400°–650°F, depending on the service desired. Normal tempering procedure for Ameralloy-5 is to hold at temperature for at least 2 hours per inch of greatest thickness.

Resulting Rockwell hardness for tempering oil- and water-quenched 3/4" dia. specimens at various temperatures

Tempering Temperature (°F)	1600°F Oil-Quench Rockwell C	1600°F Water-Quench Rockwell C
300°	63	63
400°	61	61
500°	60.5	60
600°	59	59
700°	57.5	57.5
800°	53	53.5
900°	51	51
1000°	49	48
1100°	47	45
1200°	40.5	40
1300°	33.5	33

Available Shapes And Sizes

Rounds
Squares
Flats
Octagons
Hexagons
Billets



Standard lengths 10'–12' R/L lengths. Other sizes available upon request. Prompt forging service also available

Rounds Decarb Free Or Hot Rolled Annealed

1/4	1	2	3	4
5/16	1-1/8	2-1/8	3-1/4	4-1/4
3/8	1-1/4	2-1/4	3-1/2	4-1/2
7/16	1-3/8	2-1/2	3-3/4	4-3/4
1/2	1-1/2	2-3/4		5
5/8	1-5/8			5-1/8
3/4	1-3/4			6
7/8	1-7/8			

Squares Octagons

3/8	2	1/4	1
1/2	2-1/2	3/8	1-1/8
5/8	3	7/16	1-1/4
3/4	4	1/2	
1		5/8	
1-1/4		3/4	
1-3/8		7/8	
1-1/2			
1-3/4			

Hexagons Billets

3/8	1	Round
1/2	1-1/8	Cornered
5/8	1-1/4	Square
3/4	1-1/2	4
7/8		6
		8
		10

Flats

3/8	x 2-1/2	x 2-1/2	x 4-1/2	3
x 1	x 3	x 3	x 5	x 4
x 1-1/2	x 4	x 4	x 6	x 4-1/2
x 2	x 5	x 5	2	x 5
x 5	1	x 6	x 2-1/2	x 6
1/2	x 1-1/2	1-1/2	x 3	x 7
x 5/8	x 2	x 2	x 4	x 8
x 1	x 2-1/2	x 2-1/2	x 4-1/2	3-1/2
x 1-1/2	x 3	x 3	x 5	x 4
x 2	x 3-1/2	x 3-1/2	x 6	x 5
x 2-1/2	x 4	x 4	x 8	x 6
x 3	x 4-1/2	x 4-1/2	2-1/2	4
x 6	x 5	x 5	x 3	x 4-1/2
3/4	x 6	x 5-1/2	x 4	x 5
x 1	1-1/4	x 6	x 4-1/2	x 6
x 1-1/2	x 1-1/2	1-3/4	x 5	x 7
x 2	x 2	x 4	x 6	x 8