Monel K-500 Alloy

Introduction

Monel K-500 Alloy is basically a nickel and copper alloy that provides superior resistance to corrosion like Monel 400 and large strength and toughness. Monel k500 alloy has high capacity towards the stress corrosion cracking in the particular conditions. The enhanced features are received with the addition of aluminum and titanium and heating in the restricted environments so that the submicroscopic particles of Ni3, titanium and aluminum are precipitated from the matrix.

Chemical composition % of Monel K-500 Alloy

Ni + Co	C	Mn	Fe	S	Si	Cu	Al	Ti
63	0.25	1.5	2.0	0.01	0.5	27.0 - 33.0	2.30 - 3.15	0.35 - 0.85

Physical properties of Monel K-500 Alloy:

Density	8.44 g/cm3
Melting Range	1315-1350 oC or 2400-2600oF
Modulus of Elasticity,	103 ksi
Tension	26.0
Torsion	9.5
Poisson's Ratio	0.32

The beneficial features of Monel K-500 Alloy are that it is virtually non magnetic at the low temperatures though it is possible to produce the magnetic layer on the surface of material while treatment. Aluminum and copper may be selectively oxidized while heating that leave a highly nickel rich magnetic layer on the material. The effect is certainly evident on the thin wire or strip that possesses large ratio of surface to weight. The magnetic layer can be eradicated by pickling or bright dipping in acid and the non magnetic properties of the material will be restored.

Thermal and electric properties of Monel K-500 Alloy

Temp, oF	Mean Linear Expansion, in/in/oF x 10-6	Thermal Conductivity, Btu-in/h/ft 2/oF	Specific Heat, Btu/lb/oF	Electrical Resistivity, ohm-circ mil/f
-320	6.2	-	-	330.8
-250	6.5	86	0.071	-
-200	6.8	92	0.077	-
-100	7.2	103	0.087	-
70	-	121	0.100	370
200	7.6	136	0.107	372

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The magnetic features of Monel k-500 Aloy are shown as following:

Condition	Tensile Strength, ksi	Permeability	Curie Temperature, °F, for Permeability of 1.01
Annealed, Quenched	92.5	1.0011	-210
Annealed, Age-Hardened	151.0	1.0018	-153
Cold-Drawn 20%	137.0	1.0011	-210
Cold-Drawn 20% and Age Hardened	186.5	1.0019	-130
Cold-Drawn 50%	151.3	1.0010	-210

The combination of minimum magnetic permeability, large firmness and superior resistance to corrosion is considered as a benefit in the various application regions such as oil well surveying device and electronic parts. **Monel K-500 Alloy** comprises of extensively high dimensional consistency in the long time exposure analysis and in cyclic analysis. The outcomes are shown in the below table:

Condition	Length Change, microinch/inch					Cycled
	Aged at 70°F			Aged at 160°F		
	1 Month	3 Months	12 Months	1 Month	3 Months	
Cold-Drawn	0	-5	-5	-	-	-
Cold-Drawn, Aged	-5	-5	-	0	-5	0

This feature of alloy offers several uses in the high accuracy equipments like gyros. The age hardening causes contraction in the initial volume. The contraction in annealed rod of 2.5 x 10-4 in per inch while aging is noticed.

Mechanical Properties of Monel K-500 Alloy

The low room temperature tensile features and toughness are shown in the below table:

Form and Condition	Tensile Strength, ksi	Yield Strength, ksi	Elongation,%	Toughness, Rc
Wire, cold drawn				
Annealed	80-110	35-65	40-20	-
Annealed and Aged	120-150	90-110	30-15	-
Spring Temper	145-190	130-180	5-2	-
Spring Temper, Aged	160-200	140-190	8-3	-
Plate				
Hot-Finished	90-135	40-110	45-20	75B-26C
Hot-Finished, Aged	140-180	100-135	30-20	27-37C
Tube and Pipe, Seamless				
Cold-Drawn, Annealed	90-110	40-65	45-25	90B
Cold-Drawn, Annealed and Aged	130-180	85-120	30-15	24-36C
Cold-Drawn, As-Drawn	110-160	85-140	15-2	95B-32C
Cold-Drawn, As-Drawn, Agedb	140-220	100-200	25-3	27-40C

The approximate relationship between the tensile strength and toughness for rods and forging and similar relationships for the sheet and strip are evaluated. The notch features compared with the materials are shown in the below table:

Monel K-500 Alloy

Sample	Temper	Yield Strength, ksi	Tensile Strength, ksi	NT/TS	Elongation,%	Reduction,%	Hardness,Rc
Rod (25/8-in.Dia.)	Cold-drawn, Annealed & Aged	97.5	185.5	1.22	25	43.0	28
Rod (3 5/8 -in. Dia.)	Hot-Rolled & Aged	119.0	212.0	1.28	22	45.2	32
Rod (3-in. Dia.)	Cold-Drawn & Aged	122.0	215.0	1.34	22	43.2	29
Threaded cap screw	Cold-Drawn & Aged	125.5	205.0	1.21	18	28.5	31
Threaded Stud	Cold-Drawn & Aged	128.0-129.5	232.0- 237.5	1.41-1.43	20-20	42.0- 41.5	33-32

The analysis for hot treated bar were 0.016 inch per minute through the yield strength and 0.026 inch per minute from the point to fracture. The cold treated materials were analyzed at 0.00075 inch per minute.
The effect of temperature on the toughness of hot treated and aged material is described below:

Condition	Hardness, Brinell					
	70oF or (21°C)	700oF or (371°C)	800oF or (427°C)	900°F or (482°C)	1000°F or (538°C)	1100°F or (593°C)
Hot-Finished	241	223	207	201	170	179
Hot-Finished, Aged	331	311	302	293	255	229

The low temperature features of Monel K-500 alloy are exceptional. The tensile and yield strength of alloy K-500 are improved with the decreasing temperature however ductility and hardness are impaired. The ductile to brittle conversion doesn't occur even at low temperatures up to liquid hydrogen point. Therefore it fits best in the various cryogenic operations.
The welds can be developed with strength of age toughened primary metal without significant loss in ductility when age processing is done subsequent to welding of annealing material. The welding of age hardened alloy should be prevented due to huge loss of ductility.

Torsional Properties of Monel K-500 Alloy

The torsional analysis made on the Monel k-500 in the different tempers is shown in the below table:

Condition	Yield Strength, ksi	Elastic Limit, ksi	Angle of Twist, deg/in
Hot-Rolled	27	29	620
Hot-Rolled, Aged	57	67	104
Cold-Drawn	48	55	360
Cold-Drawn, Aged	62	71	76

The analysis is done by using the reduced diameter material that is one inch stick reduced to 0.750 inch diameter in the gauge part. To make the calculation of yield strength and Johnson's apparent elastic limit, it is considered that the shear stress changes from zero at the center of material to the maximum at the outer surface. The tensile and torsional features are provided in the below table:

Monel K-500 Alloy

Form	Condition	Tensile Strength,	Torsional, Breaking Strength,	Ratios Torsional Breaking Strength/ Tensile Strength
Wire	Cold-Drawn 50%	163 ksi	107 ksi	0.657
	Cold-Drawn 50%, Age-Hardened	197 ksi	137 ksi	0.696
Rod	Hot-Rolled	98 ksi	69 ksi	0.704
	Cold-Drawn 20%	134 ksi	80 ksi	0.597

Shear Strength

The shear strength of **Monel K-500 alloy** are shown in the below table:

Condition	Maximum Strength, Ksi	Deflection at Maximum Strength, ksi	Tensile Strength, ksi
Annealed	65.3	0.08	97.5
Annealed, aged	96.5	0.06	147.2
Half-hard, aged	98.8	0.05	155.6
Full-hard	89.5	0.04	151.5
Full-hard, aged	98.5	0.04	168.5

The analysis is made in the double shear on artificial 0.050 x 0.250 inch materials with the cutter set to 0.005 inch clearance. Such kind of test simulates the operation needs of pins that are utilized in shackles or clevises. The following table shows the shear strength of fastened Monel K-500 alloy. It shows that the rivets can be fabricated to develop large strength by the complete heat processing before driving. A negligible cut back in the ratio of shear strength to tensile strength has been noticed with the increased toughness that describes that the extended aging time improves tensile strength quicker than the shear strength of alloy.

Property	Condition				
	As Received	Aged 2 Hours	Aged 4 Hours	Aged 8 Hours	Aged 16 Hours
Shear Stress, ksi	69.3	83.2	85.3	85.0	89.2
Tensile Stress, ksi	107.3	133.0	137.6	-	147.0
Ratio	0.64	0.63	0.62	-	0.61
Hardness, Rc	13	24	26	26	32
Rivets					
Hardness, Rc					
Head	34	40	40	40	40

The thermal treatment that is used to influence the precipitation is known as age toughening or aging. Aging of Monel K-500 is performed for 4 hours at 1080oF to 1100oF subsequent to air quenching that is preferred for cold headed rivets, this processing is sufficient to produce shear strength up to 85 ksi.

Bearing Strength of Monel K-500 Alloy

Condition	Tensile Properties			Bearing Strength		Ratio, Bearing Strength	
	Tensile Strength,ksi	Yield Strength,ksi	Elongation,%	Ultimate Strength, ksi	Yield Strength, ksi	Ultimate Strength	Strength
Annealed	92.2	38.5	49	178	68.8	1.93	1.79
Annealed, Aged	145.5	98.5	31	295	162	2.03	1.65
Hard	145.9	139	5	294	190	1.72	1.37
Hard,Aged	195.5	177	10	358	262	1.83	1.48

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Compressive features of Monel K-500 Alloy

The compressive strength of Monel K-500 alloy is shown as following:

Property	Hot-Rolled		Cold-Drawn	
	Rolled	Aged	Drawn	Aged
Hardness				
Brinell (3000 kg)	165	300	205	330
Rockwell C	5	33	23	35
Vickers (30 kg - Diamond pyramid)	167	316	210	336
Tension				
Tension Tensile Strength, ksi	100	151	106.0	158.0
Yield Strength, ksi	47	111	85.0	120
Compression4				
Yield Strength, ksi	40	121	76.0	121
Yield Strength, ksi	34	96	55.0	102

Impact Strength of Monel K-500 Alloy

Room temperature impact strength of Monel K-500 alloy:

Condition	Test Orientation	Impact Strength, ft-lb
Hot-Finished	Longitudinal	74
	Transverse	51
Hot-Finished, Annealed	Longitudinal	7548
	Transverse	39
Hot-Finished, Aged	Longitudinal	23
	Transverse	25
Hot-Finished, Aged	Longitudinal	20
	Transverse	38
Hot-Finished, Annealed & Aged	Longitudinal	22
	Transverse	40

Fatigue strength of Monel k-500 alloy

The fatigue strength of **Monel k-500 alloy** at the room temperature of different tempers is shown as following:

Form and Condition	Fatigue Strength, ksi	Tensile Strength, ksi
Annealed	38	88
Hot-Rolled	43	99
Hot-Rolled, Aged	51	155
Cold-Drawn	45	120

The material for testing is subjected into alternate back and forth curves as the flat spring, the samples were sliced in the longitudinal direction parallel to the direction of rolling. In the below table the fatigue strength of aged Monel k500 is shown at the temperature of 1000oF.

Condition	Temperature, oF	Fatigue Strength, ksi
Hot-Finished, Aged	80	46.0
	1000	43.0
Cold-Drawn, Aged	80	52.0
	1000	48.0

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The fatigue strength of **Monel k-500 alloy** at the low temperature are shown below:

Temperature, oF	Stress, ksi, for a Fatigue Life of		
	10(5) cycles	10(6) cycles	10 (7) cycles
70	90	55	37
-110	99	67	-
-320	105	69	-
-423	143	101	-

The material utilized in the these analysis were 0.051 in. sheet, cold rolled half hard and aged with the tensile strength about 182.0 ksi. The analysis were done in flexure (R= -1) at 1800 cpm except those at -423oF that were at 3450 cpm. The effect of surface finish on fatigue strength of alloy has been examined. The below table shows the detrimental effects of an oxidized surface:

Condition	Surface Finish	Tensile Strength, Ksi	Fatigue Strength (10-8 cycles), ksi
Hot-Rolled, Aged	Polished	171.0	50.0
	Oxidized	172.0	39.5
Cold-Drawn, Aged	Polished	174.0	57.0
	Oxidized	167.0	39.5

These analysis shows that it is better to employ polished surface for sections that are set into periodic stress. The oxidized surface is created by age hardening in the presence of air. The initial conditions have received equal age hardening process of 1080oF to 1100oF for 16 hours, furnace cooling of 15oF to 25oF per hour to 900oF. Also the analysis from both axial and thoroughly reversed bending was performed to derive the graph, it would be conservative in the pure bending form.

Spring Features of Monel K-500 Alloy

The **Monel k-500 alloy** is utilized for resistance to corrosion springs at the temperature of 500oF. The below table shows stress as following:

Temper and Diameter, in	Method of Coiling	Aging Treatment After Coiling	Maximum Shearing Stress, ksi, for Metal Temperature		
			Up to 400oF	400oF to 450oF	450oF to 500oF
Spring 5/8 and under	Cold	1000°F/10 hr, A.C.	65	65	50
Hot-Rolled 1/2 and over	Hot	1100°F/8 hr, A.C.	65	65	55

The preferred aged processing subsequent to cold coiling at 1000oF for 10 hours or 980oF to 1000oF for 6 hours and then quenching is performed at 900oF at the rate of 15oF to 25oF per hour. The below table shows the effects of heat processing on the springs:

Thermal Treatment after Cold Coiling	Properties of Wires			Fatigue Strength or Stress Range of Springs, ksi (Curvature Correction Factor included)		
				10-6 Cycles	10-7 Cycles	10-8 Cycle
As-Drawn	162.5	106.3	67.5	-	-	-
Stress-Equalized 525°F/3 hr	171.8	107.2	67.5	-	-	-
Aged 980°F/6 hr, plus 900°F/6 hr	197.0	137.2	74.6	55.0	44.0	39.5

The spring is coiled in the standard automatic device, cold treated several times to solid height and heat processed. By following 5 to 6% relaxation for a week, the analysis describes the maximum use of alloy at temperature of 500oF.

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Monel K-500 Alloy for Bolting Purposes

The alloy K-500 is validated by ASME boiler and pressure vessel code for using in the production of bolts.

Microstructure of Monel K-500 Alloy

Monel K-500 alloy is made by adding aluminum and titanium to the prime Monel nickel - copper alloy. The suitable thermal processing prepares the submicroscopic gamma prime precipitated by the matrix.

Corrosion resistance Properties

The resistance to corrosion produced by **Monel K-500 Alloy** is partially equivalent to Monel 400 in the age toughening condition. The Monel k500 wire has higher capacity towards the stress corrosion cracking in the particular conditions.

Monel K500 offers resistance to the sour gas environment. Within six days of continuous immersion in the saturated hydrogen sulfide solutions in the acidic and basic solution in the U bend, age hardening material shows no cracks. The toughness lies between 28 to 40 Rc. The combination of minimum corrosion rate in the high velocity sea water and large firmness make Monel K500 wire highly fit for making shaft of centrifugal pump in the marine applications. The alloy shows stability in the stagnant or slow moving sea water after pitting though this pitting is reduced after quick initial attack. The resistance offered by the alloy K500 and other alloys is attacked by the different corrosive media.

Heating and Pickling of Monel K-500 Alloy

Various kinds of annealing processes are used on Monel K500 solution while annealing. The methods are exclusive in the process and purpose. **Monel K-500 Alloy** is toughened by the formation of submicroscopic particles in the secondary phase.

The production of particles takes place in the solid state reaction in age hardening. Before aging, the alloy is solution annealed to liquefy the phases that can be produced in the alloy while earlier processing. The solution annealing is performed by heating hot finished product to 1800oF and cold processed to 1900oF. To prevent extensive grain development, the temperature period is kept nominal. The heating and cooling period should be kept lower to prevent precipitation.

The quenching after solution annealing is completed by water coolant. The mechanical treatment in manufacturing and after forming **Monel K-500 Alloy** is a moderate process annealing that is necessary to liquefy the alloy. Annealing recrystallizes the alloy and it is conducted at the temperature ranges between 1400oF to 1600oF. The elevated temperature anneals the wire; moderate processing temperature is restricted to prevent the extensive grain development. The temperature time should be kept minimum to prevent the production of secondary phases that can compromise the toughness of aged **Monel K-500 Alloy**. Holding for one hour after the section has obtained the set temperature and similarity is sufficient to melt the wire while treatment. The user should take care that the exposure at the temperature for times more than 1.5 hours is not preferred. The large exposure of wire results in the production of titanium carbide. This consistent compound at aging temperature is employed to toughen the **Monel K-500 Alloy** that titanium cannot participate in hardening reaction, the production of Ni3. The strength and toughness can be limited. It is preferred to avoid the production of titanium carbide phase.

The Federal standard made for **Monel K-500 Alloy** represents only solution annealing. The annealing process remained to the caution of heat treatment. The annealing temperature of alloy is between 1600oF to 1900oF. Therefore in alloy annealed solution of temperature 2050oF, due to presence of titanium carbide, it should be immediately reduced in section thickness prior to final heat processing to meet the particular application criteria.

The annealing temperature is reduced to 1600oF. The material solution annealing at temperature of 2050oF can be aged without more reduction in section thickness and it is acceptable if it fulfills the special requirements like mechanical features.
To get an appropriate aging performance and tenderness, the sufficient water quenching from heating temperature should be done immediately without any delay. Late quenching or slow cooling results in half precipitation of age hardening phase and rapid impairment of aging. Including 2% alcohol to water reduces oxidation and increases pickling. The following age hardening processes are preferred to get the maximum characteristics. The soft metal possessing 75-90 rc hardeness is kept for 16 hours at temperatures to 1100oF to 1125oF then furnace quenching at the rate of 15oF to 25oF per hour to 900oF is done. The quenching at temperature of 900oF to room temperature is done by the furnace or air quenching without considering the rate of quenching.

This process is fit for forging and quenching or annealing or hot treated rods and wider cold treated rods and soften wire and strip. The medium cold treated material of 8-25 Rc is kept for 8 hours or more at temperature of 1100oF to 1125oF then quenching at 900oF at a rate more than 15oF to 25oF per hour is done. More hardness can be achieved by keeping the alloy for 16 hours at the above temperature especially if the alloy is cold treated moderately.

Following the general methods, the alloy with previous hardness of 175 – 200 Brinell is kept for 16 hours. **Monel K-500 Alloy** with 250 brinell hardness should get the complete hardness in eight hours. These methods are applied to the cold drawn rods, half-hard strip, cold-upset pieces and moderate-temper wire. The completely cold treated material with 25-35 Rc hardness is kept for 6 hours or more at temperature between 980oF to 1000oF then quenching up to 900oF at the rate lower than 15oF to 25oF per hour.

In few cases little more hardness can be achieved especially with the alloy having lower edge of hardness by keeping for 8 to 10 hours at the above temperature. This process is best for spring temper strip, spring wire or massive cold treated pieces like small or cold treated balls. The quenching can be performed stepwise of 100oF keeping in the furnace for 4 to 6 hours at every step. The results of furnace quenching on yield strength of cold treated rod are shown in the following table:

Diameter, in.	Tensile strength, ksi	Yield strength, ksi	Elongation %	Reduction area %	Hardness, Rc
3 1/4	156.5	98.0	26	42	29
3	154.0	95.0	24	39	29
3	152.0	96.5	26	46	28
2 3/4	149.0	91.5	26	45	27
2 5/8	156.0	99.0	25	45	29-30
160.5	102.0	26	42	29	
152.0	100.5	26	49	29	
153.0	100.5	26	47	28	
150.0	96.5	26	51	27	

The heat processing period of **Monel K-500 Alloy** is decreased to make the process, cost effective or receive the moderate features. It is tough to make the suggestions that can cover the complete series of possibilities. The best process to make the pilot analysis on material that duplicates the cross section of the sample is hardening. The below table shows the result of short term aging at temperature of 1100oF and 1000oF that can be utilized as a helper:

Monel K-500 Alloy

Condition	Thermal Treatment			Tensile Properties
	Temperature, oF	Time, Hr	Tensile Strength, Ksi	Yield Strength, ksi
Hot treated	1100	2	132	82
Annealed	1100	2	142	90
Rolled 10%	1100	2	155	122

In few cases, it is needed to reduce the heat processing time to make it economical and get the moderate features. It is tough to make certain recommendations that could meet the complete possibilities. The superior method is to perform the tests on alloy material that copies the cross section of the alloy that needs to be toughened.

The material that is heated to get particular length of time in the temperature limit of 1100oF to 1400oF is widely aged to a limit on the base of time and temperature of exposure. The massively aged alloy k-500 possesses minor mechanical characteristics as compare to the completely aged metal and the features cannot be enhanced by immediate aging process. To empower the highly aged material, it is essential to anneal the solution at 1800oF to 1900oF to dissolve the age hardening components and then age again.The following table shows the influence of slight aging of alloy K-500 at temperature of 1000oF to 1100oF:

Condition	Thermal Treatment		Tensile Properties			
	Temp, oF	Time, hours	Tensile Strength, ksi	Yield Strength, ksi	Elongation, %	Toughness, Rc
Rod,	-	0	93	45	44	82
Hot-Rolled	1100	2	132	82	36	17
		4	136	86	34	20
		8	142	90	33	22
Strip,	-	0	100	50	39	85
Annealed	1100	2	142	90	31	24
		4	141	96	27	25
		8	140	98	27	26

The advantages of cold processing disappear while annealing. The maximum strength is received that is based on the annealing and aging condition. The age hardened material produces the maximum toughness that doesn't show significant alteration in the characteristics if it is heated again or kept at temperature that is useful during the initial heat treatments. There might be minor improvement in the characteristics if the quenching rate in the initial heat processing was also between temperatures of 1050oF to 800oF.

If the toughened material is frequently heated at temperature more than 1100oF and then quenched, the obtained characteristics certainly decrease. The hardened **Monel K-500 Alloy** is set into extended and continuous heating at temperature of 800oF. Further the slight aging is done in the first month when the alloy is set open though continued heating doesn't cause any further moderation in the alloy's properties.

The below table shows the typical heat processes of wire:

Heat Processing	Tensile Strength, Ksi	Yield Strength ,Ksi	Elongation	Izod Impact, ft-lb
Hot-Rolled	97.5	40.5	44.0	83
1080°F/16 hr	147.0	92.0	28.0	48
1080°F/16 hr + 800°F/1 month	161.5	109.0	26.0	26
1080°F/16 hr + 800°F/2 months	165.0	112.0	25.0	23
1080°F/16 hr + 800°F/4 months	162.3	109.2	25.5	24
1080°F/16 hr + 800°F/8 months	164.3	113.2	23.1	27

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Fabrication of Monel K-500 Alloy

Monel K-500 Alloy is easily fabricable by following the common industrial methods. In the hot processing, providing the complete temperature for deformation is an essential factor in receiving the hot malleability. The highest preferable heating temperature for hot processing of **Monel K-500 Alloy** is 2100oF. The alloy should be set into hot furnace and taken back when it's all sections are equally heated.

The extended absorption at this temperature is risky. If it gets late then the material should be set into extended absorption while the temperature should be set at 1900oF as long as the metal is ready to use for particular purpose and then brought at temperature of 2100oF. When all parts of metal are equally heated it should be taken out from the furnace. In case of large delay, the process should be discarded from the furnace and quenched by water.

The hot processing temperature is between 1600oF to 2100oF and the massive processing is excellently performed at temperature between 1900oF to 2100oF though the processing at temperature lower than 1600oF is not suitable. To develop the fine grain in forging, the eventual heating temperature is set at 2100oF and minimum 30% reduction area is obtained in the final forging process.

During hot processing, or when it is essential for **Monel K-500 Alloy,** it is quenched before further hot processing; it should not be quenched in air but at temperature about 1450o or more. If the alloy is cooled down slightly its heat processing is done by some limit and stress established may cause thermal tearing while reheating of alloy.

Moreover the material cooling provides better response to age toughening because more age hardening components are required for processing. The material surface is oxidized to slight extent and it can be pickled easily if it is water cooled consisting of 2% of alcohol.

Cold Processing of Monel K-500 Alloy

For cold processing of **Monel K-500 Alloy**, the traditional methods are followed. Though the alloy needs an adequate power for formation, it offers superior ductility. The increased hardness is obtained by Monel k – 500 alloy with wider cold processing as compare to other metal alloys.

Machining of Monel K-500 Alloy

The heavy machining of **Monel K-500 Alloy** is completed in the best manner when it is in the annealed form or hot processed and cooled. The age hardened material is finish machined to conceal the lenience and for better finishes of alloy. The machining of alloy is done little oversize, age hardening and then end size. While aging, slight persistent contraction is obtained and minor warpage occurs due to reduced temperature and slow quenching rates of **Monel K-500 Alloy** that can be connected by following the traditional methods.

Welding of Monel K-500 Alloy

Welding of **Monel K-500 Alloy** is superiorly done by the gas tungsten arc welding method. The Monel filler metal 60 is basically utilized. Though the wedlments are not age hardenable and don't possess the comparative strength of hardened base metal. The weldments need strength just like the aged base metal that should be deposited with the filler metal consisting of similar constituents.

Applications of Monel K-500 alloy

The range of applications for **Monel K-500 Alloy** are chain, cable, fasteners and spring in the sea applications, pump and valve components for the chemical treatment, medical blades and scrap for the pulp treatment in the paper industry, oil well drill collars and devices, pump shafts and impellers and non magnetic operations, secure lifting and valves for oil and gas generation and sensing device and other electronic components.

Monel K-500 Product Forms Available:

Wire, Wiremesh Screen, Strip, Sheet, Rod, Pipe, Bar, Tubing, Plate, Ribbon, Tape

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