



## HOME

**C.P.FASTENERS** established in 1995 , promoters of **STAINLESS STEEL FASTENERS** in Gujarat , has pioneered the Manufacturing Marketing of S.S. Fastener by revolutionizing the World of Fixing Solutions creating Rust Free Fixings to resolve the Corrosion Issues in India .

**C.P.FASTENERS** , a DSA ( Direct Selling Agent ) to Top Niche Fastener Manufacturers in India , who are also Golbal Players .

Our company Boasts of Huge Stock of Stainless Steel Fasteners in all Grades , Standardized Quality & Excellent Finish .

Stringent Quality Control, Precision modules , Wide Range of Fasteners accompanied by Varied Grades availability in Ready Stock is a Part of our Establishment catered by Highly Competent Handling Team has made **C.P.Fasteners** a separate entity in itself .

**C.P.FASTENERS** is specialized in the marketing , supply & Stockists of Austenitic grade of stainless steel fastener products of flawless quality.

## ABOUT US :

# BRIEF HISTORY OF OUR COMPANY

**C.P.FASTENERS** WAS FOUNDED IN 1995 IN AHMEDABAD , GUJARAT .

**WE** ARE A MARKETING FIRM INVOLVED IN TRADING OF S.S FASTENERS FOR LAST 15 YEARS AND MANUFACTURING BIGGER DIA BOLTS , STUDS & SPECIAL TAILOR MADE JOBS AS PER CLIENT'S DRAWING AND SAMPLES .

**WE** HAVE EXTENSIVE INVENTORY WHICH INCLUDES STAINLESS STEEL FASTENERS IN VARIOUS GRADES . WE HAVE SEGREGATED OUR INFRASTRUCTURE IN VARIOUS UNITS SUCH AS MANUFACTURING UNIT , QUALITY CONTROL UNIT , PACKAGING UNIT , MARKETING DIVISION WITH RIGHT COMBINATION OF EXPERIENCED MANPOWER & QUALITY CONTROL TO MEET THE EVER INCREASING DEMANDS OF MARKETS.

**WE ARE** CATERING TO THE DOMESTIC MARKET WHICH INCLUDES DEALERS , SUB - DEALERS AND ORIGINAL EQUIPMENT MANUFACTURERS .

**WE** HAVE A HUGE STOCK OF VARIOUS FASTENERS LIKE HEXAGONAL HEADED BOLTS , NUTS , WASHERS , SPRING WASHERS , VARIOUS KINDS OF SCREWS ( I.e ROUND HEAD , C.S.K HEAD , PHILLIPS HEAD , PAN PHILLIPS HEAD , SHEET METALS Etc. ) IN 304 & 316 GRADES .

**WE ARE DEALERS AND STOCKIST OF INDIA'S LARGEST** STAINLESS STEEL FASTENER MANUFACTURER , CATERING TO THE NEEDS OF MORE THAN 1000 WELL SATISFIED CUSTOMERS ALL OVER INDIA . **OUR PRIDE IS OUR SUPPLIER , OUR STOCK AND OUR ABILITY TO SERVE THE CUSTOMERS BY SUPPLYING 90% MATERIAL OFF THE SHELF .**



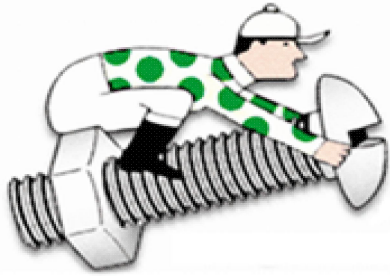
## OUR O.E.M USERS INCLUDE :

- \* PHARMACEUTICAL MACHINERY MANUFACTURERS
- \* CHEMICAL PLANTS MACHINERY MANUFACTURERS / CHEMICAL MANUF.
- \* FOOD PROCESSING MACHINERY MANUFACTURERS
- \* TELECOMMUNICATION INDUSTRY
- \* RAIL COACH / MARINE / OFFSHORE MARINE EQUIPMENT MANUFACTURERS
- \* DEFENSE EQUIPMENT / AERONAUTICAL EQUIPMENT MANUFACTURERS



### QUALITY CONTROL :

C.P.Fasteners stocks quality S.S. BOLTS , SS NUTS , SS Machine Screws,  
Sheet Metal Screws, ALLEN Cap Screws and Washers.



**In the race for business, the stakes are high.**

**Depend upon C.P. Fasteners to achieve your winning edge!**



**C.P.FASTENERS** IS DEDICATED TO SUPPLYING PRECISION QUALITY STANDARD & CUSTOM MADE FASTENERS THAT YOU CAN DEPEND ON .

WE HAVE INGRAINED THE QUALITY CONTROL IN OUR MANUFACTURING & DISTRIBUTION SYSTEM WHICH INCLUDES CLOSE MONITORING OF VARIOUS DIMENSIONS - PHYSICAL , CHEMICAL AND IS / DIN STANDARDS .

OUR QUALITY CONTROL AUDITORS INCLUDE OUR INTERNAL TEAM AND EXTERNAL - ISO APPROVED QUALITY TEST LABORATORIES TO KEEP A CLOSE CHECK ON ALL REQUIRED DIMENSIONS OF FASTENERS.



## OUR MISSION

We are conscious that the *fasteners* are a vital element in mechanical structures.

***We pursue quality assurance as our most important mission.***

Believing that profit is a by-product of *our* customer's trust in *our* products, each of *our* employees gives his all each day to meet the needs of the *fastener* industry.

***Our mission is to offer a high level support and service to customers through a wide product range along with efficient correspondence, superior quality, reliable delivery performance and competitive pricing.***



## OUR VISION

***Interfacing with changing requirements and trends in the market, we market a Bespoke range of products like Stainless Steel Fasteners, Nuts and Bolts .***

Realizing *the* pivotal role played by *our marketing* division, in echoing *the* quality of products, we have modified *our business* policies while streamlining *our vision* , ...

Using this broad expertise **C.P.FASTENERS** puts commitment into practice and delivers world class services and innovative, Cost effective Product Solutions.

Building on this strong platform **C.P.FASTENERS** is actively expanding its footprint and services to a global scale, thus responding to our Customer Needs with regard to localization in the emerging markets , exposing the S.S. BOLTS & NUTS to the various Domestic & Global Users .



## PRODUCT RANGE

WE HAVE A VARIED RANGE OF *SS FASTENERS* IN METRIC STANDARD & INCH STANDARD. SMALLER DIAMETRE RANGE IS AVAILABLE IN *COLD FORGED QUALITY* , NOT WITHSTANDING THE FACT THAT IT IS MUCH BETTER QUALITY AS COMPARED TO *HOT FORGED FASTENERS* AVAILABLE WITH US IN LARGER DIAMETRE

THE PRODUCTS WE HAVE OFFERED ARE BY NO MEANS COMPREHENSIVE AND WE ALWAYS KEEN TO ADD MORE PRODUCTS .

APART FROM THIS , SOME OF THE PRODUCTS THAT ARE REGULARLY SERVICED AND ARE ALWAYS IN STOCK WITH US ARE :



## PRODUCT GALLERY INCLUDES



## STAINLESS STEEL 304 GRADE / SS 316 GRADE

- \* **SS HEX BOLTS**
- \* **SS HEX NUTS**
- \* **SS PLAIN WASHERS : ( THIN & THICK )**
- \* **SS SPRING WASHERS [ FLAT SECTION SPRING WASHERS / SQUARE SECTION SPRING WASHERS ]**
- \* **SS ROUND HEAD SCREWS - S.S. CHEESE HEAD SCREWS - S.S. COUNTERSUNK SCREWS**
- \* **SS ALLEN SOCKET HEAD CAP SCREW / SS ALLEN CAP SCREWS / SS ALLEN BOLTS**
- \* **SS ALLEN SOCKET C.S.K HEAD SCREW / SS ALLEN CSK SCREWS**
- \* **SS GRUB SCREWS**
- \* **SS DOME NUTS - SS SQUARE NUTS , SS NYLOCK NUTS , SS WING NUTS , SS FLANGE NUTS , SS WELD NUTS**
- \* **SS COTTER PIN & SS R - PINS**
- \* **SS FULLY THREADED BARS / SS HALF THREAD STUDS - PARTIALLY THREADED STUDS / S.S. F/T STUDS / SS STUDS**
- \* **SS SELF TAPPING SCREWS : SS CSK SLOTTED S/T SCREWS/ SS PAN SLOTTED S/T SCREWS**
- \* **SS SELF TAPPING SCREWS : SS CSK PHILLIPS S/T SCREWS/ SS PAN PHILLIPS S/T SCREWS**
- \* **SS MUSHROOM HEAD SCREWS .**
- \* **SS HEX BOLTS UPTO 56 MM DIA & 600 MM LENGTH .**
- \* **SS ANCHOR FASTENERS**



## Committed to quality.....

**C.P.FASTENERS** a one stop source catering to the S.S. FASTENERS related needs of diverse industrial segments.

Our Goal is to solidify our Goodwill amidst the Prestigious Manufacturers & suppliers fulfilling their daily needs & meeting their fixing problems with supplies of High Standard S.S. Fasteners for accuracy and perfection.

Our long list of satisfied clients, comprising some big names like L & T , ABG SHIPYARD , KEMROCK INDUSTRIES , ABENGOA and many more. These Big Industries bespeak of our quality & service & is a great achievement of our company, which we endeavor to Maintain in the long run.

## Why us?

Standard & Genuine Quality

Huge Ready Stock

Competitive Pricing

Wide Networking enabling quick , safe & timely delivery of Ordered Goods .

Bulk Quantity Supply Competence .

## Resources

We are backed with all the major resources , Co-operation , immense support required for the delivery and procurement of finest quality SS Fasteners to our Channel Partners .

We have a competent team of efficient Supervisors , Stores Managers & Marketing Executives to ensure the specific needs of the clients to provide well satisfied timely & quality products at most affordable rates .

## Quality Assurance

We believe in supplying superior quality products without compromising on Grades or Dimensions for the esteemed clients .

We provide MTC , Packing List , with Weight , Quantity & Brand Of Fasteners supplied to our Clients .

## CLIENTELE

With experience of over 2 decades in the field of SSFASTENERS , We have a long list of Reputed Industries as our Clients who are not alone well satisfied , but support our cause of Quality supplies by being our Loyal Patrons .



## PRODUCT RANGE

### SS HEX BOLTS



- # SS HEX BOLTS ARE AVAILABLE IN SS 304 , SS 316 & SS 202 GRADES .
- # SS HEX HEAD BOLTS ARE AVAILABLE IN MM & INCH SERIES
- # S.S. BOLTS ARE AVAILABLE IN FULL THREAD & PARTIAL / HAL THREADS .
- # S.S. BOLTS ARE AVAILABLE IN COLD FORGED QUALITY FROM : 3MM TO 24 MM Dia.
- # SS BOLTS ARE AVAILABLE IN HOT FORGED QUALITY FROM : 20MM TO 90 MM Dia.
- # SS BOLTS RANGE FROM 3MM TO 90 MM DIAMETER & UP TO 1000 MM LENGTH IN MILLIMETER SERIES .
- # SS BOLTS RANGE FROM 1/8" TO 3" DIAMETER & UP TO 40" LENGTH IN B.S.W SERIES .



### SS HEX NUTS



- # SS HEX NUTS ARE AVAILABLE IN SS 304 , SS 316 & SS 202 GRADES .
- # SS NUTS ARE AVAILABLE IN MM & INCH SERIES
- # S.S. NUTS ARE AVAILABLE IN VARIOUS TYPES .
- # S.S. HEX NUTS AS PER DIN 934 & BS 1083
- # S.S. NYLOCK NUTS AS PER DIN 982 & DIN 985
- # S.S. DOME NUTS AS PER DIN 1587
- # S.S. HEX LOCK NUTS AS PER DIN 439
- # S.S. FLANGE NUTS AS PER DIN 6923
- # S.S. NUTS ARE AVAILABLE IN COLD FORGED QUALITY FROM : 3MM TO 24 MM Dia.
- # SS NUTS ARE AVAILABLE IN HOT FORGED QUALITY FROM : 20MM TO 90 MM Dia.



## SS PLAIN WASHERS

- # SS PLAIN WASHERS ARE AVAILABLE IN SS 304 , SS 316 & SS 202 GRADES .
- # SS PLAIN WASHERS ARE AVAILABLE IN VARIOUS THICKNESS .
- # S.S. PLAIN WASHERS ARE AVAILABLE IN VARIOUS GUAGES [ 10 Guage , 12 Guage , 14 Guage , 20 Guage , 22 Guage ]
- # S.S. PLAIN WASHERS AVAILABLE IN RANGE FROM : 2MM TO 56 MM .
- # SS WASHERS ARE AVAILABLE IN TAILOR MADE SIZES AS PER CLIENT REQUIREMENTS .



## SS SPRING WASHERS

- # SS SPRING WASHERS ARE AVAILABLE IN SS 304 , SS 316 & SS 202 GRADES .
- # SS SPRING WASHERS ARE AVAILABLE IN FLAT SECTION & SQUARE SECTION .
- # S.S. SPRING WASHERS IN VARIOUS GUAGES [ 10 Guage , 12 Guage , 14 Guage ]



## SS ALLEN CAP SCREWS

- # SS ALLEN CAP SCREWS ARE AVAILABLE IN SS 304 , SS 316 & SS 202 GRADES .
- # SS ALLEN CAP SCREWS ARE AVAILABLE IN MM & INCH SERIES
- # S.S. ALLEN CAP SCREWS ARE AVAILABLE IN FULL THREAD & PARTIAL / HAL THREADS .
- # S.S. ALLEN CAPS ARE AVAILABLE IN COLD FORGED QUALITY FROM : 6MM TO 16 MM Dia.
- # SS ALLEN CAPS ARE AVAILABLE IN HOT FORGED QUALITY FROM : 18MM TO 39 MM Dia.
- # SS ALLEN CAP SCREWS ARE ALSO KNOWN AS SS ALLEN SOCKET HEAD CAP SCREWS / SS LN CAP SCREWS





## SS ALLEN CSK SCREWS

- # SS ALLEN CSK SCREWS ARE AVAILABLE IN SS 304 , SS 316 & SS 202 GRADES .
- # SS ALLEN CSK SCREWS ARE AVAILABLE IN MM & INCH SERIES
- # S.S. ALLEN CSK SCREWS ARE AVAILABLE IN FULL THREAD & PARTIAL / HAL THREADS .
- # S.S. ALLEN CSK ARE AVAILABLE IN COLD FORGED QUALITY FROM : 6MM TO 16 MM Dia.
- # SS ALLEN CSK ARE AVAILABLE IN HOT FORGED QUALITY FROM : 18MM TO 39 MM Dia.
- # SS ALLEN CSK SCREWS ARE ALSO KNOWN AS SS ALLEN SOCKET COUNTER SUNK SCREWS / SS LN CSK SCREWS .



## SS MACHINE SCREWS

- # SS MACHINE SCREWS ARE AVAILABLE IN SS 304 , SS 316 & SS 202 GRADES .
- # SS MACHINE SCREWS ARE AVAILABLE IN MM & INCH SERIES .
- # S.S. MACHINE SCREWS ARE AVAILABLE IN VARIOUS HEADS & PUNCHES .
- # S.S. MACHINE ARE AVAILABLE IN COLD FORGED QUALITY FROM : 3MM TO 12 MM Dia.
- # S.S. MACHINE ARE AVAILABLE IN COLD FORGED QUALITY FROM : 5/32" TO 3/8" Dia.
- # SS MACHINE SCREWS INCLUDE : SS CHEESE HEAD SCREWS / CHEESE HEAD SLOTTED M/c SCREWS
- # SS MACHINE SCREWS INCLUDE : SS CSK HEAD SCREWS / CSK HEAD SLOTTED M/c SCREWS
- # SS MACHINE SCREWS INCLUDE : SS ROUND HEAD SCREWS / ROUND HEAD SLOTTED M/c SCREWS
- # SS MACHINE SCREWS INCLUDE : SS PAN HEAD SLOTTED SCREWS / PAN PHILLIPS M/c SCREWS
- # SS MACHINE SCREWS INCLUDE : SS CSK PHILLIPS MACHINE SCREWS / CSK PHILLIPS M/c SCREWS



## SS STUDS

- # SS STUDS ARE AVAILABLE IN SS 304 , SS 316 & SS 202 GRADES .
- # SS STUDS ARE AVAILABLE IN MM & INCH SERIES
- # S.S. STUDS ARE AVAILABLE IN FULL THREAD & PARTIAL / HAL THREADS .
- # S.S. STUDS ARE AVAILABLE IN DIAMETER RANGING FROM : 3MM TO 90 MM
- # S.S. STUDS ARE AVAILABLE IN DIAMETER RANGING FROM : 3/16" TO 3"
- # SS STUDS ARE AVAILABLE IN LEGTHS UPTO 3 Mtrs.



## MANUFACTURING PROCESS

### *COLD FORMING OR COLD FORGING OR COLD WORKING*

**HERE** THE FASTENERS ARE MANUFACTURED WITHOUT HEATING DIRECTLY FROM THE AVAILABLE ANNEALED COILS ON THE HEADER MACHINE . INITIALLY THE RIVETS ARE FORMED AND THEN THE WOLE LOT OF RIVETS ARE GATHERED IN A HEX TRIMMING MACHINE HOPPER , WHEREBY THE RIVETS ARE GUIDED INTO THE TRIMMING DIES VIA CONVEYER BELT . ONCE THE BOLTS ARE TRIMMED THEY ARE THREADED ON THREAD ROLLERS & THEN DRUM POLISHED . NO WHERE HEATING IS REQUIRED & THERE FORE IT IS KNOWN AS COLD FORGED PROCESS . THE FINISH OF COLD FORGED QUALITY FASTENERS IS MUCH SUPERIOR TO HOT FORGED QUALITY .

### *HOT FORMING OR HOT FORGING OR HOT WORKING*

WHEN THE FASTENERS ARE PRODUCED BY HEATING ( ROUNDS CUT TO REQUIRED LENGTHS ) THE TOP PORTION I.e ONLY THE PORTION REQUIRED TO FORM THE HEAD & ACHIEVING THE THE DESIRED HEAD AGAINST THE VARIOUS DIES BY FORGING ON AN UP - STROKE FORGING PRESS WITHOUT DISTRUBING THE CRYSTALLIZATION OF RAW - MATERIAL BOND IS KNOWN AS HOT FORGING PROCESS .

ON ANNEALING THESE BOLTS THERE IS AN INCREASE IN THE TENSILE STRENGTH AND DECREASE IN THE DUCTILITY OF THE FASTENERS .



## TECHNICAL SPECIFICATIONS

THE BOOKLET OF TECHNICAL SPECIFICATIONS AS DIN 931 & DIN 933 IS ENCLOSED

## MINI - ENCYCLOPEDIA OF STAINLESS STEEL

### AUSTENITIC

REFERS TO 300 SERIES STAINLESS, THE MOST POPULAR OF STAINLESS ALLOYS ACCOUNTING FOR 85 - 90% OF STAINLESS FASTENERS SOLD, NAMED AFTER SIR ROBERT WILLIAMS AUSTEN, AN ENGLISH METALLURGIST, AUSTENITIC STEEL IS A CRYSTAL STRUCTURE FORMED BY HEATING STEEL, CHROMIUM AND NICKEL TO A HIGH TEMPERATURE WHERE IT FORMS THE CHARACTERISTICS OF 300 SERIES STAINLESS STEEL. AN AUSTENITE IS A MOLECULAR STRUCTURE WHERE 8 ATOMS OF IRON SURROUND ONE ATOM OF CARBON, THUS LIMITING THE CORROSIVE EFFECTS OF CARBON.

AUSTENITIC FASTENERS GAVE HIGH LEVEL OF CORROSION RESISTANCE IN THE STAINLESS STEEL FAMILY, CANNOT BE HARDENED BY HEAT TREATMENT AND ARE ALMOST ALWAYS NON - MAGNETIC. SOMETIMES HEAT AND FRICTION IN COLD FORMING CAN CAUSE AUSTENITIC STAINLESS TO TAKE SLIGHT MAGNETISM, BUT THE CORROSION RESISTANT PROPERTIES REMAIN THE SAME. MOST COMMONLY USED GRADE IS TERMED AS SS 304 GRADE.

### TYPICAL INDUSTRIES USING 304 GRADE FASTENERS INCLUDE :

1	FOOD INDUSTRY	2	DAIRY INDUSTRY	3	WINE BREWERIES
4	CHEMICAL INDY.	5	PULP & PAPER	6	PHARMACEUTICAL
7	SHIPS & BOATS	8	SWIMMING POOL	9	POLLUTION CONTROL
10	ELECTRONICS	11	COMPUTERS	12	MEDICAL & HOSPITAL
13	TEXTILES	14	FURNACES	15	ELECTRICALS



**TYPE 316 STAINLESS HAS ADDED NICKEL AND ADDED MOLYBDENUM . THE MOLYBDENUM ( CALLED MOLY ) INCREASES CORROSION RESISTANCE TO CHLORIDES AND SULFATES, INCLDGS.SULFUROUS ACIDS IN PULP INDUSTRIES . IT HAS SUPERIOR TENSILE STRENGTH AT HIGHER TEMPERATURES COMPARED TO 304 , BESIDES PULP AND PAPER , TYPICAL INDUSTRIES USING 316 ARE LISTED BELOW :**



**TYPICAL INDUSTRIES USING 316 GRADE FASTENERS**

1	CHEMICAL PLANTS	2	TEXTILE INDUSTRY	3	INK & BLEACH
4	SHIPS & RELATED	5	ACID PLANTS	6	PHOTOGRAPHIC INDYS.
7	RUBBER INDYS				

**CARBIDE P RECIPITATION**

*C ARBON THAT BREAKS LOOSE FROM ITS BOND WITHIN THE STAINLESS SOLUTION WHEN MATERIAL IS HEATED BETWEEN 800 - 1400 DEGREES. UNDER SEVERE CONDITIONS , IT CAN RESULT IN EXTRA OXIDATION AND SURFACE CORRSION .*

**CARBON**

*A DDS STRENGTH TO STAINLESS STEEL , BUT ALSO LOWERS CORROSION RESISTANCE . THE MORE CARBON THERE IS , THE MORE CHROMIUM BE ADDED , BECAUSE CARBON OFFSETS 17 TIMES ITS OWN WEIGHT IN CHROMIUM TO FORM CARBIDES , THUS REDUCING CHROMIUM AVAILABLE FOR RESISTING CORROSION .*

**CHROMIUM**

*A BLUE WHITE METAL , CHROMIUM IS THE MOST IMPORTANT ELEMENT PROVIDING CORROSION RESISTANCE IN STAINLESS STEEL . BY ADDING 12% CHROMIUM TO ORDINARY STEEL , STAINLESS STEEL IS FORMED . CHROMIUM OFFSETS THE CORROSIVE EFFECTS OF CARBON FOUND IN STEEL AND IS THE PRIMARY FACTOR IN THE ABILITY OF STAINLESS TO FORM PASSIVE FILM ON IT'S SURFACE PROVIDING CORROSION RESISTANCE .*

**CREEP S TRENGTH**



*A MEASURE OF THE RESISTANCE OF FASTENERS TO STRESS UNDER ELEVATED TEMPERATURES. AT HIGHER TEMPERATURES , A FASTENER CAN CHANGE IN DIMENSION UNDER THE SAME LOAD , & IS CALLED CREEP .*

*CREEP CAN CAUSE THE LOOSENING OF FASTENERS AS TEMPERATURE INCREASES .*

## DISCONTINUITIES

*A VARIETY OF SMALL OR LARGE DISFIGURATIONS IN A FASTENER SUCH AS PITS , TOOLMARKS , VOIDS , LAPS , FOLDS AND SEAMS AND INCLUSIONS .*

*MINOR DISCONTINUITIES ARE PERMISSIBLE IN BOTH COMMERCIAL AS WELL AS SPECIAL TAILORMADE FASTENERS AND THOSE MADE TO VARIOUS SPECS .*

## DRAWING

*WHERE RAW - MATERIAL SHAPED LIKE WIRE IS PULLED THROUGH A DIE TO REDUCE ITS DIAMETER TO THAT NEEDED FOR PARTICULAR FASTENER BEING MANUFACTURED .*

## DUCTILITY

*THE ABILITY OF A FASTENER TO DEFORM BEFORE BREAKING ( FOR EXAMPLE AN ELASTIC WOULD BE MORE DUCTILE THAN DIAMOND ) .*

*DUCTILITY IS A MEASUREMENT SIMILAR TO ELONGATION .*

## ELONGATION

*STRETCHING A FASTENER TO THE POINT THAT IT BREAKS . THE PERCENTAGE ELONGATION AT RUPTURE ( SAME AS MEASURE OF DUCTILITY ) IS DETERMINED BY DIVIDING THE TOTAL LENGTH AFTER STRETCHING TO THE ORIGINAL LENGTH. ELONGATION DECREASES AS THE STRENGTH AND HARDNESS INCREASES .*

## MAGNETISM



*A S RELATED TO STAINLESS STEEL FASTENERS , 300 SERIES STAINLESS IS NON MAGNETIC IN TIS RAW MATERIAL CONDITION . COLD WORKING CAN SOMETIMES INDUCE TRACES OF MAGNETISM IN 300 SERIES , DEPENDING ON THE SEVERITY OF COLD WORKING AND CHEMICAL COMPOSITION OF STAINLESS . A RISE IN MAGNETISM IS RELATED TO INCREASE IN TENSILE STRENGTH AND WORK HARDENING CAUSED BY THE HEAT AND FRICTION OF COLD FORMING AND DOES NOT REDUCE CORROSION RESISTANCE OR CAUSE ANY MOLECULAR CHANGE IN AUSTENITIC RAW - MATERIAL .*

*A HIGHER PORTION OF NICKEL CAN INCREASE STABILITY IN STAINLESS , THUS DECREASING WORK HARDENING AND ANY POSSIBILITIES OF MAGNETISM . MANY STAINLESS SPECS ALLOW 2.0 MAGNETIC PERMEABILITY WHICH TRANSLATES TO LOW / MEDIUM MAGNETISM .*

### **MANGANESE**

*A NON - MAGNETIC METAL WHICH IMPROVES STRENGTH AND HARDNESS .*

### **MOLYBDENUM**

*N ICKNAMED MOLY , MOLYBDENUM IS A METAL ADDED TO 316 STAINLESS STEEL , SHARPLY INCREASING CORROSION RESISTANCE TO CHLORIDES AND SULFATES , ESPECIALLY VARIOUS SULFUROUS ACIDS IN THE PULP INDUSTRY . MOLYBDENUM HELPS REDUCE HARDNESS AND INCREASES TENSILE STRENGTH AT HIGHER TEMPERATURES .*

### **NICKEL**

*A METAL ADDED TO 300 SERIES STAINLESS TO PROVIDE CORROSION RESISTANCE , INCREASED STRENGTH IN BOTH HIGH AND LOW TEMPERATURES AND INCREASED TOUGHNESS IN LOW TEMPERATURES . NICKEL LOWER THE EFFECTS OF WORK HARDENING , THUS REDUCING TRACES OF MAGNETISM CAUSED BY COLD FORMING AND MAKING MATERIAL FLOW MORE FREELY IN MANUFACTURING .*

### **P ASSIVATING**

*T ECHNICALLY , PASSIVATING IS THE PROCESS OF DIPPING FASTENERS INTO NITRIC-ACID SOLUTION*



*TO RAPIDLY FORM CHROMIUM OXIDE ON THE SURFACE OF THE MATERIAL , CREATING A PASSIVE FILM THAT PROTECTS STAINLESS FROM FURTHER OXIDATION . THE PURPOSE OF PASSIVATION IS TO REMOVE BOTH GREASE LEFT FROM MANUFACTURING AND TRACES OF STEEL PARTICLES WHICH MAY HAVE RUBBED OFF MANUFACTURING TOOLS ON TO THE FASTENERS .*



## **PASSIVE FILM**

*THE MAJOR CHARACTERISTIC OF STAINLESS IS ITS ABILITY TO FORM A THIN LAYER OF PROTECTION CALLED PASSIVE FILM ON ITS OUTSIDE SURFACE . THIS FILM RESULTS FROM A CONTINUAL PROCESS OF LOW OXIDATION , SO OXYGEN FROM THE ATMOSPHERE IS NEEDED FOR THE PASSIVE FILM TO EXIST . ONCE FORMED IT PREVENTS FURTHER OXIDATION OR CORROSION FROM OCCURRING . EVEN IF CHIPPED OR SCRATCHED , A NEW PASSIVE FILM ON STAINLESS WILL FORM.*



## **PROOF LOAD**

*A TEST LOAD THAT A FASTENER MUST UNDERGO WITHOUT SHOWING SIGNIFICANT DEFORMATION . IT IS USUALLY 90% OF THE YIELD STRENGTH .*

## **TENSILE STRENGTH**

*A COMMON MEASURE TO COMPARE THE STRENGTH OF A FASTENER . IT IS THE LOAD NEEDED TO PULL THE FASTENER APART .*

## **YIELD STRENGTH**

*THE AMOUNT OF PRESSURE REQUIRED TO CAUSE PERMANENT DEFORMITY .*

## **TORQUE OR TORSION STRENGTH**

*TORQUE IS THE FORCE USED IN TWISTING, SUCH AS TIGHTENING A FASTENER. TORSION STRENGTH IS THE AMOUNT OF FORCE NEEDED TO TWIST A FASTENER APART . BOTH MEASURES CONSIDER THE AMOUNT OF PRESSURE APPLIED TO THE FASTENER AND THE LENGTH OF THE WRENCH USED IN THE APPLICATION .*



## **STAINLESS STEEL**

**WITH THE ADDITION OF 12% CHROMIUM TO IRON, STAINLESS STEEL IS FORMED. THE CHROMIUM PROTECTS THE IRON AGAINST MOST CORROSION OR RED COLOUR RUST, THUS THE TERM STAINLESS STEEL. THE ABILITY OF STAINLESS TO FORM A THIN LAYER OF PROTECTION ON ITS OUTSIDE SURFACE, CALLED A " PASSIVE FILM ", IS ITS MOST IMPORTANT CHARACTERISTICS IN PREVENTING CORROSION.**

**THE OVERRIDING PURPOSE OF STAINLESS STEEL IS TO PROVIDE CORROSION RESISTANCE AGAINST ( a ) ATMOSPHERIC CONDITIONS SUCH AS CARBON DIOXIDE , MOISTURE , ELECTRICALS FIELDS , SULFUR , SALT AND CHLORIDES COMPOUNDS ( b ) NATURAL AND ARTIFICIALLY PRODUCED CHEMICALS ( c ) EXTREME WHETHER WHERE COLD TEMPERATURES CAUSE BRITTLENESS AND HOT TEMPERATURES REDUCE STRENGTH AND INCREASE CORROSION.**



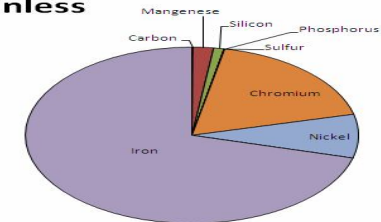
## CHEMICAL COMPOSITION OF S.S FASTENERS

( %VALUES IN MAX.UNLESS OTHERWISE STATED )

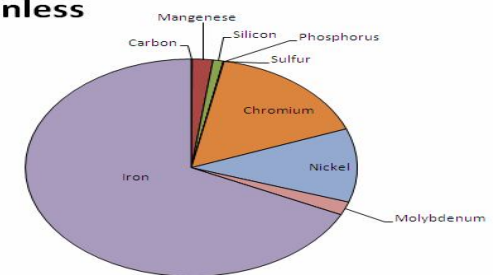
Elements	C%	Si%	Mn%	P%	S%	Cr%	Mo%	Ni%
A2 ( 304 )	0.080	1.000	2.000	0.045	0.030	18 - 20	NIL	8 - 10%
A4 ( 316 )	0.080	1.000	2.000	0.045	0.030	16 - 18	2 - 3%	10 - 14%

**ALL DIMENSIONAL , MECHANICAL AND CHEMICAL PROPERTIES ARE AS PER SPECIFIED STANDARDS . THE DESIGNATION SYSTEM COMPLY WITH ' I S O ' 3506 STANDARD . A270 DONATES A = AUSTENITIC CHROMIUM - NICKEL STEEL , 2 = COLD HEADING STEEL ALLOYED WITH CHROMIUM AND NICKEL NORMALLY CALLED AS 304 GRADE . 4 = COLD HEADING STEEL ALLOYED WITH CHROMIUM , NICKEL AND MOLYBDENUM . 70 = PROPERTY CLASS , ie : TENSILE STRENGTH WHICH IS 10 TIMES OF THE DENOTED FIGURE IN N / mm 2 min .**

**304 Stainless**



**316 Stainless**



## Magnetism in Stainless Steel Fasteners







## Magnetism in Stainless Steel Fasteners

"The stainless steel fasteners I received stick to a magnet." This is one of the more frequently heard complaints at Fastenal Engineering & Design Support HQ in Winona, MN. **Stainless steel fasteners being nonmagnetic is also one of the largest misconceptions amongst fastener users. This document will explain why most stainless steel fasteners are at least slightly magnetic and why many are so magnetic they are attracted to even weak household magnets.**

## How Does an Austenitic Stainless Steel Become Magnetic ?

As stated before, the microstructure of the metal is what gives the steel its magnetic properties. If the stainless steel chosen was austenitic, e.g. type 316, and a portion of the microstructure were changed to any one of the other four classes then the material would have some magnetic permeability, i.e. magnetism, built into the steel.

The microstructure of austenitic stainless steel can be changed by a process called martensitic stress induced transformation (MSIT). This is a microstructural change from austenite to martensite and the transformation can occur due to cold working (the process by which many fasteners are made) as well as slow cooling from austenitizing temperatures. After cold working or slow cooling an austenitic stainless steel will have an appreciable level of martensitic microstructure. Due to martensite being magnetic, the once nonmagnetic austenitic stainless steel will now have a degree of magnetism.

## Cold Working

Though it may not seem like it, all fasteners can go through quite a bit of cold working prior to seeing service in the field. Cold working fasteners occurs in the wire drawing, forming, and thread rolling processes. Each of these processes will, typically, create enough martensite to produce a measurable degree of magnetism. See the Fastenal Engineering & Design Support videos on thread rolling and cold heading for more information.

## QUERIES



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***KINDLY FILL UP THE QUERY FORM OR MAIL YOUR VALUED ENQUIRIES TO US , SO WE CAN DEPUTIZE OUR SALES REPRESENTATIVE AT YOUR SERVICE .***

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