



# Inconel Pipe Fittings

Prepared for :

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# Introduction

Duplex Supply Inc. are the suppliers of Inconel Pipe Fittings over the past decade. We are one of the in-competitive brands in alloy industry. We go with the saying “Customer is king” thus we make our Clients buying feel esteemed and exemplary. Inconel Pipe Fittings are the best quality product manufactured by us. Today, our industry is filled with high volume but low-quality suppliers which are below the line with what the industry requires. Inconel Pipe fittings are one of the fastest selling products. Because of such situations, it results in lapse of the quality of goods and hence, the entire project. We also look after it that our industrial Hazards are dumped appropriately and not polluting the environment also we have such procedures in factory by which the harm-full chemicals are directly ventilated which doesn't harms environment and houses located around our factory. We present customers in various countries for all size demand. We have always kept our Vision clear which serves best in acquiring our mission. We modify the changes required in industry with changing time and keep getting superior Control over the quality of our product. The main aim of this organization is to provide commodities of determined quality, in addition to making our client's buying experience world-class and a memorable one. Today our firm is one of the admirable Organization in Industry, Which makes us secluded in such a Competitive Industry. Our Product Reliability and performance has made us one of the top brands. Because of such service our clients recommend us to other prospectors which is more than enough to prove our distinction in steel industry. Duplex Supply Inc. Works in consideration of Clients, Environment and best Quality we do no compromise in these matters.



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# Product & Types

Pipe fitting is the profession of installing or repairing piping or tubing systems that transfer liquid, gas, and seldom solid materials. This work absorbs selecting and preparing pipe or tubing, joining it together by various methods, and the location and repair of leaks. Inconel Pipe fittings affix to pipes in one of two ways: by threads or by slip fit. Metal pipes are threaded, while plastic pipe can be threaded or slip fit. As the names signify, threaded pipes screw together to connect, while slip fit pipes use sleeves that slip into one another. Inconel Pipe fittings are one of the greater quality material pipe fitting.

## Types of Inconel Pipe Fittings

Different types of Inconel pipe fittings:

- Elbow
- Coupling
- Olet
- Reducer
- Tee type
- Unions
- Cross Type
- Plug
- Adaptors
- Cap

## Different Functions of Inconel Pipe Fittings:

### Elbow Pipe Fittings

Elbows are used to change the oversight of flow between two pipes. Elbows are generally available with an angle of 22.5o, 45o and 90o. If pipes are of same breadth then normal elbows are used otherwise Reducer elbows are used. Elbows are made of variety of materials. These Inconel Pipe Fittings mainly come with female threads and we can fix them by butt or socket welding also.

### Tee type Pipe Fitting

Tee type fitting is a constituent of plumbing system which is in T-shape. It is having one inlet and two outlets, outlets are arranged at 90o to the main line connection (inlet). It can also be used to integrate the flow from two inlets to one outlet. They are also available in different materials and dissimilar sizes. If the 3 sides of T-fitting are similar in size then it is called as Equal tee otherwise it is called as Unequal tee.

### Plug

Plug is constituent of plumbing component which is generally used to close pipe opening during inspections and repairs. Plug generally contains male threads.

### Cap

Cap is a type of pipe fitting which function is same as plug but the only difference is plug contain male threads and cap contain female threads which is screws on the male thread of pipe. These are available in different materials like rubber, copper, steel, plastic etc.

### Unions

Union is a kind of fitting, which functions as similar to coupling. But coupling cannot be removed after fixing but in this case we can take off the union whenever we require. Unions consists nut, male and female ended threads. So, this is also useful for maintaining purpose of pipe.



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## Coupling Pipe Fitting

A coupling is used to connect the pipes of identical diameter. Coupling are also useful if the pipe is broken or leakage occurs. Generally there are two types of couplings available for Inconel Pipe Fittings. Compression coupling and slip coupling.

Compression coupling is regular coupling which is connected between two pipes and it prevents leakage by the arrangement of gaskets or rubber seals on both sides, otherwise glue is provided. Slip coupling is easier to install and it contains two pipes which are arranged as one into other, inner pipe can slide up to some length. So, we can fix long length damaged pipe by slip coupling.

## Adaptors

If Inconel pipe fittings are not having definite ends or plain ends then adaptors make them threaded either male or female whichever is needed. Adapters are generally used for copper and PVC pipes. Male adapters contain male threads and female adapters contains female threads. One end of adapter is plain which is glued or welded or soldered to the plain pipe end.

## Olet

Olets are used when there is standard sizes of fittings are not suitable for our requirement. Sometimes the inlet pipe size is larger compared to outlet pipes in t-sections then also Olets are used. There are many types of olets are available. Some important types of olets are:

- Butt-Weld Olet
- Threaded olet
- Nipple olet
- Sweep olet
- Socket weld Olet
- Elbow olet
- Lateral olet
- Flanged olet

## Cross type Pipe Fitting

Cross type fittings contains 4 opening in 4 directions. These are connected when there are 4 pipes are meeting at a point. These fittings generate more amount of stress on pipe as the temperature changes, because they are located at the center of four connection points. Cross fittings are generally used for fire sprinkler systems.

## Reducer Pipe Fittings

Reducer is a pipe fitting component which reduces the flow size from larger to smaller by reducing size of pipe. Usually there are two types of reducers are available. One is concentric reducer which is like cone shaped with gradual decreasing around the pipe but in this case accumulation of air may possible and it results in cavitation. Other one is eccentric reducer which is having one edge parallel to connecting pipe due to which air accumulation is not possible.



# Materials

## Inconel Alloy Applications & Properties

Inconel is typically used in applications where high temperatures are present due to a thick, stable passivating oxide layer which is formed when Inconel is heated. This layer protects the Inconel's surface making it resistant to heat. In addition to heat, Inconel has a high resistance to corrosion, pressure and oxidation. Inconel super-alloys also have excellent mechanical properties and are frequently used in the chemical and aerospace industries.

Our range of Inconel alloys serve a wide variety of different industries including:

- Aerospace
- Jet Engine Components
- Commercial Gas Turbines
- Food Processing
- Chemical Processing
- Cryogenic Storage Tanks

The Inconel family of alloys was first developed in the 1940s by research teams at Wiggin Alloys (Hereford, England), which has since been acquired by SMC, in support of the development of the Whittle jet engine. Inconel alloys are oxidation and corrosion-resistant materials well suited for service in extreme environments subjected to high pressure and kinetic energy. When heated, Inconel forms a thick and stable passivating oxide layer protecting the surface from further attack. Inconel retains strength over a wide temperature range, attractive for high-temperature applications where aluminum and steel would succumb to creep as a result of thermally induced crystal vacancies (see Arrhenius equation). Inconel's high temperature strength is developed by solid solution strengthening or precipitation strengthening, depending on the alloy. In age-hardening or precipitation-strengthening varieties, small amounts of niobium combine with nickel to form the intermetallic compound Ni3Nb or gamma prime ( $\gamma'$ ). Gamma prime forms small cubic crystals that inhibit slip and creep effectively at elevated temperatures. The formation of gamma-prime crystals increases over time, especially after three hours of a heat exposure of 850 °C, and continues to grow after 72 hours of exposure. Inconel is a difficult metal to shape and machine using traditional techniques due to rapid work hardening. After the first machining pass, work hardening tends to plastically deform either the work piece or the tool on subsequent passes. For this reason, age-hardened Inconel's such as 718 are machined using an aggressive but slow cut with a hard tool, minimizing the number of passes required. Alternatively, the majority of the machining can be performed with the work piece in a solutionized form, with only the final steps being performed after age hardening.

External threads are machined using a lathe to "single-point" the threads or by rolling the threads in the solution treated condition (for harden able alloys) using a screw machine. Inconel 718 can also be roll-threaded after full aging by using induction heat to 1,300 °F (704 °C) without increasing the grain size. Holes with internal threads are made by thread milling. Internal threads can also be formed using a sinker EDM (electrical discharge machine).]

Cutting of a plate is often done with a water jet cutter. New whisker-reinforced ceramic cutters are also used to machine nickel alloys. They remove material at a rate typically eight times faster than carbide cutters. Apart from these methods, Inconel parts can also be manufactured by selective laser melting.

More often than machining, water-jet or laser, grinding is a preferred and economical method for forming Nickel alloy components to shape and finish. Due to the hardness of the abrasives used, the grinding wheels are not as affected by the material work hardening and remain sharp and durable.

This material is further used to create a product i.e. Inconel pipe fittings.



# Quality

Duplex Supply Inc. strongly has characteristic Quality control over all our products and our esoteric work quality and product quality makes us one of the top manufacturers in Industry. We provide Best Quality Inconel Pipe Fittings . Quality is our peak concern. We sustain high Quality Standards through our Committed Personnel and Sound Infrastructure. Not even a single fitting is left without a 3 layer inspection of chemical test, mechanical test, visual inspection, dimension inspection, pressure test, gauge test and conformity to the order. Quality Assurance System is beacons by Axioms that support our work culture which hooks in respect, self-administration, imaginative-ness and self-articulation. Duplex Supply Inc. is backed by all the possible certifications of a world class mill including ISO 9001:2008, ISO 14001:2007, OH-SAS 18001: 2004 & CE-PED 97/23/EC. We are also members of various renowned agencies and Chambers of Commerce including MASSMA, EEPC, FICCI, FIEO, Indian Merchants Chamber etc.

We are Highly Concerned about our customer's expectations.



We Strain To always act with probity and Honesty.

We Aim To be Paramount in our Industry.



We do our absolute best to esteem our commitments.

We are delighted to be saturated with loads of order 50 days schedule ahead of time. Every single piece of our product is attached with test certificates and authentication certificate of our Quality Product. Day by Day we keep moving to improve Quality of our products for our client. We also welcome any third party inspection from an agency nominated by the customer to comply with NACE 3.2 Certification if required by customer at an extra costs satisfaction. Our Quality Management systems and work plans ensures pursuance of total Quality Management .We never compromise in terms of Quality of Inconel Pipe Fittings and also for our other products. We follow stringent Quality Norms and ethics by monitoring each production process which leads in supreme product quality. With years of experience in manufacturing we offer High Quality, Lower cost and Best service. Quality Assurance begins with understanding Customer's needs and is continued till the customer is completely convinced with the delivery of products and services. Inconel Pipe Fittings is one of the rough and tough product due to its great quality. We efficiently fulfil customer's needs in terms of Cost, Quality and Delivery.



# Why Clients Choose us ?

Our clients have their trust in us and our Products because Duplex Supply Inc. is the most popular vendor of Inconel Pipe Fittings . We uniformly export our products to all the 5 continents in the world. Inconel Pipe Fittings are supplied majorly in Middle Eastern countries. Our all products are of marvelous quality. We have always followed saying of “Customer is king” for us and their satisfaction is what we aim for. Product replacement warranty is given. Our products can sustain high pressure. As of 2015, we stocked 500 tons of Inconel Pipe Fittings , highest in the country. With Duplex Supply Inc. you get un-comparable buying experience of products made from best raw materials. We execute both small and bulk orders. Every 4 months a 3rd party inspection is conducted.

## Customer is king

Duplex supply Inc. furnishes MTC with EN10204 NACE 3.1, NACE 3.2 specifications. All clients are provided with a copy of the same. Duplex Supply Inc. have the distributor in more than 15 countries. With ISO 9001:2008, ISO 14001:2004, OHSAS 18001:2007 certificate We are majestic manufacturer and exporter of Inconel Pipe Fittings . Duplex Supply Inc. has emerged to become the most trusted company in several European, African and gulf based companies.

No compromises are made even when it comes to the packing of our products for sea as well as air transport. Also, the raw material taken for manufacturing is of the highest grade. Our specialized logistic team focuses on delivering the first model, which provides for instant dispatch against the receipt of bank transfer copy. At competitive pricing, Duplex Supply Inc. has become the ultimate destination of Inconel Pipe Fittings buyers Duplex Supply Inc. is looking forward to providing you with your specialty metal needs. Also the Customization we do on personal demand of customers gets us client satisfaction and our high quality products with flexible pricing makes us admired by our clients our clients feel delighted in buying our products and consumer satisfaction in itself is the biggest achievement for our firm.



# Technical Details

## Chemical Composition of Inconel 600, %

	C	Mn	Si	P	S	Cr	Mo	Ni + Co	N	Fe	Cu
Min	-	-	-	-	-	14	-	72	-	6	-
Max	0.15	1	0.5	NA	0.015	17	NA	79	NA	10	0.5

## Chemical Composition of Inconel 625, %

	C	Mn	Si	P	S	Cr	Mo	Ni	N	Fe	Nb+Ta	Al	Ti	Co
Min	-	-	-	-	-	20	8	58	-	-	3.15	-	-	-
Max	0.1	0.5	0.5	0.015	0.015	23	10	-	NA	5	4.15	0.4	0.4	1

## Mechanical Properties of Inconel 600

UTS Min (MPA)	551
Yield Min (MPA)	170
Elongation MIn (%)	35
Hardness Max (HRB)	88
Heat Treatment	1090°C - 1150°C

## Mechanical Properties of Inconel 625

UTS Min (MPA)	827
Yield Min (MPA)	414
Elongation MIn (%)	35
Hardness Max (HRB)	100
Heat Treatment	1095 - 1200



# Production



# Packaging & Documentation

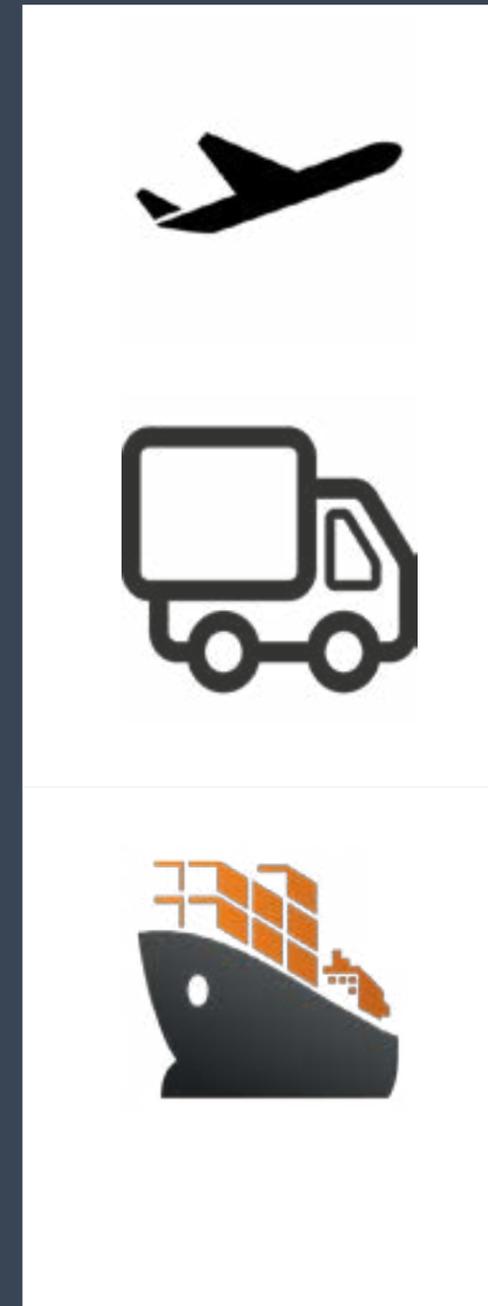
## Production process of Inconel Pipe Fittings

Each year, millions and tons of Inconel pipe fittings are produced. Its versatility makes it the most often used product. Inconel pipe fittings are found in a variety of places. Since they are very substantial in industrial work everywhere. The Production Process of Inconel pipe fittings are divided into 3 parts which are BODY, NUTS AND FERRULE.

- i. **Body:** As per design standard the body is made from hex or round bar which is subject to heat treatment depending on the stature of the bar. Followed by that, the body is machined depending on the thread required by customer.
- ii. **Nuts:** Nuts are made in a fairly simple process by a machining of hex bar as per size and thread from a standardized design.
- iii. **Ferrule:** Ferrules are the heart of Inconel pipe fittings. Our specialization lies in the manufacture of an innovative method that makes the ferrules compatible with other manufacturer designs and increases the life of Inconel Pipe fittings.

Our production range also comprises of instrumentation valves, condensate pots, snubber, manifolds, and custom designed valves. Fittings are also made in NPT, BSPT & BSPP Threads.

Our production amplitude at apex in a 3 shift schedule is 1.3 million pieces of amassed units per month. Over and above to that we have in house testing facilities like spectra machine, PMI Machine, Mechanical test, Hardness Test, Ultrasonic Testing, Hydrostatic Testing, Pressure testing, and manual inspection of gauge. We take appropriate consternation that there are no errors and bungles caused in our production process because efficient production process is foremost for enrooting goods. Our state of the art factory has 21 CNC Machines, 12 Lathe Machines, 3 Heavy Punch Machines, and 5 Dye Machines for an end to end process at one place. Our Production process has very creamy operating system which maintains proper co-ordination of work.



Duplex Supply Inc. provide the certificate of origin legalized/attested by the chamber. Also, a commercial invoice including HS code is provided. Our product packing lists which come with the product includes a number of boxes, net weight, and gross weight. We provide test certificate certifying NACE MRO103, NACE MR0175 during the delivery of Inconel Pipe Fittings to our Clients, Along with this, a raw material test report is provided as well. Our laboratory reports that are NABL approved also is provided to our loyal customers. Other reports like raw material reports, heat treatment charts and letter of guarantee is also provided by Duplex Supply Inc. Our Inconel Pipe Fittings are packaged in such a way that no damage is caused during the time of delivery. We provide a free sample kit for all clients against purchase order copy for quality approval free of cost. Request your free sample kit now and get your personalized orders at tip of your We offer price basis depending on your requirements. It can be based on previous works, FOB Nhava sheva, CFR, CIF, CPT your destination port or your door to door delivery duty which can be paid or unpaid finger by ordering it online.





# About Duplex Supply Inc.

Duplex Supply Inc. is a privately held stockiest supplier and manufacturer of various alloy and metal products, the head office is located in Mumbai. DSI is committed to provide merit quality serviceability to all its customers with the minimal lead time.

Duplex supply Inc. provides shipping for all over global Customers. DSI has made noteworthy impact in metal Industry. With Duplex Supply Inc. you get un-comparable buying experience of products made from best raw materials. Duplex Supply Inc. has emerged to become the most trusted company in Indian market and in several European, African and gulf based companies. Duplex Supply Inc. is backed by all the possible certifications of a world class mill including ISO 9001:2008, ISO 14001:2007, OHSAS 18001: 2004 & CE-PED 97/23/EC.

**“Your wish we Accomplish, You Demand we Deliver”**



## OUR MISSION

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Our Aim is At Business Excellence through Higher business ethics and standards, Optimum use of resources, Spirit of Entrepreneurship.



## OUR PRECISION

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We are very Accurate from our Production System to our Delivery System we handle all our goods very precisely. We precisely fulfill all our promises to the clients and make sure that they have no complaints regarding our products.



## OUR VISION

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To provide best Quality products and service to our Clients and fulfilling their demands beyond their expectations and to be globally esteemed organization.



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# We Look Forward to Hearing From You...

After knowing about all the information above mentioned regarding our products we look forward a hearing from you regarding any Queries and Orders we are delighted to serve all our customers the existing ones and also we welcome our new customer orders. We assure that our products will never disenchant you.



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