



Inconel Tube Fittings

Prepared for :

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Introduction

Duplex Supply Inc. are specialized manufacturers, dealers of premier quality Inconel tube Fittings. We are an innovation driven company, and provide with the best services ever. Right from processing, assembling to logistics, we emphasize a great on the quality. Rated best in the industry, we are positively recommended by our clients. Inconel Tube Fittings that we supply rank higher in compared to other firms because of our product reliability. Duplex Supply Inc. are the suppliers of Inconel tubes 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. Today, our industry is filled with high volume but low-quality suppliers which are below the line with what the industry requires. 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. Inconel tube fittings are one of the most demanding product in our product list. 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. We bring in tremendous experience to the industry. Our process consists of procedural development cycles: designing (also customization provided), the engineering process, machining the raw materials, assembling the parts, testing (hundred percent in house testing), packing and warehousing, logistics and documentation.



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Product

Inconel Tube fittings are used to accommodate a leak free acquaintance between tubes for a seamless flow of liquids and gases. The most ordinary types of tube fittings manufactured by us are various types of Stainless steel, Monel, Inconel, Hastelloy fittings which are used for their corrosion resistance and provide inventive finishes. The tube is designed to withstand. Inconel Tube Fittings are also designed to have a high vacuum which is the maximum vacuum pressure that can be created in the tube. Tubes can be conjoined to tube fitting by bulging the ferrule to the nuts and tubes. Inconel Tube fittings are used in tube systems to conjoin straight pipe or tubing sections. The main use of fitting is to make the pipe or the tube adaptable to different sizes or shapes. Inconel Tube Fittings are also used for calibrating the liquid flow. The term plumbing is generally used to describe conveyance of water, gas, or liquid waste in ordinary domestic or commercial environments, whereas piping is often used to describe jazzed up conveyance of fluids in functional applications. The term tubing is sometimes used for lighter-weight piping, especially kinds that are flexible enough to be supplied in coiled form. The principal companies in which there is application of Inconel tube fittings are Automotive, Shipbuilding/Marine, Railway, and Aerospace. These Tubes are majorly used in industries for their scrupulous and rigorous work. These are most commonly used in the oil and gas, pulp & paper, petro-chemical/chemical processing, research laboratories, aerospace and defense, chemical processing, power generation, cryogenic and semiconductor, shipbuilding and heavy industrial industries. It is worth asserting that all steel types exposed to water and oxygen will corrode. International standard stated that if less than 0.1 mm of the surface of Inconel tube fittings are not corroded in a year, then it is sturdy and can be accepted as chosen quality for the application. It is important to know which fitting should be used in which application. There are kinds of variations in application of use of Inconel tube fittings.

Applications of Inconel tube fittings that we accommodate at Duplex Supply Inc. are:

1. Hydraulic Application- Hydraulic Applications Comprises alteration of liquid fluids such as water and other chemical solvents. They have seals which prevents leakage of liquid and frequently be rust resistant and other chemical corrosion.
2. Pneumatics-They Involve alteration of gases. They have tight seals which prevents gas leakages and are resistant to chemical corrosion.
3. Instrumentations- They are Strongly Physically Instrumented and do not require much sealing.
4. Calibration- This comprises of sequence-fully altered which is also not leak proof or spill proof sealed.
5. Oil & gas- Oil & Gas Application comprises of highly rust resistant and chemical corrosion seals which prevents leakages of oil & Gas.



Design

Types of Inconel 625 Tube Fittings consists subtypes

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. TUBE TO UNION CONNECTION <ul style="list-style-type: none"> • UNION • UNION TEE • UNION ELBOW • UNION CROSS • BULK HEAD UNION • REDUCING UNION | <ol style="list-style-type: none"> 2. TUBE TO MALE CONNECTION <ul style="list-style-type: none"> • MALE CONNECTOR • MALE ELBOW • MALE BULKHEAD CONNECTOR • MALE RUN TEE • MALE BRANCH TEE |
| <ol style="list-style-type: none"> 3. TUBE TO FEMALE CONNECTION <ul style="list-style-type: none"> • FEMALE CONNECTOR • FEMALE ELBOW • FEMALE BULKHEAD CONNECTOR • FEMALE RUN TEE • FEMALE BRANCH TEE | <ol style="list-style-type: none"> 4. ACCESSORIES <ul style="list-style-type: none"> • FRONT FERRULE • BACK FERRULE • NUT • BLANKING PLUG • BLANKING END |
-
4. **INSTRUMENTATION FITTINGS**
 - MALE TEE
 - FEMALE TEE
 - STREET TEE
 - BRANCH TEE
 - FEMALE CROSS
 - MALE ELBOW
 - FEMALE ELBOW
 - STREET ELBOW
 - ADAPTER
 - BUSHING
 - HEX COUPLING
 - REDUCING HEX COUPLING
 - HEX NIPPLE
 - HEX PLUG
 - FEMALE CAP
 - ALLEN KEY



Materials

Inconel Alloy Applications & Properties

Inconel is typically used in applications where high temperatures are present due to a thick, stable passive 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.

Industries We Serve

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 passive 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 (γ'). 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 solution-I-zed 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.

This material is further used to create a product i.e. Inconel tube 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 tube 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 tube 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 tube 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 tube fittings. We uniformly export our products to all the 5 continents in the world. Inconel tube 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 tube 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 tube 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 tube 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

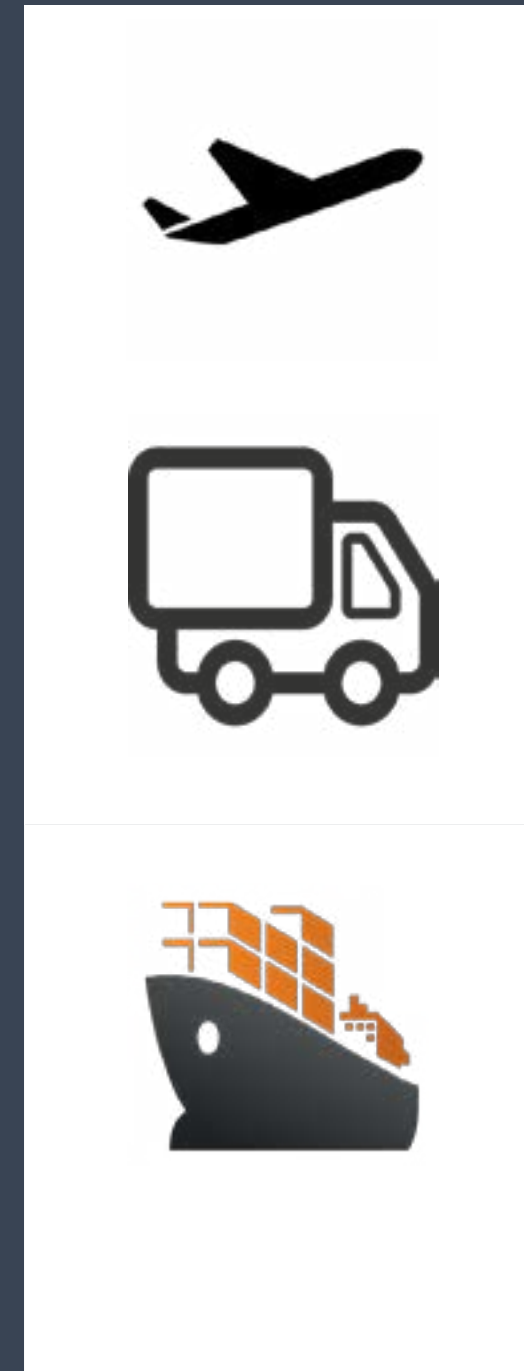
Each year, millions of tons of Inconel tube fittings are produced. Its versatility makes it the most often used product. Inconel tube fittings are found in a variety of places. Since they are very substantial in industrial work everywhere. The Production Process of Inconel tube fittings are divide into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

- 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 the Inconel Tube Fittings manufacturers. Our specialization lies in the manufacture of an innovative method that makes the ferrules compatible with other manufacturer designs and increases the life of the fitting.

Our production range also comprises of instrumentation valves, condensate pots, snubber, manifolds, and custom designed valves. Fittings can be 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.



Packaging & Documentation



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 Tube Fittings to our customers, 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. Packaging of Inconel Tube fittings are done in such a way that there is no damage caused to the product during 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

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



OUR PRECISION

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

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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