

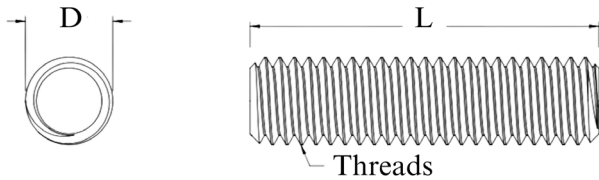
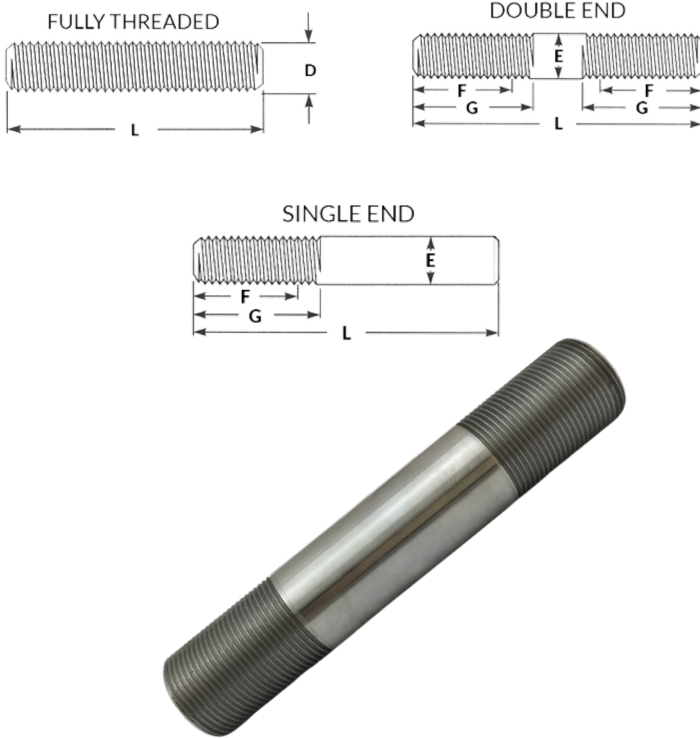


FASTENERS STUDS & THREAD RODS

Product Sheet



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Stainless Steel Stud and Threaded Rods

YTM Makina specializes in producing threaded rods and studs from high-grade stainless steel, encompassing varieties such as 304, 316, 317, 321, 310, 347, 904L, 420, 17-4PH, and 15-4PH. These products are distinguished by their exceptional corrosion resistance, high-temperature endurance, and superior strength, making them ideal for a multitude of industrial applications. Each variant is tailored to specific requirements, offering excellent formability, weldability, and durability, ensuring robust performance in demanding environments such as aerospace, petrochemical, and energy sectors.

Stainless Steel Rod / Studs Specifications

Stainless Steel Grade	Rod Standards	Universal Rod Standards	Length	Rod Size	Thread Types
SS 304					
SS 310					
SS 316					
SS 317	ASTM A193 / A194,	DIN, ASTM, BS and all International Standards	1000 mm to 3000 mm	M3 – M52, & 1/4" to 2"	MM, UNC, UNF and BSW
SS 321	ASME SA193 / SA194, ASTM F593, SF593				
SS 347					
SS 420					
SS 904L					
SS 17-4 PH					
SS 15-5 PH					

Features

Corrosion Resistance: Stainless Steel 304, 316, 317, 321, 347, 904L, and 420 offer varying degrees of corrosion resistance, suitable for different industrial environments.

High-Temperature Performance: Grades 310, 321, 347, and 17-4PH are designed to withstand high temperatures, making them ideal for heat-intensive applications.

Durability and Strength: All grades are known for their robustness, with specific grades like 316, 317, and 17-4PH offering enhanced tensile strength.

Versatile Formability: Especially notable in the 304 series, the rods and studs can be easily formed to fit various applications.

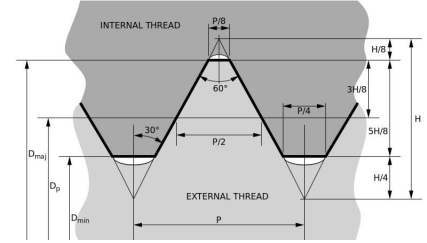
Weldability: Grades like 316 and 317 provide excellent weldability, facilitating ease of integration into complex structures.

Oxidation Resistance: Grades 310 and 321 exhibit superior resistance to oxidation, making them ideal for cyclic temperature conditions.

Typical Applications: The comprehensive properties of these stainless steel grades facilitate their wide range of applications. From general use (304, 18-8) and high-temperature environments (310, 321, 347), to scenarios demanding high strength (410, 15-5 PH, 17-4 PH) and exceptional corrosion resistance (316/317, 904L), the suitability of these bolts is vast.

Chemical Composition

Stainless Steel Grade	Cr (%)	Ni (%)	Mo (%)	Mn MAX (%)	Si MAX (%)	C MAX (%)	P MAX (%)	S MAX (%)	Fe (%)	Other
SS 304	18 - 20	8 - 10.5	-	2	0.75	0.08	0.045	0.03	Balance	-
SS 310	24 - 26	19 - 21	0.1 max	2	0.15	0.015	0.020	0.015	54.7 min	-
SS 316	16 - 18	11 - 14	2 - 3	2	1	0.08	0.045	0.03	67.8 min	-
SS 317	18 - 20	11 - 15	3 - 4	2	1	0.08	0.045	0.03	57.8 min	-
SS 321	17 - 19	9 - 12	-	2	1	0.08	0.045	0.03	Balance	0.7 Ti
SS 347	17 - 20	9 - 13	-	2	1	0.08	0.045	0.03	62.7 min	1 Nb + Ta
SS 410	17 - 20	9 - 13	-	1	1	0.08	0.04	0.03	Balance	-
SS 904L	19 - 23	23 - 28	4 - 5	2	1	0.02	0.04	0.03	Balance	1-2 Cu
SS 15-5 PH	14 - 15.5	3.5 - 4.5	0.5	1	1	0.07	0.03	0.015	Balance	2 - 5 Cu
SS 17-4 PH	15 - 17.5	3 - 5	-	1	1	0.07	0.04	0.03	Balance	3 - 5 Cu

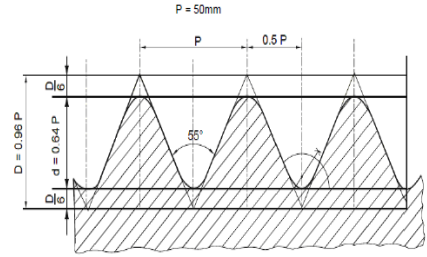


UNC

Mechanical Properties

Stainless Steel Grade	Tensile Strength (MPa)	Yield Strength 0.2% Proof (MPa)	Elongation (% in 50mm)	Hardness Rockwell B (HR B)	Hardness Brinell (HB)
SS 304	515	205	40	92	201
SS 310	515	205	40	95	217
SS 316	515	205	35	95	217
SS 317	515	205	35	95	217
SS 321	515	205	35	95	217
SS 347	515	205	35	95	201
SS 410	480	275	16	95	201
SS 904L	490	220	36	70-90	150-166
SS 15-5 PH	1311	1173	10	388	-
SS 17-4 PH	1103	1000	5	-	-

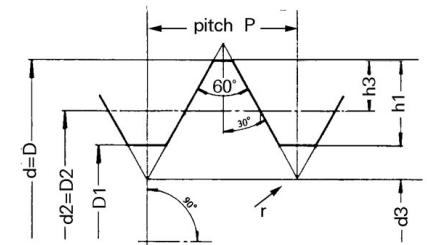
Thread Types



BSW

Physical Properties

Stainless Steel Grade	Density (G/Cm ³)	Melting Point (°C)	Thermal Expansion (Mm/M°C)	Thermal Conductivity (W/M·K)	Electrical Resistivity (Nø·M)	Specific Heat (J/Kg·K)
SS 304	8.0	1400 - 1455	17.2	16.2	720	500
SS 310	7.9	1400 - 1455	14.2	14.2	720	500
SS 316	8.0	1390 - 1450	15.9	16.3	740	500
SS 317	7.9	1390 - 1450	15.9	14.6	740	500
SS 321	8.0	1450	16.6	16.1	720	500
SS 347	7.96	1450	16.0	16.3	720	500
SS 410	7.74	1400 - 1450	9.9	24.9	570	460
SS 904L	7.98	1300 - 1390	15.0	11.5	950	450
SS 15-5 PH	7.78	1440	10.8	19.0	582	460
SS 17-4 PH	7.78	1400 - 1440	10.8	19.0	582	460



MM

Comparison of Grades

Available Rod / Stud Types

- Threaded Rod
- Fully Threaded Rod
- Partially Threaded
- Tap End Threaded
- Double End Threaded
- Fine Pitch Threaded
- Metric Threaded
- All Threaded
- Heavy Threaded
- Acme Threaded
- Trapezoidal Threaded
- Coil Rod
- Threaded Bar
- Half Threaded
- Customized Threaded Rods and Studs

Stainless Steel Grade	Advantages	Disadvantages	Typical Applications
SS 304	Excellent corrosion resistance, good formability, good weldability	Lower strength at high temperatures, not suitable for extremely corrosive environments	Kitchen equipment, architecture, medical equipment
SS 310	High temperature resistance, excellent toughness at cryogenic temperatures	More expensive, less readily available	Heat treatment industry, furnace parts
SS 316	Excellent corrosion resistance, especially against chlorides and other industrial solvents	More expensive than SS 304	Marine applications, chemical processing
SS 317	More resistant to corrosion and pitting than 316, especially in chloride environments	High cost, less readily available	Chemical and petrochemical processing
SS 321	Improved intergranular corrosion resistance due to added titanium	Not as readily available as 304, more expensive	Aerospace, high temperature applications
SS 347	Enhanced high-temperature service due to the addition of columbium and tantalum	High cost, less readily available	Aerospace, high temperature applications
SS 410	Excellent hardness after heat treatment, good corrosion resistance for a martensitic stainless steel	Poor corrosion resistance compared to austenitic grades, must be hardened for maximum effectiveness	Cutlery, dental and surgical instruments
SS 904L	Super austenitic, hence improved resistance to strong reducing acids, particularly sulfuric acid	More expensive, less readily available	Chemical processing, pollution control equipment
SS 15-5 PH	High strength and toughness, good corrosion resistance	Must be heat treated for optimal performance, more expensive	Aerospace applications, high pressure applications
SS 17-4 PH	High strength, good corrosion resistance, maintains properties at high temperatures	Requires precise heat treatment, not as corrosion resistant as austenitic grades	Aerospace, nuclear and food processing
18-8	Excellent corrosion resistance, good formability, good weldability	Lower strength at high temperatures, not suitable for extremely corrosive environments	Kitchen equipment, architecture, medical equipment



Material Options

High Nickel Stud and Threaded Rods

Description - TM Makina's threaded rods and studs portfolio, encompassing Nickel 200, Monel 400, K-500, Inconel variants (600, 601, 625, 718, 800HT, 825, 925), Hastelloy C276, C22, and Titanium Grades 2 and 5, are engineered with precision for specific industrial applications. These products are manufactured from high-grade alloys, ensuring optimal performance under various environmental conditions. Each material is chosen for its unique properties, such as corrosion resistance, thermal stability, and mechanical strength, making them suitable for applications ranging from chemical processing to aerospace engineering.

Features

Corrosion Resistance: Nickel 200, Hastelloy C276, C22, and Inconel 825, 925 are highly corrosion-resistant, ideal for the petrochemical and marine sectors.

High-Temperature Performance: Inconel 600, 601, 625, 718, 800HT excel in extreme temperatures, suitable for aerospace, automotive, and power industries.

Mechanical Strength: Monel 400, K-500, and Titanium Grades 2, 5 offer robust strength, vital for construction and heavy engineering.

Electrical and Thermal Conductivity: Nickel 200 and 201 boast superior electrical and thermal properties, key in electronics and heat exchangers.

Weldability and Fabrication: Inconel 600, 601 are notably weldable, ideal for complex pharmaceutical and chemical processing structures.

Oxidative and Reductive Resistance: Hastelloy C22 and C276 excel in resisting both oxidative and reductive environments, crucial for chemical processing.

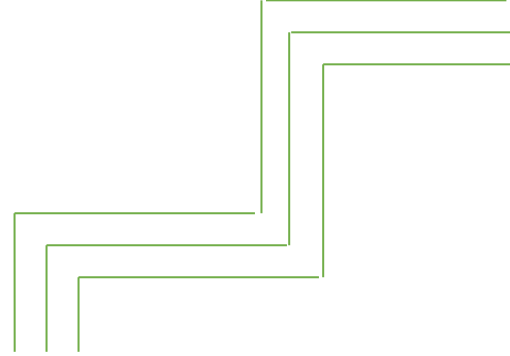
High Nickel Stud / Rod Specifications

High Nickel Group	Rod Standards	Universal Rod Standards	Length	Rod Size	Thread Types
Ni 200/201					
Monel 400					
Monel K500					
Inconel 600/601/625					
Inconel 718	ASTM / ASME SB 160 / 164 / 425 / 166 / 446 / 574 / 472	DIN, ASTM, BS and all International Standards	1000 mm to 3000 mm	M3 – M52, & 1/4" to 2"	MM, UNC, UNF and BSW
Incoloy 800/800H/ 800HT					
Incoloy 825					
Incoloy 925					
Hastelloy C276					
Hastelloy C22					
Titanium 2	ASTM B348, ASME SB348				
Titanium 5					



Duplex & Super Duplex Steel Stud & Threaded Rods

Description - YTM Makina's range of Duplex and Super Duplex threaded rods, including the 31803, F51, 32205, F60, F53, and 32760 grades, are expertly engineered to meet the demanding requirements of the piping industry. These rods are crafted from a blend of nickel, carbon, chromium, and molybdenum, ensuring exceptional tensile strength and superior corrosion resistance. Designed to withstand challenging environments, they are ideal for high-pressure, corrosive, and temperature-sensitive applications commonly encountered in piping systems.



Duplex and Super Duplex Steel Specifications

Features

Enhanced Corrosion Resistance: Grades like Duplex 31803, F51, and Super Duplex F53 and 32760 exhibit remarkable resistance against corrosive substances, essential for maintaining pipeline integrity.

Optimal Strength and Durability: These threaded rods boast high tensile strength and wear resistance, making them reliable for long-term use in critical pipeline infrastructures.

Adaptable Formability: Duplex 32205 and F60 grades are highly formable, allowing for versatile applications in various pipeline configurations and designs.

Performance at Extreme Temperatures: Selected grades offer robust performance even in cryogenic conditions, expanding their applicability in extreme temperature pipelines.

Diverse Application Suitability: Ideal for chemical, marine, petrochemical, and power generation sectors, these rods ensure seamless pipeline operations in various industrial environments.

Customized Solutions: Available in multiple dimensions and specifications, they cater to unique pipeline design requirements, facilitating customization for specific projects.

Super Duplex Strength: The unique composition of grades like 32760 offers augmented strength and resistance to stress cracking and erosion, crucial for high-stress pipeline systems.

D and Super D Steel Rods	Rod Standards	Universal Rod Standards	Length	Rod Size	Thread Types
D S31803 (F51)	ASTM A182, A479 / ASME SA182, SA479	DIN, ASTM, BS and all International Standards	1000 mm to 3000 mm	M3 – M52, & 1/4" to 2"	MM, UNC, UNF and BSW
D S32205 (F60)					
SD S32750 (F53)					
SD S32760 (F55)					



Mild Steel & Carbon Steel Stud & Threaded Rods

Description - YTM Makina's Threaded Rods and studs, are available in both Mild and Carbon Steel, are engineered for high performance in industrial environments. The Mild Steel Rods offer exceptional durability and resistance to stress, abrasion, and extreme temperatures, making them versatile for use in corrosive settings and with chemical substances. The Carbon Steel Rods, made from cold-rolled steel, provide cost-efficiency, heightened strength, and superior surface finish. Their available coatings – plain steel, hot-dip galvanized, yellow zinc, and zinc plating – deliver varying degrees of corrosion resistance and aesthetic options. This range of features ensures YTM Makina's rods are a reliable and adaptable solution for a spectrum of industrial applications.



Features

Durability: The Mild Steel Rods are built to withstand harsh industrial environments, offering high resistance to stress and abrasion.

High-Temperature Resistance: Specifically engineered to perform under extreme temperatures, making them suitable for use in environments with chemical exposure.

Enhanced Strength: Carbon Steel Rods, made from cold-rolled steel, provide superior mechanical strength.

Superior Surface Finish: The use of cold-rolled steel ensures a higher quality surface finish, with uniform precision across all rods.

Corrosion Resistance: Multiple finish options including plain steel, hot-dip galvanized, yellow zinc, and zinc plating, each providing effective corrosion protection to suit various environmental conditions.

Aesthetic Versatility: Zinc plating offers a range of color finishes for aesthetic preferences, enhancing the visual appeal of the rods.

Customization: Available in a variety of sizes, shapes, and dimensions, tailored to meet specific requirements of diverse industrial applications.

Mild & Carbon Steel	Rod Standards	Universal Rod Standards	Length	Rod Size	Thread Types
Mild Steel	ASTM A307, ASME SA307	DIN, ASTM, BS and all International Standards	1000 mm to 3000 mm	M3 – M52, & 1/4" to 2"	MM, UNC, UNF and BSW

Mild & Carbon Steel Specifications

Alloy 20, SMO 254 and Grade 660 Stud & Threaded Rods

Description - YTM Makina presents Alloy 20, SMO 254, and A453 Grade 600 Threaded Rods, each engineered for specific industrial challenges. Alloy 20 rods, blending nickel, chromium, molybdenum, and copper, provide excellent corrosion resistance, ideal for chemical and petrochemical environments. SMO 254, with its robust composition, excels in resisting corrosion in harsh conditions like seawater processing. A453 Grade 600 rods offer high tensile strength and durability, making them suitable for diverse applications from heavy engineering to marine use. These rods collectively showcase YTM Makina's focus on delivering quality and reliability in demanding industrial settings.

Features

High Tensile Strength: These rods are known for their exceptional tensile strength, making them suitable for demanding applications in heavy engineering and industrial sectors where durability is key.

Enhanced Material Quality: The inclusion of copper in Alloy 20 and restricted carbon in SMO 254 enhances their overall material quality, contributing to their robustness in various industrial applications.

Stress and Crevice Corrosion Resistance: SMO 254 and A453 Grade 600 rods offer outstanding resistance to stress and crevice corrosion, ensuring long-term integrity in challenging environments.

Adaptability and Versatility: These rods are adaptable for a wide range of applications, including chemical processing, seawater handling, and high-temperature environments, thanks to their versatile material properties and construction.

Customization Options: Available in a variety of sizes, shapes, and dimensions, YTM Makina's rods are customizable to meet specific requirements, ensuring broad usability across different industries.

Specialized Coating Options: A453 Grade 600 rods, available with hot-dip galvanized and zinc plating finishes, provide additional corrosion resistance and aesthetic appeal, enhancing their applicability in diverse settings.

Alloy 20, SMO 254 & Grade 660 Specifications

Other Types	Rod Standards	Universal Rod Standards	Length	Rod Size	Thread Types
Alloy 20	ASTM B473, ASME SB473	DIN, ASTM, BS and all International Standards	1000 mm to 3000 mm	M3 – M52, & 1/4" to 2"	MM, UNC, UNF and BSW
SMO 254	ASTM A193 / A194, ASME SA193 / SA194 / ASTM F593, ASME SF593				
Grade 660	ASTM A453, ASME SA453				



Coating Solutions

We provide a wide range of coating solutions designed to enhance the performance and longevity of various industrial components. Our offerings include a variety of metallic coatings and PTFE coatings, each tailored to meet specific operational requirements and environmental conditions.

Metallic Coatings

Metallic coatings, including Nickel, Zinc, Chromium, Gold, and Silver, offer corrosion resistance and other beneficial properties. They are widely used across various industries.

Hot-Dip Galvanized Coatings: These coatings provide dual corrosion protection for steel: barrier and galvanic. They act as a semi-impermeable barrier against corrosion-causing environmental elements.

Mechanical Galvanizing: This process, similar to hot-dip galvanizing, applies a zinc coating on bare steel, offering protective benefits.

Silver-Plating: Ideal for applications where lubricants can't be used or galling is a risk. Silver plating acts as a solid lubricant, reducing friction when used dry.

Types of Metallic Coatings

- Electro Zinc Plating (UNI 4721 - ASTM B633 - BS 1706)
- Hot-Dip Galvanizing (ASTM A153 - ISO 1461- UNI 3740- BS 729)
- Aluminizing (ISO 2063)
- Nickel Plating (ASTM B689)
- Silver Plating (ASTM B254 - B700)
- Chromium / Zinc Coating (Dacromet 320 / 500 - ASTM F1136)
- Electro Cadmium Plating (ASTM B766)
- Electroless Nickel Plating (ASTM B733)
- Zinc Phosphate Coating / Manganese Phosphate Coating (ASTM F1137)
- Electro Zinc/Nickel Plating (ASTM B841)
- Mechanical Zinc Coating (ASTM B695)

PTFE Coatings

PTFE (Polytetrafluoroethylene) coatings, including Xylan, Teflon, and Fluorocarbon, are known for their corrosive chemical and heat resistance, and their low friction surface. PTFE coated bolts offer:

- Low Coefficient of Friction
- Nonwetting properties
- Heat Resistance up to 260°C/ 500 °F
- Cryogenic Stability down to -270°C/ -454 °F
- Chemical Resistance, except against molten alkali metals and highly reactive fluorinating agents.