

Duplex Stainless Steel – A Global Market Overview

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Abstracts

Duplex Stainless Steel Market Trends and Outlook

Duplex Stainless Steels form a specialized class of stainless steels, named for their metallurgical structure comprising two phases, viz., austenite (face-centered cubic lattice) and ferrite (body centered cubic lattice) in approximately equal ratios. Although exact proportions can vary by grade, a majority of Duplex Stainless Steels usually have a structure with 50% austenite and 50% ferrite. As a result, this type of steel gains the benefits of both austenitic and ferritic families of steel, even while rendering drawbacks to the minimum. Other common components of Duplex Stainless Steels, in varying proportions, can include carbon, manganese, silicon, chromium, nickel, phosphorous and sulfur, with molybdenum, nitrogen and copper also being utilized for further improvements, as and when required.

Duplex Stainless Steels account for a very small part of the overall stainless steel produced globally, though their range of benefits far supersede conventionally used austenitic and ferritic stainless steel grades. Primary among these include improved strength as much as two times stronger, superior toughness & ductility, excellent corrosion resistance and cost-effectiveness. Owing to these factors, the use of Duplex Stainless Steels has extended to a variety of sectors that include offshore and near-shore operations, such as oil drilling, desalination, water treatment & other industrial operations, chemical & liquid processing, pulp & paper production, construction and automotive & marine parts & components. The global demand for Duplex Stainless Steel is estimated at US\$4.4 billion in 2024 and is projected to reach US\$6 billion by 2030 at a CAGR of 5.4% between the two years.

Emerging markets and regions experiencing rapid industrialization have been the major drivers for Duplex Stainless Steel demand. The investments by these regions in the areas of oil & gas, chemical processing and infrastructure have propelled the demand

for this unique variety of steel that can withstand the harsh operating environments of these sectors. The oil & gas industry has been, and will continue to be, the major driver for Duplex Stainless Steel demand. The higher strength and toughness, coupled with outstanding corrosion resistance, of this variety of stainless steel, allow it to be most extensively used in this critical sector of the economy. Other than this, Duplex Stainless Steel is also widely employed for construction and chemical applications because of the same advantageous features, with bridges and other buildings being major consumers of Lean Duplex Stainless Steel. The number of infrastructure projects across the world has been growing at a steady pace, owing to which the benefits offered by Duplex Stainless Steels have enabled their replacing traditional austenitic and ferritic stainless steels. Other factors likely to drive growth for Duplex Stainless Steels include developments in manufacturing techniques, compositional alterations for better product quality and surface treatments that enhance product durability, opening the doors for newer applications. As production processes improve and get streamlined, the overall cost of production also gets reduced, thereby increasing final output.

Duplex Stainless Steel Regional Market Analysis

Asia-Pacific, in addition to being the largest global market for Duplex Stainless Steel, is also expected to be the fastest growing. Industrial and commercial developments in the region have been surpassing the well-entrenched economies of the West, for which the need for various resources, Duplex Stainless Steel being one, is vital. Leading manufacturers have shifted focus towards Asia-Pacific and established production facilities to cater to growing demand. The number of oil & gas projects underway in countries, such as China, India, Australia and South Korea, is testimony to the fact that the largest end-user for Duplex Stainless Steel will maintain its dominance in the region. Additionally, construction of commercial and residential units for an ever-growing population will further propel the market for this variety of steel. Owing to the growing importance of Duplex Stainless Steels in the oil & gas industry, Middle East & Africa is also likely to emerge as a key market, with prospects of healthy growth over the analysis period.

Duplex Stainless Steel Market Analysis by Grade

The extensive use of Super Duplex Stainless Steel in the Oil & Gas sector makes it the leading end-user that would also post the fastest growth. This variety of Duplex Stainless Steel is specifically designed for withstanding the extremely corrosive and high pressure environments typical of oil & gas exploration and extraction, which would

drive market growth. In the processing of chemicals and petrochemicals, Super Duplex Stainless Steel's resistance to corrosion in the presence of aggressive chemicals and high temperatures renders it ideal to fabricate equipment such as reactors, heat exchangers and storage tanks. Lean Duplex Stainless Steel's wide consumption in construction and infrastructure applications, such as buildings and bridges, is instrumental in driving demand for the same. Ongoing studies aimed at finding innovative uses for these materials will ensure that the market for Duplex Stainless Steels maintains an upswing over the coming years.

Duplex Stainless Steel Market Analysis by Form

The major forms in which Duplex Stainless Steels are utilized include Fittings & Flanges, Pipes & Tubes, Pumps & Valves, Rebar & Mesh and Welding Wires & Consumables, among Others (Incl. Bars & Rods and Plates). Within these, the market for Pipes & Tubes is the largest, as also the fastest growing, due to their widespread application in offshore oil & gas exploration & production, heat exchangers in the chemical industry and in the marine industry for hydraulics and instrumentation.

Duplex Stainless Steel Market Analysis by End-Use Sector

By far, the global Oil & Gas sector is the largest end-user of Duplex Stainless Steel, accounting for an estimated share of over 34% in 2024. Components, such as pipes & tubes, made using this variety of steel are high in strength, toughness and corrosion resistance, all of which are factors highly suited to the extremely harsh environment of this industry. Because of this, there has been a marked shift towards using Duplex Stainless Steel to fabricate some of the most critical components used in oil & gas exploration, extraction and production. Construction & Infrastructure is another rapidly growing sector for Duplex Stainless Steel, where they can be used in various forms in building bridges, industrial units and residential & commercial establishments.

Duplex Stainless Steel Market Report Scope

This global report on Duplex Stainless Steel analyzes the market based on grade, form and end-use sector. In addition to providing profiles of major companies operating in this space, the latest corporate and industrial developments have been covered to offer a clear panorama of how and where the market is progressing.

Key Metrics

Historical Period: 2021-2023

Base Year: 2023

Forecast Period: 2024-2030

Units: Value market in US\$

Companies Mentioned: 30+

Duplex Stainless Steel Market by Geographic Region

North America (The United States, Canada and Mexico)

Europe (France, Germany, Italy, Russia, Spain, The United Kingdom and Rest of Europe)

Asia-Pacific (China, Japan, India, South Korea and Rest of Asia-Pacific)

South America (Argentina, Brazil and Rest of South America)

Middle East & Africa

Duplex Stainless Steel Market by Grade

Lean Duplex Stainless Steel

Standard Duplex Stainless Steel

Super Duplex Stainless Steel

Duplex Stainless Steel Market by Form

Fittings & Flanges

Pipes & Tubes

Pumps & Valves

Rebar & Mesh

Welding Wires & Consumables

Other Forms (Incl. Bars & Rods and Plates)

Duplex Stainless Steel Market by End-Use Sector

Chemical Processing

Construction & Infrastructure

Desalination

Oil & Gas

Pulp & Paper

Other End-Use Sectors (Incl. Automotive & Transportation, Marine & Shipbuilding and Water Management)

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Desalination

Oil & Gas

Pulp & Paper

Other End-Use Sectors (Incl. Automotive & Transportation, Marine & Shipbuilding and Water Management)

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Acerinox S.A.

Allegheny Technologies Incorporated

Ambica Steels

Aperam SA

ArcelorMittal SA

Baosteel

Carpenter Technology Corp

Cleveland-Cliffs, Inc.

Cogne Acciai Speciali SpA

Daido Steel Co Ltd

Erasteel

Foroni SpA
H. Butting GmbH & Co KG
JFE Steel Corporation
Jindal Stainless
Jindal Steel & Power Ltd.
Langley Alloys Ltd.
Metline Industries
Nippon Steel & Sumikin Stainless Steel Corp
Nippon Steel Corp
Nippon Yakin Kogyo Co Ltd
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