

# ASTM A105 Flange Specification | Carbon Steel Forged Flanges

ASTM A105 flanges are forged carbon steel flanges designed for ambient and high-temperature pressure service. Manufactured in accordance with ASTM A105/A105M, these flanges are widely used in oil & gas, petrochemical, power generation, and industrial piping systems where strength, toughness, and reliability are required.

## ASTM A105 Standard Overview

ASTM A105 is a standard specification for forged carbon steel components used in pressure systems, including flanges, valves, fittings, and similar parts. The standard defines chemical composition, mechanical properties, hardness limits, heat treatment, and testing requirements to ensure safe operation under pressure.

## Flange Types

Weld Neck (WN), Slip On (SO), Blind (BL), Socket Weld (SW), Threaded (TH), and Lap Joint (LJ) flanges.

## Size Range & Pressure Class

Nominal Pipe Size (NPS): 1/2" – 48"

Pressure Class: Class 150 / 300 / 600 / 900 / 1500 / 2500

## Applicable Standards

Material Standard: ASTM A105 / A105M

Flange Dimensions: ASME B16.5, ASME B16.47 Series A & B

Testing Standard: ASTM A961

## Chemical Composition (wt %)

Carbon (C)	≤ 0.35
Manganese (Mn)	0.60 – 1.05
Silicon (Si)	0.10 – 0.35
Phosphorus (P)	≤ 0.035
Sulfur (S)	≤ 0.040
Copper (Cu)	≤ 0.40
Nickel (Ni)	≤ 0.40
Chromium (Cr)	≤ 0.30
Molybdenum (Mo)	≤ 0.12
Vanadium (V)	≤ 0.08

## Mechanical Properties (Room Temperature)

Tensile Strength	485 – 655 MPa
Yield Strength	≥ 250 MPa
Elongation	≥ 22%

## Hardness Requirement

Maximum hardness for ASTM A105 flanges shall not exceed 187 HB. Controlled hardness ensures good weldability and resistance to cracking.

### Heat Treatment

ASTM A105 flanges are typically supplied in as-forged, normalized, or normalized and tempered condition. Heat treatment improves toughness, relieves internal stresses, and ensures uniform mechanical properties.

### Testing & Inspection Requirements

Chemical analysis, tensile test, hardness test, dimensional inspection, and visual inspection are mandatory. Optional non-destructive testing (UT, MT) may be applied upon request. Certification is provided in accordance with EN 10204 3.1 or 3.2.

### Applications

Oil and gas pipelines, petrochemical and chemical plants, power generation, refineries, pressure vessels, and industrial piping systems.

The ASTM A105 flange specification PDF provides a complete technical reference covering hardness, flange types, size range, standards, testing requirements, and applications. For drawings, pricing, and fast delivery, contact us

