



## Carbon Steel

Steel is predominantly an alloy of iron and carbon, while it's classified as carbon steel when the alloying composition of carbon is less than 2.00% and with acceptable maximum limits up to 0.60% of silicon and 1.65% of manganese.

Carbon steel is the most common steel grade used in various industrial projects including oil and gas refineries, power plants, petrochemical plants etc. For high pressure and high temperature applications cross sectional weld joints are not advisable hence seamless piping is the most preferred due to its construction of extruding from a solid billet. Carbon steel grade are more desirable in moderate temperature environment needing good strength and ductility, they are more cost effective, easy available and easy to fabricate as well.

Most commonly used and available specifications of Carbon steel are in ASTM A53 Gr.B, ASTM A106 Gr.B and API 5LGr.B. ASTM A106 specification covers pipes in seamless construction while ASTM A53 covers black and galvanized pipes in seamless and welded construction, due to their similar chemical and mechanical characteristics [refer below table] it's often to find pipes complying and multiple certified to all 3 specifications together.

**SMLS** (Seamless): SMLS pipes are manufactured by extruding a heated solid billet. Seamless piping possesses a higher mechanical strength due to its construction with no weld.

**ERW** (Electric resistance welding): ERW pipes are manufactured from steel coils. High frequency welding technologies adapted in the industry is making it compatible at certain low & medium pressure applications.

**LSAW** (Longitudinal sub merged arc welding): SAW pipes are manufactured by bending plates. The main types of SAW pipes are LSAW with a single weld seam to the outer surface and DSAW with seam welds to inner and outer surfaces.

### Chemical and Mechanical properties of Carbon steel grades available from stock

Mat	CONST	Grade	UNS	C %	Mn %	P %	S %	Si %	Tensile	Yield Point
Pipe	Seamless	A106 Gr. B	K03006	0.30	0.29-1.06	0.035	0.035	0.10 min	415	240
	Seamless	A53 Gr. B	K03005	0.30	0.29-1.20	0.05	0.045	-	415	240
	Welded	API 5L Gr.B	-	0.24	1.40	0.025	0.15	0.45	460	300
Fittings	Buttweld	A234 WPB	K03006	0.30	0.29-1.06	0.050	0.058	0.10 min	415-585	240
Fittings	Forged	A105	K03504	0.35	0.60-1.05	0.035	0.040	0.10-0.35	485	250
Flanges	Forged	A105	K03504	0.35	0.60-1.05	0.035	0.040	0.10-0.35	485	250

### Stock available size ranges in Carbon Steel to ASME B36.10 / ASME B36.19 specifications

Category	Construction	Size Range (DN)	SCH/Ratings	Standard
Pipe	Seamless	015 - 600	10S - XXS	ASTM A106/A53/API 5L ASTM A691/672
	Welded	350 - 900		
BW Fittings	Seamless	015 - 400	10S - XXS	ASTM A234
	Welded	250 - 750		
SW Fittings	Forged	015 - 100	CL 3000 - 6000	ASTM A105
Flanges	Forged	015 - 900	CL 150 - 1500	ASTM A105

## Stock Certifications, Testings and Reports

All stock available materials from Ferro FPF are coming with full traceability and necessary testing reports along with Material Test Certificates to EN 10204 3.1. Most of our process piping materials from stock is coming with dual certification. This is achieved according to the international standards by controlling the chemical composition and mechanical properties in the permissible ratio meeting different grades and standards. This is an optimal way of providing our customers with a comprehensive range of material grades in the most efficient way suiting the project requirements.

Any client and project requirements over and above the normal standards are achieved with possible additional testings, modifications and inspections using in-house and approved third party facilities. All project confirmed modifications are performed according to relevant international standards and backed with conformity reports.

Ferro Pipe and Fittings is having a demonstrated experience in managing project package supplies of Pipes, Fittings, Flanges and Valves for various national and international projects directly with end users and through international EPC's. [Contact us](#) to discuss on our capacities and custom solutions we can offer to your project piping requirements.

