



## Low Temperature Carbon Steel (LTCS)

As the name says LTCS is the steel used in low temperature and low pressure applications. In low temperature carbon steel the alloying composition of carbon is limited to a maximum of 0.30% and with acceptable maximum limits up to 0.60% of silicon and 1.06% of manganese and impact tested at a minimum temperature of -45°C. Above the maximum allowed limit of 1.06% an increase of manganese at 0.05% to a maximum of 1.35% is allowed for each reduction of 0.01% of carbon below the maximum allowed 0.30%.

For low temperature applications ASTM A333 is the most widely used specification covering the carbon and alloy steel pipes in seamless construction and welded construction with no addition of filler in welding process. Based on the service requirements and steel making processes this specification covers several steel grades even with addition of nickel as well, which are capable to handle extreme low temperature environments as low as -195°C. Even though various ferritic grades are covered under ASTM A333, the most common stock available and preferred grade is of Grade.6 with proven character in negative temperature environments, however Grade.3 will also be available in a limited quantity.

It is to be noted hydrostatic test is not a mandatory requirement under ASTM A333 meanwhile manufacturer can opt for other non-destructive electric testings like eddy current or ultrasonic referring to ASTM A999, unless specified by the purchaser.

Common characteristics of LTCS are suitability to perform in low temperature services below -29°C, non-brittle, good weldability and machinability, hardening by carburization, strengthening by cold working, non-expensive etc. These proven characteristics and excellent properties make this grade very preferred among piping experts to use in several applications

Chemical and Mechanical properties of Carbon steel grades available from stock

Grade	UNS	C %	Mn %	P %	S %	Si %	Ni%	Tensile	Yield Point
A333 Gr. 6	K03006	0.30	0.29-1.06	0.025	0.025	0.10 min	-	415	240
A333 Gr. 3	K31918	0.19	0.31-0.64	0.025	0.025	0.18-0.37	3.18 -3.82	450	240

The chemical and mechanical properties of Grade.6 is very much similar to ASTM A106 and it's often to find multiple certified

The casting grades for equivalent to the forging grades are of A352 LCB and A352 LC3

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 A333
	Welded	350 - 900		ASTM A333 / A671
BW Fittings	Seamless	015 - 400	10S - XXS	ASTM A420
	Welded	250 - 750		
SW Fittings	Forged	015 - 100	CL 3000 - 6000	ASTM A350
Flanges	Forged	015 - 900	CL 150 - 1500	ASTM A350

## 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.

