



Corrosion-Resistant High-Silicon Iron

High Silicon Cast Iron (HSCI) is a special iron for Corrosion Resistant application, which contains up 14% - 18% silicon. This typical cast iron is aimed for acid environment exploitation. Widely used for centrifugal pumps, equipment for sulphuric acids such as blades and mixer, pipe fittings, tubular anode kit

ASTM A518/A518M-99(2018) Standard Specification for Corrosion-Resistant High-Silicon Iron Castings

ASTM A861 is a high silicon cast iron application:

ASTM A861 - 04(2017) Standard Specification for High-Silicon Iron Pipe and Fittings

There are three grades in ASTM A518 standard: Grade 1, Grade 2, and Grade 3.

ASTM A518/518M High Silicon Cast Iron Chemical requirements

Standard	ASTM A518	ASTM A518	ASTM A518
Grade	Grade 1	Grade 2	Grade 3
C	0.65-1.10	0.75-1.15	0.70-1.10
Si max	14.20-14.75	14.20-14.75	14.20-14.75
Mn max	1.50 max	1.50 max	1.50 max
P max	-	-	-
S max	-	-	-
Cr	0.50 max	3.25-5.00	3.25-5.00
Mo	0.50 max	0.40-0.60	0.20 max
Cu	0.50 max	0.50	0.50 max

High Silicon Cast Iron Heat treatment process:



High-silicon iron castings are generally used in the heat-treated (stress-relieved) condition. Small castings of simple configuration not conducive to high-residual stresses may be used in the as-cast condition. If the castings are to be supplied in the stress-relieved condition, the purchaser must so specify.

At its option, the foundry may heat treat the castings to remove stresses without the purchaser so specifying.

If used, the stress-relieving heat treatment shall be as follows:

- ü Heat at a rate that will not crack the castings.
- ü Hold the castings at a minimum temperature of 1600°F [870°C] for a minimum period of 1 h/in. [mm] of maximum section thickness, except that in no case shall the holding period be less than 2 h.
- ü Cool the castings to 400°F [205°C] maximum at a rate not faster than 100°F [55°C]/15 min.
- ü From 400°F [205°C] to ambient temperature, the castings may be cooled in still ambient air.

High Silicon Cast Iron Mechanical Requirements in ASTM A518

If buyers required, HSCI shall be given a Transvers Bend Test and Hydrostatic Test.



- Ü **Transvers Bend Test:** the test bars are to be tested on supports 12in(3.5mm) apart, load at center 930Lbf[4090N], deflection at center 0.026in[0.66mm]
- Ü **Hydrostatic Test :** When specified by the purchaser, subject the castings for critical applications involving pressure or vacuum conditions to a hydrostatic pressure test at a minimum of 40 psig [275 kPa]. Any leak revealed by this test shall be cause for rejection of the casting

Similar Standard:

BS 1591:1975 Specification for corrosion resisting high silicon iron castings



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