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ALLOY DATA SHEET **ABRASION RESISTANT ALLOY**

F15-3 B

HIGH ALLOY MARTENSITIC WHITE IRON

REVISION: 05/00

DESCRIPTION

15-3 B alloy is a high alloy martensitic white iron with high abrasion resistance and improved toughness compared to 15-3 A alloy, due to a reduced carbon content. Section thicknesses of up to 4 inches can be fully air hardened. The alloy can be annealed, machined and hardened for use in machined abrasion resistant parts. Abrasion resistance is excellent under conditions of high stress abrasion (grinding), low stress abrasion (scratching), gouging abrasion and slurry erosion. Although it is significantly tougher than low alloy pearlitic white irons, 15-3 B is not suitable for applications with severe impact. 15-3 B alloy's superior wear resistance is due primarily to a high volume fraction of very hard, well-dispersed primary and secondary carbides in a matrix of martensite.

COMPOSITION

	C	Mn	Si	Cr	Mo
Min %	2.4	-	-	14.0	2.5
Max %	2.8	1.5	1.0	18.0	3.0

APPLICATIONS

Briquetting press segments, Ball and rod mill liners, sand and dredge pump parts, clay working machine parts, pulverizer impactor and blow bars, tires and grinding rings for roller mill pulverizers, wear plates, chutes and liners, shot blast impeller blades.

PRODUCT FORMS

Horizontal and vertical centrifugal castings; static castings.

PHYSICAL PROPERTIES

Density (lbs/in$^{3)}$	0.27	
Melting Point(^{o}F)	2300^{o}F	
Thermal Conductivity (Btu/h/ft^{2}/ft/^{o}F)	13.0 @ 70^{o}F (estimated)	
Thermal Expansion (10^{-6} in/in ^{o}F)	7.0 @ 70-200^{o}F	
	8.2 @ 200-800^{o}F	

Typical Hardness

	HRC	Brinell
As Cast	44-48	410-460
Annealed	35-40	330-380
Hardened	57-63	600-710

HEAT TREATMENT (Typical)

Softening Anneal: 1600-1750 ^{o}F , Furnace cool.
Hardening: 1750-1950 ^{o}F , Air cool.
Stress Relief: 400-800 ^{o}F , Air cool.

MECHANICAL PROPERTIES (Typical Values at room temperature, Hardened condition)

	K.S.I.
Ultimate Tensile strength	145
Ultimate Compression strength	443
Compression 0.2% Yield strength	266

TOUGHNESS

Toughness of 15-3 B is significantly better than low alloy pearlitic white iron and better than for the higher carbon alloy 15-3 A, however it is not suitable for applications with severe high speed impact. If moderate impact is not a concern, then higher carbon alloy 15-3 A will provide better wear resistance.

HARDENABILITY

Section thicknesses of up to 4 inches may be hardened for 15-3 B alloy.

MACHINABILITY

15-3 B is readily machinable in the annealed condition, using carbide tools. Alloy 15-3 B is more readily machined than alloy 15-3 A due to the lower carbon content and correspondingly lower volume fraction of primary carbides.

SERVICE TEMPERATURE

The alloy is suitable for service at temperatures up to approximately 600 ^{o}F

WELDABILITY

Welding of 15-3 alloy is not recommended.

RELATED SPECIFICATIONS

ASTM: A 532 grade II-B

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