

# Unicast Typical Alloys\*

	Nominal Hardness HRC (BHN)	Typical Equivalent Standard	Carb	Cr	Ni	Mang	Moly	Remarks & Common Usages
<b>Austenitic Manganese Steel</b>								
M2	(210-230)	ASTM A128 Gr. C	1.2	2.0	-	12.5	-	Crusher parts- Medium section, Hammers
M8	(min. 250)	-	1.2	2.5	-	8.0	-	High impact End Liners
M19	(230-250)	-	1.4	1.5	-	19.0	-	Crusher parts- High abrasion, lower impact
M22	(230-250)	-	1.3	0.7	-	23.0	-	Special high abrasion
<b>Carbon Low Alloy Steel</b>								
A2	(140-170)	ASTM A27 70-36	0.25	-	-	0.6	-	Mild carbon steel, adjusts to WCB, LCB
CS1	(250-300)	ASTM A148 90-60	0.35	0.8	-	1.1	-	General purpose medium strength steel
CS2	(275-350)	4130	0.3	0.9	-	0.5	0.2	Higher impact strength medium carbon steel
<b>Wear Alloy Steels</b>								
WR1	(min. 45HRC)	-	0.25	1.1	0.7	0.8	0.4	Impeller Bars, Hammers
WR2	(450-500)	4340 modified	0.35	1.1	-	1.0	0.6	General wear & impact resistant
WR3	(380-450)	4140 modified	0.4	1.2	-	1.0	0.3	Diaphragm & Grate Liners
WR4	(450-500)	-	0.4	0.8	1.7	1.0	0.4	Abrasive wear, Chute Liners
WR7	(450-500)	-	0.3	7.0	-	1.0	-	Grinding mill heads, division heads and discharge grates
<b>Heat Resistant Steel</b>								
S3	-	ASTM A297 HH	0.4	25.5	12.5	1.3	0.3	Cooler Grates. High heat strength up to 1800deg.F
S4	-	ASTM A297 HK	0.4	25.5	21.0	1.3	0.3	Nose Ring Segments. High heat strength to 1900deg.F
S5	-	ASTM A297 HN	0.4	21.0	25.0	1.3	0.3	Improved high strength at 1900deg.F
<b>Standard Iron</b>								
D1	(185-210)	ASTM A536 65/45/1	3.7	-	-	0.3	-	Ductile Iron
HE3	-	-	3.4	0.6	-	-	-	Heat Resistant Iron
CL30	-	ASTM A48 C1-30B	3.1	-	0.7	-	-	Cast Iron
<b>Martensitic Iron</b>								
UI11	48-57 HRC	-	1.6	13.0	-	0.5	-	Shell Liners
UI15	(min. 60HRC)	-	2.8	16.5	0.8	0.7	0.5	Shell Liners, Impeller Bars
UI25	(min. 55HRC)	ASTM A532 IIIA	2.8	26.5	-	1.0	0.8	Shell Liners, Valve & Pump Parts
UN1	(min. 52HRC)	ASTM A532 IA	3.1	2.5	4.0	0.3	-	NiHard equivalent, thin section castings

Alloys offered may change without notice. Please contact your Unicast representative for current information and options for custom alloys.

\*Median Analysis

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**Crusher Parts**

**Hammers & Breaker Blocks**

**Apron Feeder Pans**

**Chute Liners**

**Mill Liners**

**Partition Grates**

**Cyclone Thimble Segments**

**Nose & Feed Ring Segments**

**Drag Chains**

**Clinker Breaker Hammers**

**Grizzly Panels**

**Clinker Cooler Grates**

**Shut-Off Valves**

**Diverter Valves**

**UNICAST**  
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