invest cast inc.®
PRECISION CASTINGS
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Tool Steels

Alloy Type	Similar Destinations	Approx. Tempered Hardness	Distortion in Heat Testing	Toughness	Wear Resistance	Resistance to Softening at High Heat	Castability	Resistance to Hot Tearing	Shrinkage	Fluidity
A-2	ASTM A-597, GR. CA-2	R_C55	Best	Fair to Poor	Good	Good	85	B	B	B
A-6	IC CA-6	R_C55	Best	Fair to Poor	Good	Fair	80	B	B	B
D-2	ASTM A-597, GR. CD-2	R_C60	Best	Poor	Very Good	Good	85	B	B	C
D-3	IC CD-3	R_C60	Very Good	Poor	Very Good	Good	85	B	B	C
D-6	IC CD-6	R_C61	Very Good	Poor	Very Good	Good	80	B	B	C
H-11	IC CH-11	R_C52	Very Good	Poor	Fair	Good	80	B	B	B
H-13	ASTM A-597, GR. CH-13	R_C50	Very Good	Fair	Fair	Good	85	B	B	B
L-6	IC CL-6	R_C62	Good	Fair	Poor	Poor	80	B	B	B
M-2	ASTM A-597, GR. CM-2	R_C63	Fair	Poor	Very Good	Very Good	80	C	B	B
M-4	IC CM-4	R_C64	Fair	Poor	Best	Very Good	75	C	B	B
M-42	IC CM-42	R_C68	Fair	Poor	Very Good	Best	75	B	B	B
O-1	ASTM A-597, GR. CO-1	R_C60	Very Good	Fair to Poor	Fair	Poor	80	B	A	B
O-2	IC CO-2	R_C60	Very Good	Fair to Poor	Fair	Poor	80	B	A	B
O-7	IC CO-7	R_C62	Very Good	Fair to Poor	Fair	Poor	80	B	A	B
S-1	IC CS-1	R_C50	Fair	Good	Poor	Fair	90	B	B	B
S-2	IC CS-2	R_C56	Poor	Good	Poor	Poor	90	B	B	B
S-4	IC CS-4	R_C56	Poor	Good	Poor	Poor	90	B	B	B
S-5	ASTM A-597, GR. CS-5	R_C58	Fair	Good	Poor	Poor	90	B	B	B
S-7	ASTM A-597, GR. CS-7	R_C58	Fair	Good	Poor	Poor	90	B	B	B
T-1	IC CT-1	R_C63	Fair	Poor	Very Good	Very Good	85	C	A	B

Tool Steels

Carbon	Manganese	Silicon	Chromium	Molybdenum	Nickel	Tungsten	Cobalt	Phosphorous	Sulfer	Vanadium	Iron	Copper	Aluminum	Zinc	Titanium	Magnesium	Other
.95 1.05	0.75	1.50	4.75 5.50	.90 1.40				0.03	0.03	.20 .50	Bal.						
.65 .75	1.80 2.20	1.00	.80 1.20	.80 1.30				0.025	0.025		Bal.						
1.40 1.60	1.00	1.50	11.0 13.0	.70 1.20			.70 1.00	0.03	0.03	.40 1.00	Bal.						
2.10 2.30	0.75	1.00	11.5 13.0	0.40				0.025	0.025		Bal.						
2.10 2.35	0.75	.80 1.20	11.5 13.0	0.40		.80 1.20		0.025	0.025		Bal.						
.30 .40	0.75	.95 1.15	4.60 5.60	1.20 1.60				0.025	0.025	.30 .50	Bal.						
.30 .42	0.75	1.50	4.75 5.75	1.25 1.75				0.03	0.03	.75 1.20	Bal.						
.65 .75	0.75	1.00	.80 1.00		1.50 1.90			0.025	0.025		Bal.						
.78 .88	0.75	1.00	3.75 4.50	4.50 5.50	0.25	5.50 6.75	0.25	0.03	0.03	1.25 2.20	Bal.						
1.25 1.35	0.75	1.00	3.75 4.50	4.50 5.50		5.20 6.20		0.025	0.025	3.60 4.40	Bal.						
1.00 1.20	0.75	1.00	3.50 4.25	9.0 10.0		1.25 1.75	7.50 8.50	0.025	0.025	.95 1.35	Bal.						
.85 1.00	1.00 1.30	1.50	.40 1.00			.40 .60		0.03	0.03	0.30	Bal.						
.85 .95	1.50 1.80	1.00	0.40	0.30				0.025	0.025	0.30	Bal.						
1.10 1.20	0.75	1.00	.50 .70			1.65 1.85		0.025	0.025	.15 .25	Bal.						
.45 .55	0.75	1.00	1.35 1.65			2.35 2.65		0.025	0.025		Bal.						
.45 .55	0.75	.90 1.20		.40 .60				0.025	0.025	0.30	Bal.						
.50 .60	.70 .90	1.80 2.20	0.30					0.025	0.025	0.30	Bal.						
.50 .60	.60 1.00	1.75 2.25	0.35	.20 .80				0.03	0.03	0.35	Bal.						
.45 .55	.40 .80	.60 1.00	3.00 3.50	1.20 1.60				0.03	0.03		Bal.						
.65 .75	0.75	1.00	3.75 4.50			17.25 18.75		0.025	0.025	.90 1.30	Bal.						