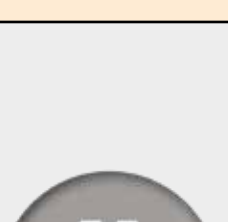


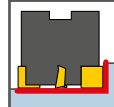
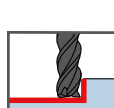
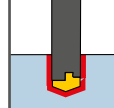
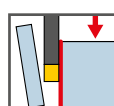
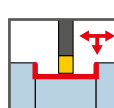
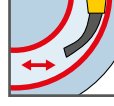
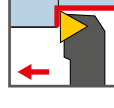
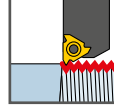
ISCAR GRADE CHART

MACHINED MATERIALS*	MILLING	SOLID CARBIDE and MULTI-MASTER**	DRILLING	PARTING	GROOVE TURN	FACE GROOVING	ISO TURNING	THREADING
 Steel Material Groups 1-13	Hard IC5400 IC30N IC808/908 IC810 IC5500 IC830/928 IC330/328 IC845 Tough	Hard IC702 IC902 IC903 IC608 IC900/908 IC300 Tough	Hard IC8080 IC808/908 IC5500 IC907 Tough	Hard IC30N IC807/907 IC808/908 IC1010 IC5400 IC830 IC1030 Tough	Hard IC20N IC807/907 IC808/908 IC8250 IC830 IC528 IC228 Tough	Hard IC808/908 IC8250 IC830 Tough	Hard IC520N/IC20N IC530N IC807/IC907 IC908 IC8150 IC8250 IC8350 IC830 Tough	Hard IC1007 IC808/908 IC250 IC228 Tough
 Stainless Steel Material Group 14	Hard IC808/908 IC840 IC830/928 IC330/328 IC882 Tough	Hard IC902 IC608 IC903 IC900/908 IC300/308 Tough	Hard IC907 IC808/908 IC5500 Tough	Hard IC808/908 IC1010 IC5400 IC830 IC1030 Tough	Hard IC20N IC807/907 IC808/908 IC8250 IC830 IC528 IC228 Tough	Hard IC806 IC808/908 IC8250 IC830 Tough	Hard IC806 IC807/907 IC908 IC6015 IC830 IC8250 IC6025 Tough	Hard IC1007 IC908 IC228 Tough
 Cast Iron Material Groups 15-20	Hard IS8 IC5100/4100 DT7150 IC810 IC808/908 Tough	Hard IS6 IC902 IC903 IC608 IC900/908 Tough	Hard IC8080 ⁽¹⁾ IC907 IC808/908 IC5500 Tough	Hard IC807/907 IC20 IC808/908 IC1010 Tough	Hard IC428 IC5010 IC418 IC808/908 IC807/907 Tough	Hard IC428 IC5010 IC808/908 Tough	Hard IS6 IN23 IB90 IC5005 IC5010 IS8 IC8150 Tough	Hard IC1007 IC808/908 Tough
 Nonferrous Materials Material Groups 21-30	Hard ID5 IC04 IC08 IC28 Tough	Hard IC08 Tough	Hard ID5 IC907 IC808/908 IC08 Tough	Hard IC807/907 IC20 IC808/908 Tough	Hard ID5 IC07 IC20 Tough	Hard IC20 IC808/908 Tough	Hard ID5 IC20 Tough	Hard IC1007 IC08 Tough
 Super Alloys Material Groups 31-37	Hard IC808/908 IC380 IC840 IC5820 IC882 IC830/928 IC330/328 Tough	Hard IS6 IC902 IC903 IC608 IC900/908 IC300/308 Tough	Hard IC907 IC808/908 Tough	Hard IC807/907 IC808/908 IC1010 Tough	Hard IC804 IC806 IC807/907 IC808/908 Tough	Hard IC806 IC808/908 Tough	Hard IB05S IB10S IW7 IS25 IS35 IS9 IC804 IC806 IC807/907 IC908 Tough	Hard IC806 IC1007 IC808/908 Tough
 Hardened Materials Material Groups 38-41	Hard IB55 IB85 IC30N IC808/908 DT7150 Tough	Hard IC702 IC902 IC903 IC608 IC900/908 Tough	Hard IC907 IC808/908 Tough	Hard IC807/907 IC808/908 IC1010 Tough	Hard IB50 IB10H IB20H IC807/907 Tough	Hard IC806 IC428 IC808/908 Tough	Hard IB05H IB10HC/IB10H IB20HC IB20H IB25HA IB25HC IN420 IN22 Tough	Hard IC1007 IC808/908 Tough

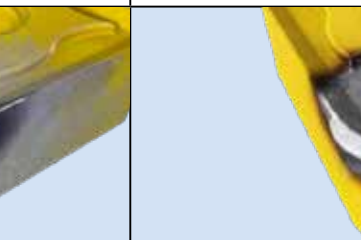
 First choice
* ISCAR material groups in accordance with VDI 3323 standard
** Solid Carbide and MULTI-MASTER Endmills
*** In accordance with ISO 513 standard
(1) Use for an outer insert on DR drills



Application Range And Coating Data For The Most Popular Grades

Grades	Machined Materials***	Coating	Application
			MILLING
IC830	P, M, S	PVD - AlTiN	
IC928	P, M, S	PVD - TiAlN	
IC330	P, M, S	PVD - TiCN+TiN	
IC810	P, K	PVD - AlTiCrN+TiN	
IC28	N	Uncoated	
IC840	M, S	PVD - AlTiN+TiAlSiN+TiSiN	
IC882	M, S	PVD - AlTiN+TiAlSiN+TiSiN	
IC808	P, M, K, S, H	PVD - AlTiN/TiAlN	
			SOLID CARBIDE MULTI-MASTER**
IC900/908	P, M, K, S, H	PVD - AlTiN	
IC902	P, M, K, S, H	PVD - AlTiN	
IC903	P, M, K, S, H	PVD - AlTiN	
IC702	P, H	PVD - AlTiCrSiN	
IC300/308	P, M, S	PVD - TiCN	
			DRILLING
IC808/908	P, M, K, S, H	PVD - TiAlN	
IC5500	P	CVD - TiCN+Al2O3+TiN	
IC8080	P, K	CVD - TiCN+Al2O3+TiN- TiAlN	
IC907	P, M, K, N, S, H	PVD - TiAlN	
ID5	P, M, K, N, S, H	PCD grade	
IC08	N	Uncoated	
			PARTING
IC30N	P	CERMET	
IC1030	P, M	PVD - AlTiN+TiN	
IC5400	P, M	MT-CVD - TiCN+Al2O3	
IC807/907	P, K, N, S, H	PVD - TiAlN	
IC808/908	P, M, K, S, H	PVD - TiAlN	
IC830	P, M	PVD - TiAlN	
IC1010	P, M, K, S, H	PVD - AlTiN+TiN	
			GROOVE TURN
IC808/908	P, M, K, S	PVD - AlTiN	
IC804	S	PVD - AlTiN	
IC428	K	CVD - TiC+Al2O3	
IC5010	K	CVD - TiCN+Al2O3	
IC807/907	P, M, K, S, H	PVD - AlTiN	
IB50	H	CBN grade	
IC20	N	Uncoated	
			FACE GROOVING
IC808/908	P, M, K, N, S, H	PVD - TiAlN	
IC8250	P, M	MT-CVD - TiCN+Al2O3+TiN	
IC830	P, M	PVD - TiAlN	
IC428	K, H	CVD - TiC+Al2O3	
IC5010	K	CVD - TiCN+Al2O3+TiN	
IC20	N	Uncoated	
			ISO TURNING
IC8250	P	MT-CVD - TiCN+Al2O3 +TiN	
IC6025	M	MT-CVD - TiCN+Al2O3 +TiN	
IC5010	K	CVD - TiCN+Al2O3 +TiN	
IC20	N	Uncoated	
IC806	M	PVD - AlTiN	
IB20H	H	CBN grade	
IC807/907	P, M, S	PVD-TiAlN	
IC908	P, M, S	PVD-TiAlN	
IC908	P, M, K, S, H	PVD - TiAlN	
IC1007	P, M, K, N, S, H	PVD - TiAlN+TiN	

Type Of Wear And Remedy

Flank wear	Crater wear	Notch wear	Chipping	Fracture	Comb cracks	Built-up edge	Plastic deformation
							
Possible causes: - Cutting speed too high - Heat development too high - Carbide grade too low-wear	Possible causes: - Cutting speed too high - Heat development too high - Feed too low	Possible causes: - Cutting speed too high - Carbide grade too low-wear	Possible causes: - Carbide grade too wear-resistant - Cutting edge too positive - Formation of edge	Possible causes: - Cutting edge too positive - Carbide grade too rigid - Vibrations	Possible causes: - Heat alternating voltage - Strongly interrupted cut - Thermal shock through coolant	Possible causes: - Low cutting speed - Feed too low - Cutting edge too negative	Possible causes: - Feed too high - Cutting speed too high - Carbide grade too tough
Possible remedy: - Reduce cutting speed - Harder carbide grade - Smaller lead angle	Possible remedy: - Reduce cutting speed - Harder carbide grade - Increase feed	Possible remedy: - Reduce cutting speed - Harder carbide grade - Vary cutting depth	Possible remedy: - Tougher carbide grade - Higher cutting speed - Choice of more stable cutting edge	Possible remedy: - Reduce cutting depth - Lower feed - More stable cutting wedge	Possible remedy: - Choice of tougher carbide grade - Improved coolant supply - Dry machining for interrupted cuts	Possible remedy: - High cutting speed - Increase feed - Smooth, positive cutting edge	Possible remedy: - Reduce cutting speed - Reduce feed - Choice of harder carbide grade