



Depth of Cut:
 15G1B - .024"
 15G1F, 5G5F, 5G6F - .060"
 15M1P, 5M5P, 5M6P - .088"
 5G5Q, 5G6Q - .107"
 5G5M, 5G6M - .145"

Diameters:
 .375" to 7.000"

Insert Grades:
 IN2504
 IN2505
 IN2515
 IN2530
 IN2535
 IN4005
 IN4015
 IN4030
 IN4035
 IN7035

Materials:
 All material types



Expanded and Rebranded

Our most popular high feed mill series, **GOLD-QUAD**, is now expanded to include 4mm and 16mm cutter series and rebranded **GOLDSPEED**

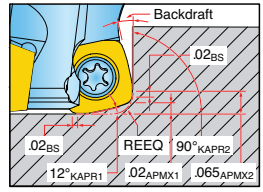
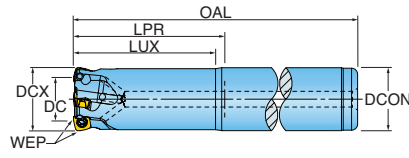
Features & Benefits:

- 5 high-feed families offering insert sizes of 4, 9, 13, 16 and 19mm, multiple cutter - adaptations, pilot sizes and densities
- Inserts feature 12° lead-angles to produce 5x the feedrates in any material
- Each cutter family includes light, medium and heavy duty insert geometries, multiple edge configurations and our most advanced grades
- Inserts include multiple types of edge reinforcement and corner configurations
- All cutter families offer inserts with radial wiping flats that can eliminate secondary passes



GOLDSPEED™ 04 SERIES 15G1B (CYLINDRICAL SHANK)

HIGH FEED END MILLS (4MM INSERT)



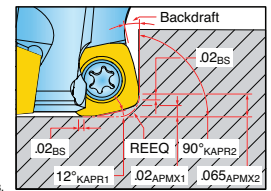
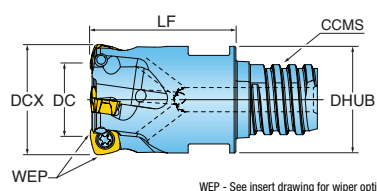
WEP - See insert drawing for wiper options.

Part Number	DCX Cutting Dia. Max.	DC Cutting Dia.	LUX Usuable Length Max.	LPR Protruding Length	REEQ Program Radius Equivalent	OAL Overall Length	ZEFF Effective Teeth	DCON Shank Dia.	RMPX Ramp Angle Max.
15G1B-03015R8R01	0.375	0.167	1.300	1.500	0.043	2.920	2	0.375	1.80
15G1B-05015S4R01	0.500	0.291	1.300	1.500	0.042	3.280	3	0.500	4.70
15G1B-06015S6R01	0.625	0.415	1.300	1.500	0.042	3.410	4	0.625	3.00
15G1B-07015S7R01	0.750	0.540	1.300	1.500	0.042	3.500	5	0.750	2.20

Insert screw tightening torque: 10-14 in*lb.

GOLDSPEED™ 04 SERIES 15G1B (CHIP•SURFER STYLE)

HIGH FEED END MILLS (4MM INSERT)



WEP - See insert drawing for wiper options.

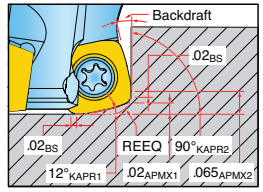
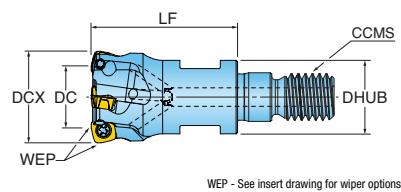
Part Number	DCX Cutting Dia. Max.	DC Cutting Dia.	LF Functional Length	ZEFF Effective Teeth	REEQ Program Radius Equivalent	DHUB Hub Dia.	CCMS Connection Code Machine Side	RMPX Ramp Angle Max.
15G1B-03006T6R01	0.375	0.167	0.669	2	0.043	0.369	Chip Surfer T06	1.80
15G1B-05007T8R01	0.500	0.291	0.748	3	0.042	0.485	Chip Surfer T08	4.70
15G1B-06008TRR01	0.625	0.415	0.827	4	0.042	0.605	Chip Surfer T10	3.00
15G1B-07010TSR01	0.750	0.540	1.024	5	0.042	0.725	Chip Surfer T12	2.20

Insert screw tightening torque: 10-14 in*lb.



GOLDSPEED™ 04 SERIES 15G1B (TOP-ON STYLE)

HIGH FEED END MILLS (4MM INSERT)



Part Number	DCX Cutting Dia. Max.	DC Cutting Dia.	LF Functional Length	ZEFF Effective Teeth	REEQ Program Radius Equivalent	DHUB Hub Dia.	CCMS Connection Code Machine Side	RMPX Ramp Angle Max.
15G1B-05007X4R01	0.500	0.291	0.75	3	0.042	0.465	TopOn M06	4.70
15G1B-06010X5R01	0.625	0.415	1.00	4	0.042	0.505	TopOn M08	3.00
15G1B-07010X6R01	0.750	0.540	1.00	5	0.043	0.704	TopOn M10	2.20

Insert screw tightening torque: 10-14 in*lb.

GOLDSPEED™ 04 INSERTS

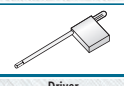


SDXS0402MPR-MM	SDXS0402MPR-MR	SDXS0402MPR-MR1

Part Number	Application	RE Corner Radius	BS Wiper Length	IC Inscribed Circle	S Thickness	IH Insert Hand	Grade	IN2505	IN2530
SDXS0402MPR-MM	Hi-Feed, Positive Geometry	0.021	0.022	04 mm	0.079	Right		•	•
SDXS0402MPR-MR	High Feed, Heavy Duty	0.021	0.022	04 mm	0.079	Right		•	•
SDXS0402MPR-MR1	Hi-Feed, Heavy-Duty Keen Edge	0.021	0.022	04 mm	0.079	Right		•	•



GOLDSPEED™ 04 HARDWARE



Driver

Screw

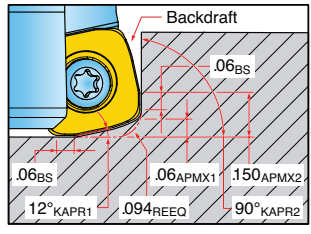
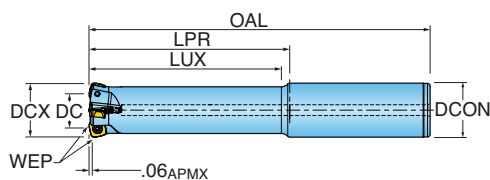
	Driver	Screw
15G1B-03015R8R01	DS-TP06S-NEU	TS18034I/HG-P
15G1B-05015S4R01	DS-TP06S-NEU	TS18034I/HG-P
15G1B-06015S6R01	DS-TP06S-NEU	SM18-041-00
15G1B-07015S7R01	DS-TP06S-NEU	SM18-041-00
15G1B-03006T6R01	DS-TP06S-NEU	TS18034I/HG-P
15G1B-05007T8R01	DS-TP06S-NEU	TS18034I/HG-P
15G1B-06008TRR01	DS-TP06S-NEU	SM18-041-00
15G1B-07010TSR01	DS-TP06S-NEU	SM18-041-00
15G1B-05007X4R01	DS-TP06S-NEU	TS18034I/HG-P
15G1B-06010X5R01	DS-TP06S-NEU	SM18-041-00
15G1B-07010X6R01	DS-TP06S-NEU	SM18-041-00

Insert screw tightening torque: 10-14 in*lb.



GOLDSPEED™ 09 SERIES 15G1F (CYLINDRICAL SHANK) FORMERLY GOLD@QUAD™

HIGH FEED END MILLS (9MM INSERT)



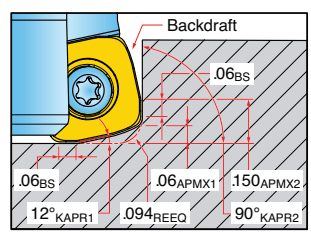
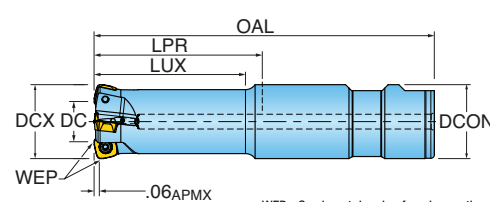
WEP - See insert drawing for wiper options.

Part Number	DCX Cutting Dia. Max.	DC Cutting Dia.	LUX Usable Length Max.	LPR Protruding Length	OAL Overall Length	ZEFF Eff. Teeth	REEQ Program Radius Equivalent	KAPR Cutting Edge Angle	DCON Shank Dia.	RMPX Ramp Angle Max.
15G1F-10019S1R01	1.000	0.524	1.78	1.97	7.00	3	0.094	12.0	1.000	5.5
15G1F-10020S1R01	1.000	0.524	1.81	2.00	10.00	3	0.094	12.0	1.000	5.5
15G1F-12047S9R01	1.250	0.773	4.55	4.75	8.00	3	0.094	12.0	1.250	3.3
15G1F-12047S9R02	1.250	0.773	4.55	4.75	8.00	4	0.094	12.0	1.250	3.3
15G1F-15060S9R01	1.500	1.022	6.00	6.00	10.00	4	0.094	12.0	1.250	2.3
15G1F-15060S9R02	1.500	1.022	6.00	6.00	10.00	5	0.094	12.0	1.250	2.3

Insert screw tightening torque: 14-18 in*lb.

GOLDSPEED™ 09 SERIES 15G1F (WELDON SHANK) FORMERLY GOLD@QUAD™

HIGH FEED END MILLS (9MM INSERT)



WEP - See insert drawing for wiper options.

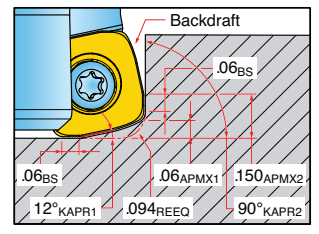
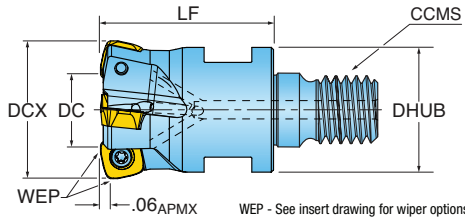
Part Number	DCX Cutting Dia. Max.	DC Cutting Dia.	LUX Usable Length Max.	LPR Protruding Length	OAL Overall Length	ZEFF Eff. Teeth	REEQ Program Radius Equivalent	KAPR Cutting Edge Angle	DCON Shank Dia.	RMPX Ramp Angle Max.
15G1F-12027E2R01	1.250	0.773	2.55	2.75	5.75	3	0.094	12°	1.250	3.3
15G1F-12027E2R02	1.250	0.773	2.55	2.75	5.75	4	0.094	12°	1.250	3.3
15G1F-12047E2R01	1.250	0.773	4.55	4.75	7.75	3	0.094	12°	1.250	3.3
15G1F-15016E2R01	1.500	1.022	1.69	1.69	6.00	4	0.094	12°	1.250	2.3
15G1F-15016E2R02	1.500	1.022	1.69	1.69	6.00	5	0.094	12°	1.250	2.3

Insert screw tightening torque: 14-18 in*lb.



GOLDSPEED™ 09 SERIES 15G1F (TOP-ON STYLE) FORMERLY GOLDQUAD®

HIGH FEED END MILLS (9MM INSERT)

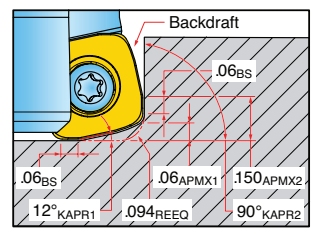
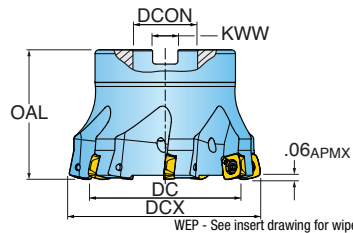


Part Number	DCX Cutting Dia. Max.	DC Cutting Diameter	LF Functional Length	ZEFF Effective Teeth	REEQ Program Radius Equivalent	KAPR Cutting Edge Angle	DHUB Hub Diameter	CCMS Connection Code	RMPX Ramp Angle Max.
15G1F-10015X7R01	1.000	0.524	1.57	3	0.094	12.0	.82	TopOn M12	5.5
15G1F-12015X8R02	1.250	0.773	1.57	4	0.094	12.0	1.13	TopOn M16	3.3
15G1F-15017X9R01	1.500	1.022	1.57	5	0.094	12.0	1.42	TopOn M20	2.3

Insert screw tightening torque: 14-18 in*lb.

GOLDSPEED™ 09 SERIES 5G5F, 5G6F FORMERLY GOLDQUAD®

HIGH FEED FACE MILLS (9MM INSERT)

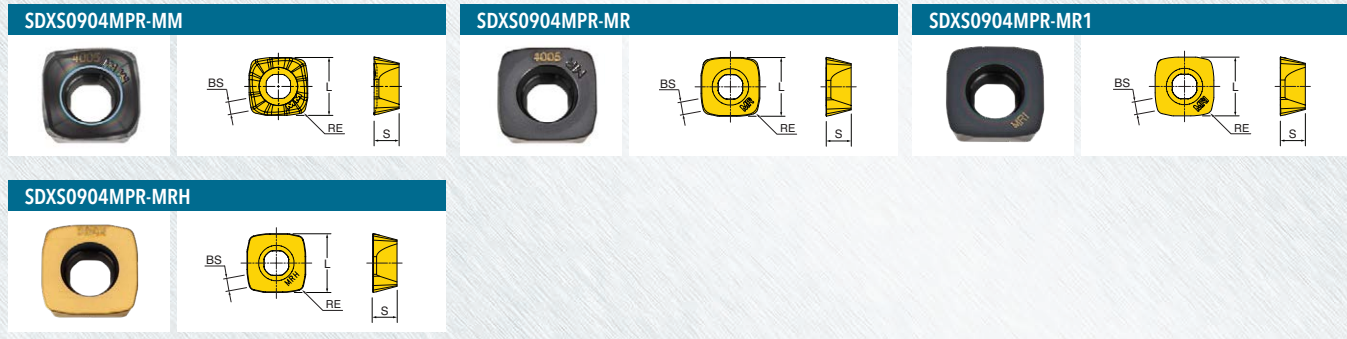


Part Number	DCX Cutting Dia. Max.	DC Cutting Dia.	OAL Overall Length	ZEFF Eff. Teeth	REEQ Program Radius Equivalent	DCON Shank Dia.	KWW Keyway	RMPX Ramp Angle Max.
5G5F-20R01	2.000	1.521	1.97	7	0.094	0.750	0.31	1.5
5G6F-20R01	2.000	1.521	1.97	6	0.094	0.750	0.31	1.5
5G5F-25R01	2.500	2.020	1.97	8	0.094	0.750	0.31	1.1
5G5F-30R01	3.000	2.520	2.00	9	0.094	1.000	0.38	.8
5G6F-30R01	3.000	2.520	2.00	7	0.094	1.000	0.38	.8

Insert screw tightening torque: 14-18 in*lb.







GOLDSPEED™ 09 INSERTS **FORMERLY GOLD@QUAD[®]**



Part Number	Application	RE Corner Radius	BS Wiper Length	L Cutting Edge Length	S Thickness	Grade	IN2504	IN4005	IN2505	IN4030	IN2530	IN7035	IN4035	IN2535
SDXS0904MPR-MM	Multi-Purpose	.040	.060	.370	.158			•	•	•	•	•	•	•
SDXS0904MPR-MR	Heavy-Duty	.040	.060	.370	.158			•	•	•	•		•	•
SDXS0904MPR-MR1	Flat-Top, Keen Edge	.040	.060	.370	.158					•	•	•	•	•
SDXS0904MPR-MRH	Hardened Steels	.040	.060	.370	.158	•								

GOLDSPEED™ 09 HARDWARE **FORMERLY GOLD@QUAD[®]**

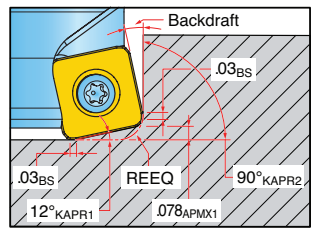
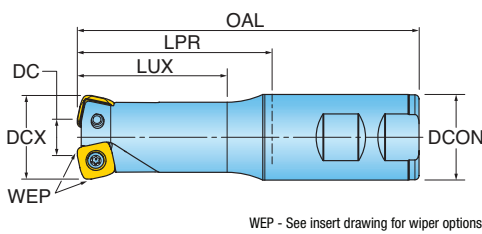
	 Insert Screw	 Driver	 Retention Bolt	 **OPTIONAL** Coolant Bolt
15G1F-10019S1R01	SM30-075-R0	DS-T09W	-	-
15G1F-10020S1R01	SM30-075-R0	DS-T09W	-	-
15G1F-10015X7R01	SM30-075-R0	DS-T09W	-	-
15G1F-12047S9R02	SM30-075-R0	DS-T09W	-	-
15G1F-12047S9R01	SM30-075-R0	DS-T09W	-	-
15G1F-12027E2R02	SM30-075-R0	DS-T09W	-	-
15G1F-12027E2R01	SM30-075-R0	DS-T09W	-	-
15G1F-12047E2R01	SM30-075-R0	DS-T09W	-	-
15G1F-12015X8R02	SM30-075-R0	DS-T09W	-	-
15G1F-15060S9R02	SM30-075-R0	DS-T09W	-	-
15G1F-15060S9R01	SM30-075-R0	DS-T09W	-	-
15G1F-15016E2R02	SM30-075-R0	DS-T09W	-	-
15G1F-15016E2R01	SM30-075-R0	DS-T09W	-	-
15G1F-15017X9R01	SM30-075-R0	DS-T09W	-	-
5G5F-20R01	SM30-075-R0	DS-T09W	SD-06-48	SD06-A6
5G6F-20R01	SM30-075-R0	DS-T09W	SD-06-48	SD06-A6
5G5F-25R01	SM30-075-R0	DS-T09W	SD-06-48	SD06-A6
5G5F-30R01	SM30-075-R0	DS-T09W	SD-08-47	SD-08-C9
5G6F-30R01	SM30-075-R0	DS-T09W	SD-08-47	SD-08-C9

Insert screw tightening torque: 14-18 in*lb.



GOLDSPEED™ 13 SERIES 15M1P **FORMERLY GOLD@QUAD®**

HIGH FEED END MILLS (13MM INSERT)



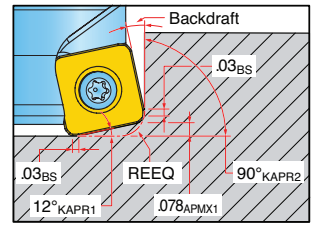
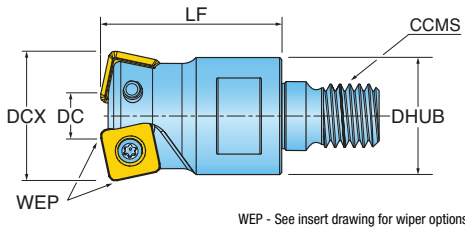
WEP - See insert drawing for wiper options.

Part Number	DCX Cutting Dia. Max.	DC Cutting Dia.	LUX Usable Length Max.	LPR Protruding Length	OAL Overall Length	ZEFF Eff. Teeth	REEQ Program Radius Equivalent	DCON Shank Dia.	RMPX* Ramp Angle Max.
15M1P-1202781R01	1.250	0.423	2.00	2.75	5.00	2	0.125	1.250 Weldon	13.10
15M1P-1204759R01	1.250	0.423	4.00	4.75	8.00	2	0.125	1.250 Cylindrical	13.10
15M1P-1502786R01	1.500	0.673	2.00	2.75	5.41	3	0.125	1.500 Weldon	7.10
15M1P-1505386R01	1.500	0.673	5.00	5.34	8.00	3	0.125	1.500 Weldon	7.10

* All of the above data is with insert SDES1305MDR installed. Please see Technical Literature for dimensions when using other inserts.
Insert screw tightening torque: 30-35 in*lb.

GOLDSPEED™ 13 SERIES 15M1P (TOP-ON STYLE) **FORMERLY GOLD@QUAD®**

HIGH FEED END MILLS (13MM INSERT)



WEP - See insert drawing for wiper options.

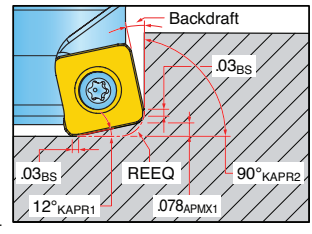
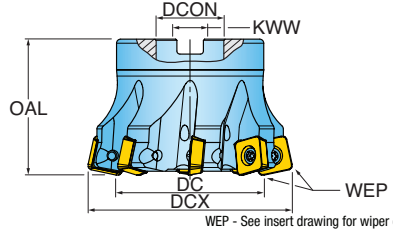
Part Number	DCX Cutting Dia. Max.	DC Cutting Diameter	APMX Depth of Cut Max.	LF Functional Length	ZEFF Effective Teeth	REEQ Program Radius Equivalent	DHUB Hub Diameter	CCMS Connection Code	RMPX* Ramp Angle Max.
15M1P-12017X8R01	1.250	0.423	0.088	1.75	2	0.125	1.13	TopOn M16	13.10

* All of the above data is with insert SDES1305MDR installed. Please see Technical Literature for dimensions when using other inserts.
Insert screw tightening torque: 30-35 in*lb.



GOLDSPEED™ 13 SERIES 5M5P, 5M6P **FORMERLY GOLD@QUAD®**

HIGH FEED END MILLS (13MM INSERT)

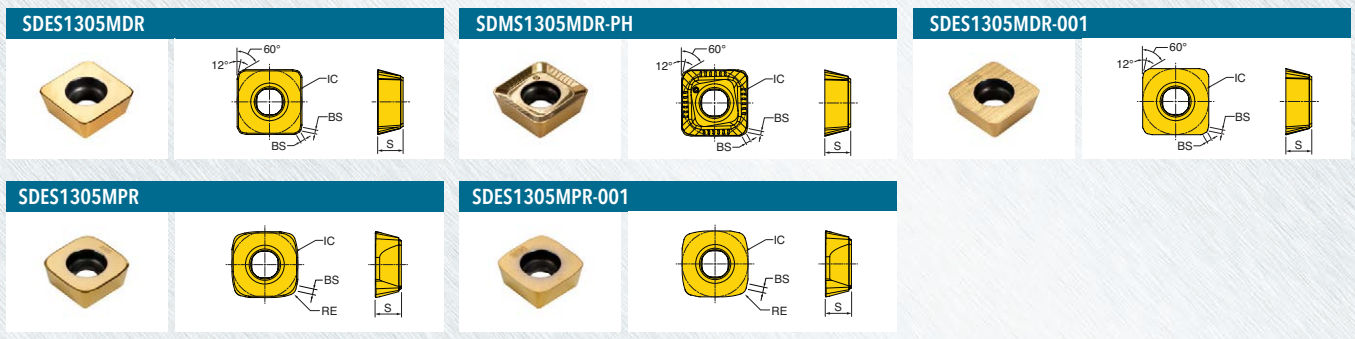
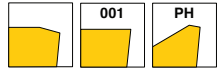


Part Number	DCX Cutting Dia. Max.	DC Cutting Dia.	OAL Overall Length	ZEFF Eff. Teeth	DCON Bore Dia.	KWW Keyway	RMPX* Ramp Angle Max.	REEQ Program Radius Equivalent
5M5P-20R01	2.000	1.170	2.000	5	0.750	0.313	3.90	0.125
5M6P-20R01	2.000	1.170	2.000	4	0.750	0.313	3.90	0.125
5M5P-25R01	2.500	1.670	2.000	6	0.750	0.313	2.70	0.125
5M6P-25R01	2.500	1.670	2.000	5	0.750	0.313	2.70	0.125
5M5P-30R01	3.000	2.170	2.000	8	1.000	0.375	1.60	0.125
5M5P-30R02	3.000	2.170	2.000	8	1.250	0.500	1.60	0.125
5M6P-30R01	3.000	2.170	2.000	6	1.000	0.375	1.60	0.125
5M6P-30R02	3.000	2.170	2.000	6	1.250	0.500	1.60	0.125
5M5P-40R01	4.000	3.170	2.500	10	1.500	0.625	1.10	0.125
5M6P-40R01	4.000	3.170	2.500	8	1.500	0.625	1.10	0.125
5M5P-50R01	5.000	4.170	2.500	11	1.500	0.625	0.80	0.125
5M6P-50R01	5.000	4.170	2.500	9	1.500	0.625	0.80	0.125

* All of the above data is with insert SDES1305MDR installed. Please see Technical Literature for dimensions when using other inserts.
Insert screw tightening torque: 30-35 in*lb.



GOLDSPEED™ 13 INSERTS FORMERLY **GOLD@QUAD®**



Part Number	Application	RE Corner Radius	BS Wiper Length	IC Inscribed Circle	S Thickness	Grade	IN2505	IN2530	IN4005	IN4030	IN4035
SDES1305MDR	Hi-Feed, Flat Face / Wiper - Facets	.125	0.030	13 mm	.200		•	•			
SDMS1305MDR-PH	Hi-Feed, Pos Precision / Wiper - Facets	.125	0.030	13 mm	.200		•	•	•	•	•
SDES1305MDR-001	Hi-Feed, Precision Flat Face / Wiper - Facets	.125	0.030	13 mm	.200		•	•			
SDES1305MPR	Hi-Feed, Heavy Duty - Standard	.140	0.060	13 mm	.200		•	•	•		•
SDES1305MPR-001	Hi-Feed, Heavy Duty - Precision	.140	0.060	13 mm	.200		•	•	•	•	•

GOLDSPEED™ 13 HARDWARE FORMERLY **GOLD@QUAD®**

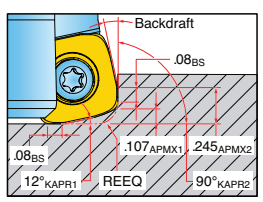
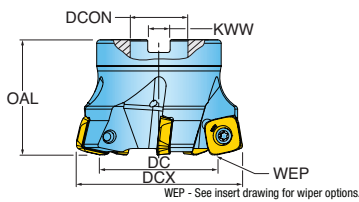
	Insert Screw	Driver	Driver Bit	Retention Bolt	Coolant Bolt
15M1P-1202781R01	SM40-100-R0	DS-A00T	BLD T15/S7	-	-
15M1P-1204759R01	SM40-100-R0	DS-A00T	BLD T15/S7	-	-
15M1P-1502786R01	SM40-100-R0	DS-A00T	BLD T15/S7	-	-
15M1P-1505386R01	SM40-100-R0	DS-A00T	BLD T15/S7	-	-
15M1P-12017X8R01	SM40-100-R0	DS-A00T	BLD T15/S7	-	-
5M5P-20R01	SM40-100-R0	DS-A00T	BLD T15/S7	SD-06-48	SD06-A6
5M6P-20R01	SM40-100-R0	DS-A00T	BLD T15/S7	SD-06-48	SD06-A6
5M5P-25R01	SM40-100-R0	DS-A00T	BLD T15/S7	SD-06-48	SD06-A6
5M6P-25R01	SM40-100-R0	DS-A00T	BLD T15/S7	SD-06-48	SD06-A6
5M5P-30R01	SM40-100-R0	DS-A00T	BLD T15/S7	SD-08-47	SD-08-92
5M6P-30R01	SM40-100-R0	DS-A00T	BLD T15/S7	SD-08-47	SD-08-92
5M5P-30R02	SM40-100-R0	DS-A00T	BLD T15/S7	SD-10-47	SD-10-99
5M6P-30R02	SM40-100-R0	DS-A00T	BLD T15/S7	SD-10-47	SD-10-99
5M5P-40R01	SM40-100-R0	DS-A00T	BLD T15/S7	SD-12-82	SD-12-99
5M6P-40R01	SM40-100-R0	DS-A00T	BLD T15/S7	SD-12-82	SD-12-99
5M5P-50R01	SM40-100-R0	DS-A00T	BLD T15/S7	SD-12-82	SD-12-99
5M6P-50R01	SM40-100-R0	DS-A00T	BLD T15/S7	SD-12-82	SD-12-99

Insert screw tightening torque: 30-35 in*lb.



GOLDSPEED™ 16 SERIES 5G5Q, 5G6Q

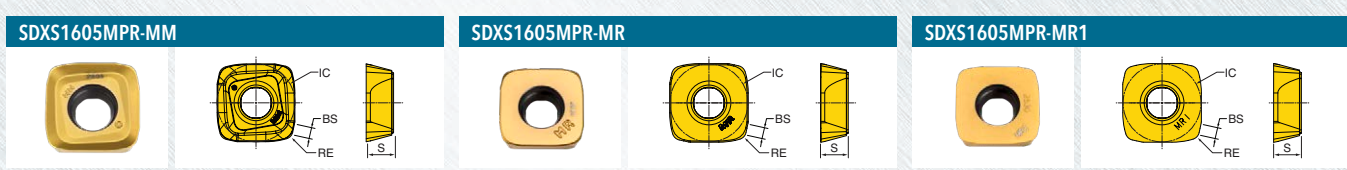
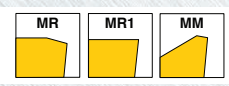
HIGH FEED END MILLS (16MM INSERT)



Part Number	DCX Cutting Dia. Max.	DC Cutting Dia.	APMX Depth of Cut Max.	OAL Overall Length	ZEFF Effective Teeth	REEQ Program Radius Equivalent	DCON Bore Dia.	KWW Keyway	RMPX Ramp Angle Max.
5G5Q-25R01	2.500	1.645	0.107	2.000	5	0.167	0.750	0.31	3.3
5G5Q-25R02	2.500	1.645	0.107	2.000	5	0.167	1.000	0.38	3.3
5G5Q-30R01	3.000	2.144	0.107	2.000	6	0.167	1.000	0.38	2.4
5G6Q-30R01	3.000	2.144	0.107	2.000	5	0.167	1.000	0.38	2.4
5G5Q-30R02	3.000	2.144	0.107	2.000	6	0.167	1.250	0.50	2.4
5G5Q-40R01	4.000	3.144	0.107	2.500	8	0.166	1.500	0.63	1.6
5G6Q-40R01	4.000	3.144	0.106	2.500	6	0.166	1.500	0.63	1.6
5G6Q-50R01	5.000	4.144	0.106	2.500	8	0.166	1.500	0.63	1.2
5G6Q-60R01	6.000	5.144	0.106	2.500	9	0.166	1.500	0.63	0.9

Insert screw tightening torque: 40-45 in*lb.

GOLDSPEED™ 16 INSERTS



Part Number	Application	RE Corner Radius	BS Wiper Length	IC Inscribed Circle	S Thickness	NOI Number of Indexes	IH Insert Hand	Grade	IN2505	IN2515	IN2530	IN2535	IN4005	IN4015	IN4030	IN4035	IN7035
SDXS1605MPR-MM	Positive Geometry	0.210	0.079	16 mm	0.220	4	Right		•	•	•	•	•	•	•	•	•
SDXS1605MPR-MR	Utility Insert - Heavy Duty	0.210	0.079	16 mm	0.220	4	Right		•		•	•	•			•	
SDXS1605MPR-MR1	Utility Insert- Heavy Duty- Keen Edge	0.210	0.079	16 mm	0.220	4	Right		•	•	•	•	•	•		•	•



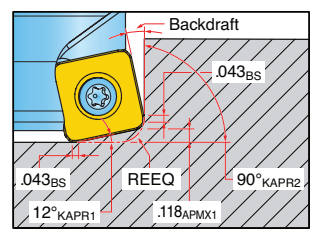
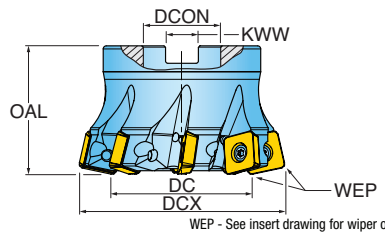
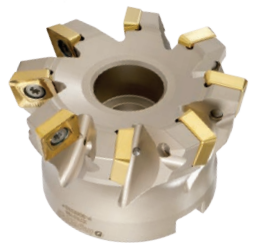
GOLDSPEED™ 16 HARDWARE

	Screw	Retention Bolt	Driver Handle	Torx Driver Blade	
5G5Q-25R01	SM50-130-R0	SD-06-48	DS-A00T	DS-T206B	
5G5Q-25R02	SM50-130-R0	SD-08-48	DS-A00T	DS-T206B	
5G5Q-30R01	SM50-130-R0	SD-08-47	DS-A00T	DS-T206B	
5G6Q-30R01	SM50-130-R0	SD-08-47	DS-A00T	DS-T206B	
5G5Q-30R02	SM50-130-R0	SD-10-47	DS-A00T	DS-T206B	
5G5Q-40R01	SM50-130-R0	SD-12-82	DS-A00T	DS-T206B	
5G6Q-40R01	SM50-130-R0	SD-12-82	DS-A00T	DS-T206B	
5G6Q-50R01	SM50-130-R0	SD-12-82	DS-A00T	DS-T206B	
5G6Q-60R01	SM50-130-R0	SD-12-82	DS-A00T	DS-T206B	

Insert screw tightening torque: 40-45 in*lb.

GOLDSPEED™ 19 SERIES 5G5M, 5G6M FORMERLY GOLD@QUAD™

HIGH FEED END MILLS (19MM INSERT)

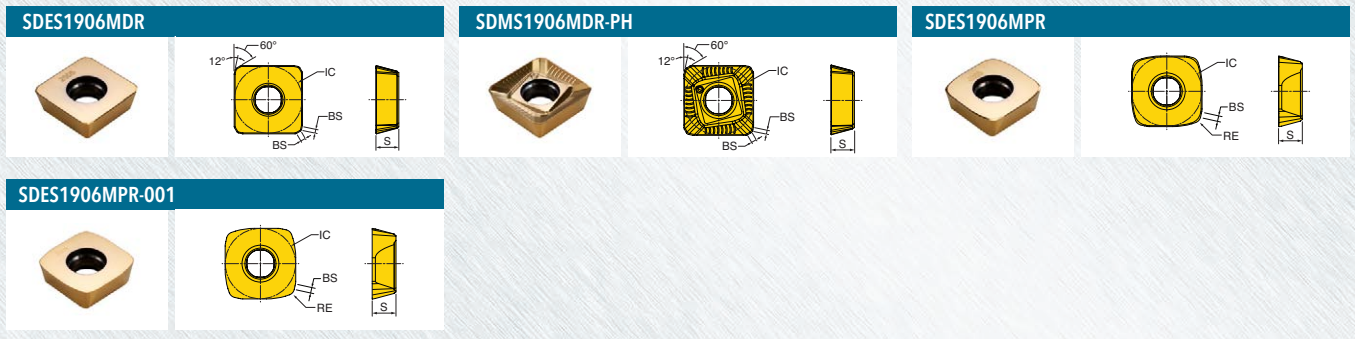
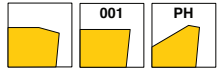


Part Number	DCX Cutting Dia. Max.	DC Cutting Dia.	OAL Overall Length	ZEFF Eff. Teeth	DCON Bore Dia.	KWW Keyway	RMPX* Ramp Angle Max.	REEQ Program Radius Equivalent
5G5M-30R01	3.000	1.755	2.000	6	1.000	0.375	2.70	0.180
5G6M-30R01	3.000	1.755	2.000	5	1.000	0.375	4.40	0.180
5G5M-40R01	4.000	2.755	2.500	8	1.500	0.625	1.70	0.180
5G6M-40R01	4.000	2.755	2.500	6	1.500	0.625	2.60	0.180
5G5M-50R01	5.000	3.755	2.500	9	1.500	0.625	1.70	0.180
5G6M-50R01	5.000	3.755	2.500	7	1.500	0.625	1.90	0.180
5G5M-60R01	6.000	4.755	2.500	10	1.500	0.625	1.30	0.180
5G6M-60R01	6.000	4.755	2.500	8	1.500	0.625	1.50	0.180
5G6M-70R01	7.000	5.755	2.500	8	1.500	0.625	1.23	0.180

* All of the above data is with insert SDES1906MDR installed. Please see Technical Literature for dimensions when using other inserts.
Insert screw tightening torque: 72-77 in*lb.







GOLDSPEED™ 19 INSERTS FORMERLY **GOLD@QUAD®**



Part Number	Application	RE Corner Radius	BS Wiper Length	IC Inscribed Circle	S Thickness	Grade	IN2505	IN2530	IN4005	IN4030	IN4035
SDES1906MDR	Hi-Feed, Flat Face / Wiper - Facets	.180	0.043	19 mm	.250		•	•			
SDMS1906MDR-PH	Hi-Feed, Pos Precision / Wiper - Facets	.180	0.043	19 mm	.250		•	•	•	•	•
SDES1906MPR	Hi-Feed, Heavy Duty - Standard	.212	0.061	19 mm	.250		•	•	•		•
SDES1906MPR-001	Hi-Feed, Heavy Duty - Precision	.212	0.061	19 mm	.250		•	•	•	•	•

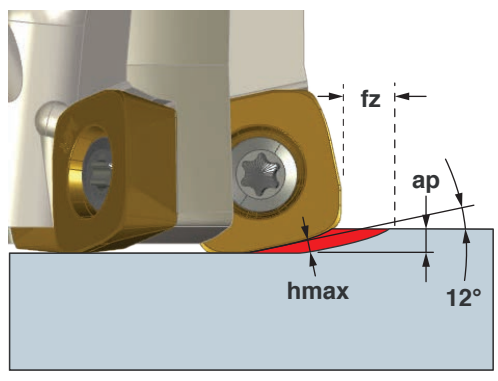
GOLDSPEED™ 19 HARDWARE FORMERLY **GOLD@QUAD®**

					
	Insert Screw	Driver	Retention Bolt	Coolant Bolt	
5G5M-30R01	SM60-135-R0	DS-T25T	SD-08-47	SD-08-92	
5G6M-30R01	SM60-135-R0	DS-T25T	SD-08-47	SD-08-92	
5G5M-40R01	SM60-135-R0	DS-T25T	SD-12-82	SD-12-99	
5G6M-40R01	SM60-135-R0	DS-T25T	SD-12-82	SD-12-99	
5G5M-50R01	SM60-135-R0	DS-T25T	SD-12-82	SD-12-99	
5G6M-50R01	SM60-135-R0	DS-T25T	SD-12-82	SD-12-99	
5G5M-60R01	SM60-135-R0	DS-T25T	SD-12-82	SD-12-99	
5G6M-60R01	SM60-135-R0	DS-T25T	SD-12-82	SD-12-99	
5G6M-70R01	SM60-135-R0	DS-T25T	SD-12-82	SD-12-99	

Insert screw tightening torque: 72-77 in*lb.

GOLDSPEED™ 04 OPERATING GUIDELINES

• Axial Chip Thinning

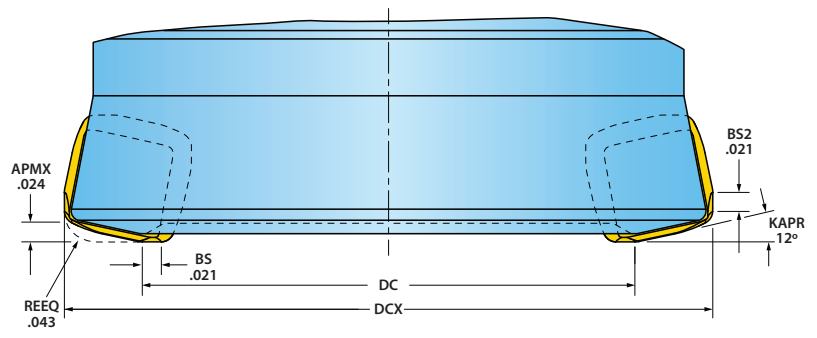


NOTE:
The operating guidelines table below includes a column for feed-per-tooth (fz). That column accounts for the axial chip thinning that's generated by the cutting-edge angle (lead angle). All GoldSpeed high-feed cutters have a 12° cutting edge angle resulting in an fz that is approximately 5x the recommended chip thickness (hex).

ISO	Materials			V _c Cutting Speed SFM	H _{hex} Max. Chip Thickness (inch)	f _z Feed/Tooth (inch)	Harder <--> Tougher		Coolant	Geometry		
	Mat'l Group #VDI 3323	Type	Examples				IN2505	IN2530		MR	MR1	MM
P	1 thru 5	Non-alloy Steel	1018, A36, 1045, A572, 1070	600 - 1000	.002 - .008	.010 - .040	1	2	NO	1	2	3
	6 thru 9	Low-alloy Steel	4140, 4340, P20, 8620, 300M	500 - 800	.002 - .006	.010 - .030	1	2	NO	1	2	3
	10, 11	High-alloy Steel	H13, A2, D2, M2, T1	400 - 700	.002 - .004	.010 - .020	1	2	NO	1	2	3
M	12 thru 13	"Stainless Steel (Ferritic & Martensitic)"	410, 416, 440	400 - 700	.002 - .004	.010 - .020	2	1	YES		1	2
	14	Stainless Steel (Austenitic)	"303, 304, 316, 15-5, 17-4"	500 - 800	.002 - .006	.010 - .030	2	1	YES		2	1
K	15 thru 16	Gray Cast Iron	CLS. 20, 30, 45	600 - 1000	.002 - .008	.010 - .040	1	2	NO	3	1	2
	17 thru 20	Nodular Cast Iron	"60-40-18, 100-70-03"	500 - 800	.002 - .006	.010 - .030	1	2	NO	3	1	2
N	21 thru 30	Aluminum	7075, 6061	1000+	.004 - .008	.020 - .040	1	2	YES		2	1
S	31 thru 35	High-Temp Alloys	Inconel, Hastelloy, Nimonic, Monel	80 - 140	.001 - .003	.005 - .015	2	1	YES		1	2
	36 thru 37	Titanium Alloys	6AL-4V, 5Al-5Mo-5V-3Cr	100 - 200	.002 - .005	.010 - .025	2	1	YES		1	2
H	38 thru 39	Hardened Steel >48	A2, 01, D2	100 - 200	.001 - .004	.005 - .020	1	2	NO	1	2	

Note: Feed and speed recommendations are starting operating parameters. They are only guidelines from which further optimization should take place. Operating parameters are influenced by many machining variables. These variables may cause for reductions in feeds and speed or dramatic increases. Additionally, DOC and WOC may need to be revised to optimize the tools performance.

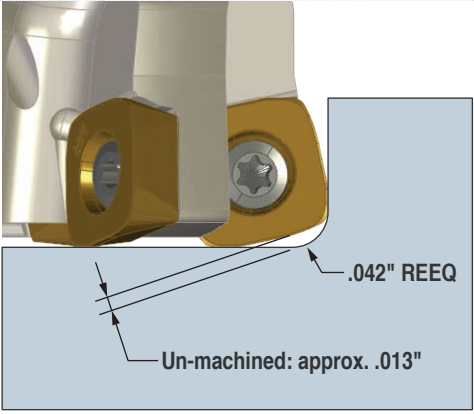
GOLDSPEED™ 04 PROGRAMMING DATA



Definitions	
DCX	Maximum Cutter Diameter
DC	Effective Cutter Diameter
KAPR	Cutting Edge Angle
APMX	Maximum Depth of Cut
REEQ	Program Radius
BS	Axial Wiper Length
BS2	Radial Wiper Length

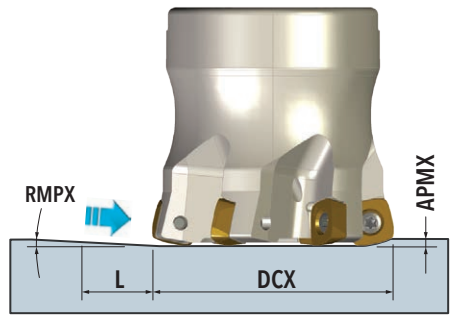
Part Number	DCX Cutting Dia. Max.	DC Cutting Dia.
15G1B-03006T6R01	0.375	0.167
15G1B-03015R8R01	0.375	0.167
15G1B-05007T8R01	0.500	0.291
15G1B-05007X4R01	0.500	0.291
15G1B-05015S4R01	0.500	0.291
15G1B-06008TRR01	0.625	0.415
15G1B-06010X5R01	0.625	0.415
15G1B-06015S6R01	0.625	0.415
15G1B-07010TSR01	0.750	0.540
15G1B-07010X6R01	0.750	0.540
15G1B-07015S7R01	0.750	0.540

GOLDSPEED™ 04 PROGRAMMING TIPS



1. The shape of the insert nose can be approximated by programming as-if the insert had a .042" corner radius (REEQ). The difference will result in an un-machined area that's approximately .013" deep.
2. The recommendations for cutting speed, chip-thickness grade and insert geometry are starting recommendations and should be optimized based on the type and rate of edge failure.
3. The Machining-Calculator at Ingersoll's Website is another resource for estimating and optimizing parameters. There are additional inputs like the radial width of cut and the effective rake angle can be included into the estimates.

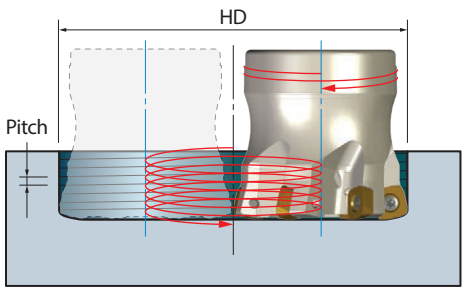
GOLDSPEED™ 04 STRAIGHT RAMPING



DCX Cutter Diameter	RMPX Ramp Angle Max.	L	APMX Depth of Cut Max.
0.375	1.80	0.763	0.024
0.500	4.70	0.279	0.024
0.625	3.00	0.438	0.024
0.750	2.20	0.598	0.024

L in this table is the length the cutter travels to reach the max. depth of cut (.024") while traveling at the max ramp angle listed for the cutter.

GOLDSPEED™ 04 HELICAL RAMPING



Pitch:
The max. pitch is determined to not exceed the max. depth of cut (APMX) and to not exceed the max. ramp angle (RMPX).

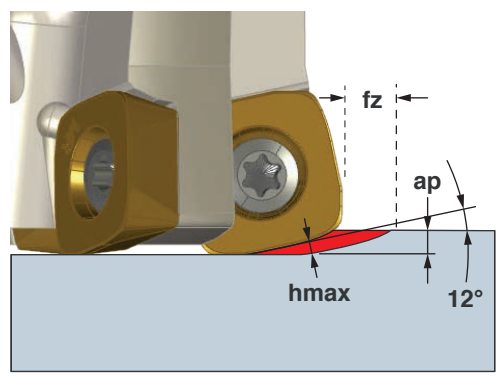
DCX Cutter Diameter	HD Min.	HD Max.	HD Max. w/o Cusp	Max Pitch Per Revolution
0.375	0.476	0.750	0.542	0.024
0.500	0.704	1.000	0.791	0.024
0.625	0.952	1.250	1.040	0.024
0.750	1.202	1.500	1.290	0.024

- Example:**
1. The min. hole dia. that the .375" dia. cutter can interpolate from solid is .476" (leaving a raised cusp).
 2. The max. hole dia. that the .375" dia. cutter can interpolate from solid is .750".
 3. The max. hole dia. that the .375" dia. cutter can interpolate from solid while leaving a flat-bottom is .542" (leaving no raised cusp).
 4. The max. pitch for this series matches the insert's radial wiper length of .024".



GOLDSPEED™ 09 OPERATING GUIDELINES FORMERLY GOLDQUAD®

• Axial Chip Thinning

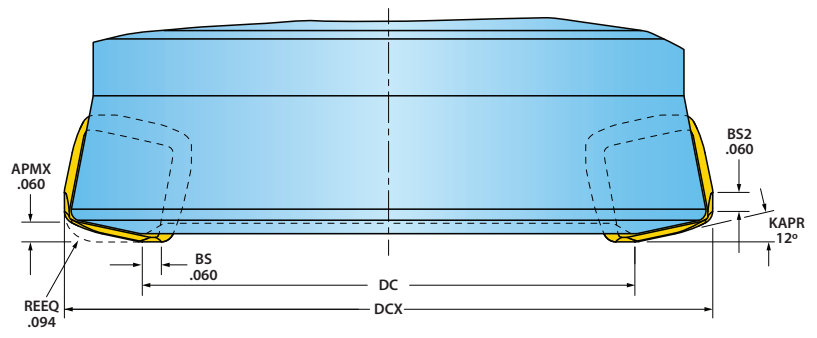


NOTE:
The operating guidelines table below includes a column for feed-per-tooth (fz). That column accounts for the axial chip thinning that's generated by the cutting-edge angle (lead angle). All GoldSFeed high-feed cutters have a 12° cutting edge angle resulting in an fz that is approximately 5x the recommended chip thickness (hex).

ISO	Materials			Vc Cutting Speed SFM	Hex Max. Chip Thickness (inch)	fz Feed/ Tooth (inch)	Harder <-----> Tougher								Coolant	Geometry			
	Mat'l Group #VDI 3323	Type	Examples				IN2504	IN4005	IN2505	IN4030	IN2530	IN7035	IN4035	IN2535		MR	MR1	MM	MRH
P	1 thru 5	Non-alloy Steel	1018, A36, 1045, A572, 1070	500 - 900	.006 - .014	.030 - .070	1	2	3	4					NO	1	2	3	
	6 thru 9	Low-alloy Steel	4140, 4340, P20, 8620, 300M	400 - 600	.005 - .012	.025 - .060	1	2	3	4					NO	1	2	3	
	10, 11	High-alloy Steel	H13, A2, D2, M2, T1	300 - 500	.004 - .010	.020 - .050	1	2	3	4					NO	1	2	3	
M	12 thru 13	"Stainless Steel (Ferritic & Martensitic)"	410, 416, 440	400 - 700	.004 - .010	.020 - .050				2	1			4	3	YES		1	2
	14	"Stainless Steel (Austenitic)"	"303, 304, 316, 15-5, 17-4"	300 - 600	.004 - .010	.020 - .050				2	1			4	3	YES		2	1
K	15 thru 16	Gray Cast Iron	CLS. 20, 30, 45	500 - 900	.006 - .015	.030 - .075	1	2	3	4					NO	3	1	2	
	17 thru 20	Nodular Cast Iron	"60-40-18, 100-70-03"	400 - 600	.005 - .012	.025 - .060	1	2	3	4					NO	3	1	2	
N	21 thru 30	Aluminum	7075, 6061	1000+	.004 - .015	.020 - .075	1	2	3	4					YES		2	1	
S	31 thru 35	High-Temp Alloys	Inconel, Hastelloy, Nimonic, Monel	80 - 140	.002 - .005	.010 - .025							2	3	1	YES		1	2
	36 thru 37	Titanium Alloys	6AL-4V, 5Al-5Mo-5V-3Cr	100 - 200	.005 - .008	.025 - .040							3	1	2	YES		1	2
H	38 thru 39	Hardened Steel >48	A2, O1, D2	100 - 200	.002 - .004	.010 - .020	1	2	3						NO	2		1	

Note: Feed and speed recommendations are starting operating parameters. They are only guidelines from which further optimization should take place. Operating parameters are influenced by many machining variables. These variables may cause for reductions in feeds and speed or dramatic increases. Additionally, DOC and WOC may need to be revised to optimize the tools performance.

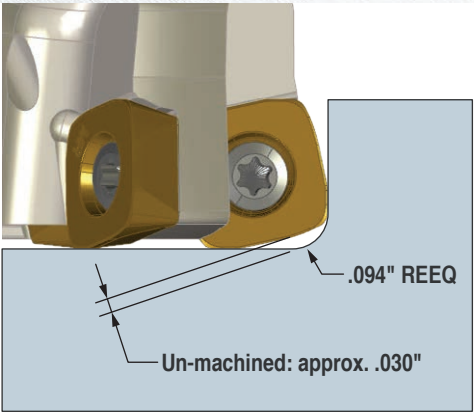
GOLDSPEED™ 09 PROGRAMMING DATA *FORMERLY GOLD@QUAD®*



Definitions	
DCX	Maximum Cutter Diameter
DC	Effective Cutter Diameter
KAPR	Cutting Edge Angle
APMX	Maximum Depth of Cut
REEQ	Program Radius
BS	Axial Wiper Length
BS2	Radial Wiper Length

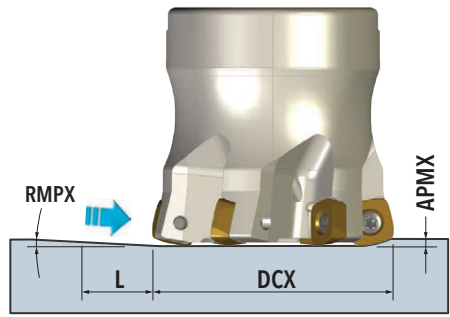
Part Number	DCX Cutting Dia. Max.	DC Cutting Dia.
15G1F-10019S1R01	1.000	0.524
15G1F-10020S1R01	1.000	0.524
15G1F-10015X7R01	1.000	0.524
15G1F-12047S9R02	1.250	0.773
15G1F-12047S9R01	1.250	0.773
15G1F-12027E2R02	1.250	0.773
15G1F-12027E2R01	1.250	0.773
15G1F-12047E2R01	1.250	0.773
15G1F-12015X8R02	1.250	0.773
15G1F-15060S9R02	1.500	1.022
15G1F-15060S9R01	1.500	1.022
15G1F-15016E2R02	1.500	1.022
15G1F-15016E2R01	1.500	1.022
15G1F-15017X9R01	1.500	1.022
5G5F-20R01	2.000	1.521
5G6F-20R01	2.000	1.521
5G5F-25R01	2.500	2.020
5G5F-30R01	3.000	2.520
5G6F-30R01	3.000	2.520

GOLDSPEED™ 09 PROGRAMMING TIPS *FORMERLY GOLD@QUAD®*



1. The shape of the insert nose can be approximated by programming as-if the insert had a .094" corner radius (REEQ). The difference will result in an unmachined area that's approximately .030" deep.
2. The recommendations for cutting speed, chip-thickness grade and insert geometry are starting recommendations and should be optimized based on the type and rate of edge failure.
3. The Machining-Calculator at Ingersoll's Website is another resource for estimating and optimizing parameters. There are additional inputs like the radial width of cut and the effective rake angle can be included into the estimates.

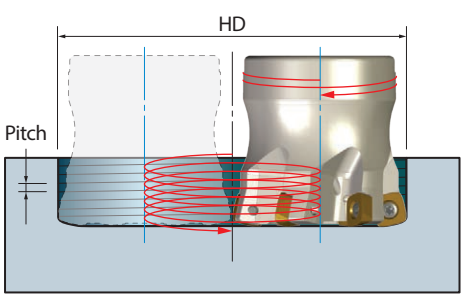
GOLDSPEED™ 09 STRAIGHT RAMPING *FORMERLY GOLDQUAD®*



DCX Cutter Diameter	RMPX Ramp Angle Max.	L	APMX Depth of Cut Max.
1.000	5.5	0.623	0.060
1.250	3.3	1.041	0.060
1.500	2.3	1.494	0.060
2.000	1.5	2.291	0.060
2.500	1.1	3.125	0.060
3.000	0.8	4.297	0.060

L in this table is the length the cutter travels to reach the max. depth of cut (.060") while traveling at the max ramp angle listed for the cutter.

GOLDSPEED™ 09 HELICAL RAMPING *FORMERLY GOLDQUAD®*



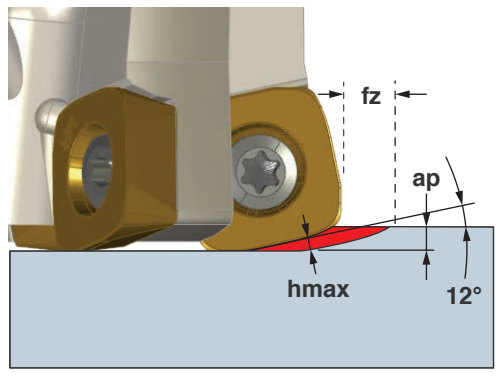
Pitch:
The max. pitch is determined to not exceed the max. depth of cut (APMX) and to not exceed the max. ramp angle (RMPX).

DCX Cutter Diameter	HD Min.	HD Max.	HD Max. w/o Cusp	Max Pitch Per Revolution
1.000	1.324	2.000	1.524	0.060
1.250	1.822	2.500	2.023	0.060
1.500	2.320	3.000	2.522	0.060
2.000	3.320	4.000	3.520	0.060
2.500	4.330	5.000	4.520	0.060
3.000	5.330	6.000	5.520	0.060

- Example:**
1. The min. hole dia. that the 1.000" dia. cutter can interpolate from solid is 1.324" (leaving a raised cusp).
 2. The max. hole dia. that the 1.000" dia. cutter can interpolate from solid is 2.000".
 3. The max. hole dia. that the 1.000" dia. cutter can interpolate from solid while leaving a flat-bottom is 1.524" (leaving no raised cusp).
 4. The max. pitch for this series matches the insert's radial wiper length of .060".

GOLDSPEED™ 13 OPERATING GUIDELINES FORMERLY GOLDQUAD®

• Axial Chip Thinning



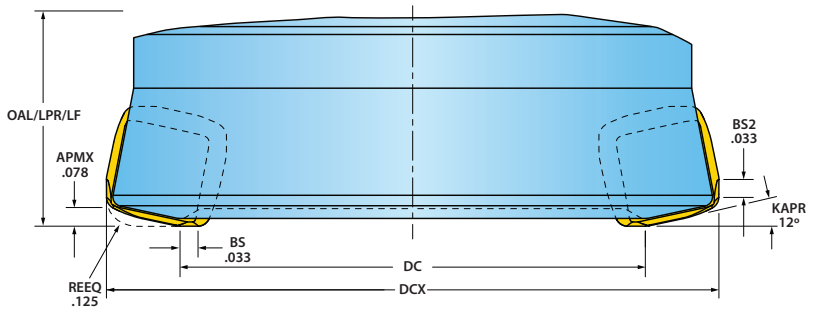
NOTE:
 The operating guidelines table below includes a column for feed-per-tooth (fz). That column accounts for the axial chip thinning that's generated by the cutting-edge angle (lead angle). All GoldSpeed high-feed cutters have a 12° cutting edge angle resulting in an fz that is approximately 5x the recommended chip thickness (hex).

ISO	Materials			V _c Cutting Speed SFM	Hex Max. Chip Thickness (inch)	f _z Feed/Tooth (inch)	Harder <-----> Tougher							Coolant	Geometry			
	Mat'l Group #VDI 3323	Type	Examples				IN4005	IN2505	IN4030	IN2530	IN7035	IN4035	IN2535					
P	1 thru 5	Non-alloy Steel	1018, A36, 1045, A572, 1070	450 - 750	.006 - .018	.030 - .090	1	2	3	4					NO	1	2	3
	6 thru 9	Low-alloy Steel	4140, 4340, P20, 8620, 300M	350 - 550	.005 - .015	.025 - .075	1	2	3	4					NO	1	2	3
	10, 11	High-alloy Steel	H13, A2, D2, M2, T1	250 - 450	.004 - .012	.020 - .060	1	2	3	4					NO	1	2	3
M	12 thru 13	"Stainless Steel (Ferritic & Martensitic)"	410, 416, 440	350 - 550	.004 - .010	.020 - .050			2	1		4	3	YES		1	2	
	14	"Stainless Steel (Austenitic)"	"303, 304, 316, 15-5, 17-4"	250 - 500	.004 - .008	.020 - .040			2	1		4	3	YES		2	1	
K	15 thru 16	Gray Cast Iron	CLS. 20, 30, 45	500 - 900	.006 - .020	.030 - .100	1	2	3	4				NO	3	1	2	
	17 thru 20	Nodular Cast Iron	"60-40-18, 100-70-03"	350 - 650	.005 - .015	.025 - .075	1	2	3	4				NO	3	1	2	
N	21 thru 30	Aluminum	7075, 6061	1000+			1	2	3	4				YES		2	1	
S	31 thru 35	High-Temp Alloys	Inconel, Hastelloy, Nimonic, Monel	60 - 110	.002 - .005	.010 - .025						2	3	1	YES		1	2
	36 thru 37	Titanium Alloys	6AL-4V, 5Al-5Mo-5V-3Cr	100 - 170	.004 - .008	.020 - .040						3	1	2	YES		1	2
H	38 thru 39	Hardened Steel >48	A2, 01, D2	100 - 200	.002 - .005	.010 - .025	2	3						NO	1	2		

Note: Feed and speed recommendations are starting operating parameters. They are only guidelines from which further optimization should take place. Operating parameters are influenced by many machining variables. These variables may cause for reductions in feeds and speed or dramatic increases. Additionally, DOC and WOC may need to be revised to optimize the tools performance.



GOLDSPEED™ 13 PROGRAMMING DATA FOR MDR INSERTS FORMERLY GOLD@QUAD®

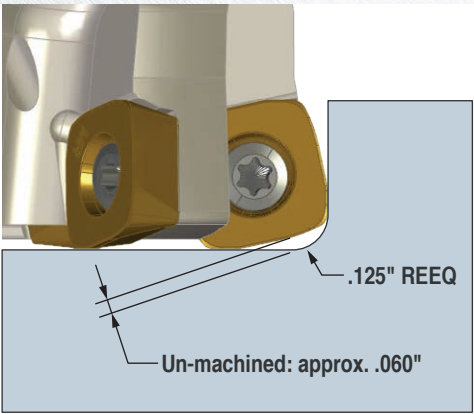


Definitions	
DCX	Maximum Cutter Diameter
DC	Effective Cutter Diameter
KAPR	Cutting Edge Angle
APMX	Maximum Depth of Cut
REEQ	Program Radius
BS	Axial Wiper Length
BS2	Radial Wiper Length
OAL	Overall Length
LPR	Protruding Length
LF	Functional Length

Using inserts SDES1305MDR, SDES1305MDR-001, SDMX1305MDR-PH, SDXS1305MDR-PH

Part Number	DCX Cutting Dia. Max.	DC Cutting Dia.	OAL Overall Length
15M1P-1202781R01	1.250	.423	2.750
15M1P-1204759R01	1.250	.423	4.750
15M1P-1502786R01	1.500	.673	2.750
15M1P-1505386R01	1.500	.673	5.340
15M1P-12017X8R01	1.250	.423	1.750
5M5P-20R01	2.000	1.170	2.000
5M6P-20R01	2.000	1.170	2.000
5M5P-25R01	2.500	1.170	2.000
5M6P-25R01	2.500	1.170	2.000
5M5P-30R01	3.000	2.170	2.000
5M6P-30R01	3.000	2.170	2.000
5M5P-30R02	3.000	2.170	2.000
5M6P-30R02	3.000	2.170	2.000
5M5P-40R01	4.000	3.170	2.500
5M6P-40R01	4.000	3.170	2.500
5M5P-50R01	5.000	4.170	2.500
5M6P-50R01	5.000	4.170	2.500

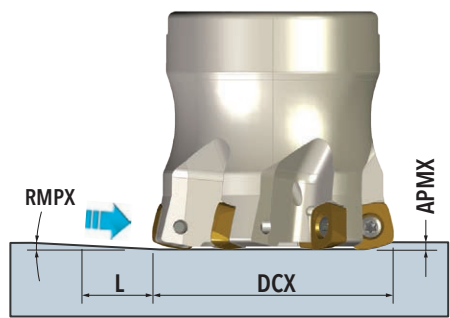
GOLDSPEED™ 13 PROGRAMMING TIPS FOR MDR INSERTS FORMERLY GOLD@QUAD®



Using inserts SDES1305MDR, SDES1305MDR-001, SDMX1305MDR-PH, SDXS1305MDR-PH

1. The shape of the insert nose can be approximated by programming as-if the insert had a .125" corner radius (REEQ). The difference will result in an un-machined area that's approximately .060" deep.
2. The recommendations for cutting speed, chip-thickness grade and insert geometry are starting recommendations and should be optimized based on the type and rate of edge failure.
3. The Machining-Calculator at Ingersoll's Website is another resource for estimating and optimizing parameters. There are additional inputs like the radial width of cut and the effective rake angle can be included into the estimates.

GOLDSPEED™ 13 STRAIGHT RAMPING FOR MDR INSERTS **FORMERLY GOLDQUAD®**

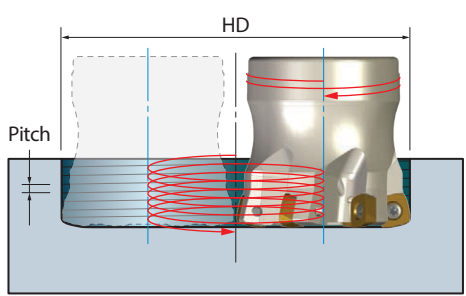


Using Inserts SDES1305MDR, SDES1305MDR-001, SDMS1305MDR-PH, SDXS1305MDR-PH

DCX Cutting Dia. Max.	RMPX Ramp Angle Max.	L	APMX Depth of Cut Max.
1.250	13.10	0.344	0.078
1.500	7.10	0.631	0.078
2.000	3.90	1.147	0.078
2.500	2.70	1.656	0.078
3.000	1.60	2.794	0.078
4.000	1.10	4.063	0.078
5.000	0.80	5.587	0.078

L in this table is the length the cutter travels to reach the max. depth of cut (.078") while traveling at the max ramp angle listed for the cutter.

GOLDSPEED™ 13 HELICAL RAMPING FOR MDR INSERTS **FORMERLY GOLDQUAD®**



Pitch:
The max. pitch is determined to not exceed the max. depth of cut (APMX) and to not exceed the max. ramp angle (RMPX).

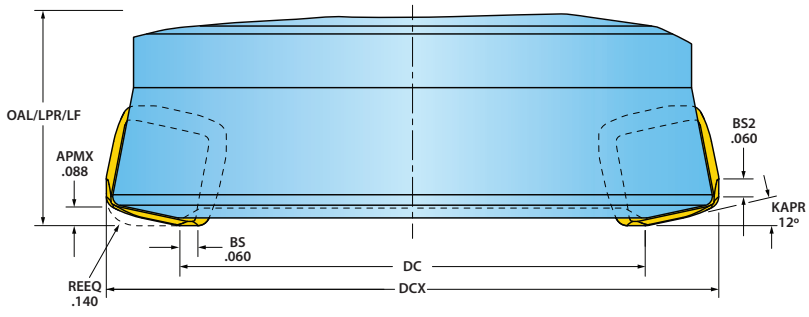
Using Inserts SDES1305MDR, SDES1305MDR-001, SDMS1305MDR-PH, SDXS1305MDR-PH

DCX Cutting Dia. Max.	HD Min. with Cusp	HD Max. with Cusp	HD Min. w/o Cusp	HD Max. w/o Cusp	Max Pitch Per Revolution
1.250	1.502	2.500	1.607	1.673	0.078
1.500	2.000	3.000	2.107	2.173	0.078
2.000	2.996	4.000	3.104	3.170	0.078
2.500	3.996	5.000	4.102	4.170	0.078
3.000	5.002	6.000	5.105	5.171	0.078
4.000	7.002	8.000	7.102	7.170	0.078
5.000	9.002	10.000	9.104	9.170	0.078

The table lists the max. and min. hole dia. (HD) for helical interpolating a hole from solid stock. For holes where a flat-bottom is required the table includes max and min hole dia. such that no cusp is remaining at the bottom of the hole.

The figure shows that the max. pitch (advance for every 360° of machine travel) should not exceed .078".

GOLDSPEED™ 13 PROGRAMMING DATA FOR MPR INSERTS **FORMERLY GOLD@QUAD®**

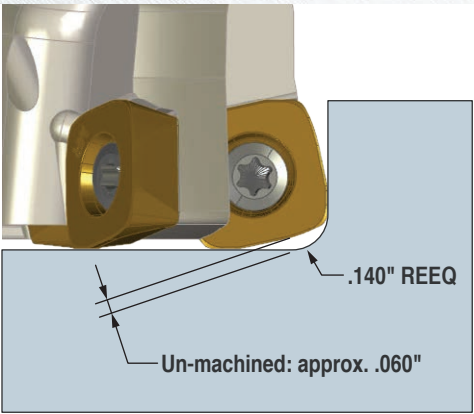


Definitions	
DCX	Maximum Cutter Diameter
DC	Effective Cutter Diameter
KAPR	Cutting Edge Angle
APMX	Maximum Depth of Cut
REEQ	Program Radius
BS	Axial Wiper Length
BS2	Radial Wiper Length
OAL	Overall Length
LPR	Protruding Length
LF	Functional Length

Using Inserts SDES1305MPR, SDES1305MPR-001, SDXS1305MPR-MR & SDXS1305MPR-MR1

Part Number	DCX Cutting Dia. Max.	DC Cutting Dia.	OAL Overall Length
15M1P-1202781R01	2.220	.533	2.735
15M1P-1204759R01	1.220	.533	4.735
15M1P-1502786R01	1.470	.784	2.735
15M1P-1505386R01	1.470	.784	5.325
15M1P-12017X8R01	1.220	.533	1.735
5M5P-20R01	1.970	1.281	1.985
5M6P-20R01	1.970	1.281	1.985
5M5P-25R01	2.470	1.781	1.985
5M6P-25R01	2.470	1.781	1.985
5M5P-30R01	2.970	2.281	1.985
5M6P-30R01	2.970	2.281	1.985
5M5P-30R02	2.970	2.281	1.985
5M6P-30R02	2.970	2.281	1.985
5M5P-40R01	3.970	3.281	2.485
5M6P-40R01	3.970	3.281	2.485
5M5P-50R01	4.970	4.281	2.485
5M6P-50R01	4.970	4.281	2.485

GOLDSPEED™ 13 PROGRAMMING TIPS FOR MPR INSERTS **FORMERLY GOLD@QUAD®**

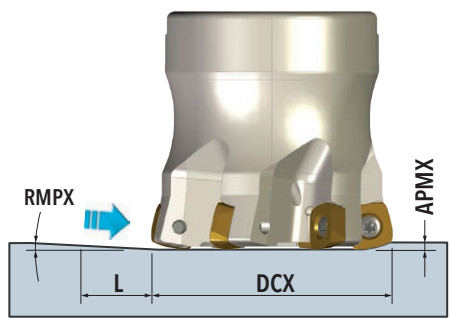


Using Inserts SDES1305MPR, SDES1305MPR-001, SDXS1305MPR-MR & SDXS1305MPR-MR1

1. The shape of the insert nose can be approximated by programming as-if the insert had a .140" corner radius (REEQ). The difference will result in an unmachined area that's approximately .060" deep.
2. The recommendations for cutting speed, chip-thickness grade and insert geometry are starting recommendations and should be optimized based on the type and rate of edge failure.
3. The Machining-Calculator at Ingersoll's Website is another resource for estimating and optimizing parameters. There are additional inputs like the radial width of cut and the effective rake angle can be included into the estimates.



GOLDSPEED™ 13 STRAIGHT RAMPING FOR MPR INSERTS FORMERLY GOLDQUAD®

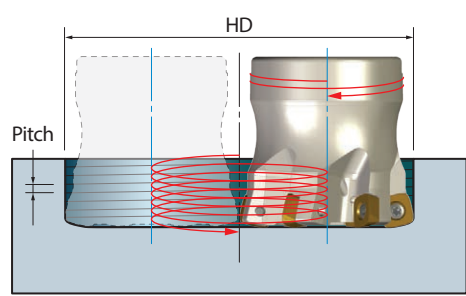


Using Inserts SDES1305MPR, SDES1305MPR-001, SDXS1305MPR-MR & SDXS1305MPR-MR1

DCX Cutting Dia. Max.	RMPX Ramp Angle Max.	L	APMX Depth of Cut Max.
1.220	9.10	0.556	0.088
1.470	5.20	0.971	0.088
2.960	2.90	1.739	0.088
3.960	2.10	2.402	0.088
4.961	1.20	4.202	0.088
5.961	0.80	6.303	0.088
6.961	0.60	8.404	0.088

L in this table is the length the cutter travels to reach the max. depth of cut (.088") while traveling at the max ramp angle listed for the cutter.

GOLDSPEED™ 13 HELICAL RAMPING FOR MPR INSERTS FORMERLY GOLDQUAD®



Pitch:
The max. pitch is determined to not exceed the max. depth of cut (APMX) and to not exceed the max. ramp angle (RMPX).

Using Inserts SDES1305MPR, SDES1305MPR-001, SDXS1305MPR-MR & SDXS1305MPR-MR1

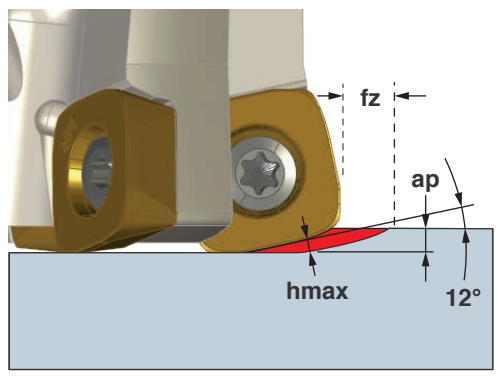
DCX Cutting Dia. Max.	HD Min. with Cusp	HD Max. with Cusp	HD Min. w/o Cusp	HD Max. w/o Cusp	Max Pitch Per Revolution
1.220	1.504	2.440	1.635	1.753	0.088
1.470	2.004	2.940	2.136	2.254	0.088
1.970	3.000	3.940	3.133	3.251	0.088
2.470	3.998	4.940	4.133	4.251	0.088
2.970	5.014	5.940	5.134	5.252	0.088
3.970	7.012	7.940	7.131	7.251	0.088
4.970	9.012	9.940	9.133	9.251	0.088

The table lists the max. and min. hole dia. (HD) for helical interpolating a hole from solid stock. For holes where a flat-bottom is required the table includes max and min hole dia. such that no cusp is remaining at the bottom of the hole.

The figure shows that the max. pitch (advance for every 360° of machine travel) should not exceed .088".

GOLDSPEED™ 16 OPERATING GUIDELINES

• Axial Chip Thinning

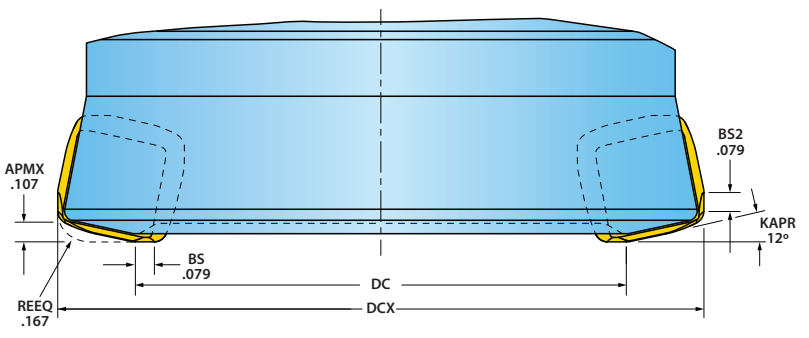


NOTE:
The operating guidelines table below includes a column for feed-per-tooth (fz). That column accounts for the axial chip thinning that's generated by the cutting-edge angle (lead angle). All GoldSFeed high-feed cutters have a 12° cutting edge angle resulting in an fz that is approximately 5x the recommended chip thickness (hex).

ISO	Materials			V _c Cutting Speed SFM	H _{hex} Max. Chip Thickness (inch)	f _z Feed/ Tooth (inch)	Harder <-----> Tougher								Coolant	Geometry		
	Mat'l Group #VDI 3323	Type	Examples				IN4015	IN2515	IN4005	IN2505	IN4030	IN2530	IN7035	IN4035		IN2535	MR	MR1
P	1 thru 5	Non-alloy Steel	1018, A36, 1045, A572, 1070	400 - 600	.008 - .022	.040 - .110			1	2	3	4			NO	1	2	3
	6 thru 9	Low-alloy Steel	4140, 4340, P20, 8620, 300M	300 - 500	.008 - .018	.040 - .090			1	2	3	4			NO	1	2	3
	10, 11	High-alloy Steel	H13, A2, D2, M2, T1	200 - 400	.008 - .015	.040 - .075			1	2	3	4			NO	1	2	3
M	12 thru 13	"Stainless Steel (Ferritic & Martensitic)"	410, 416, 440	200 - 400	.006 - .012	.030 - .060					4	3		2	1	YES	1	2
	14	"Stainless Steel (Austenitic)"	"303, 304, 316, 15-5, 17-4"	300 - 500	.004 - .008	.020 - .040					4	3		2	1	YES	2	1
K	15 thru 16	Gray Cast Iron	CLS. 20, 30, 45	500 - 900	.004 - .025	.020 - .125	1	2	3	4					NO	3	1	2
	17 thru 20	Nodular Cast Iron	"60-40-18, 100-70-03"	300 - 700	.004 - .020	.020 - .100	1	2	3	4					NO	3	1	2
N	21 thru 30	Aluminum	7075, 6061	1000+	.004 - .025	.020 - .125	1	2	3	4					YES	2	1	
S	31 thru 35	High-Temp Alloys	Inconel, Hastelloy, Nimonic, Monel	50 - 100	.002 - .005	.010 - .025						4	3	2	1	YES	1	2
	36 thru 37	Titanium Alloys	6AL-4V, 5Al-5Mo-5V-3Cr	90 - 150	.004 - .008	.020 - .040						4	3	2	1	YES	1	2
H	38 thru 39	Hardened Steel >48	A2, 01, D2	100 - 200	.003 - .005	.015 - .025			1	2					NO	2	1	

Note: Feed and speed recommendations are starting operating parameters. They are only guidelines from which further optimization should take place. Operating parameters are influenced by many machining variables. These variables may cause for reductions in feeds and speed or dramatic increases. Additionally, DOC and WOC may need to be revised to optimize the tools performance.

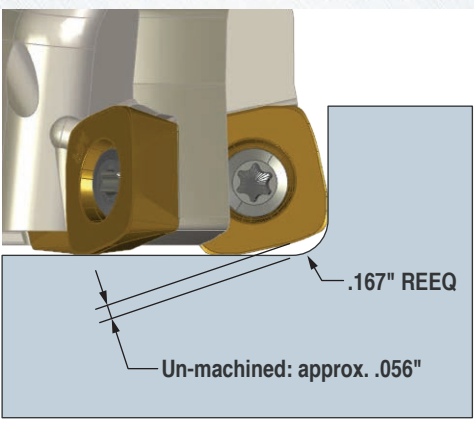
GOLDSPEED™ 16 PROGRAMMING DATA



Definitions	
DCX	Maximum Cutter Diameter
DC	Effective Cutter Diameter
KAPR	Cutting Edge Angle
APMX	Maximum Depth of Cut
REEQ	Program Radius
BS	Axial Wiper Length
BS2	Radial Wiper Length

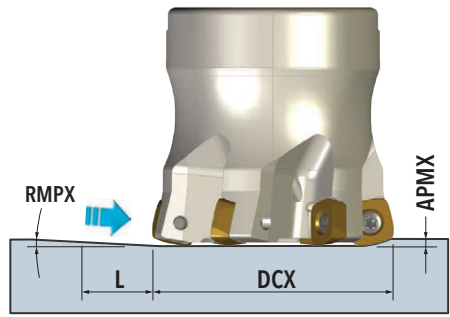
Part Number	DCX Cutting Dia. Max.	DC Cutting Dia.
5G5Q-25R01	2.500	1.645
5G5Q-25R02	2.500	1.645
5G5Q-30R01	3.000	2.144
5G6Q-30R01	3.000	2.144
5G5Q-30R02	3.000	2.144
5G5Q-40R01	4.000	3.144
5G6Q-40R01	4.000	3.144
5G6Q-50R01	5.000	4.144
5G6Q-60R01	6.000	5.144

GOLDSPEED™ 16 PROGRAMMING TIPS



1. The shape of the insert nose can be approximated by programming as-if the insert had a .167" corner radius (REEQ). The difference will result in an un-machined area that's approximately .056" deep.
2. The recommendations for cutting speed, chip-thickness grade and insert geometry are starting recommendations and should be optimized based on the type and rate of edge failure.
3. The Machining-Calculator at Ingersoll's Website is another resource for estimating and optimizing parameters. There are additional inputs like the radial width of cut and the effective rake angle can be included into the estimates.

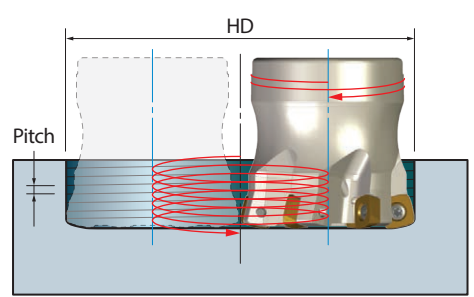
GOLDSPEED™ 16 STRAIGHT RAMPING



DCX Cutter Diameter	RMPX Ramp Angle Max.	L	APMX Depth of Cut Max.
2.500	3.3	1.856	0.107
3.000	2.4	2.553	0.107
4.000	1.6	3.831	0.107
5.000	1.2	5.108	0.107
6.000	0.9	6.811	0.107

L in this table is the length the cutter travels to reach the max. depth of cut (.107") while traveling at the max ramp angle listed for the cutter.

GOLDSPEED™ 16 HELICAL RAMPING



Pitch:
The max. pitch is determined to not exceed the max. depth of cut (APMX) and to not exceed the max. ramp angle (RMPX).

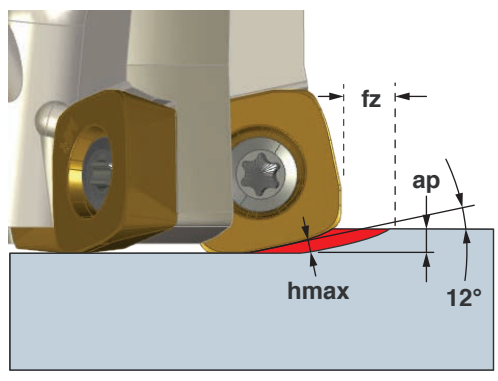
DCX Cutter Diameter	HD Min.	HD Max.	HD Max. w/o Cusp	Max Pitch Per Revolution
2.500	3.822	5.000	4.145	0.107
3.000	4.822	6.000	5.144	0.107
4.000	6.822	8.000	7.144	0.107
5.000	8.824	10.000	9.144	0.107
6.000	10.824	12.000	11.144	0.107

- Example:**
1. The min. hole dia. that the 2.500" dia. cutter can interpolate from solid is 3.822" (leaving a raised cusp).
 2. The max. hole dia. that the 2.500" dia. cutter can interpolate from solid is 5.000".
 3. The max. hole dia. that the 2.500" dia. cutter can interpolate from solid while leaving a flat-bottom is 4.145" (leaving no raised cusp).
 4. The max. pitch for this series matches the insert's radial wiper length of .107".



GOLDSPEED™ 19 OPERATING GUIDELINES FORMERLY GOLDQUAD®

• Axial Chip Thinning

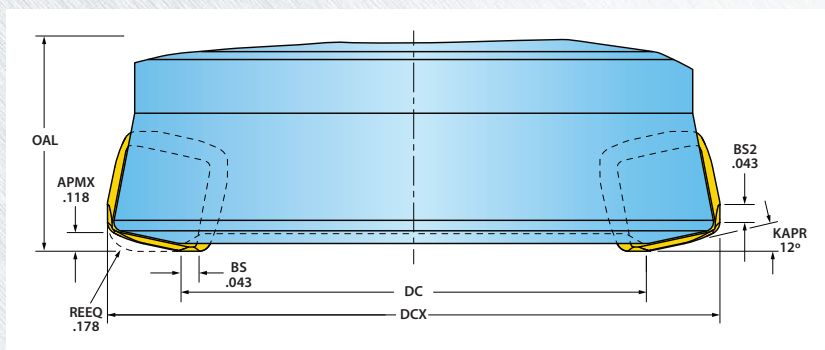


NOTE:
The operating guidelines table below includes a column for feed-per-tooth (fz). That column accounts for the axial chip thinning that's generated by the cutting-edge angle (lead angle). All GoldSFeed high-feed cutters have a 12° cutting edge angle resulting in an fz that is approximately 5x the recommended chip thickness (hex).

ISO	Materials			V _c Cutting Speed SFM	Hex Max. Chip Thickness (inch)	f _z Feed/Tooth (inch)	Harder <-----> Tougher						Coolant	Geometry		
	Mat'l Group #VDI 3323	Type	Examples				IN4005	IN2505	IN4030	IN2530	IN4035	IN2535			001	PH
P	1 thru 5	Non-alloy Steel	1018, A36, 1045, A572, 1070	300 - 600	.008 - .025	.040 - .125	1	2	3	4			NO	1	2	3
	6 thru 9	Low-alloy Steel	4140, 4340, P20, 8620, 300M	250 - 500	.008 - .020	.040 - .100	1	2	3	4			NO	1	2	3
	10, 11	High-alloy Steel	H13, A2, D2, M2, T1	200 - 400	.008 - .016	.040 - .080	1	2	3	4			NO	1	2	3
M	12 thru 13	"Stainless Steel (Ferritic & Martensitic)"	410, 416, 440	200 - 400	.006 - .014	.030 - .070			4	3	2	1	YES		1	2
	14	Stainless Steel (Austenitic)	"303, 304, 316, 15-5, 17-4"	300 - 500	.004 - .008	.020 - .040			4	3	2	1	YES		2	1
K	15 thru 16	Gray Cast Iron	CLS. 20, 30, 45	500 - 900	.004 - .025	.020 - .125	1	2	3	4			NO	3	1	2
	17 thru 20	Nodular Cast Iron	"60-40-18, 100-70-03"	300 - 700	.004 - .020	.020 - .100	1	2	3	4			NO	3	1	2
N	21 thru 30	Aluminum	7075, 6061	1000+	.004 - .025	.020 - .125	1	2	3	4			YES		2	1
S	31 thru 35	High-Temp Alloys	Inconel, Hastelloy, Nimonic, Monel	50 - 100	.002 - .005	.010 - .025			4	3	2	1	YES		1	2
	36 thru 37	Titanium Alloys	6AL-4V, 5Al-5Mo-5V-3Cr	90 - 150	.004 - .008	.020 - .040			4	3	2	1	YES		1	2
H	38 thru 39	Hardened Steel >48	A2, 01, D2	100 - 200	.003 - .005	.015 - .025			1	2			NO	2	1	

Note: Feed and speed recommendations are starting operating parameters. They are only guidelines from which further optimization should take place. Operating parameters are influenced by many machining variables. These variables may cause for reductions in feeds and speed or dramatic increases. Additionally, DOC and WOC may need to be revised to optimize the tools performance.

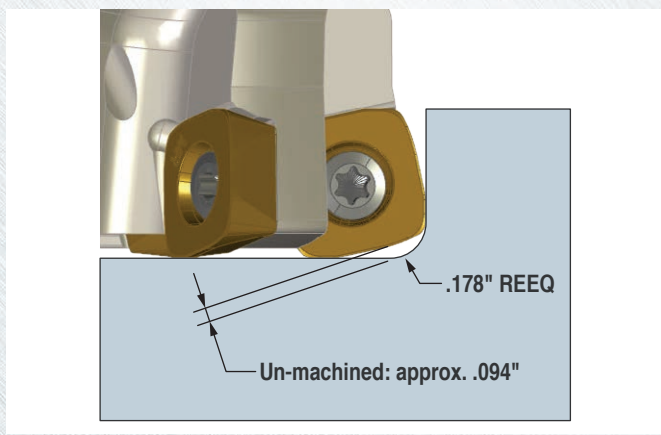
GOLDSPEED™ 19 PROGRAMMING DATA FOR MDR INSERTS FORMERLY GOLD@QUAD®



Definitions	
DCX	Maximum Cutter Diameter
DC	Effective Cutter Diameter
KAPR	Cutting Edge Angle
APMX	Maximum Depth of Cut
REEQ	Program Radius
BS	Axial Wiper Length
BS2	Radial Wiper Length
OAL	Overall Length

Using Inserts SDES1906MDR & SDMS1906MDR-PH			
Part Number	DCX Cutting Dia. Max.	DC Cutting Dia.	OAL Overall Length
5G5M-30R01	3.000	1.766	2.000
5G6M-30R01	3.000	1.755	2.000
5G5M-40R01	4.000	2.769	2.500
5G6M-40R01	4.000	2.755	2.500
5G5M-50R01	5.000	3.759	2.500
5G6M-50R01	5.000	3.755	2.500
5G5M-60R01	6.000	4.757	2.500
5G6M-60R01	6.000	4.755	2.500
5G6M-70R01	7.000	5.755	2.500

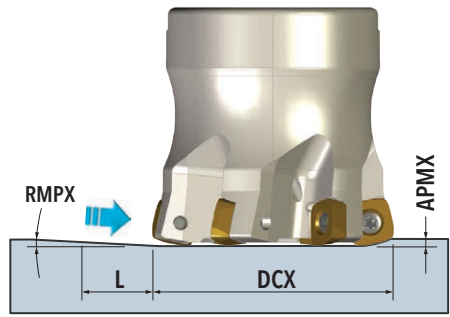
GOLDSPEED™ 19 PROGRAMMING TIP FOR MDR INSERTS FORMERLY GOLD@QUAD®



Using Inserts SDES1906MDR & SDMS1906MDR-PH

1. The shape of the insert nose can be approximated by programming as-if the insert had a .178" corner radius (REEQ). The difference will result in an unmachined area that's approximately .094" deep.
2. The recommendations for cutting speed, chip-thickness grade and insert geometry are starting recommendations and should be optimized based on the type and rate of edge failure.
3. The Machining-Calculator at Ingersoll's Website is another resource for estimating and optimizing parameters. There are additional inputs like the radial width of cut and the effective rake angle can be included into the estimates.

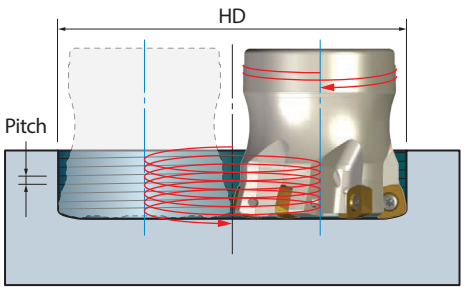
GOLDSPEED™ 19 STRAIGHT RAMPING FOR MDR INSERTS **FORMERLY GOLDQUAD®**



Using Inserts SDES1906MDR & SDMS1906MDR-PH			
DCX Cutting Dia. Max.	RMPX Ramp Angle Max.	L	APMX Depth of Cut Max.
3.000	2.70	2.505	0.118
4.000	1.70	3.978	0.118
5.000	1.70	3.978	0.118
6.000	1.30	5.201	0.118
7.000	1.02	6.629	0.118

L in this table is the length the cutter travels to reach the max. depth of cut (.118") while traveling at the max ramp angle listed for the cutter.

GOLDSPEED™ 19 HELICAL RAMPING FOR MDR INSERTS **FORMERLY GOLDQUAD®**

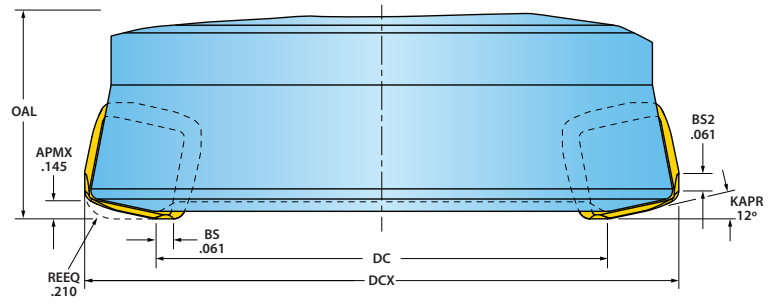


Pitch:
The max. pitch is determined to not exceed the max. depth of cut (APMX) and to not exceed the max. ramp angle (RMPX).

Using Inserts SDES1906MDR & SDMS1906MDR-PH				
DCX Cutting Dia. Max.	HD Min.	HD Max.	HD Max. w/o Cusp	Max Pitch Per Revolution
3.000	4.518	6.000	4.766	0.118
4.000	6.520	8.000	6.769	0.118
5.000	8.520	10.000	8.759	0.118
6.000	10.520	12.000	10.757	0.118
7.000	12.521	14.000	12.755	0.118

- Example:**
1. The min. hole dia. that the 3.000" dia. cutter can interpolate from solid is 4.518" (with a raised cusp remaining).
 2. The max. hole dia. that the 3.000" dia. cutter can interpolate from solid is 6.000" (with a raised cusp remaining).
 3. The max. hole dia. that the 3.000" dia. cutter can interpolate from solid while leaving a flat-bottom is 4.766" (with no raised cusp remaining).

GOLDSPEED™ 19 PROGRAMMING DATA FOR MPR INSERTS FORMERLY GOLD@QUAD™

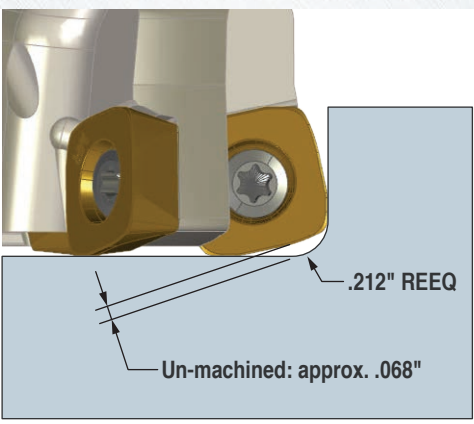


Definitions	
DCX	Maximum Cutter Diameter
DC	Effective Cutter Diameter
KAPR	Cutting Edge Angle
APMX	Maximum Depth of Cut
REEQ	Program Radius
BS	Axial Wiper Length
BS2	Radial Wiper Length
OAL	Overall Length

Using Inserts SDES1906MPR, SDMS1906MPR-001, SDXS1906MPR & SDXS1906MPR-MR1

Part Number	DCX Cutting Dia. Max.	DC Cutting Dia.	OAL Overall Length
5G5M-30R01	2.960	1.903	1.981
5G6M-30R01	2.960	1.894	1.981
5G5M-40R01	3.960	2.906	2.481
5G6M-40R01	3.960	2.894	2.481
5G5M-50R01	4.961	3.897	2.481
5G6M-50R01	4.961	3.894	2.481
5G5M-60R01	5.961	4.896	2.481
5G6M-60R01	5.961	4.894	2.481
5G6M-70R01	6.961	5.894	2.481

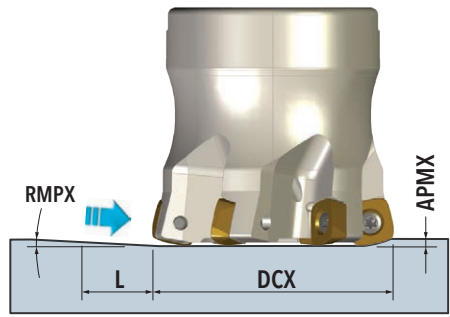
GOLDSPEED™ 19 PROGRAMMING TIPS FOR MPR INSERTS FORMERLY GOLD@QUAD™



Using Inserts SDES1906MPR, SDMS1906MPR-001, SDXS1906MPR & SDXS1906MPR-MR1

1. The shape of the insert nose can be approximated by programming as-if the insert had a .212" corner radius (REEQ). The difference will result in an unmachined area that's approximately .068" deep.
2. The recommendations for cutting speed, chip-thickness grade and insert geometry are starting recommendations and should be optimized based on the type and rate of edge failure.
3. The Machining-Calculator at Ingersoll's Website is another resource for estimating and optimizing parameters. There are additional inputs like the radial width of cut and the effective rake angle can be included into the estimates.

GOLDSPEED™ 19 STRAIGHT RAMPING FOR MPR INSERTS **FORMERLY GOLDQUAD®**

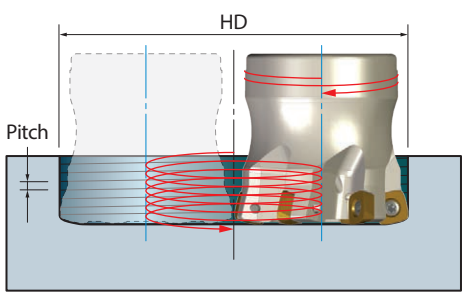


Using Inserts SDES1906MPR, SDMS1906MPR-001, SDXS1906MPR & SDXS1906MPR-MR1

DCX Cutting Dia. Max.	RMPX Ramp Angle Max.	L	APMX Depth of Cut Max.
2.960	1.90	4.373	0.145
3.960	1.20	6.924	0.145
4.961	1.40	5.935	0.145
5.961	1.10	7.553	0.145
6.961	1.02	8.145	0.145

L in this table is the length the cutter travels to reach the max. depth of cut (.145") while traveling at the max ramp angle listed for the cutter.

GOLDSPEED™ 19 HELICAL RAMPING FOR MPR INSERTS **FORMERLY GOLDQUAD®**



Pitch:
The max. pitch is determined to not exceed the max. depth of cut (APMX) and to not exceed the max. ramp angle (RMPX).

Using Inserts SDES1906MPR, SDMS1906MPR-001, SDXS1906MPR & SDXS1906MPR-MR1

DCX Cutting Dia. Max.	HD Min.	HD Max.	HD Max. w/o Cusp	Max Pitch Per Revolution
2.960	4.526	5.920	4.863	0.145
3.960	6.528	7.920	6.866	0.145
4.961	8.528	9.922	8.858	0.145
5.961	10.528	11.922	10.857	0.145
6.961	12.530	13.922	12.895	0.145

- Example:**
1. The min. hole dia. that the 2.960" dia. cutter can interpolate from solid is 4.526" (with a raised cusp remaining).
 2. The max. hole dia. that the 2.960" dia. cutter can interpolate from solid is 5.920" (with a raised cusp remaining).
 3. The max. hole dia. that the 2.960" dia. cutter can interpolate from solid while leaving a flat-bottom is 4.863" (with no raised cusp remaining).