


Sumitomo High Efficiency, Double-sided 90° Milling Cutter

DFC Milling Cutter

P M K S

Superior Toughness & Excellent Tool Life
High Performance Double-sided 6 Edge Inserts

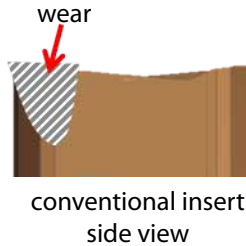
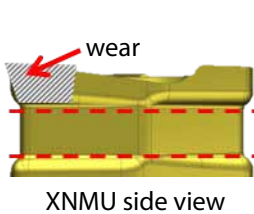
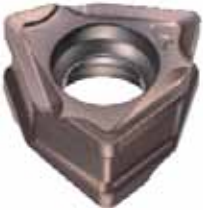
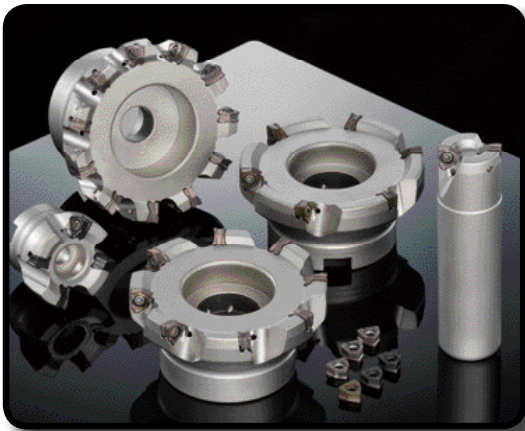
DFC Mill Features & Benefits

- High toughness insert design enables stable cutting and high efficiency machining with high feed rate
- Optimized machining accuracy by separating the insert contact areas and the cutting edges
- Large lineup for DFC available from 1" through 8" in standard, fine pitch and extra-fine pitch styles

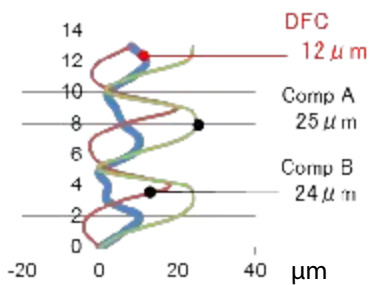
Insert Characteristics

Precise repositioning of inserts due to thick supporting area

Optimized cutting edge yields excellent machining accuracy



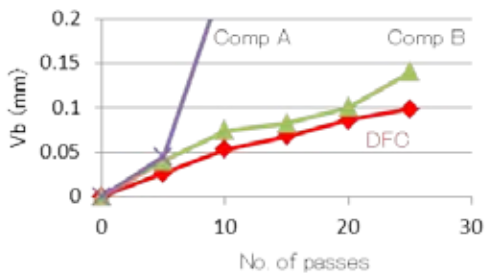
Squareness Performance



Work material : 1049 steel

Cutting Conditions: $v_c=650$ SFM $f_z=.0039$ IPT
 $D_C=63$ mm
 $a_p=.197"$ x 3 pass, $a_e=.197"$

Wear Resistance Chart



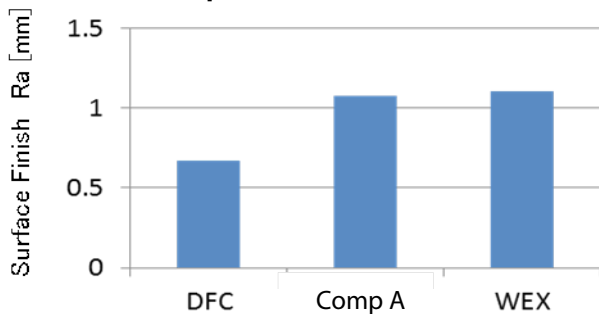
Work material: 1049 steel
 Cutting Conditions: $v_c=650$ SFM $f_z=.0079$ IPT
 $D_C=100$ mm cutter
 $a_p=.118"$, $a_e=3.346"$

Cutting Edge Strength

	Feed Per Tooth (in/t)		
	0.012	0.016	0.020
DFC	•	•	•
Comp A	•	damage	
Comp B	damage		

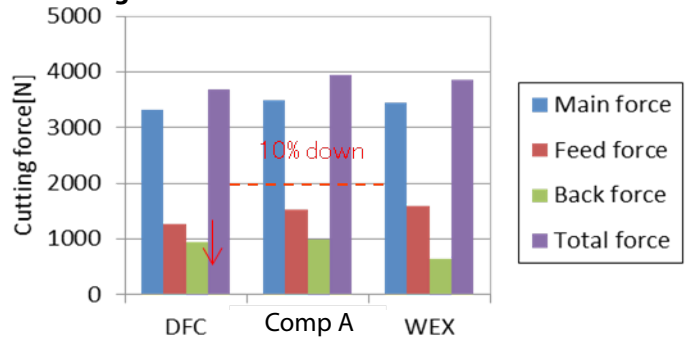
Work material: 1049 steel with holes
 Cutting Conditions: $v_c=650$ SFM $f_z=.0079$ IPT
 $D_C=100$ mm cutter
 $a_p=.118"$, $a_e=2.047"$ x 3 pass

Surface Finish Graph



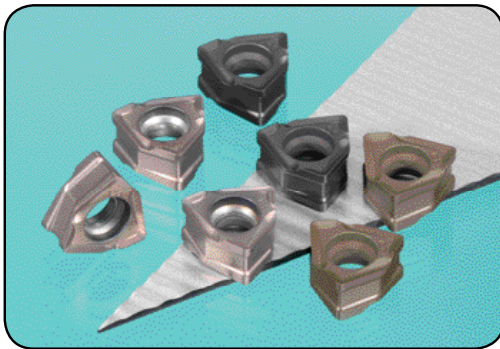
Work material: 1049 steel
 Cutting Conditions: $v_c=650$ SFM $f_z=.0079$ IPT
 $D_C=100$ mm cutter
 $a_p=.118"$, $a_e=3.346"$

Cutting Force



Work material: 1049 steel
 Cutting Conditions: $v_c=650$ SFM $f_z=.0079$ IPT
 $D_C=100$ mm cutter
 $a_p=.118"$, $a_e=2.953"$

Inserts



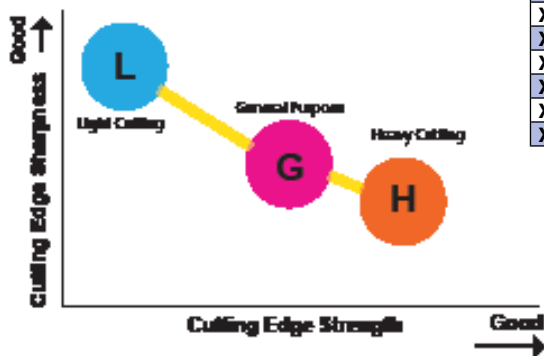
XNMU Inserts

Max. Depth of Cut: 6mm (.236")

Material	P10/M10/C7	P20/M20/C6	P30/M30/C5A	P40/M40/C5
Steel	ACP100			
	ACP200			
	ACP300			
Stainless Steel				
Material	K01	K10	K20	K30
Cast Iron	ACK200			
	ACK300			
Material	Wear Resistance		Fracture Resistance	
Stainless Steel	ACM200			
			ACM300	
Exotic Material			ACM300	

● USA stocked item

Material	P10/M10/C7	P20/M20/C6	P30/M30/C5A	P40/M40/C5
Steel	ACP100			
	ACP200			
	ACP300			
Stainless Steel				
Material	K01	K10	K20	K30
Cast Iron	ACK200			
	ACK300			
Material	Wear Resistance		Fracture Resistance	
Stainless Steel	ACM200			
			ACM300	
Exotic Material			ACM300	

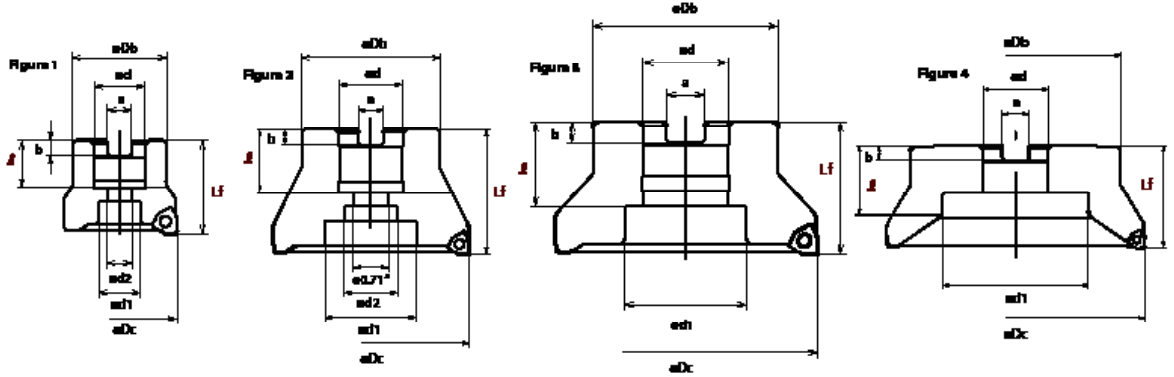


Work Material	Steel, Cast Iron		
	L type	G type	H type
Chip breaker			
Feature	Low cutting force	General purpose	Strong edge
Cutting edge figure			
Application	Light cut, low rigidity milling and reduced burr formation	Main breaker, General purpose to interrupted milling	Roughing, heavy interrupted and hardness steel milling.

Running Conditions

ISO	Work Material	Hardness	Cutting Speed (SFM) Min. - Optimum - Max.	Feed Rate (in./t) Min. - Optimum - Max.	D.O.C. (in.)	Grade
P	General Steel	180 ~ 280HB	500 - 650 - 820	0.004 - 0.008 - 0.012	<0.236	ACP200 ACP300
	Soft Steel	<180HB	600 - 820 - 1,150	0.006 - 0.010 - 0.014	< 0.236	ACP200 ACP300
	Die Steel	200 ~ 220HB	330 - 500 - 650	0.004 - 0.007 - 0.010	< 0.157	ACP200 ACP300
M	PH Stainless Steel	>220HB	300 - 500 - 750	0.004 - 0.007 - 0.010	<0.196	ACM200
	Austenitic Stainless	<250HB	525 - 675 - 820	0.005 - 0.007 - 0.010	<0.236	ACM300
K	Cast Iron	250HB	500 - 750 - 1150	0.004 - 0.008 - 0.012	<0.236	ACK200 ACK300

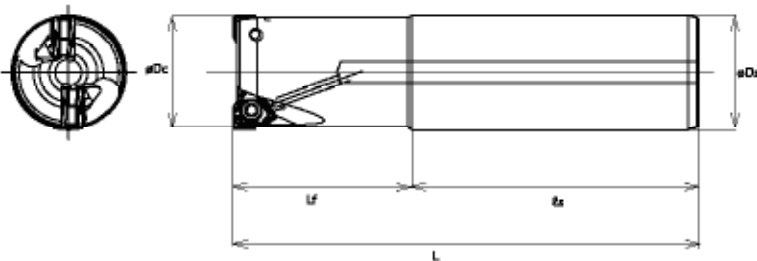
DFC Shell Mill Inch Lineup



Body (Standard Pitch) - Inch													
Cat. No.	Stock	Dimensions (in.)									No. of Teeth	Weight (lbs)	Fig.
		ϕD_c	ϕD_b	L_f	ϕd	a	b	ℓ	ϕd_1	ϕd_2			
DFC22000R	●	2.000	1.500	1.750	0.750	0.312	0.190	0.750	0.609	0.406	4	0.66	1
DFC22500R	●	2.500	1.750	1.750	1.000	0.375	0.220	0.750	0.797	0.531	5	1.10	1
DFC23000R	●	3.000	2.250	1.750	1.000	0.375	0.220	0.750	0.797	0.531	6	2.20	1
DFC24000R	●	4.000	2.870	2.000	1.250	0.500	0.280	0.750	1.000	0.656	6	3.08	3
DFC25000R	●	5.000	3.750	2.500	1.500	0.625	0.380	1.000	2.000	1.181	7	6.17	1
DFC26000R	●	6.000	4.380	2.500	1.500	0.625	0.380	1.000	2.000	1.181	8	10.14	4
DFC28000R	●	8.000	5.906	2.500	2.500	1.000	0.560	1.594	5.118	-	10	12.56	1
Body (Fine Pitch) - Inch													
DFCM22000R	●	2.000	1.500	1.750	0.750	0.312	0.190	0.750	0.609	0.406	5	0.66	1
DFCM22500R	●	2.500	1.750	1.750	1.000	0.375	0.220	0.750	0.797	0.531	6	1.10	1
DFCM23000R	●	3.000	2.250	1.750	1.000	0.375	0.220	0.750	0.797	0.531	8	1.98	1
DFCM24000R	●	4.000	2.870	2.000	1.250	0.500	0.280	0.750	1.000	0.656	10	3.08	3
DFCM25000R	●	5.000	3.750	2.500	1.500	0.625	0.380	1.000	2.000	1.181	12	5.95	1
DFCM26000R	●	6.000	4.380	2.500	1.500	0.625	0.380	1.000	2.000	1.181	14	9.90	4
DFCM28000R	●	8.000	5.906	2.500	2.500	1.000	0.560	1.594	5.118	-	15	12.05	1
Body (Extra-Fine Pitch) - Inch													
DFCF22000R	●	2.000	1.500	1.750	0.750	0.312	0.190	0.750	0.609	0.406	6	0.66	1
DFCF22500R	●	2.500	1.750	1.750	1.000	0.375	0.220	0.750	0.797	0.531	7	1.10	1
DFCF23000R	●	3.000	2.250	1.750	1.000	0.375	0.220	0.750	0.797	0.531	9	2.00	1
DFCF24000R	●	4.000	2.870	2.000	1.250	0.500	0.280	0.750	1.000	0.656	11	2.86	3
DFCF25000R	●	5.000	3.750	2.500	1.500	0.625	0.380	1.000	2.000	1.181	14	5.73	1
DFCF26000R	●	6.000	4.380	2.500	1.500	0.625	0.380	1.000	2.000	1.181	16	12.41	4
DFCF28000R	●	8.000	5.906	2.500	2.500	1.000	0.560	1.594	5.118	-	20	14.75	1



● USA stocked item

DFC Endmill Inch Lineup

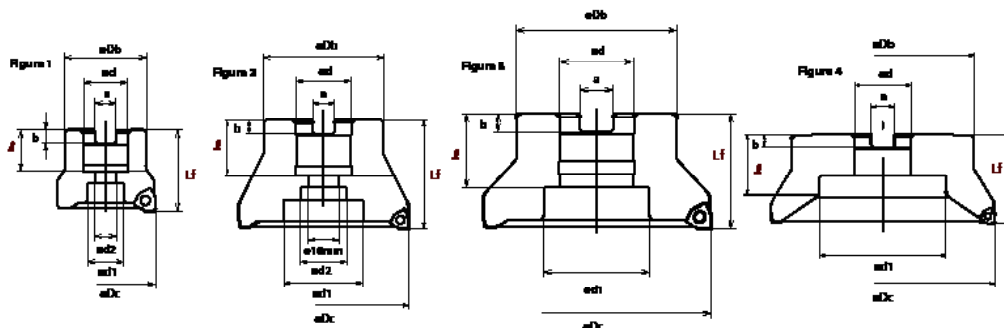


Body (Shank Type)							
Cat. No.	Stock	Dimensions (in.)					No. of Teeth
		ϕD_c	ϕD_s	L_f	ℓ_s	L	
DFC21000EW	●	1.000	1.000	2.060	2.281	4.341	2
DFC21250EW	●	1.250	1.250	2.060	2.281	4.341	3
DFC21500EW	●	1.500	1.250	2.060	2.281	4.341	3
DFC22000EW	●	2.000	1.250	2.060	2.281	4.341	4
DFC22500EW	●	2.500	1.250	2.060	2.281	4.341	5
DFCM21500EW	●	1.500	1.250	2.060	2.281	4.341	4
DFCM22000EW	●	2.000	1.250	2.060	2.281	4.341	5
DFCM22500EW	●	2.500	1.250	2.060	2.281	4.341	7

Hardware

Insert Screw	Insert Wrench	Coolant Through Bolts	
		Catalog Number	Cutter Size
		BFXH 3/8 x 1	2.00"
		BFXH 1/2 x 1 1/4	2.50"
		BFXH 1/2 x 1 1/4	3.00"
		BFXH 5/8 x 1 1/4	4.00"
BFTX03512IP	TRDR15IP Torque: 3.0 N • m	BFXH 3/4 x 2	5.00"

DFC Shell Mill Metric Lineup



Body (Standard Pitch) - Metric

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)	Fig.
		øD _C	øD _B	L _f	ød	a	b	ℓ	ød ₁	ød ₂			
DFC09050RS	★	50	41	40	22	10.4	6.3	20	18	11	4	0.3	1
DFC09063RS	★	63	50	40	22	10.4	6.3	20	18	11	4	0.5	1
DFC09080RS	★	80	55	50	27	12.4	7	22	20	14	5	1	1
DFC09100RS	★	100	70	50	32	14.4	8	26	46	32	6	1.4	3
DFC09125RS	★	125	80	63	40	16.4	9	29	52	29	7	2.8	1
DFC09160RS	★	160	100	63	40	16.4	9	29	90	-	8	4.6	4
DFC09080R	★	80	55	50	25.4	9.5	6	25	20	14	5	1	1
DFC09100R	★	100	70	63	31.75	12.7	8	32	27	18	6	2	2
DFC09125R	★	125	80	63	38.1	15.9	10	35.5	55	30	7	2.8	1
DFC09160R	★	160	100	63	50.8	19.1	11	38	72	-	8	3.6	4

Body (Fine Pitch) - Metric

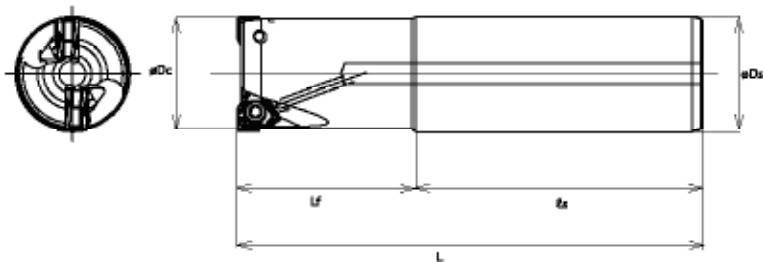
DFCM09050RS	★	50	41	40	22	10.4	6.3	20	18	11	5	0.3	1
DFCM09063RS	★	63	50	40	22	10.4	6.3	20	18	11	6	0.5	1
DFCM09080RS	★	80	55	50	27	12.4	7	22	20	14	7	0.9	1
DFCM09100RS	★	100	70	50	32	14.4	8	26	46	32	8	1.4	3
DFCM09125RS	★	125	80	63	40	16.4	9	29	52	29	11	2.7	1
DFCM09160RS	★	160	100	63	40	16.4	9	29	90	-	12	4.5	4
DFCM09080R	★	80	55	50	25.4	9.5	6	25	20	14	7	0.9	1
DFCM09100R	★	100	70	63	31.75	12.7	8	32	27	18	8	1.9	2
DFCM09125R	★	125	80	63	38.1	15.9	10	35.5	55	30	11	2.7	1
DFCM09160R	★	160	100	63	50.8	19.1	11	38	72	-	12	3.5	4

Body (Extra-Fine Pitch) - Metric

DFCF09050RS	★	50	41	40	22	10.4	6.3	20	18	11	6	0.3	1
DFCF09063RS	★	63	50	40	22	10.4	6.3	20	18	11	7	0.5	1
DFCF09080RS	★	80	55	50	27	12.4	7	22	20	14	9	0.9	1
DFCF09100RS	★	100	70	50	32	14.4	8	26	46	32	11	1.3	3
DFCF09125RS	★	125	80	63	40	16.4	9	29	52	29	14	2.6	1
DFCF09160RS	★	160	100	63	40	16.4	9	29	90	-	16	4.6	4
DFCF09080R	★	80	55	50	25.4	9.5	6	25	20	14	9	0.9	1
DFCF09100R	★	100	70	63	31.75	12.7	8	32	27	18	11	1.9	2
DFCF09125R	★	125	80	63	38.1	15.9	10	35.5	55	30	14	2.7	1
DFCF09160R	★	160	100	63	50.8	19.1	11	38	72	-	16	3.5	4

★ worldwide warehouse item

DFC Endmill Metric Lineup



Body (Shank Type)

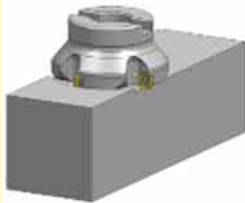
Cat. No.	Stock	Dimensions (mm)					No. of Teeth
		øD _C	øD _S	L _f	ℓ _S	L	
DFC09025E	★	25	25	40	80	120	2
DFC09032E	★	32	32	50	80	130	2
DFC09040E	★	40	32	50	80	130	3
DFC09050E	★	50	32	50	80	130	3
DFC09050E-42	★	50	42	50	100	150	3
DFC09063E	★	63	32	50	80	130	4
DFC09063E-42	★	63	42	50	100	150	4
DFC09080E	★	80	32	50	80	130	5
DFC09080E-42	★	80	42	50	100	150	5
DFCM09032E	★	32	32	50	80	130	3
DFCM09040E	★	40	32	50	80	130	4
DFCM09050E	★	50	32	50	80	130	5
DFCM09050E-42	★	50	42	50	100	150	5
DFCM09063E	★	63	32	50	80	130	6
DFCM09063E-42	★	63	42	50	100	150	6
DFCM09080E	★	80	32	50	80	130	7
DFCM09080E-42	★	80	42	50	100	150	7

★ worldwide warehouse item

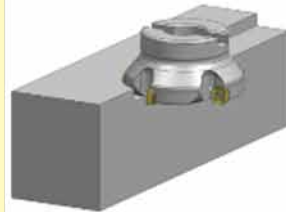
High efficiency machining due to its optimized cutting edge geometry and highly rigid body

For a wide range of applications

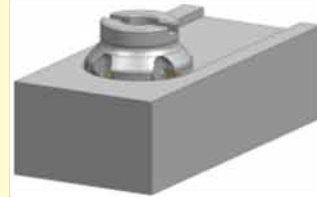
Face Milling



Shoulder Milling



Slot Milling



Side Face Milling



Application Examples

Work Material	Sumitomo	Comp. A	Work Material	Sumitomo	Comp. A		
	Breaker	G		Breaker	G		
	Grade	ACP200		Grade	ACP200		
	V_c (sfm)	750		650	V_c (sfm)	600	600
	V_f (ipm)	49.61		35.83	V_f (ipm)	42.99	35.83
	f_t	0.0110		0.0079	f_t	0.0118	0.0079
	a_p	0.079"		0.079"	a_p	2 pass x 0.079"	2 pass x 0.079"
	a_e	2.0"		2.0"	a_e	2.0"	2.0"
	Dry or Wet	Wet		Wet	Dry or Wet	Dry	Dry
	Tool Diameter	3"		3"	Tool Diameter	63mm	63mm
	# of Teeth	5		5	# of Teeth	4	5
	Result	Efficiency: 158% achieved		Result	Efficiency: 120% achieved		
Evaluation	Wear resistance, efficiency		Evaluation	Wear resistance, efficiency			

Work Material	Sumitomo	Comp. A	
	Breaker	G	
	Grade	ACP200	
	V_c (sfm)	500	500
	V_f (ipm)	21.10	15.91
	f_t	0.0067	0.0035
	a_p	0.087	0.087
	a_e	2.5"	2.5"
	Dry or Wet	Dry	Dry
	Tool Diameter	3"	3"
	# of Teeth	5	7
	Result	Efficiency: 133% achieved Tool life: 138% achieved	
Evaluation	Wear resistance, efficiency		

In addition to drastic economic advantage from DFC, double-sided 90° milling cutter, Sumitomo Electric Carbide, Inc. also provides a wide variety of high performance 90° milling cutters to fulfill your needs in any application!





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