

FORM MASTER SPEED™

Hi-Feed Mill



- **FAST** - Ultra high feed rates to 400 inches per minute or faster
- **FREE** - Chips flow freely across the insert face, unobstructed by insert clamps
- **STABLE** - Dove tailed insert mounting and Torx+® screw combine to maximize insert life
- **STRONG** - Double edged insert is uniquely well suited to difficult long reach applications

Ingersoll **D&M** line

Member IMC Group
Ingersoll
Cutting Tools

FACEMILL SERIES 5V6E, 5V6H

Diameters

2.000" to 4.000"
52.00 to 80.00mm

Max. Depth of Cut

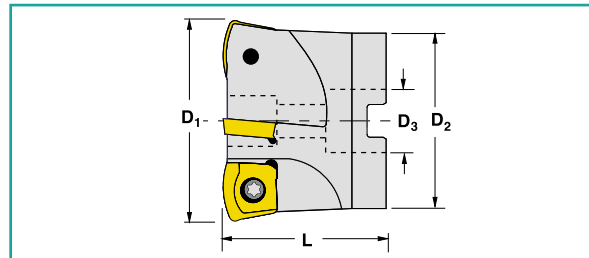
5V6E: .060 (1.5mm)
5V6H: .080 (2.0mm)

Geometry

Positive/Positive

Insert Corner

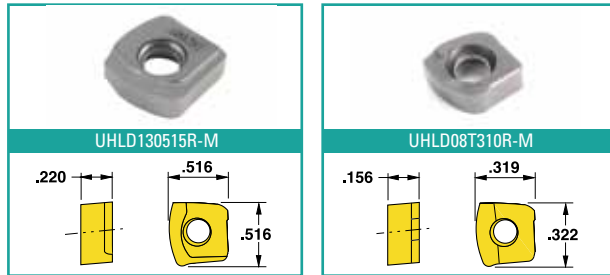
See figure 1 for
programming considerations



D ₁ Nominal Diameter	Cutter Number	D ₂ Adaption Diameter	L Overall Length	D ₃ Pilot Diameter	Effective Inserts
INCH DIAMETERS / INCH ADAPTIONS (inches)					
2.000	5V6E-20R01	1.750	1.625	0.750	5
2.000	5V6H-20R01	1.750	1.625	0.750	4
3.000	5V6H-30R01	2.750	2.000	1.000	5
4.000	5V6H-40R01	2.750	2.125	1.250	6
METRIC DIAMETERS / INCH ADAPTIONS (inches)					
52mm	5V6E052R01	1.750	1.625	0.750	5
52mm	5V6H052R01	1.750	1.625	0.750	4
66mm	5V6E066R01	2.250	2.000	1.000	6
80mm	5V6H080R01	2.750	2.000	1.000	5
METRIC DIAMETERS / METRIC ADAPTIONS (mm)					
*50	5V6E050R00	40	50	22	5
*52	5V6E052R00	40	50	22	5
*52	5V6H052R00	40	50	22	4
*63	5V6E063R00	48	50	27	6
*66	5V6E066R00	48	50	27	6
*66	5V6H066R00	48	50	27	4
*80	5V6H080R00	60	50	27	5

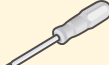
*Identifies cutter with 2 week delivery

INSERTS (INCHES)



Cutter Series	Insert Number	Rake Geometry	Indexes per Insert	Grades		
				IN2005	IN2040	IN2030
15V1E / 5V6E	UHLD08T310R-M	Pos/Pos	2	■		■
15V1H / 5V6H	UHLD130515R-M	Pos/Pos	2	■	■	

HARDWARE

15V1E / 5V6E			
SM25-075-60 Torx+® 8		DS-TP08S	

15V1H / 5V6H			
SM40-120-20 Torx® 15		DS-T15S	

OPERATING GUIDELINES

OPERATING PARAMETERS

MATERIAL	TYPE	CLASSIFICATION	HARDNESS RANGE 1	SFM	HARDNESS RANGE 2	SFM	CHIP THICKNESS (CT)	CHIP THICKNESS (CT)	GRADE RECOMMENDATION 1ST / 2ND / 3RD	COOLANT
							UHLD130515R-M	UHLD08T310R-M		
STEEL	MILD	1018, 1045	125-275 (HB)	1100-800	300-425 (HB)	800-500	.015 - .035	.010 - .030	IN2005 / IN2040 IN2030	NO
	LOW ALLOY	4140, 8620, 4340	150-275 (HB)	1000-700	300-425 (HB)	700-400	.010 - .025	.008 - .018		
	MED ALLOY	P20, S7, H13, O1, A2	150-275 (HB)	900-600	300-425 (HB)	600-300	.005 - .020	.005 - .015		
	HIGH ALLOY	A7, D2	200-275 (HB)	600-300	300-425 (HB)	500-300	.015 - .030	.010 - .030		
STAINLESS STEEL	FREE MACHINING	303, 416	150-275 (HB)	800-600	300-425 (HB)	600-300	.015 - .030	.010 - .030	IN2005 / IN2030	YES
	300 SERIES	304, 310, 316	150-275 (HB)	600-400	300-425 (HB)	500-200	.008 - .020	.005 - .015		
	400 SERIES	410, 420	150-275 (HB)	600-400	300-425 (HB)	500-200	.005 - .020	.005 - .015		
	PH SERIES	13-8, 15-5, 17-4	150-275 (HB)	500-300	300-425 (HB)	400-200	.005 - .010	.005 - .010		
HARDENED STEEL	ALL				42-52 (HRC)	400-300	.004 - .010	.004 - .010	IN2005 / IN2040	NO
					52-58 (HRC)	350-250	.002 - .006	.002 - .006		
					58-62 (HRC)	300-200				

OPERATING GUIDELINES (CONTINUED)

EXAMPLE CALCULATION

GIVEN	STEP 1	STEP 2	STEP 3	STEP 4	OPERATING PARAMETERS
- CUTTER = 5V6E-20R01 - INSERT = UHLD08T310R-M - NUMBER OF INSERTS = 5 - MATERIAL = H13 PRE-HARD - HARDNESS = 38-42 HRC - EXTENSION LENGTH = 6.00"	CONVERT 38-42 HRC TO BRINELL THEN SELECT SURFACE FEET PER MINUTE (SFM). CALCULATE RPM FOR A 2.00" DIA. CUTTER	SELECT DEPTH OF CUT AND FEEDRATE MULTIPLIER FROM THE APPLICATION TABLE FOR RATIO OF 3:1	SELECT CHIP THICKNESS (CT) FOR THE UHLD08T310R-M INSERT IN H13	CALCULATE FEEDRATE (FULL WIDTH OF CUTTER)	- RPM = 860 - DEPTH OF CUT = .04" - FEEDRATE = 172 IPM - WIDTH OF CUT = 2.00"
	*RPM = 860 (450 SFM)	DOC = .04" FRM MULTIPLIER = 4	0.010"	**FEEDRATE = 172 IPM	

*RPM = SFM x 3.82 / Cutter Diameter **Feedrate = RPM x # of inserts x CT x FRM

APPLICATION TABLE

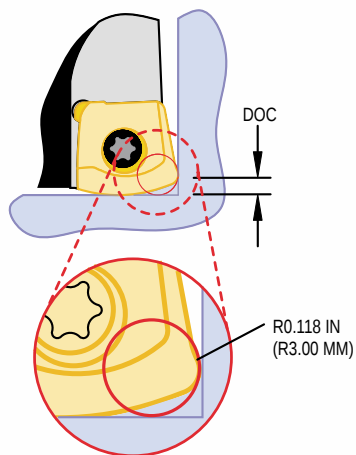
RATIO OF EXTENSION LENGTH TO CUTTER DIAMETER	GREATER THAN 8:1	FROM 3:1 TO 8:1	LESS THAN 3:1
DEPTH OF CUT (DOC)	FROM .01" TO .03"	FROM .02" TO .06"	FROM .04" TO .08"
FEEDRATE MULTIPLIER (FRM)	3	4	5

MATERIAL HARDNESS

BRINELL (HB)	ROCKWELL (HRC)
200	15
225	20
250	24
275	29
300	32
325	34
350	38
375	40
400	43
425	46

FIGURE 1

PROGRAM ALL FORMMASTER-SPEED CUTTERS AS THOUGH THEY ARE BULLNOSE CUTTERS WITH .118"/ 3.0MM CORNER RADII. THIS METHOD WILL BOTH ENSURE AND MINIMIZE REMAINING STOCK FOR SECONDARY PASSES.



RAMP ANGLES

CUTTER DIA.	.750"	1.000"	1.250"	1.500"	2.000"	NA	3.000"	4.000"
INCHES								
MM	20.00 MM	25.00 MM	32.00 MM	42.00 MM	52.00 MM	66.00 MM	80.00 MM	NA
RAMP ANGLE (MAX)	3.5 DEG	3.0 DEG	2.5 DEG	1.6 DEG	1.2 DEG	0.7 DEG	0.5 DEG	0.2 DEG

TOP-ON MODULAR HEAD SERIES 15V1E, 15V1H (COOLANT-THROUGH)

Diameters

.750" to 1.500"
20.00 to 42.00mm

Max. Depth of Cut

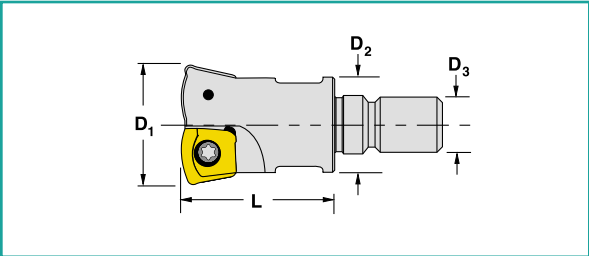
15V1E: .060" (1.5mm)
15V1H: .080" (2.0mm)

Geometry

Positive/Positive

Insert Corner

See figure 1 for
programming considerations



D ₁ Nominal Diameter	Cutter Number	D ₂ Adaption Diameter	L Head Length	D ₃ Thread Diameter	Effective Inserts
INCH DIAMETERS (inches)					
0.750	15V1E-07012X6R01	0.700	1.250	M10	2
1.000	15V1E-10012X7R01	0.820	1.250	M12	2
1.000	15V1E-10012X7R02	0.820	1.250	M12	3
1.250	15V1E-12015X8R01	1.140	1.500	M16	3
1.250	15V1H-12015X8R01	1.140	1.500	M16	2
1.500	15V1H-15017X8R01	1.140	1.750	M16	3
METRIC DIAMETERS (mm)					
20.00	15V1E020030X6R00	18.00	30.0	M10	2
25.00	15V1E025035X7R00	21.00	35.0	M12	2
25.00	15V1E025035X7R01	21.00	35.0	M12	3
*32.00	15V1E032043X8R00	29.00	43.0	M16	3
32.00	15V1H032043X8R00	29.00	43.0	M16	2
35.00	15V1E035043X8R00	29.00	43.0	M16	4
*40.00	15V1E040043X8R00	29.00	43.0	M16	4
*42.00	15V1E042043X8R00	29.00	43.0	M16	4
42.00	15V1H042043X8R00	29.00	43.0	M16	3

*Identifies cutter with 2 week delivery

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