

MIN. ORDER \$30.00		LONG TO XXXXLONG CUTOFF ENDS CUTOFF O.D.					REFLUTE OR DOUBLE	DOUBLE W/1 OPER.	DOUBLE W/2 OPER.	DOUBLE W/3 OPER.
SIZE	REGULAR	EXCESSIVE WEAR	2 OPER.	3 OPER.	4 OPER.	5 OPER.				
MODIFIED ENDMILL CARB PRICE x 2										
2-FLUTE HSS/SQUARE ENDMILL		1 OF ABOVE OPER.								
.000 TO .500	8.34	10.01	12.01	14.41	17.29	20.75	16.68	20.02	24.02	28.82
.501 TO .750	9.54	11.45	13.74	16.49	19.78	23.74	19.08	22.90	27.48	32.97
.751 TO 1.000	11.94	14.33	17.19	20.63	24.76	29.71	23.88	28.66	34.39	41.26
1.001 TO 1.250	14.34	17.21	20.65	24.78	29.74	35.69	28.68	34.42	41.30	49.56
1.251 TO 1.500	17.94	21.53	25.83	31.00	37.20	44.64	35.88	43.06	51.67	62.00
1.501 TO 1.750	21.54	25.85	31.02	37.22	44.67	53.60	43.08	51.70	62.04	74.44
2-FLUTE HSS/BALLNOSE ENDMILL		1 OF ABOVE OPER.								
000 TO .500	10.74	12.89	15.47	18.56	22.27	26.72	21.48	25.78	30.93	37.12
.501 TO .750	13.14	15.77	18.92	22.71	27.25	32.70	26.28	31.54	37.84	45.41
.751 TO 1.000	14.34	17.21	20.65	24.78	29.74	35.69	28.68	34.42	41.30	49.56
1.001 TO 1.250	17.94	21.53	25.83	31.00	37.20	44.64	35.88	43.06	51.67	62.00
1.251 TO 1.500	22.74	27.29	32.75	39.29	47.15	56.58	45.48	54.58	65.49	78.59
1.501 TO 1.750	26.34	31.61	37.93	45.52	54.62	65.54	52.68	63.22	75.86	91.03
2"	74.93	12.89								
2-FLUTE CARBIDE/SQUARE ENDMILL		1 OF ABOVE OPER.								
000 TO .500	10.74	12.89	15.47	18.56	22.27	26.72	21.48	25.78	30.93	37.12
.501 TO .750	15.54	18.65	22.38	26.85	32.22	38.66	31.08	37.30	44.76	53.71
.751 TO 1.000	20.34	24.41	29.29	35.15	42.18	50.62	40.68	48.82	58.58	70.30
1.001 TO 1.250	23.94	28.73	34.47	41.37	49.64	59.57	47.88	57.46	68.95	82.74
1.251 TO 1.500	29.94	35.93	43.11	51.74	62.08	74.50	59.88	71.86	86.23	103.47
1.501 TO 1.750	39.54	47.45	56.94	68.33	81.99	98.39	79.08	94.90	113.88	136.65

MIN. ORDER \$30.00

LONG TO XXXXLONG
CUTOFF ENDS
CUTOFF O.D.

SIZE	REGULAR	EXCESSIVE WEAR	2 OPER.	3 OPER.	4 OPER.	5 OPER.	REFLUTE OR DOUBLE	DOUBLE W/1 OPER.	DOUBLE W/2 OPER.	DOUBLE W/3 OPER.
------	---------	----------------	------------	------------	------------	------------	-------------------------	------------------------	------------------------	------------------------

2-FLUTE CARBIDE/BALLNOSE ENDMILL

000 TO .500	15.54	18.65	22.38	26.85	32.22	38.66	31.08	37.30	44.76	53.71
.501 TO .750	19.14	22.97	27.56	33.07	39.69	47.63	38.28	45.94	55.12	66.15
.751 TO 1.000	22.74	27.29	32.75	39.29	47.15	56.58	45.48	54.58	65.49	78.59
1.001 TO 1.250	25.14	30.17	36.20	43.44	52.13	62.56	50.28	60.34	72.40	86.88
1.251 TO 1.500	32.34	38.81	46.57	55.88	67.06	80.47	64.68	77.62	93.14	111.77
1.501 TO 1.750	43.14	51.77	62.12	74.55	89.46	107.35	86.28	103.54	124.24	149.09

3 & 4-FLUTE HSS/SQUARE ENDMILL

000 TO .500	9.54	11.45	13.74	16.49	19.78	23.74	19.08	22.90	27.48	32.97
.501 TO .750	11.94	14.33	17.19	20.63	24.76	29.71	23.88	28.66	34.39	41.26
.751 TO 1.000	14.34	17.21	20.65	24.78	29.74	35.69	28.68	34.42	41.30	49.56
1.001 TO 1.250	16.74	20.09	24.11	28.93	34.71	41.65	33.48	40.18	48.21	57.85
1.251 TO 1.500	20.34	24.41	29.29	35.15	42.18	50.62	40.68	48.82	58.58	70.30
1.501 TO 1.750	23.94	28.73	34.47	41.37	49.64	59.57	47.88	57.46	68.95	82.74

3 & 4-FLUTE HSS/BALLNOSE ENDMILL

000 TO .500	11.94	14.33	17.19	20.63	24.76	29.71	23.88	28.66	34.39	41.26
.501 TO .750	14.34	17.21	20.65	24.78	29.74	35.69	28.68	34.42	41.30	49.56
.751 TO 1.000	16.74	20.09	24.11	28.93	34.71	41.65	33.48	40.18	48.21	57.85
1.001 TO 1.250	19.14	22.97	27.56	33.07	39.69	47.63	38.28	45.94	55.12	66.15
1.251 TO 1.500	23.94	28.73	34.47	41.37	49.64	59.57	47.88	57.46	68.95	82.74
1.501 TO 1.750	29.94	35.93	43.11	51.74	62.08	74.50	59.88	71.86	86.23	103.47

MIN. ORDER \$30.00

LONG TO XXXXLONG
CUTOFF ENDS
CUTOFF O.D.

SIZE	REGULAR	EXCESSIVE WEAR	2 OPER.	3 OPER.	4 OPER.	5 OPER.	REFLUTE OR DOUBLE	DOUBLE W/1 OPER.	DOUBLE W/2 OPER.	DOUBLE W/3 OPER.
------	---------	----------------	------------	------------	------------	------------	-------------------------	------------------------	------------------------	------------------------

3 & 4-FLUTE CARBIDE/SQUARE ENDMILL

000 TO .500	13.14	15.77	18.92	22.71	27.25	32.70	26.28	31.54	37.84	45.41
.501 TO .750	17.94	21.53	25.83	31.00	37.20	44.64	35.88	43.06	51.67	62.00
.751 TO 1.000	22.74	27.29	32.75	39.29	47.15	56.58	45.48	54.58	65.49	78.59
1.001 TO 1.250	27.54	33.05	39.66	47.59	57.11	68.53	55.08	66.10	79.32	95.18
1.251 TO 1.500	31.14	37.37	44.84	53.81	64.57	77.48	62.28	74.74	89.68	107.62
1.501 TO 1.750	43.14	51.77	62.12	74.55	89.46	107.35	86.28	103.54	124.24	149.09

3 & 4-FLUTE CARBIDE/BALLNOSE ENDMILL

000 TO .500	16.74	20.09	24.11	28.93	34.71	41.65	33.48	40.18	48.21	57.85
.501 TO .750	22.74	27.29	32.75	39.29	47.15	56.58	45.48	54.58	65.49	78.59
.751 TO 1.000	25.14	30.17	36.20	43.44	52.13	62.56	50.28	60.34	72.40	86.88
1.001 TO 1.250	32.34	38.81	46.57	55.88	67.06	80.47	64.68	77.62	93.14	111.77
1.251 TO 1.500	35.94	43.13	51.75	62.10	74.53	89.44	71.88	86.26	103.51	124.21
1.501 TO 1.750	46.74	56.09	67.31	80.77	96.92	116.30	93.48	112.18	134.61	161.53

5 & 6-FLUTE HSS/SQUARE ENDMILL

.000 TO 1.000	15.54	18.65	22.38	26.85	32.22	38.66	31.08	37.30	44.76	53.71
1.001 TO 1.250	22.74	27.29	32.75	39.29	47.15	56.58	45.48	54.58	65.49	78.59
1.251 TO 1.500	27.54	33.05	39.66	47.59	57.11	68.53	55.08	66.10	79.32	95.18
1.501 TO 2.000	39.54	47.45	56.94	68.33	81.99	98.39	79.08	94.90	113.88	136.65

FORMULA: RE: 2" HSS ENDMILLS - MIN. CHARGE \$25.95

BREAKDOWN:

RESHARP = \$1.79 PER INCH/PER FLUTE
REFURBISH = \$2.25 PER INCH/PER FLUTE

2 1/2" & 3" HSS ENDMILLS

RESHARP= \$1.99 PER INCH/PER FLUTE
1 1/4"= \$1.45

MIN. ORDER \$30.00

**LONG TO XXXXLONG
CUTOFF ENDS
CUTOFF O.D.**

SIZE	REGULAR	EXCESSIVE WEAR	2 OPER.	3 OPER.	4 OPER.	5 OPER.	REFLUTE OR DOUBLE	DOUBLE W/1 OPER.	DOUBLE W/2 OPER.	DOUBLE W/3 OPER.
-------------	----------------	-----------------------	--------------------	--------------------	--------------------	--------------------	----------------------------------	---------------------------------	---------------------------------	---------------------------------

NOTE: ANY TOOLS REQUIRING REPAIRS BEYOND REFURBISHING WILL BE QUOTED ON.

FORMULA: RE: 2" CARBIDE INSERTED ENDMILLS
RESHARP = \$2.59 PER INCH/PER FLUTE REFURBISH =
\$3.25 PER INCH/ER FLUTE

MIN. ORDER \$30.00

LONG TO XXXXLONG
CUTOFF ENDS
CUTOFF O.D.

SIZE	REGULAR	EXCESSIVE WEAR	2 OPER.	3 OPER.	4 OPER.	5 OPER.	REFLUTE OR DOUBLE	DOUBLE W/1 OPER.	DOUBLE W/2 OPER.	DOUBLE W/3 OPER.
------	---------	----------------	------------	------------	------------	------------	-------------------------	------------------------	------------------------	------------------------

5 & 6-FLUTE HSS/BALLNOSE ENDMILL

.000 TO 1.000	31.14	37.37	44.84	53.81	64.57	77.48	62.28	74.74	89.68	107.62
1.001 TO 1.250	44.34	53.21	63.85	76.62	91.94	110.33	88.68	106.42	127.70	153.24
1.251 TO 1.500	55.14	66.17	79.40	95.28	114.34	137.21	110.28	132.34	158.80	190.56
1.501 TO 2.000	79.14	94.97	113.96	136.75	164.10	196.92	158.28	189.94	227.92	273.51

8 FLUTE HSS/SQUARE ENDMILL

1.75	65.24	78.29	93.95	112.74.24	135.29	162.35				
------	-------	-------	-------	-----------	--------	--------	--	--	--	--

LARGE ENDMILLS - SQUARE

2.000" Dia x 2.000"	31.14	37.37	44.84	53.81	64.57	77.48	62.28	74.74	89.68	107.62
2.000" Dia x 3.000"	34.74	41.69	50.03	60.03	72.04	86.45	69.48	83.38	100.05	120.06
2.000" Dia X 4.000"	39.54	47.45	56.94	68.33	81.99	98.39	79.08	94.90	113.88	136.65
2.000" Dia X 5.000"	43.14	51.77	62.12	74.55	89.46	107.35	86.28	103.54	124.24	149.09
2.000" Dia x 6.000"	46.74	56.09	67.31	80.77	96.92	116.30	93.48	112.18	134.61	161.53
2.000" Dia x 7.000"	50.34	60.41	72.49	86.99	104.39	125.27	100.68	120.82	144.98	173.98
2.000" Dia x 8.000"	53.94	64.73	77.67	93.21	111.85	134.22	107.88	129.46	155.35	186.42

ROUGHING ENDMILL - SQUARE (BASED ON 4 FL EM)

.000 TO .500	10.74	12.89	15.47	18.56	22.27	26.72	21.48	25.78	30.93	37.12
.501 TO .750	13.14	15.77	18.92	22.71	27.25	32.70	26.28	31.54	37.84	45.41
.751 TO 1.000	16.74	20.09	24.11	28.93	34.71	41.65	33.48	40.18	48.21	57.85
1.001 TO 1.250	19.14	22.97	27.56	33.07	39.69	47.63	38.28	45.94	55.12	66.15
1.251 TO 1.500	22.74	27.29	32.75	39.29	47.15	56.58	45.48	54.58	65.49	78.59
1.501 TO 1.750	29.94	35.93	43.11	51.74	62.08	74.50	59.88	71.86	86.23	103.47

MIN. ORDER \$30.00

LONG TO XXXXLONG
CUTOFF ENDS
CUTOFF O.D.

SIZE	REGULAR	EXCESSIVE WEAR	2 OPER.	3 OPER.	4 OPER.	5 OPER.	REFLUTE OR DOUBLE	DOUBLE W/1 OPER.	DOUBLE W/2 OPER.	DOUBLE W/3 OPER.
------	---------	----------------	------------	------------	------------	------------	-------------------------	------------------------	------------------------	------------------------

2" ROUGHING ENDMILLS=\$2.25 PER INCH/PER FLUTE REFURBISH + 30%
 2.5" ROUGHING ENDMILLS=\$2.69 PER INCH/PER FLUTE
 3" ROUGHING ENDMILLS=\$3.25 PER INCH/PER FLUTE

OVERSIZED ENDMILLS

2.0" Dia x 3.0"	35.94	43.13	51.75	62.10	74.53	89.44	71.88	86.26	103.51	124.21
2.0" Dia x 4.0"	46.74	56.09	67.31	80.77	96.92	116.30	93.48	112.18	134.61	161.53
2.0" Dia x 5.0"	51.54	61.85	74.22	89.06	106.87	128.24	103.08	123.70	148.44	178.12
2.0" Dia x 6.0"	56.34	67.61	81.13	97.36	116.83	140.20	112.68	135.22	162.26	194.71
2.0" Dia x 7.0"	56.34	67.61	81.13	97.36	116.83	140.20	112.68	135.22	162.26	194.71
2.0" Dia x 8.0"	62.34	74.81	89.77	107.72	129.27	155.12	124.68	149.62	179.54	215.45

FORMULA: STANDARD SHARPENING \$2.25 x # OF FLUTES x LENGTH OF CUT

COUNTER BORES AND SPOT FACE TOOLS	3 Flute	4 Flute
-----------------------------------	---------	---------

.000 TO .500	11.94	14.33	17.19	20.63	24.76
.501 TO .750	13.14	15.77	18.92	22.71	27.25
.751 TO 1.000	14.34	17.21	20.65	24.78	29.74
1.001 TO 1.250	15.54	18.65	22.38	26.85	32.22
1.251 TO 1.500	19.14	22.97	27.56	33.07	39.69
1.501 TO 2.000	20.34	24.41	29.29	35.15	42.18

DRILLS

.000 TO .750	9.54	11.45	13.74	16.49	19.78	23.74	19.08	22.90	27.48	32.97
.751 TO 1.500	17.94	21.53	25.83	31.00	37.20	44.64	35.88	43.06	51.67	62.00
1.501 TO 2.00	23.94	28.73	34.47	41.37	49.64	59.57	47.88	57.46	68.95	82.74

MIN. ORDER \$30.00

LONG TO XXXXLONG
CUTOFF ENDS
CUTOFF O.D.

SIZE	REGULAR	EXCESSIVE WEAR	2 OPER.	3 OPER.	4 OPER.	5 OPER.	REFLUTE OR DOUBLE	DOUBLE W/1 OPER.	DOUBLE W/2 OPER.	DOUBLE W/3 OPER.
------	---------	----------------	------------	------------	------------	------------	-------------------------	------------------------	------------------------	------------------------

2-FLUTE CARBIDE DRILL

.000 TO .500	11.94	14.33	17.19	20.63	24.76	29.71	23.88	28.66	34.39	41.26
.501 TO .750	15.54	18.65	22.38	26.85	32.22	38.66	31.08	37.30	44.76	53.71
.751 TO 1.000	17.94	21.53	25.83	31.00	37.20	44.64	35.88	43.06	51.67	62.00
1.001 TO 1.250	20.34	24.41	29.29	35.15	42.18	50.62	40.68	48.82	58.58	70.30
1.251 TO 1.500	22.74	27.29	32.75	39.29	47.15	56.58	45.48	54.58	65.49	78.59

3-FLUTE CARBIDE DRILL

.000 TO .500	17.93	21.51	25.82	30.98	37.18	44.62	35.86	43.03	51.63	61.96
.501 TO .750	23.33	27.99	33.59	40.31	48.37	50.04	46.66	55.99	67.18	80.62
.751 TO 1.000	26.93	32.31	38.78	46.53	55.84	67.01	53.86	64.63	77.55	93.06
1.001 TO 1.250	30.53	36.63	43.96	52.75	63.30	75.96	61.06	73.27	87.92	105.50
1.251 TO 1.500	34.13	40.95	49.14	58.97	70.77	84.92	68.26	81.91	98.29	117.95

HIGH PERFORMANCE DRILL POINTS W/COATING SHARPENING + COATING COST + 30% FOR REFURBISHED

0mm TO 6.35mm (.250")	22.97	27.56	33.07	39.69	47.63					
6.36mm TO 12.75mm (1/2") .500	33.05	39.66	47.59	57.11	68.53					
12.76mm TO 19.05mm (3/4") .750	51.77	62.12	74.55	89.46	107.35					
19.06mm TO 25.4mm (1") 1.000	64.73	77.67	93.21	111.85	134.22					

MIN. ORDER \$30.00

LONG TO XXXXLONG
CUTOFF ENDS
CUTOFF O.D.

SIZE	REGULAR	EXCESSIVE WEAR	2 OPER.	3 OPER.	4 OPER.	5 OPER.	REFLUTE OR DOUBLE	DOUBLE W/1 OPER.	DOUBLE W/2 OPER.	DOUBLE W/3 OPER.
HIGH PERFORMANCE DRILL POINTS	W/COATING - TiCN or CrN		4"	6"	8"	10"				
0mm TO 6.35mm (.250")			28.73	34.47	41.37	49.64				
6.36mm TO 12.75mm (1/2") .500			40.25	48.30	57.96	69.55				
12.76mm TO 19.05mm (3/4") .750			60.41	72.49	86.99	104.39				
19.06mm TO 25.4mm (1") 1.000			76.25	91.50	109.80	131.76				

HIGH PERFORMANCE DRILL POINTS	W/COATING -		4"	6"	8"	10"				
0mm TO 6.35mm (.250")			34.46	41.35	49.62	59.55				
6.36mm TO 12.75mm (1/2") .500			49.58	59.50	71.39	85.67				
12.76mm TO 19.05mm (3/4") .750			77.66	93.19	111.83	134.20				
19.06mm TO 25.4mm (1") 1.000			97.10	116.52	139.82	167.79				

CARBIDE ENDMILLS TIN COATED

000 TO .500	28.51	32.53	22.37	22.37
.501 TO .750	40.28	45.74	31.94	31.94
.751 TO 1.000	57.05	63.08	47.83	47.83
1.001 TO 1.250				
1.251 TO 1.500				
1.501 TO 1.750				

MIN. ORDER \$30.00

LONG TO XXXXLONG CUTOFF ENDS

SIZE	CUTOFF O.D.					REFLUTE OR DOUBLE	DOUBLE W/1 OPER.	DOUBLE W/2 OPER.
	REGULAR	EXCESSIVE WEAR	2 OPER.	3 OPER.	4 OPER.			

CARBIDE ENDMILLS CrN & TICN COATED

000 TO .500

.501 TO .750

.751 TO 1.000

1.001 TO 1.250

SHARPENING + COATING PRICES

1.251 TO 1.500

1.501 TO 1.750

CARBIDE ENDMILLS ZrN, TIALN & ALTiN COATED ALCRONA, XCD, HELICA COATED

000 TO .500

.501 TO .750

.751 TO 1.000

1.001 TO 1.250

SHARPENING + COATING PRICES

1.251 TO 1.500

1.501 TO 1.750

HSS ENDMILLS TIN COATED

	4"	6"	8"	10"
000 TO .500	21.35	24.21	27.65	31.78
.501 TO .750	32.60	36.04	40.17	45.13
.751 TO 1.000	42.50	46.52	51.34	57.12
1.001 TO 1.250	62.48	67.07	72.58	79.20
1.251 TO 1.500				
1.501 TO 1.750				

HSS ENDMILLS CrN or TICN COATED

SHARPENING + COATING PRICES

HSS ENDMILLS SHARPENING + COATING PRICE ALCRONA, XCD, HELICA COATED

000 TO .500

.501 TO .750

.751 TO 1.000

SHARPENING + COATING PRICES

1.001 TO 1.250

1.251 TO 1.500

1.501 TO 1.750

MIN. ORDER \$30.00

LONG TO XXXXLONG
CUTOFF ENDS
CUTOFF O.D.

SIZE	REGULAR	EXCESSIVE WEAR	2 OPER.	3 OPER.	4 OPER.	5 OPER.	REFLUTE OR DOUBLE	DOUBLE W/1 OPER.	DOUBLE W/2 OPER.	DOUBLE W/3 OPER.
------	---------	----------------	------------	------------	------------	------------	-------------------------	------------------------	------------------------	------------------------

3FL CARBIDE DRILLS TIN COATED

.000 TO .500	26.35	29.93	35.92							
.501 TO .750	41.79	46.45	55.74							
.751 TO 1.000	53.81	59.19	71.03							
1.001 TO 1.250										
1.251 TO 1.500										

3 FL CARBIDE DRILLS

.000 TO .500										
.501 TO .750										
.751 TO 1.000	SHARPENING + COATING PRICES									
1.001 TO 1.250										
1.251 TO 1.500										

3 FL CARBIDE DRILLS ALCRONA, XCD, HELICA COATED

.000 TO .500										
.501 TO .750										
.751 TO 1.000	SHARPENING + COATING PRICES									
1.001 TO 1.250										
1.251 TO 1.500										

REAMERS/ SHELL REAMERS

.000 TO .500			12.89	15.47	18.56	22.27				
.501 TO .750			17.21	20.65	24.78	29.74				

MIN. ORDER \$30.00

LONG TO XXXXLONG
CUTOFF ENDS
CUTOFF O.D.

SIZE	REGULAR	EXCESSIVE WEAR	2 OPER.	3 OPER.	4 OPER.	5 OPER.	REFLUTE OR DOUBLE	DOUBLE W/1 OPER.	DOUBLE W/2 OPER	DOUBLE W/3 OPER.
.751 TO 1.000		20.09	24.11	28.93	34.71					
1.001 TO 1.250		22.97	27.56	33.07	39.69					
1.251 TO 1.500		27.29	32.75	39.29	47.15					
1.501 TO 2.000		33.05	39.66	47.59	57.11					
2.5										

TAPS

WILL BE QUOTED PRIOR TO
SHARPENING

SPIRAL TAPS

WILL BE QUOTED PRIOR TO
SHARPENING

SPADE DRILLS WITH TIN COATING

.000 TO 2.000	46.80	56.16	67.39	80.87	97.04					
2.001 TO 3.000	57.60	69.12	82.94	99.53	119.44					
3.001 +	70.80	84.96	101.95	122.34	146.81					
.000 TO 2.000	33.60	40.32	48.38	58.06	69.67					

MIN. ORDER \$30.00

LONG TO XXXXLONG
CUTOFF ENDS
CUTOFF O.D.

SIZE	REGULAR	EXCESSIVE WEAR	2 OPER.	3 OPER.	4 OPER.	5 OPER.	REFLUTE OR DOUBLE	DOUBLE W/1 OPER.	DOUBLE W/2 OPER.	DOUBLE W/3 OPER.
------	---------	----------------	------------	------------	------------	------------	-------------------------	------------------------	------------------------	------------------------

2.001 TO 3.000	46.80	56.16	67.39	80.87	97.04					
3.001 +	57.60	69.12	82.94	99.53	119.44					

REFURBISHED * 1.5%

COUNTER SINKS 1-3 FLUTES 4 - 8 FLUTES

.000 TO .500	<i>HOURLY</i>	
.501 TO .750		
.751 TO 1.500		
1.501 TO 2.000		
2.001 TO 3.000		

DOVE TAIL CUTTERS

.000 TO .500	<i>HOURLY</i>	
.501 TO .750		
.751 TO 1.000		
1.001 TO 1.250		
1.251 TO 1.500		

WOODRUFF CUTTERS 4-12 TEETH 13 - 24 TEETH

.000 TO .500	<i>HOURLY</i>	
.501 TO .750		
.751 TO 1.000		
1.001 TO 1.250		
1.251 TO 1.500		

