## FEEDS & SPEEDS FOR DRILLING - CARBIDE TIPPED

Feeds & speeds are a starting recommendation only. Factors such as machine, fixture and tooling rigidity, horsepower available, coolant application and others will affect the performance significantly. Please read machine operators instructions and use all safety shields and glasses before performing these operations. Top chart is for general purpose drilling. Bottom chart is for drilling with coolant.

RPM = Rotations Per Minute SFPM = Surface Feet Per Minute Drill Diameter = Diameter of the drill in inches

RPM=SFPM\*3.82/DRILL DIAMETER



CLASS OF MATERIALS				HOLE DIAMETER YOU ARE DRILLING IN INCHES									
	MATERIAL	BRINELL	SPEED IN SFPM		FEED RATE (INCHES PER REVOLUTION)								
			GENERAL PURPOSE	1/8	1/4	3/8	1/2	5/8	3/4	1	11/4	1½	
	ALLIMINIA ALLOV MIDOLIOLIT	30-150	250 250	002	005	007	000	010	011	01.4	017	010	
	ALUMINUM ALLOY - WROUGHT	(500kg)	250-350	.003	.005	.007	.008	.010	.011	.014	.017	.019	
NON-FERROUS	MAGNESIUM ALLOY	50-90	300-400	.003	.005	.006	.007	.008	.009	.013	.015	.016	
(SOFT)	LEAD ALLOY	10-20	350-450	.003	.005	.006	.007	.008	.009	.013	.015	.017	
	NON-METAL AND PLASTIC	-	175-450	.002	.004	.005	.005	.006	.008	.009	.010	.012	
	ZINC ALLOY - DIE CAST	80-100	300-400	.003	.005	.007	.009	.011	.012	.014	.016	.018	
	ALUMINUM BRONZE	40-175	125-190	.002	.005	.007	.008	.009	.010	.012	.014	.016	
NON-FERROUS	BRASS ALLOY - LEADED AND	10-100Rb	225-400	.003	.005	.007	.008	.009	.010	.012	.014	.016	
(HARD)	FREE CUTTING												
()	NICKEL SILVER	10-100Rb	125-190	.002	.005	.007	.008	.009	.010	.012	.014	.016	
	COPPER ALLOY - TOUGH	40-200	125-190	.002	.005	.007	.008	.009	.010	.012	.014	.016	
	DUCTILE CAST IRON - AUSTENITIC DUCTILE CAST IRON - FERRITIC	120-275	150.225	-	- 00.4	-	-	- 010	- 012	- 01.4	- 017	- 010	
	DUCTILE CAST IRON - FERRITIC  DUCTILE CAST IRON - MARTENSITIC	140-270	150-225	.002	.004	.006	.008	.010	.012	.014	.016	.018	
CAST IRON	GRAY - PEARLITIC	270-400 220-320	130-225	.002	.004	.006	.007	.009	.010	.013	.016	.018	
CASTIKON	GRAY - FERRITIC	110-240	125-190	.002	.004	.008	.007	.010	.010	.013	.016	.016	
	MALLEABLE CAST IRON -		123-170										
	MARTENSITIC	200-320	100-150	.002	.004	.006	.007	.008	.010	.012	.014	.016	
LOW CARBON STEELSt	LOW AND MEDIUM CARBON STEEL -												
	FREE MACHINING	100-250	125-175	.003	.004	.008	.010	.012	.014	.017	.018	.019	
	LOW AND MEDIUM CARBON STEEL -												
	WROUGHT	100-375	-	-	-	_	_	_	-	-	-	-	
	LOW AND MEDIUM CARBON	100 275											
MEDIUM STRENGTH STEELS	ALLOY STEEL - FREE MACHINING	100-275	-		-		-		-	_	_	-	
	LOW AND MEDIUM CARBON	85-375			_		_	_	_		_	_	
	ALLOY STEEL	*** ***	_			_	_				_		
	STAINLESS STEEL - 400 SERIES	135-325	-	-	-	-	-	-	-	-	-	_	
	STAINLESS STEEL - 400 SERIES	135-275	100-150	.002	.004	.005	.006	.007	.008	.010	.012	.014	
	FREE MACHINING	133-273	100-150	.002	.004	.003	.000	.007	.008	.010	.012	.014	
HIGH STRENGTH	HIGH STRENGTH STEEL -	175-400	_	_	_	_	_	_	_	_	_	_	
STEELS  HIGH TEMP. ALLOYS	WROUGHT & TOOL STEEL												
	HIGH TEMP ALLOYS	140-300	_	_	_	_	_	_	_	_	_	-	
	NICKEL & IRON BASE ALLOY												
	STAINLESS STEEL - 300 SERIES	135-375	-	-	-	-	-	-	-	_	-	-	
	STAINLESS STEEL - PH SERIES TITANIUM ALLOY	150-440	-		-	-	_	_	_	-	-	-	
	THANIUM ALLOT	110-380	=		_		_	_			_		
OL ACC OF			CDEED IN CEDM		HOL	E DIAMI	ETER YO	U ARE I	ORILLIN	G IN IN	CHES		
CLASS OF	MATERIAL	BRINELL	SPEED IN SFPM			E DIAMI FEED RA							
CLASS OF MATERIALS	MATERIAL	BRINELL	SPEED IN SFPM COOLANT FED	1/8								1½	
		BRINELL 30-150	COOLANT FED		1/4	FEED RA	ATE (INC	CHES PE	R REVOI	LUTION 1	11/4		
	ALUMINUM ALLOY - WROUGHT			1/8		FEED RA 3/8 .005	1/2 .006	5% .006	R REVOI	.009	)	1½	
MATERIALS  NON-FERROUS	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY	30-150 (500kg) 50-90	COOLANT FED 375-550 450-550		.004	FEED RA 3/8 .005 .006	ATE (INC 1/2 .006 .007	% .006 .008	34 .007 .009	.009 .013	11/4		
MATERIALS	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY	30-150 (500kg) 50-90 10-20	COOLANT FED 375-550	- - -	.004 .005 .004	FEED RA 3/8 .005 .006 .006	1/2 .006 .007 .007	.006 .008 .008	R REVOI 34 .007 .009 .009	.009 .013 .013	1¼ - - -	- - -	
MATERIALS  NON-FERROUS	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY  NON-METAL AND PLASTIC	30-150 (500kg) 50-90 10-20	COOLANT FED  375-550  450-550  400-500  -	- - -	.004 .005 .004	## .005 .006 .006 .006	.006 .007 .007	.006 .008 .008	.007 .009 .009	.009 .013 .013 -	1¼ - - - -	- - -	
MATERIALS  NON-FERROUS	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY  NON-METAL AND PLASTIC  ZINC ALLOY - DIE CAST	30-150 (500kg) 50-90 10-20 - 80-100	COOLANT FED  375-550  450-550  400-500  -  400-500	- - - -	.004 .005 .004 - .004	FEED RA 3/8 .005 .006 .006 - .005	.006 .007 .007 .006	.006 .008 .008 - .008	R REVOI 34 .007 .009 .009 - .009	.009 .013 .013 - .010	) 1¼	- - - -	
MATERIALS  NON-FERROUS	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY  NON-METAL AND PLASTIC  ZINC ALLOY - DIE CAST  ALUMINUM BRONZE	30-150 (500kg) 50-90 10-20	COOLANT FED  375-550  450-550  400-500  -	- - -	.004 .005 .004	## .005 .006 .006 .006	.006 .007 .007	.006 .008 .008	.007 .009 .009	.009 .013 .013 -	1¼ - - - -	- - -	
MATERIALS  NON-FERROUS	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY  NON-METAL AND PLASTIC  ZINC ALLOY - DIE CAST  ALUMINUM BRONZE  BRASS ALLOY - LEADED AND	30-150 (500kg) 50-90 10-20 - 80-100	COOLANT FED  375-550  450-550  400-500  -  400-500	- - - -	.004 .005 .004 - .004	FEED RA 3/8 .005 .006 .006 - .005	.006 .007 .007 .006	.006 .008 .008 - .008	R REVOI 34 .007 .009 .009 - .009	.009 .013 .013 - .010	) 1¼	- - - -	
MATERIALS  NON-FERROUS (SOFT)	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY  NON-METAL AND PLASTIC  ZINC ALLOY - DIE CAST  ALUMINUM BRONZE  BRASS ALLOY - LEADED AND  FREE CUTTING	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb	COOLANT FED  375-550  450-550  400-500  -  400-500  200-300  300-450	- - - - - -	.004 .005 .004 - .004 .004 .004	FEED RA 3/8 .005 .006 .006 - .005 .005 .005	ATE (INC 1/2 .006 .007 .007 - .006 .006 .006	.006 .008 .008 .008 .008 .007 .007	R REVOI  34  .007  .009  .009 009  .009  .008	.009 .013 .013 .013 - .010 .010	) 1¼	- - - - -	
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY  NON-METAL AND PLASTIC  ZINC ALLOY - DIE CAST  ALUMINUM BRONZE  BRASS ALLOY - LEADED AND  FREE CUTTING  NICKEL SILVER	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb	COOLANT FED  375-550  450-550  400-500  -  400-500  200-300  300-450  225-300	- - - - - -	.004 .005 .004 - .004 .004 .004	FEED RA  3/8  .005  .006  .006 005  .005  .005	.006 .007 .007 .006 .006 .006 .006	.006 .008 .008 .008 .008 .007 .007	R REVOI  34  .007  .009  .009 009  .008  .008	.009 .013 .013 .013 - .010 .010	) 11/4	- - - - -	
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY  NON-METAL AND PLASTIC  ZINC ALLOY - DIE CAST  ALUMINUM BRONZE  BRASS ALLOY - LEADED AND  FREE CUTTING  NICKEL SILVER  COPPER ALLOY - TOUGH	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 10-100Rb	COOLANT FED  375-550  450-550  400-500   400-500  200-300  300-450  225-300  225-300	- - - - - - -	.004 .005 .004 - .004 .004 .004	FEED RA 3/8 .005 .006 .006 .006 .005 .005 .005 .005	NTE (INC 1/2 .006 .007 .007 - .006 .006 .006 .006	.006 .008 .008 .008 .008 .007 .007	R REVOI  34  .007  .009 .009009 .009 .008 .008	.010 .013 .013 .013 .010 .010 .010 .010	) 11/4	- - - - - - -	
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY  NON-METAL AND PLASTIC  ZINC ALLOY - DIE CAST  ALUMINUM BRONZE  BRASS ALLOY - LEADED AND  FREE CUTTING  NICKEL SILVER  COPPER ALLOY - TOUGH  DUCTILE CAST IRON - AUSTENITIC	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275	COOLANT FED  375-550  450-550  400-500   400-500  200-300  300-450  225-300	- - - - - - - -	.004 .005 .004 - .004 .004 .004	FEED RA 3/8 .005 .006 .006 .005 .005 .005 .005	NTE (INC 1/2 .006 .007 .007 - .006 .006 .006 .006	.006 .008 .008 .008 .008 .007 .007 .007	R REVOI  34  .007  .009  .009  -  .009  .008  .008	.009 .013 .013 .010 .010 .010 .010 .010 .010	) 1¼	- - - - - - -	
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY LEAD ALLOY NON-METAL AND PLASTIC ZINC ALLOY - DIE CAST ALUMINUM BRONZE BRASS ALLOY - LEADED AND FREE CUTTING NICKEL SILVER COPPER ALLOY - TOUGH DUCTILE CAST IRON - AUSTENITIC DUCTILE CAST IRON - FERRITIC	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270	COOLANT FED  375-550  450-550  400-500   400-500  200-300  300-450  225-300  225-300   200-250	- - - - - - -	.004 .005 .004 - .004 .004 .004 .004	FEED RA 36 .005 .006 .006005 .005 .005 .005 .005	ATE (INC  1/2  .006  .007  .007 006  .006  .006  .006  .006  .006	.006 .008 .008 .008 .008 .007 .007 .007	R REVOI  34  .007  .009  .009 009  .008  .008  .008  .008	.009 .013 .013 .010 .010 .010 .010 .010 .010	) 1¼	- - - - - - -	
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS (HARD)	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY LEAD ALLOY NON-METAL AND PLASTIC ZINC ALLOY - DIE CAST ALUMINUM BRONZE BRASS ALLOY - LEADED AND FREE CUTTING NICKEL SILVER COPPER ALLOY - TOUGH DUCTILE CAST IRON - AUSTENITIC DUCTILE CAST IRON - FERRITIC DUCTILE CAST IRON - MARTENSITIC	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400	COOLANT FED  375-550  450-550  400-500  -  400-500  200-300  300-450  225-300  225-300  -  200-250	- - - - - - - -	.004 .005 .004  .004 .004 .004 .004 .004	FEED RA 38 .005 .006 .006005 .005 .005 .005 .005 .005	ATE (INC  1/2  .006  .007  .007  .006  .006  .006  .006  .006  .006  .006  .006	.006 .008 .008 .008 .007 .007 .007 .007	R REVOI  34  .007  .009  .009 009  .008  .008  .008 008	.010 .010 .010 .010 .010 .010 .010 .010	) 1¼	- - - - - - -	
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY LEAD ALLOY NON-METAL AND PLASTIC ZINC ALLOY - DIE CAST ALUMINUM BRONZE BRASS ALLOY - LEADED AND FREE CUTTING NICKEL SILVER COPPER ALLOY - TOUGH DUCTILE CAST IRON - AUSTENITIC DUCTILE CAST IRON - FERRITIC	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270	COOLANT FED  375-550  450-550  400-500   400-500  200-300  300-450  225-300  225-300   200-250	- - - - - - - - - - - - - - - - - - -	.004 .005 .004 - .004 .004 .004 .004	FEED RA 36 .005 .006 .006005 .005 .005 .005 .005	ATE (INC  1/2  .006  .007  .007 006  .006  .006  .006  .006  .006	.006 .008 .008 .008 .008 .007 .007 .007	R REVOI  34  .007  .009  .009 009  .008  .008  .008  .008	.009 .013 .013 .010 .010 .010 .010 .010 .010	) 1¼	- - - - - - - - -	
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS (HARD)	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY  NON-METAL AND PLASTIC  ZINC ALLOY - DIE CAST  ALUMINUM BRONZE  BRASS ALLOY - LEADED AND  FREE CUTTING  NICKEL SILVER  COPPER ALLOY - TOUGH  DUCTILE CAST IRON - AUSTENITIC  DUCTILE CAST IRON - FERRITIC  DUCTILE CAST IRON - MARTENSITIC  GRAY - PEARLITIC	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400 220-320 110-240	COOLANT FED  375-550  450-550  400-500  -  400-500  200-300  300-450  225-300  225-300  -  200-250  200-250  225-325  200-250	- - - - - - - - - - - - - - - -	14 .004 .005 .004 - .004 .004 .004 .004 .004 - .004 .004	FEED RA 36 .005 .006 .006 .005 .005 .005 .005 .00	NTE (INC 1/2	.006 .008 .008 .008 .007 .007 .007 .007 .007	R REVOI 34 .007 .009 .009 .009 .008 .008 .008 .008 .008	.009 .013 .013 .010 .010 .010 .010 .010 .010	) 1¼ - - - - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - - - - -	
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS (HARD)	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY  NON-METAL AND PLASTIC  ZINC ALLOY - DIE CAST  ALUMINUM BRONZE  BRASS ALLOY - LEADED AND  FREE CUTTING  NICKEL SILVER  COPPER ALLOY - TOUGH  DUCTILE CAST IRON - AUSTENITIC  DUCTILE CAST IRON - MARTENSITIC  GRAY - FERRITIC  GRAY - FERRITIC	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400 220-320	COOLANT FED  375-550  450-550  400-500   400-500  200-300  300-450  225-300  225-300   200-250  200-250  225-325	- - - - - - - - - - - - - - - - - - -	.004 .005 .004 - .004 .004 .004 .004 - .004 .004	FEED RA 36 .005 .006 .006005 .005 .005 .005 .005 .005 .005 .0	NTE (INC  1/2  .006  .007  .007 006  .006  .006  .006  .006  .006  .006  .006  .006  .006	.006 .008 .008 .008 .007 .007 .007 .007 .007	R REVOI  34  .007  .009  .009  -  .009  .008  .008  .008  .008  .008  .008	.009 .013 .013 .010 .010 .010 .010 .010 .010	) 1¼ - - - - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - - - - -	
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS (HARD)	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY LEAD ALLOY NON-METAL AND PLASTIC ZINC ALLOY - DIE CAST ALUMINUM BRONZE BRASS ALLOY - LEADED AND FREE CUTTING NICKEL SILVER COPPER ALLOY - TOUGH DUCTILE CAST IRON - AUSTENITIC DUCTILE CAST IRON - MARTENSITIC GRAY - PEARLITIC GRAY - FERRITIC MALLEABLE CAST IRON -	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400 220-320 110-240 200-320	COOLANT FED  375-550  450-550  400-500   400-500  200-300  300-450  225-300  225-300  200-250  200-250  200-250  200-250  200-250		.004 .005 .004 	FEED RA  .005 .006 .006 .005 .005 .005 .005 .00	NTE (INC 1/2	.006 .008 .008 .008 .008 .007 .007 .007 .007	R REVOI 34 .007 .009 .009009 .008 .008 .008 .008 .008 .008 .008	.010 .010 .010 .010 .010 .010 .010 .010	) 1¼	- - - - - - - - - - - - - - - - - - -	
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS (HARD)	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY LEAD ALLOY NON-METAL AND PLASTIC ZINC ALLOY - DIE CAST ALUMINUM BRONZE BRASS ALLOY - LEADED AND FREE CUTTING NICKEL SILVER COPPER ALLOY - TOUGH DUCTILE CAST IRON - AUSTENITIC DUCTILE CAST IRON - FERRITIC DUCTILE CAST IRON - FERRITIC GRAY - PEARLITIC GRAY - FERRITIC MALLEABLE CAST IRON - MARTENSITIC	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400 220-320 110-240	COOLANT FED  375-550  450-550  400-500  -  400-500  200-300  300-450  225-300  225-300  -  200-250  200-250  225-325  200-250	- - - - - - - - - - - - - - - -	14 .004 .005 .004 - .004 .004 .004 .004 .004 - .004 .004	FEED RA 36 .005 .006 .006 .005 .005 .005 .005 .00	NTE (INC 1/2	.006 .008 .008 .008 .007 .007 .007 .007 .007	R REVOI 34 .007 .009 .009 .009 .008 .008 .008 .008 .008	.009 .013 .013 .010 .010 .010 .010 .010 .010	) 1¼ - - - - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - - - - -	
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS (HARD)  CAST IRON	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY LEAD ALLOY NON-METAL AND PLASTIC ZINC ALLOY - DIE CAST ALUMINUM BRONZE BRASS ALLOY - LEADED AND FREE CUTTING NICKEL SILVER COPPER ALLOY - TOUGH DUCTILE CAST IRON - AUSTENITIC DUCTILE CAST IRON - FERRITIC DUCTILE CAST IRON - MARTENSITIC GRAY - PEARLITIC GRAY - FERRITIC MALLEABLE CAST IRON - MARTENSITIC LOW AND MEDIUM CARBON STEEL - FREE MACHINING LOW AND MEDIUM CARBON STEEL -	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400 220-320 110-240 200-320	COOLANT FED  375-550  450-550  400-500   400-500  200-300  300-450  225-300  225-300  200-250  200-250  200-250  200-250  200-250		.004 .005 .004 .004 .004 .004 .004 .004	FEED RA 36 .005 .006 .006 .005 .005 .005 .005 .00	NTE (INC  1/2  .006  .007  .007  .006  .008  .008	.006 .008 .008 .008 .007 .007 .007 .007 .007	R REVOI  34  .007  .009  .009  .009  .008  .008  .008  .008  .008  .008  .012 .008  .008  .008	.010 .010 .010 .010 .010 .010 .010 .010	) 1¼		
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS (HARD)  CAST IRON	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY  NON-METAL AND PLASTIC  ZINC ALLOY - DIE CAST  ALUMINUM BRONZE  BRASS ALLOY - LEADED AND  FREE CUTTING  NICKEL SILVER  COPPER ALLOY - TOUGH  DUCTILE CAST IRON - AUSTENITIC  DUCTILE CAST IRON - FERRITIC  DUCTILE CAST IRON - FERRITIC  GRAY - PEARLITIC  GRAY - FERRITIC  MALLEABLE CAST IRON -  MARTENSITIC  LOW AND MEDIUM CARBON STEEL -  FREE MACHINING  LOW AND MEDIUM CARBON STEEL -  WROUGHT	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400 220-320 110-240 200-320	COOLANT FED  375-550  450-550  400-500   400-500  200-300  300-450  225-300  225-300  200-250  200-250  200-250  200-250  200-250		.004 .005 .004 	FEED RA  .005 .006 .006 .005 .005 .005 .005 .00	NTE (INC 1/2	.006 .008 .008 .008 .008 .007 .007 .007 .007	R REVOI 34 .007 .009 .009009 .008 .008 .008 .008 .008 .008 .008	.010 .010 .010 .010 .010 .010 .010 .010	) 1¼	- - - - - - - - - - - - - - - - - - -	
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS (HARD)  CAST IRON	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY  NON-METAL AND PLASTIC  ZINC ALLOY - DIE CAST  ALUMINUM BRONZE  BRASS ALLOY - LEADED AND  FREE CUTTING  NICKEL SILVER  COPPER ALLOY - TOUGH  DUCTILE CAST IRON - AUSTENITIC  DUCTILE CAST IRON - FERRITIC  DUCTILE CAST IRON - MARTENSITIC  GRAY - PEARLITIC  GRAY - FERRITIC  MALLEABLE CAST IRON -  MARTENSITIC  LOW AND MEDIUM CARBON STEEL -  FREE MACHINING  LOW AND MEDIUM CARBON  WROUGHT  LOW AND MEDIUM CARBON	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400 220-320 110-240 100-250	COOLANT FED  375-550  450-550  400-500   400-500  200-300  300-450  225-300  225-300  200-250  200-250  200-250  200-250   200-250		.004 .005 .004 .004 .004 .004 .004 .004	FEED RA  .005 .006 .006 .005 .005 .005 .005 .00	NTE (INC 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2	.006 .008 .008 .007 .007 .007 .007 .007 .007	R REVOI  34  .007  .009 .009009 .008 .008 .008 .008 .008 .008 .008		) 1¼		
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS (HARD)  CAST IRON  LOW CARBON STEELS	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY  NON-METAL AND PLASTIC  ZINC ALLOY - DIE CAST  ALUMINUM BRONZE  BRASS ALLOY - LEADED AND  FREE CUTTING  NICKEL SILVER  COPPER ALLOY - TOUGH  DUCTILE CAST IRON - AUSTENITIC  DUCTILE CAST IRON - FERRITIC  DUCTILE CAST IRON - MARTENSITIC  GRAY - FERRITIC  GRAY - FERRITIC  MALLEABLE CAST IRON -  MARTENSITIC  LOW AND MEDIUM CARBON STEEL -  FREE MACHINING  LOW AND MEDIUM CARBON  ALLOY STEEL - FREE MACHINING	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400 220-320 110-240 200-320	COOLANT FED  375-550  450-550  400-500   400-500  200-300  300-450  225-300  225-300  200-250  200-250  200-250  200-250  200-250		.004 .005 .004 .004 .004 .004 .004 .004	FEED RA 36 .005 .006 .006 .005 .005 .005 .005 .00	NTE (INC  1/2  .006  .007  .007  .006  .008  .008	.006 .008 .008 .008 .007 .007 .007 .007 .007	R REVOI  34  .007  .009  .009  .009  .008  .008  .008  .008  .008  .008  .012 .008  .008  .008	.010 .010 .010 .010 .010 .010 .010 .010	) 1¼		
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS (HARD)  CAST IRON  LOW CARBON STEELS  MEDIUM	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY LEAD ALLOY NON-METAL AND PLASTIC ZINC ALLOY - DIE CAST ALUMINUM BRONZE BRASS ALLOY - LEADED AND FREE CUTTING NICKEL SILVER COPPER ALLOY - TOUGH DUCTILE CAST IRON - AUSTENITIC DUCTILE CAST IRON - FERRITIC GRAY - PEARLITIC GRAY - FERRITIC MALLEABLE CAST IRON - MARTENSITIC LOW AND MEDIUM CARBON STEEL - FREE MACHINING LOW AND MEDIUM CARBON STEEL - WROUGHT LOW AND MEDIUM CARBON STEEL - LOW AND MEDIUM CARBON STEEL - WROUGHT LOW AND MEDIUM CARBON STEEL - LOW AND MEDIUM CARBON STEEL - WROUGHT LOW AND MEDIUM CARBON ALLOY STEEL - FREE MACHINING LOW AND MEDIUM CARBON ALLOY STEEL - FREE MACHINING LOW AND MEDIUM CARBON ALLOY STEEL - FREE MACHINING LOW AND MEDIUM CARBON	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400 220-320 110-240 200-320 100-250	COOLANT FED  375-550  450-550  400-500		.004 .005 .004 .004 .004 .004 .004 .004	FEED RA 36 .005 .006 .006 .006 .005 .005 .005 .00	NTE (INC  1/2  .006  .007  .007  .006  .006  .006  .006  .006  .006  .006  .006  .006  .008  .008  .008	.006 .008 .008 .008 .007 .007 .007 .007 .007	R REVOI  34  .007  .009  .009  .009  .008  .008  .008  .008  .008  .012 .008  .008  .010  .010	.010 .010 .010 .010 .010 .010 .010 .010	) 1¼		
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS (HARD)  CAST IRON  LOW CARBON STEELS  MEDIUM STRENGTH	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY  NON-METAL AND PLASTIC  ZINC ALLOY - DIE CAST  ALUMINUM BRONZE  BRASS ALLOY - LEADED AND  FREE CUTTING  NICKEL SILVER  COPPER ALLOY - TOUGH  DUCTILE CAST IRON - AUSTENITIC  DUCTILE CAST IRON - FERRITIC  DUCTILE CAST IRON - FERRITIC  GRAY - PEARLITIC  GRAY - FERRITIC  MALLEABLE CAST IRON - MARTENSITIC  LOW AND MEDIUM CARBON STEEL -  FREE MACHINING  LOW AND MEDIUM CARBON  ALLOY STEEL - FREE MACHINING  LOW AND MEDIUM CARBON  ALLOY STEEL - FREE MACHINING	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400 220-320 110-240 200-320 100-250 100-275	COOLANT FED  375-550  450-550  400-500   400-500  200-300  300-450  225-300   200-250  200-250  200-250  200-250   100-250   100-220	- - - - - - - - - - - - - - - - - - -	.004 .005 .004 .004 .004 .004 .004 .004	FEED RA 36 .005 .006 .006 .006 .005 .005 .005 .00	NTE (INC  1/2  .006  .007 .007 -006 .006 .006 .006 .006 .006 .006 .006	.006 .008 .008 .008 .007 .007 .007 .007 .007	R REVOI  34  .007  .009  .009  .009  .008  .008  .008  .008  .008  .012 .008  .008  .010  .010	.010 .010 .010 .010 .010 .010 .010 .010	) 1¼	- - - - - - - - - - - - - - - - - - -	
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS (HARD)  CAST IRON  LOW CARBON STEELS  MEDIUM	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY  NON-METAL AND PLASTIC  ZINC ALLOY - DIE CAST  ALUMINUM BRONZE  BRASS ALLOY - LEADED AND  FREE CUTTING  NICKEL SILVER  COPPER ALLOY - TOUGH  DUCTILE CAST IRON - AUSTENITIC  DUCTILE CAST IRON - FERRITIC  DUCTILE CAST IRON - MARTENSITIC  GRAY - PEARLITIC  GRAY - FERRITIC  MALLEABLE CAST IRON -  MARTENSITIC  LOW AND MEDIUM CARBON STEEL -  FREE MACHINING  LOW AND MEDIUM CARBON  ALLOY STEEL - FREE MACHINING  LOW AND MEDIUM CARBON  ALLOY STEEL - FREE MACHINING  LOW AND MEDIUM CARBON  ALLOY STEEL - STAINLESS STEEL - 400 SERIES	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400 220-320 110-240 200-320 100-250	COOLANT FED  375-550  450-550  400-500	- - - - - - - - - - - - - - - - - - -	.004 .005 .004 .004 .004 .004 .004 .004	FEED RA 36 .005 .006 .006 .006 .005 .005 .005 .00	NTE (INC  1/2  .006  .007  .007  .006  .006  .006  .006  .006  .006  .006  .006  .006  .008  .008  .008	.006 .008 .008 .008 .007 .007 .007 .007 .007	R REVOI  34  .007  .009  .009  .009  .008  .008  .008  .008  .008  .012 .008  .008  .010  .010	.010 .010 .010 .010 .010 .010 .010 .010	) 1¼		
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS (HARD)  CAST IRON  LOW CARBON STEELS  MEDIUM STRENGTH	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY  NON-METAL AND PLASTIC  ZINC ALLOY - DIE CAST  ALUMINUM BRONZE  BRASS ALLOY - LEADED AND FREE CUTTING NICKEL SILVER  COPPER ALLOY - TOUGH  DUCTILE CAST IRON - AUSTENITIC  DUCTILE CAST IRON - MARTENSITIC  GRAY - PEARLITIC  GRAY - PEARLITIC  MALLEABLE CAST IRON - MARTENSITIC  GRAY - FERRITIC  MALLEABLE CAST IRON - MARTENSITIC  LOW AND MEDIUM CARBON STEEL - FREE MACHINING  LOW AND MEDIUM CARBON ALLOY STEEL - FREE MACHINING  LOW AND MEDIUM CARBON ALLOY STEEL - FREE MACHINING  LOW AND MEDIUM CARBON ALLOY STEEL - FREE MACHINING  LOW AND MEDIUM CARBON ALLOY STEEL - FREE MACHINING  LOW AND MEDIUM CARBON ALLOY STEEL - 400 SERIES  STAINLESS STEEL - 400 SERIES	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400 220-320 110-240 200-320 100-250 100-275 140-275 140-270 110-275	COOLANT FED  375-550  450-550  400-500   400-500  200-300  300-450  225-300  225-300   200-250  200-250  200-250  200-250   100-250   100-220  100-150  110-150	- - - - - - - - - - - - - - - - - - -	.004 .005 .004 .004 .004 .004 .004 .004	FEED RA 36 .005 .006 .006 .006 .005 .005 .005 .00	NTE (INC  1/2  .006  .007 .007 -006 .006 .006 .006 .006 .006 .006 .006	.006 .008 .008 .008 .007 .007 .007 .007 .007	R REVOI  34  .007  .009  .009  .009  .008  .008  .008  .008  .008  .012 .008  .008  .010  .010	.010 .010 .010 .010 .010 .010 .010 .010	) 1¼	- - - - - - - - - - - - - - - - - - -	
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS (HARD)  CAST IRON  LOW CARBON STEELS  MEDIUM STRENGTH STEELS	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY  NON-METAL AND PLASTIC  ZINC ALLOY - DIE CAST  ALUMINUM BRONZE  BRASS ALLOY - LEADED AND  FREE CUTTING  NICKEL SILVER  COPPER ALLOY - TOUGH  DUCTILE CAST IRON - AUSTENITIC  DUCTILE CAST IRON - FERRITIC  DUCTILE CAST IRON - FERRITIC  GRAY - PEARLITIC  GRAY - FERRITIC  MALLEABLE CAST IRON - MARTENSITIC  LOW AND MEDIUM CARBON STEEL -  FREE MACHINING  LOW AND MEDIUM CARBON STEEL -  WROUGHT  LOW AND MEDIUM CARBON STEEL -  WROUGHT  LOW AND MEDIUM CARBON  ALLOY STEEL - FREE MACHINING  LOW AND MEDIUM CARBON  ALLOY STEEL - 400 SERIES  STAINLESS STEEL - 400 SERIES  FREE MACHINING	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400 220-320 110-240 200-320 100-250 100-275	COOLANT FED  375-550  450-550  400-500   400-500  200-300  300-450  225-300   200-250  200-250  200-250  200-250   100-250   100-220		.004 .005 .004 .004 .004 .004 .004 .004	FEED RA 36 .005 .006 .006 .006 .005 .005 .005 .00	NTE (INC  1/2  .006  .007 .007 .006 .006 .006 .006 .0	.006 .008 .008 .008 .007 .007 .007 .007 .007	R REVOI  34  .007  .009 .009 .009 .008 .008 .008 .008 .00	.010 .010 .010 .010 .010 .010 .010 .010	) 1¼	- - - - - - - - - - - - - - - - - - -	
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS (HARD)  CAST IRON  LOW CARBON STEELS  MEDIUM STRENGTH STEELS  HIGH STRENGTH	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY  NON-METAL AND PLASTIC  ZINC ALLOY - DIE CAST  ALUMINUM BRONZE  BRASS ALLOY - LEADED AND  FREE CUTTING  NICKEL SILVER  COPPER ALLOY - TOUGH  DUCTILE CAST IRON - AUSTENITIC  DUCTILE CAST IRON - FERRITIC  DUCTILE CAST IRON - FERRITIC  GRAY - PEARLITIC  GRAY - FERRITIC  MALLEABLE CAST IRON - MARTENSITIC  LOW AND MEDIUM CARBON STEEL -  FREE MACHINING  LOW AND MEDIUM CARBON STEEL -  WROUGHT  LOW AND MEDIUM CARBON  ALLOY STEEL - FREE MACHINING  LOW AND MEDIUM CARBON  ALLOY STEEL  STAINLESS STEEL - 400 SERIES  STAINLESS STEEL - 400 SERIES  FREE MACHINING  HIGH STRENGTH STEEL -	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400 220-320 110-240 200-320 100-250 100-275 140-275 140-270 110-275	COOLANT FED  375-550  450-550  400-500   400-500  200-300  300-450  225-300  225-300   200-250  200-250  200-250  200-250   100-250   100-220  100-150  110-150		.004 .005 .004 .004 .004 .004 .004 .004	FEED RA 36 .005 .006 .006 .006 .005 .005 .005 .00	NTE (INC  1/2  .006  .007 .007 .006 .006 .006 .006 .0	.006 .008 .008 .008 .007 .007 .007 .007 .007	R REVOI  34  .007  .009 .009 .009 .008 .008 .008 .008 .00	.010 .010 .010 .010 .010 .010 .010 .010	) 1¼	- - - - - - - - - - - - - - - - - - -	
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS (HARD)  CAST IRON  LOW CARBON STEELS  MEDIUM STRENGTH STEELS	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY  NON-METAL AND PLASTIC  ZINC ALLOY - DIE CAST  ALUMINUM BRONZE  BRASS ALLOY - LEADED AND  FREE CUTTING  NICKEL SILVER  COPPER ALLOY - TOUGH  DUCTILE CAST IRON - AUSTENITIC  DUCTILE CAST IRON - FERRITIC  DUCTILE CAST IRON - MARTENSITIC  GRAY - PEARLITIC  GRAY - FERRITIC  MALLEABLE CAST IRON - MARTENSITIC  LOW AND MEDIUM CARBON STEEL -  FREE MACHINING  LOW AND MEDIUM CARBON STEEL -  WROUGHT  LOW AND MEDIUM CARBON  ALLOY STEEL - FREE MACHINING  LOW AND MEDIUM CARBON  ALLOY STEEL - FREE MACHINING  LOW AND MEDIUM CARBON  ALLOY STEEL - FREE MACHINING  LOW AND MEDIUM CARBON  ALLOY STEEL - 400 SERIES  STAINLESS STEEL - 400 SERIES  FREE MACHINING  HIGH STRENGTH STEEL -  WROUGHT & TOOL STEEL	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400 220-320 110-240 200-320 100-250 100-275 85-375 135-325	COOLANT FED  375-550  450-550  400-500  -  400-500  200-300  300-450  225-300  225-300  200-250  200-250  200-250  200-250  150-250  -  100-220  100-150  110-150  125-190		.004 .004 .004 .004 .004 .004 .004 .004	FEED RA	NTE (INC  1/2  .006 .007 .007 .006 .006 .006 .006 .00	.006 .008 .008 .007 .007 .007 .007 .007 .007	R REVOI  34  .007 .009 .009 .009 .008 .008 .008 .008 .008	UTION  1 .009 .013 .013 .010 .010 .010 .010 .010 .010	) 1¼	- - - - - - - - - - - - - - - - - - -	
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS (HARD)  CAST IRON  LOW CARBON STEELS  MEDIUM STRENGTH STEELS  HIGH STRENGTH	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY LEAD ALLOY NON-METAL AND PLASTIC ZINC ALLOY - DIE CAST ALUMINUM BRONZE BRASS ALLOY - LEADED AND FREE CUTTING NICKEL SILVER COPPER ALLOY - TOUGH DUCTILE CAST IRON - AUSTENITIC DUCTILE CAST IRON - HERRITIC DUCTILE CAST IRON - MARTENSITIC GRAY - PEARLITIC GRAY - FERRITIC MALLEABLE CAST IRON - MARTENSITIC UCTUM AND MEDIUM CARBON STEEL - FREE MACHINING LOW AND MEDIUM CARBON STEEL - WROUGHT LOW AND MEDIUM CARBON ALLOY STEEL - FREE MACHINING LOW AND MEDIUM CARBON ALLOY STEEL - 400 SERIES STAINLESS STEEL - 400 SERIES FREE MACHINING HIGH STRENGTH STEEL - WROUGHT & TOOL STEEL - WROUGHT STRENGTH STEEL - WROUGHT STRENGTH STEEL - WROUGHT & TOOL STEEL - WROUGHT & TOOL STEEL - HIGH TEMP ALLOYS	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400 220-320 110-240 200-320 100-250 100-275 85-375 135-325	COOLANT FED  375-550  450-550  400-500  -  400-500  200-300  300-450  225-300  225-300  200-250  200-250  200-250  200-250  150-250  -  100-220  100-150  110-150  125-190		.004 .004 .004 .004 .004 .004 .004 .004	FEED RA	NTE (INC  1/2  .006 .007 .007 .006 .006 .006 .006 .00	.006 .008 .008 .007 .007 .007 .007 .007 .007	R REVOI  34  .007 .009 .009 .009 .008 .008 .008 .008 .008	UTION  1 .009 .013 .013 .010 .010 .010 .010 .010 .010	) 1¼	- - - - - - - - - - - - - - - - - - -	
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS (HARD)  CAST IRON  LOW CARBON STEELS  MEDIUM STRENGTH STEELS  HIGH STRENGTH	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY  NON-METAL AND PLASTIC  ZINC ALLOY - DIE CAST  ALUMINUM BRONZE  BRASS ALLOY - LEADED AND  FREE CUTTING  NICKEL SILVER  COPPER ALLOY - TOUGH  DUCTILE CAST IRON - AUSTENITIC  DUCTILE CAST IRON - FERRITIC  DUCTILE CAST IRON - FERRITIC  GRAY - FERRITIC  MALLEABLE CAST IRON - MARTENSITIC  GRAY - FERRITIC  MALLEABLE CAST IRON - MARTENSITIC  LOW AND MEDIUM CARBON STEEL -  FREE MACHINING  LOW AND MEDIUM CARBON STEEL -  WROUGHT  LOW AND MEDIUM CARBON  ALLOY STEEL - FREE MACHINING  LOW AND MEDIUM CARBON  ALLOY STEEL - 400 SERIES  STAINLESS STEEL - 400 SERIES  STAINLESS STEEL - 400 SERIES  FREE MACHINING  HIGH STRENGTH STEEL -  WROUGHT & TOOL STEEL  HIGH TEMP ALLOYS  NICKEL & IRON BASE ALLOY	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400 220-320 110-240 200-320 100-250 100-275 140-300	COOLANT FED  375-550  450-550  400-500		.004 .005 .004 .004 .004 .004 .004 .004	FEED RA  36 .005 .006 .006 .006 .005 .005 .005 .00	NTE (INC  1/2  .006  .007 .007 .006 .006 .006 .006 .0	.006 .008 .008 .008 .007 .007 .007 .007 .007	R REVOI  34  .007 .009 .009 .009 .008 .008 .008 .008 .008	.010 .010 .010 .010 .010 .010 .010 .010	) 1¼	- - - - - - - - - - - - - - - - - - -	
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS (HARD)  CAST IRON  LOW CARBON STEELS  MEDIUM STRENGTH STEELS  HIGH STRENGTH STEELS	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY  NON-METAL AND PLASTIC  ZINC ALLOY - DIE CAST  ALUMINUM BRONZE  BRASS ALLOY - LEADED AND  FREE CUTTING  NICKEL SILVER  COPPER ALLOY - TOUGH  DUCTILE CAST IRON - AUSTENITIC  DUCTILE CAST IRON - FERRITIC  DUCTILE CAST IRON - FERRITIC  GRAY - PEARLITIC  GRAY - FERRITIC  MALLEABLE CAST IRON - MARTENSITIC  LOW AND MEDIUM CARBON STEEL -  FREE MACHINING  LOW AND MEDIUM CARBON STEEL -  WROUGHT  LOW AND MEDIUM CARBON  ALLOY STEEL - FREE MACHINING  LOW AND MEDIUM CARBON  ALLOY STEEL - 400 SERIES  STAINLESS STEEL - 400 SERIES  FREE MACHINING  HIGH STRENGTH STEEL -  WROUGHT & TOOL STEEL  HIGH TEMP ALLOY  STAINLESS STEEL - 400 SERIES	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400 220-320 110-240 200-320 100-250 100-275 140-270 100-250 100-275 140-270 100-250 100-275 140-270 100-275	COOLANT FED  375-550  450-550  400-500   400-500  200-300  300-450  225-300  225-300   200-250  200-250  200-250   100-250   100-220  110-150  110-150  100-150  60-115  70-105		.004 .004 .004 .004 .004 .004 .004 .004	FEED RA  36  .005  .006 .006 .006005 .005 .005 .005 .005 .006 .006 .006	NTE (INC  1/2  .006  .007 .007 .006 .006 .006 .006 .0	.006 .008 .008 .007 .007 .007 .007 .007 .007	R REVOI  34  .007 .009 .009 .009 .008 .008 .008 .008 .008	.010 .010 .010 .010 .010 .010 .010 .010	) 1¼	- - - - - - - - - - - - - - - - - - -	
MATERIALS  NON-FERROUS (SOFT)  NON-FERROUS (HARD)  CAST IRON  LOW CARBON STEELS  MEDIUM STRENGTH STEELS  HIGH STRENGTH STEELS  HIGH TEMP.	ALUMINUM ALLOY - WROUGHT  MAGNESIUM ALLOY  LEAD ALLOY  NON-METAL AND PLASTIC  ZINC ALLOY - DIE CAST  ALUMINUM BRONZE  BRASS ALLOY - LEADED AND  FREE CUTTING  NICKEL SILVER  COPPER ALLOY - TOUGH  DUCTILE CAST IRON - AUSTENITIC  DUCTILE CAST IRON - FERRITIC  DUCTILE CAST IRON - FERRITIC  GRAY - FERRITIC  MALLEABLE CAST IRON - MARTENSITIC  GRAY - FERRITIC  MALLEABLE CAST IRON - MARTENSITIC  LOW AND MEDIUM CARBON STEEL -  FREE MACHINING  LOW AND MEDIUM CARBON STEEL -  WROUGHT  LOW AND MEDIUM CARBON  ALLOY STEEL - FREE MACHINING  LOW AND MEDIUM CARBON  ALLOY STEEL - 400 SERIES  STAINLESS STEEL - 400 SERIES  STAINLESS STEEL - 400 SERIES  FREE MACHINING  HIGH STRENGTH STEEL -  WROUGHT & TOOL STEEL  HIGH TEMP ALLOYS  NICKEL & IRON BASE ALLOY	30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400 220-320 110-240 200-320 100-250 100-275 140-300	COOLANT FED  375-550  450-550  400-500		.004 .005 .004 .004 .004 .004 .004 .004	FEED RA  36 .005 .006 .006 .006 .005 .005 .005 .00	NTE (INC  1/2  .006  .007 .007 .006 .006 .006 .006 .0	.006 .008 .008 .008 .007 .007 .007 .007 .007	R REVOI  34  .007 .009 .009 .009 .008 .008 .008 .008 .008	.010 .010 .010 .010 .010 .010 .010 .010	) 1¼	- - - - - - - - - - - - - - - - - - -	