FEEDS & SPEEDS FOR REAMERS - CARBIDE TIPPED

Feeds & speeds are starting recommendations 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. Use these charts for carbide tipped reamers. The top chart is for general purpose reaming. The bottom chart is for reaming with coolant.

RPM=SFPM*3.82/REAMER DIAMETER

RPM = Rotations Per Minute SFPM = Surface Feet Per Minute Reamer Diameter = Diameter of the reamer in inches

						r i i i i i i i i i i i i i i i i i i i						
GT 1 60 0 D	MATERIAL		CDEED IN CEDM	HOLE DIAMETER YOU ARE DRILLING IN INCHES								
MATERIALS		BRINELL	SPEED IN SFPM		-	FEED R/	ATE (INC	CHES PE	R REVO	LUTION)	
			GENERAL PURPOSE	1⁄8	1⁄4	3⁄8	1⁄2	5⁄8	3⁄4	1	1¼	11/2
	ALLIMINUM ALLOV WROUCHT	30-150	150.250	004	006	008	011	012	013	016	019	020
	ALOMINUM ALLOI - WROUGHT	(500kg)	150-250	.004	.000	.008	.011	.012	.015	.010	.019	.020
NON-FERROUS	MAGNESIUM ALLOY	50-90	130-190	.005	.010	.012	.015	.016	.017	.020	.022	.025
(SOFT)	LEAD ALLOY	10-20	150-250	.002	.006	.008	.012	.014	.015	.018	.021	.022
	NON-METAL AND PLASTIC	-	90-250	.004	.005	.007	.008	.009	.012	.014	.016	.018
	ZINC ALLOY - DIE CAST	80-100	140-210	.005	.007	.008	.010	.011	.012	.015	.018	.020
	ALUMINUM BRONZE	40-175	50-90	.004	.006	.010	.012	.014	.016	.018	.020	.022
NON-FERROUS	BRASS ALLOY - LEADED AND	10-100Rb	100-250	.005	.008	.011	.015	.017	.018	.020	.022	.025
(HARD)	FREE CUTTING	10 10001	50.00	004	00/	000	010	011	012	01.4	015	01(
	COPPER ALLOY TOUCH	10-100Kb	50-90	.004	.006	.008	.010	.011	.012	.014	.015	.016
	DUCTUE CAST IRON - AUSTENITIC	40-200	45-70	.003	.006	.008	.010	010	012	014	.010	020
	DUCTILE CAST IRON - FERRITIC	140-270	50-90	004	005	008	010	012	014	017	020	023
	DUCTILE CAST IRON - MARTENSITIC	270-400	35-60	004	006	007	008	009	010	012	014	016
CAST IRON	GRAY - PEARLITIC	220-320	45-70	.004	.006	.008	.009	.010	.012	.014	.018	.020
	GRAY - FERRITIC	120-220	65-135	.005	.008	.010	.011	.013	.016	.020	.022	.025
	MALLEABLE CAST IRON -	200, 220	45 70	004	00/	000	010	012	012	015	010	0.25
	MARTENSITIC	200-320	45-70	.004	.006	.008	.010	.012	.013	.015	.018	.025
LOW CARBON STEELSt	LOW AND MEDIUM CARBON STEEL -	100.250	70,100	005	008	010	012	014	015	020	025	020
	FREE MACHINING	100-230	70 100	.005	.000	.010	.012	.014	.015	.020	.043	.030
	LOW AND MEDIUM CARBON STEEL -	100-375	30-85	.004	.008	.009	.011	.013	.015	.018	.020	.022
	WROUGHT	100 575	00.00					.010	.015		.020	
MEDIUM	LOW AND MEDIUM CARBON	100-275	65-100	.005	.008	.010	.015	.017	.018	.022	.025	.027
	ALLOY STEEL - FREE MACHINING											
	LOW AND MEDIUM CARBON	85-375	40-85	.005	.010	.012	.015	.018	.020	.025	.027	.030
SIKENGIN	CTAINIESS STEEL 400 SEDIES	125 225	40.00	002	005	006	007	000	000	010	011	012
SIEELS	STAINLESS STEEL - 400 SERIES	133-323	40-90	.003	.005	.000	.007	.008	.008	.010	.011	.012
	FRFF MACHINING	135-275	65-100	.004	.006	.007	.008	.009	.009	.010	.011	.012
HIGH STRENGTH STEELS	HIGH STRENGTH STEEL -											
	WROUGHT & TOOL STEEL	175-400	35-70	.004	.006	.007	.008	.009	.010	.011	.012	.013
	HIGH TEMP ALLOYS											
	NICKEL & IRON BASE ALLOY	140-300	15-85	.003	.005	.005	.005	.006	.007	.008	.010	.012
HIGH LEMP.	STAINLESS STEEL - 300 SERIES	135-375	40-75	.003	.004	.005	.006	.006	.007	.008	.009	.010
ALLOIS	STAINLESS STEEL - PH SERIES	150-440	35-70	.003	.004	.004	.005	.006	.007	.008	.009	.010
	TITANIUM ALLOY	110-380	30-45	.004	.006	.008	.010	.011	.011	.012	.013	.014
			00.10							· · · · · · · · · · · · · · · · · · ·		
					HOL	E DIAM	ETER YC	UAREI	DRILLIN	G IN IN	CHES	
CLASS OF	MATERIAL	BRINFLL	SPEED IN SFPM		HOL	E DIAMI FEED R/	ETER YC	U ARE I	DRILLIN R REVOI	G IN IN	CHES	
CLASS OF MATERIALS	MATERIAL	BRINELL	SPEED IN SFPM	1/8	HOL	E DIAMI FEED RA	ETER YC ATE (INC	U ARE I CHES PE	DRILLIN R REVOI	G IN IN LUTION	CHES	11/3
CLASS OF MATERIALS	MATERIAL	BRINELL 30-150	SPEED IN SFPM COOLANT FED	1⁄8	HOL 1/4	E DIAMI FEED RA 38	ETER YC ATE (INC ½	DU ARE I CHES PE	DRILLIN R REVOI	G IN IN LUTION 1	CHES) 1¼	1½
CLASS OF MATERIALS	MATERIAL ALUMINUM ALLOY - WROUGHT	BRINELL 30-150 (500kg)	SPEED IN SFPM COOLANT FED 200-300	1/8 -	HOL	E DIAMI FEED RA 38 .010	ETER YC XTE (INC <u>1/2</u> .013	U ARE I CHES PE % .015	DRILLIN R REVOI 34 .017	G IN IN LUTION 1 .021	CHES) 1¼ .022	1½ .024
CLASS OF MATERIALS	MATERIAL ALUMINUM ALLOY - WROUGHT MAGNESIUM ALLOY	BRINELL 30-150 (500kg) 50-90	SPEED IN SFPM COOLANT FED 200-300 150-250	1/8 	HOL	E DIAMI FEED R/ .010 .015	ETER YC ATE (INC 1/2 .013 .018	U ARE I CHES PE 5% .015 .019	DRILLIN R REVOI 34 .017 .020	G IN IN LUTION 1 .021 .024	CHES) 1 ¹ / ₄ .022 .026	1½ .024 .028
CLASS OF MATERIALS NON-FERROUS (SOFT)	MATERIAL ALUMINUM ALLOY - WROUGHT MAGNESIUM ALLOY LEAD ALLOY	BRINELL 30-150 (500kg) 50-90 10-20	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300	1/8 - -	HOL	E DIAMI FEED R/ .010 .015 .010	2TER YC XTE (INC 1/2 .013 .018 .016	DU ARE I CHES PE % .015 .019 .017	DRILLIN R REVOI 34 .017 .020 .018	G IN IN LUTION 1 .021 .024 .022	CHES) 1¼ .022 .026 .024	1½ .024 .028 .026
CLASS OF MATERIALS NON-FERROUS (SOFT)	MATERIAL ALUMINUM ALLOY - WROUGHT MAGNESIUM ALLOY LEAD ALLOY NON-METAL AND PLASTIC	BRINELL 30-150 (500kg) 50-90 10-20 -	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300	1/8 	HOL 1/4 .008 .012 .008 .006	E DIAMI FEED R/ .010 .015 .010 .008	ETER YC XTE (INC ½ .013 .018 .016 .009	U ARE I CHES PE 5% .015 .019 .017 .010	DRILLIN R REVOI 34 .017 .020 .018 .014	G IN IN LUTION 1 .021 .024 .022 .016	CHES) 1¼ .022 .026 .024 .018	1½ .024 .028 .026 .020
CLASS OF MATERIALS NON-FERROUS (SOFT)	MATERIAL ALUMINUM ALLOY - WROUGHT MAGNESIUM ALLOY LEAD ALLOY NON-METAL AND PLASTIC ZINC ALLOY - DIE CAST	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240	1/8 	HOL 1/4 .008 .012 .008 .006 .009	E DIAMI FEED R/ 3% .010 .015 .010 .008 .011	ETER YC XTE (INC ½ .013 .018 .016 .009 .013	DU ARE I CHES PE 5% .015 .019 .017 .010 .014	DRILLIN R REVOI 34 .017 .020 .018 .014 .016	G IN IN LUTION 1 .021 .024 .022 .016 .020	CHES) 1¼ .022 .026 .024 .018 .022	11½ .024 .028 .026 .020 .025
CLASS OF MATERIALS NON-FERROUS (SOFT)	MATERIAL ALUMINUM ALLOY - WROUGHT MAGNESIUM ALLOY LEAD ALLOY NON-METAL AND PLASTIC ZINC ALLOY - DIE CAST ALUMINUM BRONZE	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105	1/8 	HOLI 1/4 .008 .012 .008 .006 .009 .008	E DIAMI FEED R/ 3% .010 .015 .010 .008 .011 .013	2TER YC XTE (INC 1/2 .013 .018 .016 .009 .013 .015	UARE I CHES PE % .015 .019 .017 .010 .014 .016	ORILLIN R REVOI 34 .017 .020 .018 .014 .016 .018	G IN IN LUTION 1 .021 .024 .022 .016 .020 .021	CHES) 1¼ .022 .026 .024 .018 .022 .024	1½ .024 .028 .026 .020 .025 .028
CLASS OF MATERIALS NON-FERROUS (SOFT)	MATERIAL ALUMINUM ALLOY - WROUGHT MAGNESIUM ALLOY LEAD ALLOY NON-METAL AND PLASTIC ZINC ALLOY - DIE CAST ALUMINUM BRONZE BRASS ALLOY - LEADED AND	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 125-300	1/8 	HOL 14 .008 .012 .008 .006 .009 .008 010	E DIAMI FEED R/ 3% .010 .015 .010 .008 .011 .013 014	2TER YC XTE (INC 1/2 .013 .018 .016 .009 .013 .015 020	UARE I CHES PE 5% .015 .019 .017 .010 .014 .016 022	ORILLIN R REVOI 34 .017 .020 .018 .014 .016 .018	G IN IN LUTION 1 .021 .024 .022 .016 .020 .021 026	CHES) 1¼ .022 .026 .024 .018 .022 .024 028	1½ .024 .028 .026 .020 .025 .028 032
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD)	MATERIAL ALUMINUM ALLOY - WROUGHT MAGNESIUM ALLOY LEAD ALLOY NON-METAL AND PLASTIC ZINC ALLOY - DIE CAST ALUMINUM BRONZE BRASS ALLOY - LEADED AND FREE CUTTING	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 125-300	1/8 	HOL 14 .008 .012 .008 .006 .009 .008 .010	E DIAMI FEED R/ 3% .010 .015 .010 .008 .011 .013 .014	CTER YC XTE (INC 4/2 .013 .018 .016 .009 .013 .015 .020	U ARE I CHES PE % .015 .019 .017 .010 .014 .016 .022	ORILLIN R REVOI ¾ .017 .020 .018 .014 .016 .018 .024	G IN IN LUTION 1 .021 .024 .022 .016 .020 .021 .026	CHES) 1¼ .022 .026 .024 .018 .022 .024 .028	11½ .024 .028 .026 .020 .025 .028 .032
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD)	MATERIAL 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	BRINELL 30-150 (500kg) 50-90 10-20 80-100 40-175 10-100Rb 10-100Rb	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 125-300 70-190 70-190	1/8 	HOL 14 .008 .012 .008 .006 .009 .008 .010 .007 .025	E DIAMI FEED R/ 3% .010 .015 .010 .008 .011 .013 .014	CTER YC VTE (INC ½ .013 .018 .016 .009 .013 .015 .020	U ARE I CHES PE % .015 .019 .017 .010 .017 .010 .014 .016 .022	ORILLIN R REVOI 34 .017 .020 .018 .014 .016 .018 .024	G IN IN LUTION 1 .021 .024 .022 .016 .020 .021 .026 .017	CHES) 1¼ .022 .026 .024 .018 .022 .024 .028 .028	1½ .024 .028 .026 .020 .025 .028 .032 .032
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD)	MATERIAL 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	BRINELL 30-150 (500kg) 50-90 10-20 	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 125-300 70-105 125-300 70-105 125-300 70-105 125-300 70-105	1/8 	HOL 14 .008 .012 .008 .006 .009 .008 .010 .007 .008 .007	E DIAMI FEED R/ 3% .010 .015 .010 .008 .011 .013 .014 .010 .010	CTER YC YTE (INC ½ .013 .018 .016 .009 .013 .015 .020 .012 .013	DU ARE I CHES PE. % .015 .019 .017 .010 .014 .016 .022 .013 .014	ORILLIN R REVOI 34 .017 .020 .018 .014 .016 .018 .024 .014	G IN INCUTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .019	CHES) 1¼ .022 .026 .024 .018 .022 .024 .028 .018 .018 .019 .020	1½ .024 .028 .026 .020 .025 .028 .032 .018 .020
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD)	MATERIAL 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	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 10-100Rb 40-200 120-275 140-270	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 125-300 70-190 70-105 65-100 70-105	1/8 	HOL 14 .008 .012 .008 .006 .009 .008 .010 .007 .008 .007	E DIAMI FEED R/ 3% .010 .015 .010 .008 .011 .013 .014 .010 .010 .010	CTER YC YTE (INC ½ .013 .018 .016 .009 .013 .015 .020 .012 .013	OU ARE I SHES PE. 5% .015 .019 .017 .010 .014 .022 .013 .014	ORILLIN R REVOI 34 .017 .020 .018 .014 .016 .018 .024 .014 .016 .017	G IN INCUTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .022 .022 .018 .022 .018 .022 .022 .022 .022 .022 .022 .022 .02	CHES) 1¼ .022 .026 .024 .018 .022 .024 .028 .018 .019 .020 .024	1½ .024 .028 .026 .020 .025 .028 .032 .018 .020 .025
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD)	MATERIAL 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	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 720,400	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 65-100 70-105 50, 95		HOL 14 .008 .012 .008 .006 .009 .008 .010 .007 .008 .007 .008 .008	E DIAMI FEED R/ .010 .015 .010 .008 .011 .013 .014 .010 .010 .009 .010	2TER YC VTE (INC ½ .013 .018 .019 .013 .015 .020 .012 .013 .011	OU ARE I HES PE % .015 .019 .017 .010 .014 .016 .022 .013 .014 .014	Number Num Num Num	G IN IN LUTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .018 .028 .014	CHES) 1¼ .022 .026 .024 .018 .022 .024 .028 .018 .019 .020 .020 .020	1½ .024 .028 .026 .020 .025 .028 .032 .032 .018 .020 .025 .027 .027
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD)	MATERIAL 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 - AUSTENITIC DUCTILE CAST IRON - MARTENSITIC CRAY - BFAPLITC	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 10-100Rb 40-200 120-275 140-270 270-400 270-400 270-400	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 125-300 70-105 65-100 70-105 50-85	1/s 	HOL 14 .008 .012 .008 .006 .009 .008 .010 .007 .008 .008 .007 .008 .007 .008	E DIAMI FEED R/ .010 .015 .010 .008 .011 .013 .014 .010 .010 .009 .010 .009 .010	CTER YC VTE (INC ½ .013 .018 .019 .013 .015 .020 .012 .013 .011 .012	Number Numer Numer Numer <td>ORILLIN R REVOI 34 .017 .020 .018 .014 .016 .018 .024 .016 .016 .016 .017</td> <td>G IN IN: LUTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .018 .018 .022 .014 .019</td> <td>CHES) 1¼ .022 .026 .024 .018 .022 .024 .028 .018 .019 .020 .020 .024 .017 .020</td> <td>11/2 .024 .028 .020 .025 .028 .032 .018 .020 .025 .027 .019 .027</td>	ORILLIN R REVOI 34 .017 .020 .018 .014 .016 .018 .024 .016 .016 .016 .017	G IN IN: LUTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .018 .018 .022 .014 .019	CHES) 1¼ .022 .026 .024 .018 .022 .024 .028 .018 .019 .020 .020 .024 .017 .020	11/2 .024 .028 .020 .025 .028 .032 .018 .020 .025 .027 .019 .027
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD) CAST IRON	MATERIAL 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 - AUSTENITIC DUCTILE CAST IRON - MARTENSITIC GRAY - PEARLITIC GRAY - FERRITIC	BRINELL 30-150 (500kg) 50-90 10-20 	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 125-300 70-190 70-105 65-100 70-105 50-85 55-100 95-190		HOL 14 .008 .012 .008 .006 .009 .008 .010 .007 .008 .007 .008 .007 .008 .007	E DIAMI FEED RA 36 .010 .015 .010 .008 .011 .013 .014 .010 .010 .009 .010 .009 .010 .009 .010	27ER YC 27ER YC 27ER INC 1/2 .013 .018 .016 .009 .013 .015 .020 .012 .011 .012 .010 .012 .014	OU ARE I HES PE % .015 .019 .017 .010 .014 .022 .013 .014 .015 .011 .014	ORILLIN R REVOI ¾ .017 .020 .018 .014 .016 .014 .016 .017 .016 .017	G IN IN LUTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .022 .014 .018 .022	CHES) 1¼ .022 .026 .024 .018 .022 .024 .028 .018 .019 .020 .020 .024 .017 .020 .024	1½ .024 .028 .026 .020 .025 .028 .032 .032 .018 .020 .025 .027 .019 .026 .030
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD) CAST IRON	MATERIAL 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 - AUSTENITIC DUCTILE CAST IRON - MARTENSITIC GRAY - PEARLITIC GRAY - PEARLITIC GRAY - FERRITIC MALLEABLE CAST IRON -	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 10-100Rb 40-200 120-275 120-270 270-400 220-320 120-220 120-220	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 125-300 70-105 50-85 55-100 95-190		HOL 14 .008 .006 .009 .008 .010 .007 .008 .007 .008 .007 .008 .007 .008	E DIAMI FEED R/ .010 .015 .010 .008 .011 .013 .014 .010 .009 .010 .009 .010 .009	27TER YC 27TE (INC 1/2 .013 .018 .016 .009 .013 .015 .020 .012 .013 .011 .012 .010 .012 .010 .012 .010 .012	OU ARE I HES PE % .015 .019 .017 .010 .014 .016 .022 .013 .014 .015 .011 .014	ORILLIN R REVOI 34 .017 .020 .018 .014 .016 .014 .016 .017	G IN IN UTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .018 .022 .014 .018	CHES) 11/4 .022 .026 .024 .022 .024 .028 .018 .019 .020 .024 .017 .020 .024	1½ .024 .028 .026 .020 .025 .028 .032 .032 .018 .020 .027 .019 .026 .030
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD) CAST IRON	MATERIAL 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 - AUSTENITIC DUCTILE CAST IRON - MARTENSITIC GRAY - FERRITIC MALLEABLE CAST IRON - MARTENSITIC	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400 220-320 200-320	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 125-300 70-105 50-85 55-100 95-190 65-100	1/8 -	HOL 34 .008 .012 .008 .009 .009 .008 .010 .007 .008 .007 .008 .007 .008 .008 .008	E DIAMI FEED RA 3% .010 .015 .010 .008 .011 .013 .014 .010 .010 .009 .010 .009 .010 .010 .010	27ER YC 27ER (INC 1/2 .013 .018 .016 .009 .013 .016 .009 .013 .016 .009 .013 .015 .020 .012 .013 .011 .012 .014 .012	OU ARE I CHES PE % .015 .019 .017 .010 .014 .013 .014 .017 .014 .011 .014 .017	ORILLIN R REVOI 34 .017 .020 .018 .014 .016 .014 .016 .017	G IN IN UTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .018 .024 .018 .024 .024 .020	CHES) 1¼ .022 .026 .024 .028 .022 .024 .028 .022 .024 .028 .019 .020 .020 .020 .021 .020 .028 .023	1½ .024 .028 .026 .025 .028 .032 .032 .032 .025 .027 .027 .027 .026 .030
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD) CAST IRON	MATERIAL 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 - AUSTENITIC DUCTILE CAST IRON - AUSTENITIC DUCTILE CAST IRON - MARTENSITIC GRAY - PEARLITIC GRAY - FERRITIC MALLEABLE CAST IRON - MARTENSITIC LOW AND MEDIUM CARBON STEEL -	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 10-100Rb 40-200 120-275 140-270 270-400 220-320 120-220 200-320 120-250	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 65-100 70-105 50-85 55-100 95-190 65-100	1/8	HOL1 14 .008 .012 .008 .008 .009 .008 .009 .008 .007 .008 .007 .008 .007 .008 .007 .008 .010 .008 .010 .008 .010 .009 .008 .009 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .007 .008 .007 .008 .008 .007 .008 .008 .007 .008 .008 .007 .008 .008 .008 .007 .008 .008 .008 .009 .008 .0	E DIAMI FEED R/ 36 .010 .015 .010 .008 .011 .013 .014 .010 .009 .010 .009 .010 .009 .010 .013 .010	2 2 <th2< th=""> <th2< th=""> <th2< th=""> <th2< th=""></th2<></th2<></th2<></th2<>	OU ARE I CHES PE % .015 .019 .017 .010 .014 .014 .015 .014 .014 .014 .014 .014 .014 .014 .014 .014	ORILLIN R REVOI 34 .017 .020 .018 .014 .016 .014 .016 .017 .020 .014 .016 .017 .016 .017 .016 .017 .018 .014 .016 .017 .015 .020 .015	G IN INULUTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .018 .022 .014 .028 .018 .022 .014 .020 .024 .020 .021 .026 .021 .026 .021 .024 .022 .021 .024 .022 .021 .024 .022 .021 .024 .022 .021 .024 .022 .021 .024 .022 .021 .026 .021 .026 .021 .026 .017 .018 .022 .018 .022 .018 .022 .018 .022 .018 .022 .018 .022 .018 .022 .018 .022 .018 .022 .018 .022 .018 .022 .018 .022 .018 .022 .018 .022 .018 .024 .022 .018 .022 .018 .022 .024 .026 .017 .018 .022 .018 .024 .024 .026 .027 .018 .026 .027 .026 .027 .027 .026 .027 .027 .028 .026 .027 .027 .028 .027 .0288 .028 .028 .028 .028 .028 .028 .028 .028	CHES) 1¼ .022 .026 .024 .018 .024 .024 .028 .018 .019 .020 .020 .024 .017 .020 .028 .023	1½ .024 .028 .026 .020 .025 .028 .032 .032 .032 .032 .025 .027 .019 .026 .030 .030
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD) CAST IRON	MATERIAL 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 - AUSTENITIC DUCTILE CAST IRON - MARTENSITIC GRAY - PEARLITIC GRAY - FERRITIC MALLEABLE CAST IRON - MARTENSITIC LOW AND MEDIUM CARBON STEEL - FREE MACHINING	BRINELL 30-150 (500kg) 50-90 10-20 	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 125-300 70-105 65-100 70-105 50-85 55-100 95-190 65-100 100-150	1/8	HOL 14 .008 .012 .008 .009 .008 .010 .007 .008 .007 .008 .007 .008 .007 .008 .010 .008 .010 .008 .010 .008 .012 .006 .006 .006 .006 .006 .007 .008 .007 .007 .007 .008 .007 .00	E DIAMI FEED RA 3% .010 .015 .010 .008 .011 .013 .014 .010 .009 .010 .009 .010 .009 .010 .013 .010 .013	2 2 .013 .018 .016 .009 .013 .015 .020 .012 .011 .012 .010 .012 .014 .012 .014	OU ARE I CHES PE 5% .015 .019 .017 .010 .014 .022 .013 .014 .015 .011 .014 .015 .011 .014 .015	ORILLIN R REVOI 34 .017 .020 .018 .016 .018 .014 .016 .017 .018 .024 .014 .016 .017 .013 .015 .020 .015 .020	G IN INULUTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .022 .014 .018 .022 .014 .020 .024 .020 .025	CHES) 114 .022 .026 .024 .022 .024 .028 .028 .028 .018 .019 .020 .024 .017 .020 .024 .023 .023 .030	1½ .024 .026 .026 .025 .028 .032 .032 .032 .032 .027 .019 .026 .030 .030 .035
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD) CAST IRON LOW CARBON STEELS	MATERIAL 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 - AUSTENITIC DUCTILE CAST IRON - FERRITIC DUCTILE CAST IRON - MARTENSITIC GRAY - PEARLITIC GRAY - PEARLITIC GRAY - FERRITIC MALLEABLE CAST IRON - MARTENSITIC LOW AND MEDIUM CARBON STEEL - FREE MACHINING LOW AND MEDIUM CARBON STEEL -	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 10-100Rb 10-100Rb 40-200 120-275 100-270 220-320 120-220 200-320 100-250 100-275	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 125-300 70-105 55-100 95-190 65-100 100-150 100-150		HOL 14 .008 .012 .008 .006 .009 .008 .010 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .006 .007 .008 .006 .007 .008 .006 .009 .008 .010 .008 .006 .009 .008 .006 .009 .008 .006 .009 .008 .006 .009 .008 .006 .009 .008 .006 .009 .008 .007 .008 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .008 .007 .008 .007 .008 .008 .007 .008 .008 .007 .008 .008 .007 .008 .008 .008 .007 .008 .008 .007 .008 .008 .007 .008 .008 .008 .008 .007 .008 .008 .009 .008 .009 .008 .007 .009 .00	E DIAMI FEED RA 3% .010 .015 .010 .008 .011 .013 .014 .010 .010 .010 .010 .009 .010 .010 .010	STER YC YTE (INC 1/2 .013 .018 .010 .011 .012 .013 .011 .012 .014 .012 .014	OU ARE I CHES PE 5% .015 .019 .017 .010 .014 .014 .017 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .015	ORILLIN R REVOI 34 .017 .020 .018 .014 .016 .014 .016 .017 .020 .014 .016 .017 .013 .015 .020 .015 .020	G IN IN UTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .022 .014 .022 .014 .022 .014 .024 .020 .025	CHES) 11/4 .022 .026 .024 .028 .022 .024 .028 .018 .019 .020 .024 .017 .020 .028 .023 .023 .030	1½ .024 .028 .026 .025 .028 .032 .032 .032 .032 .027 .027 .027 .027 .030 .030 .030
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD) CAST IRON LOW CARBON STEELS	MATERIAL 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 - 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 STEEL - WROUGHT	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 10-100Rb 40-200 120-275 140-270 270-400 220-320 120-220 200-320 100-250 100-375	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 125-300 70-105 55-100 70-105 55-100 95-190 65-100 100-150 40-110	1% -	HOL 34 .008 .012 .008 .009 .008 .009 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .010 .008 .010 .008 .010 .008 .010 .009	E DIAMI FEED RA 3% .010 .015 .010 .008 .011 .013 .014 .010 .010 .010 .010 .010 .010 .010	STER YC 2TER (INC 1/2 .013 .018 .016 .009 .013 .015 .020 .012 .013 .011 .012 .011 .012 .014 .012 .016 .013	OU ARE I CHES PE % .015 .019 .017 .010 .014 .014 .017 .014 .014 .014 .014 .014 .015	ORILLIN R REVOI ¾ .017 .020 .018 .014 .016 .014 .016 .017 .020 .014 .015 .020 .015 .020 .015 .020	G IN IN UTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .024 .018 .024 .024 .020 .025 .022	CHES) 1¼ .022 .026 .024 .022 .024 .028 .022 .024 .028 .018 .019 .020 .024 .020 .020 .028 .023 .030 .030	1½ .024 .028 .026 .020 .025 .028 .032 .032 .032 .025 .027 .027 .026 .030 .030 .035 .026
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD) CAST IRON LOW CARBON STEELS	MATERIAL 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 - AUSTENITIC DUCTILE CAST IRON - AUSTENITIC DUCTILE 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	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 120-275 140-270 200-320 120-220 200-320 100-250 100-375 100-275	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 65-100 70-105 55-5100 95-190 65-100 100-150 40-110 90-135	½	HOL 14 .008 .012 .008 .008 .009 .008 .009 .008 .007 .008 .008 .007 .008 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .008 .009 .008 .009 .008 .008 .009 .008 .008 .009 .008 .009 .008 .009 .009 .009 .009 .009 .009 .009 .009 .009 .009 .009	E DIAMI FEED R/ 3% .010 .015 .010 .008 .011 .013 .014 .010 .009 .010 .010 .010 .010 .010 .010	2:TER YC 2:TER INC 1/2 .013 .018 .016 .009 .013 .016 .009 .013 .016 .020 .012 .013 .012 .014 .012 .016 .013 .018	OU ARE I CHES PE % .015 .019 .017 .010 .014 .015 .014 .014 .014 .014 .014 .014 .015 .014 .015 .014 .015 .014 .015 .020	ORILLIN R REVOI 34 .017 .020 .018 .014 .016 .016 .017 .016 .017 .016 .017 .016 .017 .015 .020 .015 .020 .017 .020 .017 .022	G IN INULUTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .018 .022 .014 .028 .024 .020 .025 .022 .025 .025 .025 .025 .025	CHES) 1¼ .022 .026 .024 .018 .022 .024 .028 .018 .019 .020 .024 .019 .020 .024 .023 .030 .030 .024	1½ .024 .028 .026 .020 .025 .028 .032 .032 .018 .020 .025 .027 .027 .027 .026 .030 .035 .035
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD) CAST IRON LOW CARBON STEELS	MATERIAL 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 DUCTILE CAST IRON - MARTENSITIC GRAY - FERRITIC DUCTILE CAST IRON - MARTENSITIC GRAY - FERRITIC UCTILE CAST IRON - MARTENSITIC UCTILE CAST IRON - MARTENSITIC UCTILE CAST IRON - MARTENSITIC UCTILE CAST IRON - MARTENSITIC GRAY - FERRITIC MALLEABLE CAST IRON - MARTENSITIC LOW AND MEDIUM CARBON STEEL - FREE MACHINING LOW AND MEDIUM CARBON STEEL - FREE MACHINING	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 10-100Rb 40-200 120-275 140-270 220-320 120-220 200-320 100-255 100-275	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 65-100 70-105 50-85 55-100 95-190 65-100 100-150 40-110 90-135	1/8	HOL 14 .008 .012 .008 .009 .008 .009 .008 .007 .008 .007 .008 .007 .008 .007 .008 .010 .008 .010 .008 .010 .009 .010 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .009 .008 .007 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .009 .008 .009 .008 .009 .009 .008 .009 .009 .008 .0010 .008 .0010 .009 .0010 .008 .0010 .009 .0010 .009 .0010 .009 .0010 .009 .0010 .009 .010	E DIAMI FEED R/ 36 .010 .015 .010 .008 .011 .013 .014 .010 .009 .010 .009 .010 .009 .010 .013 .010 .014 .011 .014	2 TER YC YTE (INC ½ .013 .018 .016 .009 .013 .016 .020 .012 .011 .012 .012 .013 .011 .012 .014 .012 .016 .013 .018 .018	OU ARE I CHES PE % .015 .019 .017 .010 .014 .014 .014 .014 .014 .014 .014 .014 .014 .014 .015 .014 .015 .014 .015 .020	ORILLIN R REVOI 34 .017 .020 .018 .016 .018 .014 .016 .017 .018 .019 .010 .011 .012 .015 .020 .017 .015 .020 .017 .0217	G IN INCLUTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .022 .014 .018 .022 .014 .020 .025 .025 .022 .025	CHES) 114 .022 .026 .024 .018 .022 .024 .028 .028 .018 .019 .020 .024 .023 .023 .023 .030 .024 .027	1½ .024 .028 .026 .025 .028 .032 .032 .032 .032 .027 .019 .026 .030 .035 .030
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD) CAST IRON LOW CARBON STEELS	MATERIAL ALUMINUM ALLOY - WROUGHT MAGNESIUM ALLOY LEAD ALLOY NON-METAL AND PLASTIC ZINC ALLOY - DIE CAST ALUMINUM BRONZE BRASS ALLOY - DIE CAST ALUMINUM BRONZE BRASS ALLOY - DIE CAST ALUMINUM BRONZE BRASS ALLOY - DIC CAST NICKEL SILVER COPPER ALLOY - TOUGH DUCTILE CAST IRON - AUSTENITIC DUCTILE CAST IRON - AUSTENITIC 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	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 10-100Rb 40-200 120-275 140-270 270-400 220-320 120-220 200-320 100-375 100-275 85-375	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 125-300 70-105 65-100 70-105 55-100 95-190 65-100 100-150 40-110 90-135 65-100	1/8 -	HOL 14 .008 .012 .008 .009 .008 .010 .007 .008 .007 .008 .007 .008 .007 .008 .010 .008 .010 .008 .010 .009 .012 .009 .012 .012 .012 .012 .009 .012 .012 .012 .012 .006 .012 .006 .009 .012 .006 .012 .006 .009 .012 .008 .010 .009 .008 .010 .009 .008 .010 .009 .008 .010 .009 .008 .009 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .009 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .009 .008 .007 .008 .007 .008 .009 .009 .009 .009 .009 .009 .009 .009 .0010 .009 .0010 .009 .0010 .009 .0010 .009 .0010 .0010 .009 .0010 .0010 .0010 .009 .0010 .00	E DIAM FEED RA 3% .010 .015 .010 .008 .011 .013 .014 .010 .009 .010 .009 .010 .009 .010 .013 .010 .011 .011 .011 .012 .015	STER YC YTE (INC 1/2 .013 .018 .010 .013 .011 .012 .010 .012 .010 .012 .010 .012 .014 .012 .016 .013 .013	OU ARE I CHES PE 5% .015 .019 .017 .010 .014 .012 .013 .014 .015 .011 .014 .015 .011 .014 .015 .011 .014 .015 .014 .015 .014 .015 .015 .020 .022	ORILLIN R REVOI 34 .017 .020 .018 .016 .018 .014 .016 .017 .018 .014 .016 .017 .013 .015 .020 .015 .020 .017 .020 .017 .020 .017 .020 .017	G IN INULUTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .022 .014 .018 .022 .014 .020 .025 .022 .025 .022 .025 .028	CHES) 114 .022 .026 .024 .028 .022 .024 .028 .018 .019 .020 .024 .017 .020 .024 .023 .023 .023 .023 .024 .024 .024 .027	1½ .024 .028 .026 .025 .028 .032 .018 .020 .025 .027 .019 .026 .030 .030 .035 .026 .030 .030 .033
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD) CAST IRON LOW CARBON STEELS MEDIUM STRENGTH	MATERIAL ALUMINUM ALLOY - WROUGHT MAGNESIUM ALLOY LEAD 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 - MASTENSITIC DUCTILE CAST IRON - MARTENSITIC GRAY - FERRITIC LOW AND MEDIUM CARBON STEEL - FREE MACHINING LOW AND MEDIUM CARBON ALLOY STEEL - FREE MACHINING LOW AND MEDIUM CARBON ALLOY STEEL - GRAY - FERE MACHINING LOW AND MEDIUM CARBON ALLOY STEEL - GRAY - FERE MACHINING LOW AND MEDIUM CARBON ALLOY STEEL - GRAY - FERE MACHINING LOW AND MEDIUM CARBON ALLOY STEEL - GRAY - FERE MACHINING CONDUM CORBON ALLOY STEEL - GRAY - GRAVY	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 10-100Rb 10-100Rb 40-200 120-275 140-270 220-320 120-220 200-320 100-375 100-255 85-375 405-225	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 125-300 70-105 55-100 70-105 55-100 95-190 65-100 100-150 40-110 90-135 65-100 50-100		HOL 34 .008 .012 .008 .006 .009 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .009 .008 .007 .008 .009 .008 .007 .008 .009 .008 .009 .009 .009 .008 .007 .008 .009 .009 .009 .009 .009 .009 .009 .009 .009 .009 .009 .009 .009 .009 .009 .009 .009 .009 .009 .009 .0010 .009 .0010 .009 .0010 .0010 .009 .0010	E DIAM FEED RA 3% .010 .015 .010 .001 .011 .013 .014 .010 .010 .010 .010 .010 .010 .010	STER YC YTE (INC 1/2 .013 .018 .010 .011 .012 .011 .012 .011 .012 .011 .012 .014 .012 .016 .013 .018 .018	OU ARE I CHES PE 5% .015 .019 .017 .010 .011 .014 .014 .014 .014 .014 .014 .014 .015 .014 .015 .015 .020 .022	DRILLIN R REVOI 34 .017 .020 .018 .014 .016 .018 .024 .014 .016 .017 .020 .015 .020 .015 .020 .017 .022 .022	G IN INCLUTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .018 .022 .014 .018 .024 .020 .025 .022 .025 .022 .025 .028 .028 .028 .028 .028 .028 .028 .028	CHES) 11/4 .022 .026 .024 .022 .024 .028 .022 .024 .028 .018 .019 .020 .024 .020 .024 .020 .024 .023 .023 .030 .024 .027 .030	1½ .024 .028 .026 .020 .025 .028 .032 .032 .032 .027 .027 .027 .027 .030 .030 .030 .033 .033
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD) CAST IRON LOW CARBON STEELS MEDIUM STRENGTH STEELS	MATERIAL 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 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 CEDMALEABLE CAST FEY - 400 SERIES	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400 220-320 120-220 200-320 100-250 100-275 100-275 85-375 135-325	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 125-300 70-105 65-100 70-105 55-55-100 95-190 65-100 100-150 40-110 90-135 65-100 50-100		HOL 14 .008 .012 .008 .009 .008 .007 .008 .007 .008 .007 .008 .007 .008 .010 .008 .010 .008 .012 .008 .012 .009 .012 .009 .012 .009	E DIAM FEED RA 3% .010 .015 .010 .008 .011 .013 .014 .010 .010 .010 .010 .010 .010 .010		OU ARE I CHES PE 5% .015 .019 .017 .010 .014 .014 .017 .014 .014 .014 .015 .014 .015 .018 .020 .022 .009	ORILLIN R REVOI 34 .017 .020 .018 .014 .016 .018 .024 .016 .017 .020 .018 .024 .016 .017 .015 .020 .015 .020 .017 .022 .024 .009	G IN INULUTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .018 .024 .018 .024 .024 .020 .025 .022 .025 .028 .012	CHES) 11/4 .022 .026 .024 .028 .022 .024 .028 .018 .019 .020 .024 .020 .024 .020 .020 .023 .030 .030 .024 .027 .030 .014	1½ .024 .028 .026 .025 .028 .032 .032 .032 .025 .027 .027 .027 .026 .030 .030 .035 .026 .030 .033 .033 .015
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD) CAST IRON LOW CARBON STEELS MEDIUM STRENGTH STEELS	MATERIAL ALUMINUM ALLOY - WROUGHT MAGNESIUM ALLOY LEAD 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 - MASTENSITIC DUCTILE CAST IRON - MARTENSITIC GRAY - PEARLITIC GRAY - FERRITIC GRAY - FERRITIC GRAY - FERRITIC GRAY - FERRITIC LOW AND MEDIUM CARBON STEEL - FREE MACHINING LOW AND MEDIUM CARBON ALLOY STEEL - FREE MACHINING LOW AND MEDIUM CARBON ALLOY STEEL STAINLESS STEEL - 400 SERIES STAINLESS STEEL - 400 SERIES STAINLESS STEEL - 400 SERIES	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 120-275 140-270 200-320 120-220 200-320 100-250 100-275 100-275 85-375 135-325 135-275	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 65-100 70-105 50-85 55-100 95-190 65-100 100-150 40-110 90-135 65-100 50-100		HOL 14 .008 .012 .008 .009 .008 .007 .008 .007 .008 .007 .008 .007 .008 .010 .008 .010 .009 .010 .012 .009 .010 .012 .009 .012 .009 .012 .008	E DIAMI FEED R/ % .010 .015 .010 .008 .011 .013 .014 .010 .009 .010 .009 .010 .010 .010 .010	2:TER YC YTE (INC 1/2 .013 .018 .016 .009 .013 .015 .020 .012 .013 .012 .014 .012 .016 .012 .016 .013 .018 .008 .010	OU ARE I CHES PE % .015 .019 .017 .010 .014 .015 .014 .015 .014 .015 .014 .015 .014 .015 .014 .015 .014 .015 .020 .022 .009 .011	ORILLIN R REVOI 34 .017 .020 .018 .014 .016 .017 .020 .018 .014 .016 .017 .020 .015 .020 .015 .020 .015 .020 .017 .020 .017 .022 .024 .009 .012	G IN INULUTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .018 .022 .014 .018 .024 .020 .025 .025 .025 .025 .028 .012 .013	CHES) 11/4 .022 .026 .024 .028 .028 .028 .020 .024 .020 .020 .024 .020 .024 .020 .024 .023 .023 .030 .024 .027 .030 .014 .013	1½ .024 .028 .026 .020 .025 .028 .032 .032 .018 .020 .025 .027 .019 .026 .030 .035 .035 .026 .030 .033 .015 .014
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD) CAST IRON CAST IRON LOW CARBON STEELS MEDIUM STRENGTH STEELS	MATERIAL ALUMINUM ALLOY - WROUGHT MAGNESIUM ALLOY LEAD ALLOY NON-METAL AND PLASTIC ZINC ALLOY - DIE CAST ALUMINUM BRONZE BRASS ALLOY - DIE CAST ALUMINUM BRONZE BRASS ALLOY - LEADED AND FREE CUTTING NICKEL SILVER COPPER ALLOY - TOUGH DUCTILE CAST IRON - AUSTENITIC DUCTILE CAST IRON - AUSTENITIC DUCTILE CAST IRON - MARTENSITIC GRAY - FERRITIC GRAY - FERRITIC GRAY - FERRITIC GRAY - FERRITIC LOW AND MEDIUM CARBON STEEL - FREE MACHINING LOW AND MEDIUM CARBON STEEL - FREE MACHINING LOW AND MEDIUM CARBON ALLOY STEEL - FRE MACHINING LOW AND MEDIUM CARBON ALLOY STEEL - 400 SERIES STAINLESS STEEL - 400 SERIES FREE MACHINING HICH STEPNCTH STEPI	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 10-100Rb 10-100Rb 40-200 120-275 140-270 270-400 220-320 120-220 200-320 100-375 100-275 85-375 135-325 135-275	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 125-300 70-105 55-100 95-190 65-100 100-150 40-110 90-135 65-100 50-135		HOL 14 .008 .012 .008 .009 .008 .010 .007 .008 .007 .008 .010 .008 .010 .008 .010 .008 .010 .009 .010 .012 .009 .010 .012 .009 .010	E DIAM FEED RA 3% .010 .015 .010 .008 .011 .013 .014 .010 .009 .010 .009 .010 .009 .010 .013 .010 .011 .011 .011 .011 .015 .007 .009	STER YC 2TER (INC ½ .013 .018 .010 .013 .013 .013 .013 .013 .015 .020 .012 .013 .012 .010 .012 .014 .012 .016 .013 .018 .008 .010	OU ARE I CHES PE 5% .015 .019 .017 .010 .014 .016 .022 .013 .014 .015 .011 .014 .015 .011 .014 .015 .011 .014 .015 .016 .017 .014 .015 .020 .0215 .020 .022 .009 .011	ORILLIN R REVOI 34 .017 .020 .018 .014 .016 .014 .016 .017 .018 .014 .016 .017 .013 .015 .020 .015 .020 .017 .020 .017 .020 .017 .020 .017 .020 .017 .020 .017 .020 .017 .020 .017 .021	G IN INULUTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .022 .014 .018 .022 .014 .020 .025 .022 .025 .022 .025 .022 .025 .028 .012 .013	CHES) 114 .022 .026 .024 .028 .022 .024 .028 .028 .018 .029 .020 .024 .017 .020 .024 .023 .023 .023 .023 .023 .024 .023 .024 .023 .024 .023 .023 .023 .023 .023 .024 .023 .024 .025 .024 .027 .024 .026 .024 .027 .024 .027 .026 .024 .027 .024 .027 .024 .027 .024 .027 .026 .024 .027 .026 .024 .027 .026 .027 .024 .027 .026 .027 .026 .027 .026 .027 .026 .027 .026 .027 .026 .027 .026 .023 .027 .026 .027 .026 .027 .026 .027 .026 .027 .027 .026 .027 .027 .027 .027 .027 .027 .027 .027	11/2 .024 .028 .026 .025 .028 .032 .018 .020 .025 .027 .019 .026 .030 .030 .035 .026 .030 .033 .015 .014
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD) CAST IRON CAST IRON LOW CARBON STEELS MEDIUM STRENGTH STEELS HIGH STRENGTH	MATERIAL 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 - AUSTENITIC DUCTILE CAST IRON - MARTENSITIC GRAY - PEARLITIC GRAY - PEARLITIC GRAY - PEARLITIC GRAY - PEARLITIC GRAY - FERRITIC LOW AND MEDIUM CARBON STEEL - FREE MACHINING LOW AND MEDIUM CARBON STEEL - WROUGHT LOW AND MEDIUM CARBON ALLOY STEEL - 400 SERIES STAINLESS STEEL - 400 SERIES FREE MACHINING HIGH STRENGTH STEEL - WROUGHT STEEL HIGH STRENGTH STEEL - WROUGHT STEEL	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 10-100Rb 10-100Rb 40-200 120-275 100-270 220-320 120-220 200-320 100-250 100-375 100-275 85-375 135-325 135-275 175-400	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 125-300 70-105 125-300 70-105 65-100 70-105 65-100 95-190 65-100 100-150 40-110 90-135 65-100 50-100 90-135 65-100 50-100 50-100		HOL 14 .008 .012 .008 .009 .008 .010 .007 .008 .007 .008 .010 .008 .010 .008 .010 .008 .010 .008 .010 .008 .010 .008 .010 .008 .010 .008 .007 .009 .007 .008 .007 .007 .007 .009 .007 .008 .007 .00	E DIAM FEED RA 3% .010 .015 .010 .008 .011 .013 .014 .010 .010 .010 .010 .010 .010 .010	STER YC 2TER (INC 1/2 .013 .018 .010 .011 .012 .013 .011 .012 .011 .012 .014 .012 .014 .012 .016 .013 .018 .008 .010 .009	OU ARE I CHES PE 5% .015 .019 .017 .010 .014 .014 .014 .014 .014 .014 .014 .015 .011 .014 .015 .011 .014 .015 .020 .020 .022 .009 .011	ORILLIN R REVOI 34 .017 .020 .018 .014 .016 .018 .024 .014 .016 .017 .020 .013 .015 .020 .015 .020 .017 .020 .017 .020 .017 .020 .017 .020 .017 .020 .017 .022 .024 .009 .012	G IN INULUTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .022 .014 .018 .022 .014 .020 .025 .022 .025 .022 .025 .022 .025 .028 .012 .013 .014	CHES) 114 .022 .026 .024 .022 .024 .028 .018 .019 .020 .024 .017 .020 .024 .017 .020 .028 .023 .023 .023 .030 .024 .027 .030 .014 .013 .015	1½ .024 .028 .026 .025 .028 .032 .018 .020 .027 .027 .019 .026 .030 .030 .035 .026 .030 .035 .026 .030 .0315 .015 .014
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD) CAST IRON LOW CARBON STEELS MEDIUM STRENGTH STEELS HIGH STRENGTH STEELS	MATERIAL 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 DUCTILE CAST IRON - MARTENSITIC GRAY - PEARLITIC GRAY - PEARLITIC GRAY - FERRITIC UW AND MEDIUM CARBON STEEL - FREE MACHINING LOW AND MEDIUM CARBON STEEL - FREE MACHINING LOW AND MEDIUM CARBON ALLOY STEEL - 400 SERIES STAINLESS STEEL - 400 SERIES STAINLESS STEEL - 400 SERIES STAINLESS STEEL - 400 SERIES FREE MACHINING HIGH STRENGTH STEEL - WROUGHT & TOOL STEEL HIGH TFEM AL USS	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 10-100Rb 40-200 120-275 140-270 220-320 120-220 200-320 100-250 100-250 100-275 85-375 135-325 135-275 175-400	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 125-300 70-105 55-100 70-105 55-100 95-190 65-100 100-150 40-110 90-135 65-100 50-100 90-135 50-100		HOL 14 .008 .012 .008 .009 .008 .007 .008 .008 .007 .008 .010 .008 .010 .008 .010 .008 .012 .009 .010 .012 .009 .010 .012 .009 .010 .009 .010 .009 .010 .009 .010 .009 .010 .009 .010 .009 .010 .009 .009 .000 .009 .000 .009 .008 .009 .008 .008 .007 .008 .008 .009 .008 .008 .008 .009 .008 .008 .008 .008 .009 .008 .009 .008 .007 .008 .009 .007 .008 .007 .008 .007 .008 .007 .009 .007 .00	E DIAM FEED RA 3% .010 .015 .010 .008 .011 .013 .014 .010 .010 .010 .010 .010 .010 .010		OU ARE I CHES PE 5% .015 .019 .017 .010 .014 .014 .014 .014 .014 .014 .014 .014 .015 .014 .015 .020 .022 .009 .011	ORILLIN R REVOI 34 .017 .020 .018 .014 .016 .018 .024 .016 .017 .020 .013 .015 .020 .015 .020 .017 .022 .024 .009 .012	G IN INCUTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .018 .024 .018 .024 .020 .025 .022 .025 .022 .025 .022 .025 .028 .012 .013 .014	CHES) 11/4 .022 .026 .024 .022 .024 .028 .022 .024 .028 .018 .019 .020 .024 .020 .020 .020 .020 .023 .023 .030 .024 .027 .030 .024 .030 .014 .013 .015	1½ .024 .028 .026 .020 .025 .028 .032 .032 .032 .018 .020 .025 .027 .019 .026 .030 .030 .035 .026 .030 .033 .015 .014 .016
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD) CAST IRON LOW CARBON STEELS MEDIUM STRENGTH STEELS HIGH STRENGTH	MATERIAL 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 - AUSTENITIC 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 - 400 SERIES STAINLESS STEEL - 400 SERIES FREE MACHINING HIGH STRENGTH STEEL - WROUGHT & TOOL STEEL HIGH TEMP ALLOYS	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 40-200 120-275 140-270 270-400 220-320 120-220 200-320 100-250 100-275 85-375 135-325 135-275 175-400 140-300	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 65-100 70-105 50-85 55-100 95-190 65-100 100-150 40-110 90-135 65-100 50-100 200-135 65-100 50-100		HOL 14 .008 .012 .008 .009 .008 .007 .008 .007 .008 .007 .008 .007 .008 .010 .008 .010 .009 .010 .012 .009 .010 .012 .009 .010 .012 .009 .010 .012 .008 .009 .010 .010 .009 .010 .009 .010 .009 .010 .009 .010 .009 .010 .009 .010 .009 .010 .009 .010 .009 .010 .009 .010 .009 .010 .009 .010 .009 .0010 .009 .0010 .009 .0010 .009 .0010 .009 .0010 .009 .0010 .009 .0010 .009 .0010 .009 .0010 .009 .0010 .009 .0010 .009 .0010 .009 .0010 .009 .0010 .009 .0010 .009 .0010 .008 .009 .008 .008 .007 .008 .009 .0010 .009 .0010 .007 .008 .009 .0010 .007 .008 .009 .0010 .007 .008 .007 .008 .009 .0010 .007 .008 .007 .008 .009 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .007 .008 .007 .007 .007 .008 .007 .007 .006	E DIAME FEED R/ % .010 .015 .010 .008 .011 .013 .014 .010 .009 .010 .009 .010 .010 .010 .010		OU ARE I CHES PE % .015 .019 .017 .010 .014 .015 .014 .015 .014 .015 .014 .015 .014 .015 .014 .015 .014 .015 .020 .020 .021 .009 .011 .008	ORILLIN R REVOI 34 .017 .020 .018 .014 .016 .017 .020 .018 .014 .016 .017 .020 .014 .016 .017 .020 .015 .020 .017 .020 .017 .022 .024 .009 .012 .008	G IN INULUTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .018 .024 .018 .024 .020 .025 .025 .025 .022 .025 .025 .028 .012 .013 .014 .010	CHES) 11/4 .022 .026 .024 .018 .022 .024 .028 .018 .019 .020 .024 .020 .024 .020 .024 .023 .030 .024 .027 .030 .027 .030 .014 .015 .012	1½ .024 .028 .026 .020 .025 .028 .032 .032 .025 .027 .027 .027 .027 .030 .030 .030 .035 .036 .030 .033 .035 .026 .030 .033 .015 .014 .015
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD) CAST IRON LOW CARBON STEELS MEDIUM STRENGTH STEELS HIGH STRENGTH STEELS HIGH TEMP.	MATERIAL 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 GRAY - FERRITIC GRAY - FERRITIC UCTILE CAST IRON - MARTENSITIC GRAY - FERRITIC LOW AND MEDIUM CARBON STEEL - FREE MACHINING LOW AND MEDIUM CARBON STEEL - WROUGHT 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 - ALLOY NICKEL & IRON BASE ALLOY STAINLESS STEEL - ALLOY STAINLESS STEEL - ALLOY	BRINELL 30-150 (500kg) 50-90 10-20 	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 125-300 70-105 125-300 70-105 125-300 70-105 65-100 70-150 65-100 100-150 40-110 90-135 65-100 50-100 90-135 50-100 20-115 60-90		HOL 14 .008 .012 .008 .009 .008 .010 .007 .008 .007 .008 .010 .008 .010 .008 .010 .008 .010 .009 .010 .009 .010 .009 .010 .009 .010 .009 .010 .009 .010 .009 .010 .009 .010 .009 .000 .009 .000 .009 .000 .009 .000 .008 .007 .009 .007 .008 .007 .008 .007 .009 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .008 .007 .006 .006 .006 .007 .006 .006 .006 .007 .006 .006 .006 .006 .006 .007 .006 .006 .006 .006 .006 .006 .006 .006 .006 .006 .006 .006 .006	E DIAM FEED RA 3% .010 .015 .010 .008 .011 .013 .014 .010 .009 .010 .009 .010 .009 .010 .010		OU ARE I CHES PE 5% .015 .019 .017 .010 .014 .012 .013 .014 .015 .011 .014 .015 .011 .014 .015 .011 .014 .015 .016 .017 .014 .015 .020 .022 .009 .011 .0011 .0011	ORILLIN R REVOI 34 .017 .020 .018 .014 .016 .014 .016 .017 .018 .014 .016 .017 .013 .015 .020 .015 .020 .017 .020 .017 .020 .017 .020 .017 .020 .017 .020 .017 .020 .017 .021 .021 .021 .012 .008 .009	G IN INULUTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .022 .014 .018 .022 .014 .018 .022 .025 .022 .025 .022 .025 .022 .025 .022 .012 .013 .014 .010 .010 .010 .010 .010 .010 .010	CHES) 114 .022 .026 .024 .018 .022 .024 .028 .028 .028 .028 .028 .028 .028 .028	11/2 .024 .028 .026 .025 .028 .032 .018 .020 .025 .027 .019 .026 .030 .030 .030 .035 .026 .030 .033 .015 .014 .016 .015 .012
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD) CAST IRON CAST IRON LOW CARBON STEELS MEDIUM STRENGTH STEELS HIGH STRENGTH STEELS HIGH TEMP. ALLOYS	MATERIAL ALUMINUM ALLOY - WROUGHT MAGNESIUM ALLOY LEAD ALLOY NON-METAL AND PLASTIC ZINC ALLOY - DIE CAST ALUMINUM BRONZE BRASS ALLOY - DIE CAST ALUMINUM BRONZE BRASS ALLOY - LEADED AND FREE CUTTING NICKEL SILVER COPPER ALLOY - TOUGH DUCTILE CAST IRON - AUSTENITIC DUCTILE CAST IRON - MARTENSITIC DUCTILE CAST IRON - MARTENSITIC GRAY - PEARLITIC 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 - 400 SERIES STAINLESS STEEL - 400 SERIES FREE MACHINING HIGH STRENGTH STEEL - WROUGHT & TOOL STEEL HIGH TEMP ALLOYS NICKEL& IRON BASE ALLOY STAINLESS STEEL - 300 SERIES STAINLESS STEEL - 400 SERIES STAINLESS STEEL - 300 SERIES STAINLESS STEEL - 400 SERIES STAINLESS STE	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 10-100Rb 10-200 120-275 140-270 270-400 220-320 120-220 200-320 100-375 100-275 85-375 135-325 135-325 135-375 150-440	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 125-300 70-105 125-300 70-105 125-300 70-105 65-100 70-105 50-85 55-100 95-190 65-100 100-150 40-110 90-135 65-100 50-100 90-135 50-100 20-115 60-90 50-90		HOL 14 .008 .012 .008 .009 .008 .010 .007 .008 .007 .008 .010 .008 .010 .008 .010 .008 .010 .008 .010 .008 .010 .008 .010 .008 .009 .010 .009 .010 .009 .010 .009 .010 .009 .009 .009 .009 .009 .009 .009 .008 .009 .008 .009 .008 .007 .009 .007 .008 .007 .007 .009 .007 .008 .007 .007 .007 .009 .007 .008 .007 .007 .007 .007 .007 .007 .007 .008 .007 .007 .008 .007 .007 .008 .007 .007 .008 .007 .008 .007 .006 .007 .006 .006 .006 .007 .006 .006 .006 .006 .006 .006 .007 .006 .006 .006 .006 .006 .006 .006 .006 .006 .006 .006	E DIAM FEED RA 3% .010 .015 .010 .008 .011 .013 .014 .010 .010 .010 .010 .010 .010 .009 .010 .010		OU ARE I CHES PE 5% .015 .019 .017 .010 .014 .015 .013 .014 .015 .011 .014 .015 .011 .014 .015 .011 .014 .015 .015 .020 .022 .009 .011 .008 .008	ORILLIN R REVOI 34 .017 .020 .018 .014 .016 .014 .016 .017 .010 .0117 .013 .015 .020 .015 .020 .017 .020 .017 .020 .017 .022 .024 .009 .012 .008 .009 .009	G IN INULUTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .022 .014 .018 .022 .014 .020 .025 .022 .025 .022 .025 .022 .025 .022 .012 .013 .014 .010 .010 .010 .010 .010 .010 .010	CHES) 114 .022 .026 .024 .028 .022 .024 .028 .028 .018 .029 .024 .017 .020 .024 .027 .023 .023 .023 .023 .023 .024 .023 .024 .023 .023 .024 .023 .023 .023 .024 .017 .020 .024 .017 .020 .024 .017 .020 .024 .017 .020 .024 .017 .020 .024 .017 .020 .024 .017 .020 .024 .017 .020 .024 .018 .022 .024 .018 .022 .024 .018 .022 .024 .018 .022 .024 .018 .022 .024 .018 .024 .024 .024 .024 .024 .024 .024 .024	1½ .024 .028 .026 .025 .028 .032 .018 .020 .025 .027 .019 .026 .030 .030 .035 .026 .030 .035 .026 .030 .033 .015 .014
CLASS OF MATERIALS NON-FERROUS (SOFT) NON-FERROUS (HARD) CAST IRON CAST IRON LOW CARBON STEELS MEDIUM STRENGTH STEELS HIGH STRENGTH STEELS HIGH TEMP. ALLOYS	MATERIAL 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 OUCTILE CAST IRON - MARTENSITIC GRAY - PEARLITIC GRAY - PEARLITIC GRAY - FERRITIC MALLEABLE CAST IRON - MARTENSITIC LOW AND MEDIUM CARBON STEEL - FREE MACHINING LOW AND MEDIUM CARBON STEEL - VROUGHT LOW AND MEDIUM CARBON ALLOY STEEL - 400 SERIES STAINLESS STEEL - 400 SERIES FREE MACHINING HIGH STRENGTH STEEL - WROUGHT STEEL - WROUGHT STEEL HIGH TEMP ALLOYS NICKEL & IRON BASE ALLOY STAINLESS STEEL - 300 SERIES STAINLESS STEEL - 300 SERIES STAINLESS STEEL - 100 SERIES STAINLESS STEEL - 300 SERIES STAINLESS STEEL - 100 SERIES STAINLESS STEEL - 300 SERIES STAINLESS STE	BRINELL 30-150 (500kg) 50-90 10-20 - 80-100 40-175 10-100Rb 10-100Rb 10-100Rb 40-200 120-275 140-270 220-320 120-220 200-320 100-250 100-375 100-275 85-375 135-325 135-325 135-275 175-400 140-300 135-375 150-440 110-380	SPEED IN SFPM COOLANT FED 200-300 150-250 200-300 125-300 170-240 70-105 125-300 70-105 5100 70-105 65-100 70-105 50-85 55-100 95-190 65-100 100-150 40-110 90-135 65-100 50-100 90-135 50-100 20-115 60-90 50-90 40-60		HOL 34 .008 .012 .008 .006 .009 .008 .007 .008 .007 .008 .012 .009 .012 .009 .012 .009 .012 .009 .012 .009 .012 .009 .012 .009 .012 .008 .007 .008 .007 .008 .007 .008 .007 .008 .009 .009 .009 .008 .009 .008 .007 .008 .008 .007 .006 .008	E DIAM FEED RA 3% .010 .015 .010 .008 .011 .013 .014 .010 .010 .010 .010 .010 .010 .010		OU ARE I CHES PE 5% .015 .019 .017 .010 .017 .010 .014 .014 .014 .014 .014 .014 .015 .014 .015 .014 .015 .020 .022 .009 .011 .008 .008 .008 .008 .0044	ORILLIN R REVOI 34 .017 .020 .018 .014 .016 .018 .024 .016 .017 .020 .013 .015 .020 .015 .020 .017 .022 .024 .009 .012 .008 .009 .014	G IN INULUTION 1 .021 .024 .022 .016 .020 .021 .026 .017 .018 .012 .014 .018 .024 .020 .025 .022 .025 .022 .025 .022 .025 .022 .012 .013 .014 .010 .010 .010 .016	CHES) 11/4 .022 .026 .024 .022 .024 .028 .022 .024 .028 .018 .029 .024 .020 .024 .020 .024 .020 .024 .023 .023 .023 .023 .023 .023 .024 .027 .023 .024 .027 .020 .024 .017 .020 .024 .017 .020 .024 .017 .020 .024 .017 .020 .024 .017 .020 .024 .017 .020 .024 .017 .020 .024 .017 .020 .024 .017 .020 .024 .018 .022 .024 .018 .022 .024 .024 .024 .024 .024 .025 .024 .024 .024 .024 .024 .024 .024 .024	1½ .024 .028 .026 .020 .025 .028 .032 .032 .027 .027 .027 .027 .027 .030 .030 .030 .035 .026 .030 .033 .035 .026 .030 .033 .015 .014 .015 .014 .018

