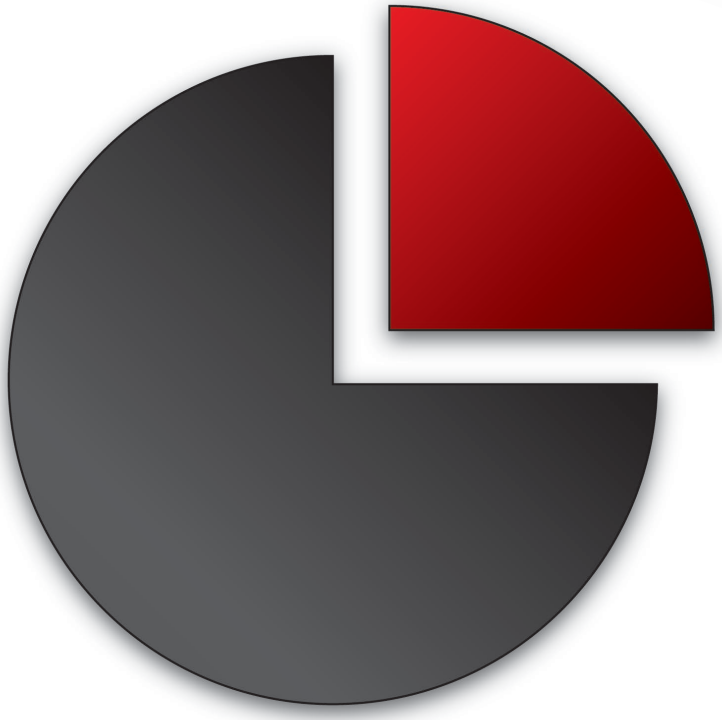
JARVIS CUTTING TOOLS

Form Tapping

Form Tapping Leader

JARVIS CUTTING TOOLS

Did you know?



25% Of the US Market uses **our form taps** for their applications

TAP TERMINOLOGY

JARVIS CUTTING TOOLS

Threaded Body:

The portion of the tap where the threads have been ground in. This is the part of the tap that does all of the work.

Neck:

A section of reduced diameter found between the threaded body and the shank. This allows easy flow of coolant or oil to the threaded body and any clearance required for longer parts.

Shank:

The portion of the tap by which it is held and driven.

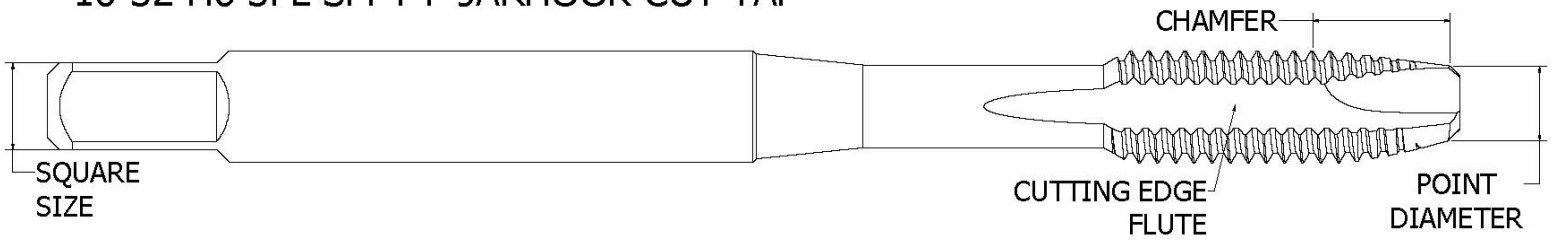
Square:

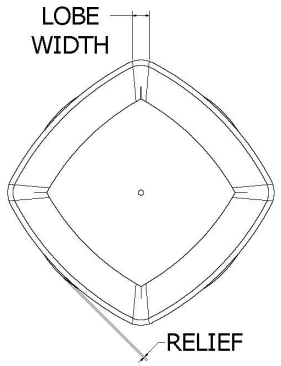
Four driving flats parallel to the shank. For location purposes, one of the flats are ground longer than the three others.

TAP NOMENCLATURE

JARVIS CUTTING TOOLS

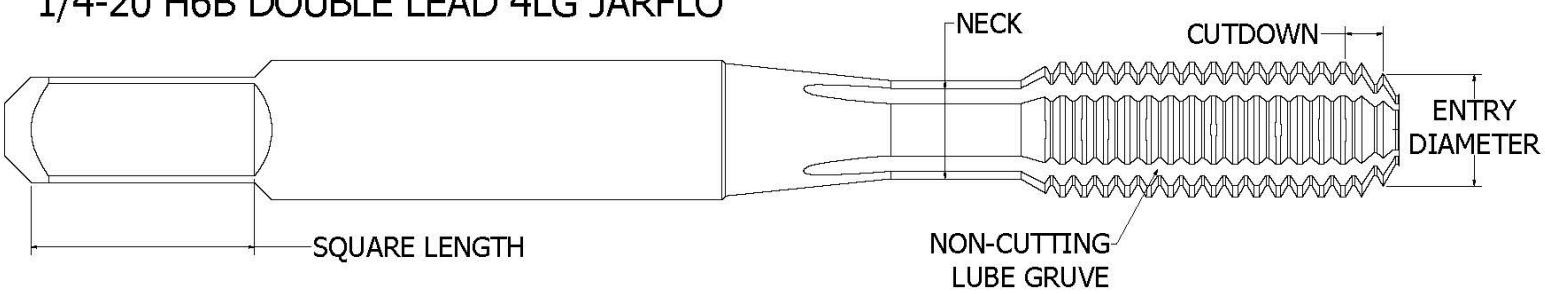
10-32 H6 3FL SPPT P JARHOOK CUT TAP

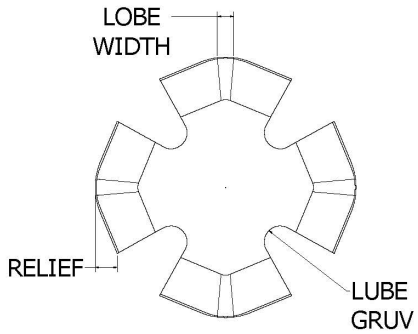




SOLID JARFLO

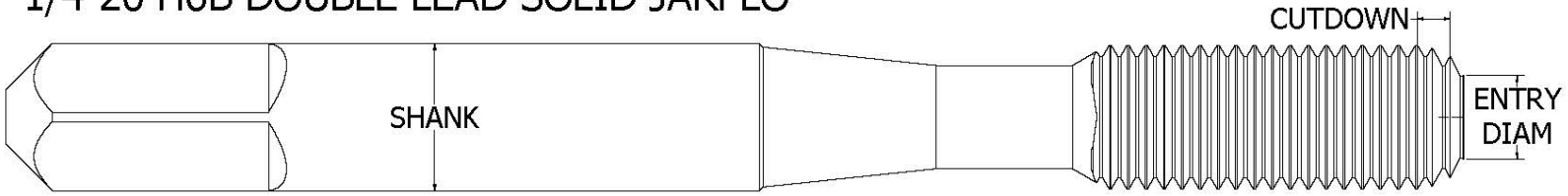
1/4-20 H6B DOUBLE LEAD 4LG JARFLO





GRUV JARFLO

1/4-20 H6B DOUBLE LEAD SOLID JARFLO

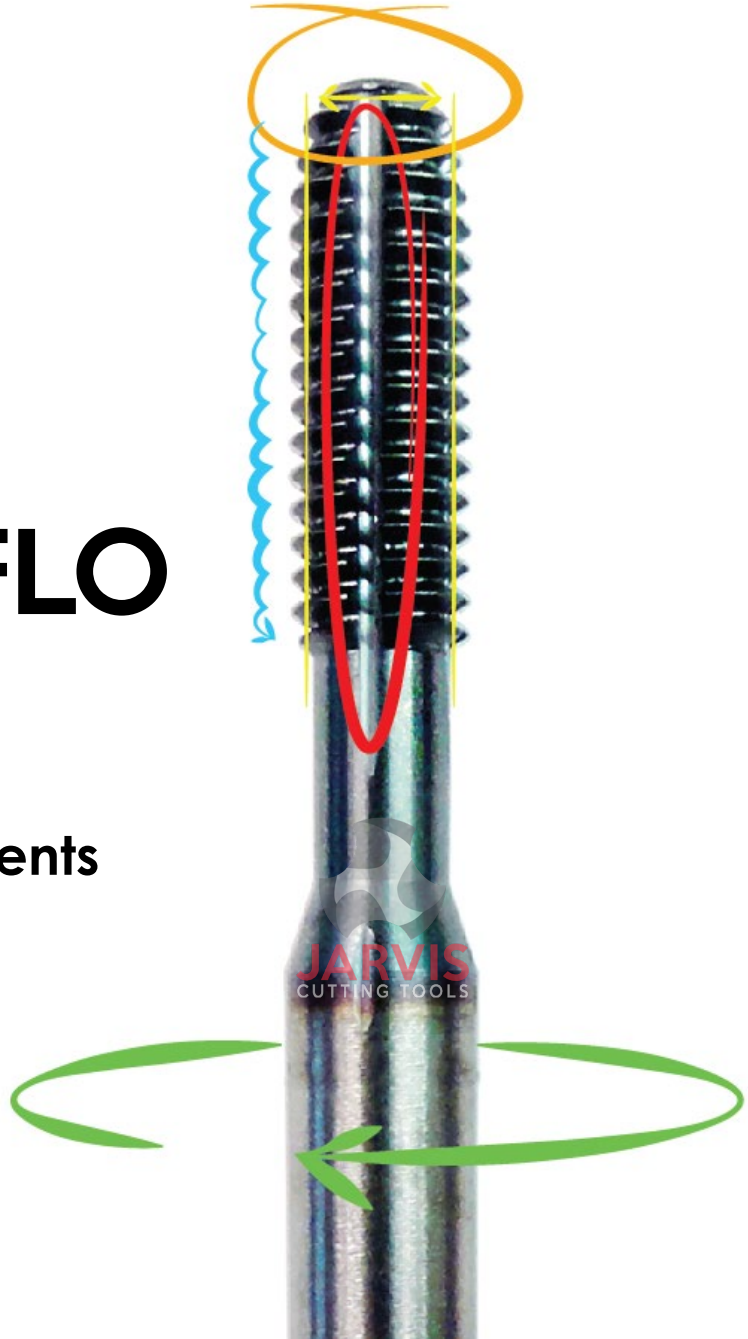


HOW TO READ A TAP DESCRIPTION

JARVIS CUTTING TOOLS

Basic tap descriptions are mostly universal across the industry

¼ - 20 H6 4LG B JARFLO



- Basic descriptions are comprised of 5 components
  - Size
  - Pitch
  - Pitch Diameter Limits
  - Fluting
  - Chamfer Style

HOW TO READ A TAP DESCRIPTION (CONT.)

1/4-28 H7 3FL SPPT P

Size:

- References the basic major diameter of the tap
- This can be expressed in
  - Inch
  - Fractions
  - Machine Screw Size
  - Metric

1/4-28 H7 3FL SPPT P

Pitch:

+ References the distance from one thread to the next. This is expressed in the number of threads per inch.

1/4-28 H7 3FL SPPT P

Pitch Diameter Limits:

+ References how far above or below the basic pitch diameter the tap is
  + Also known as the "H" limit

1/4-28 H7 3FL SPPT P

Fluting:

+ References how many flutes are on the tap and what style they are
  + For example:
    + 3FL = 3 Straight Flutes
    + 3FL SPPT = 3 Flutes with Spiral Points
    + 3SPFL = 3 Spiral Flutes

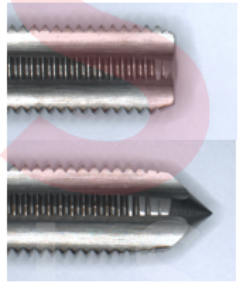
1/4-28 H7 3FL SPPT P

Chamfer Style:

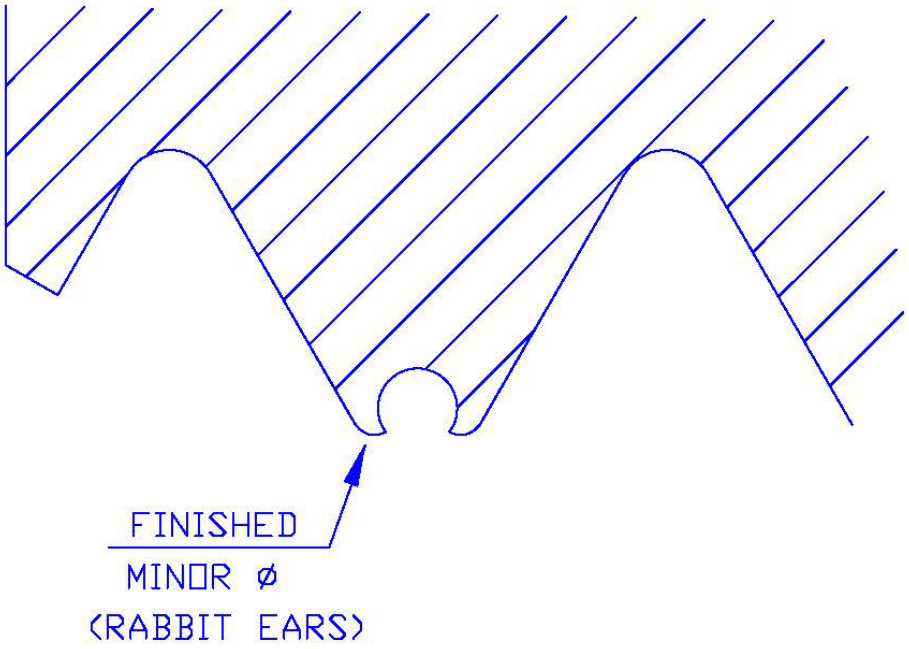
+ References how what kind of chamfer is on the tap
  For example:

B = Bottom

P = Plug

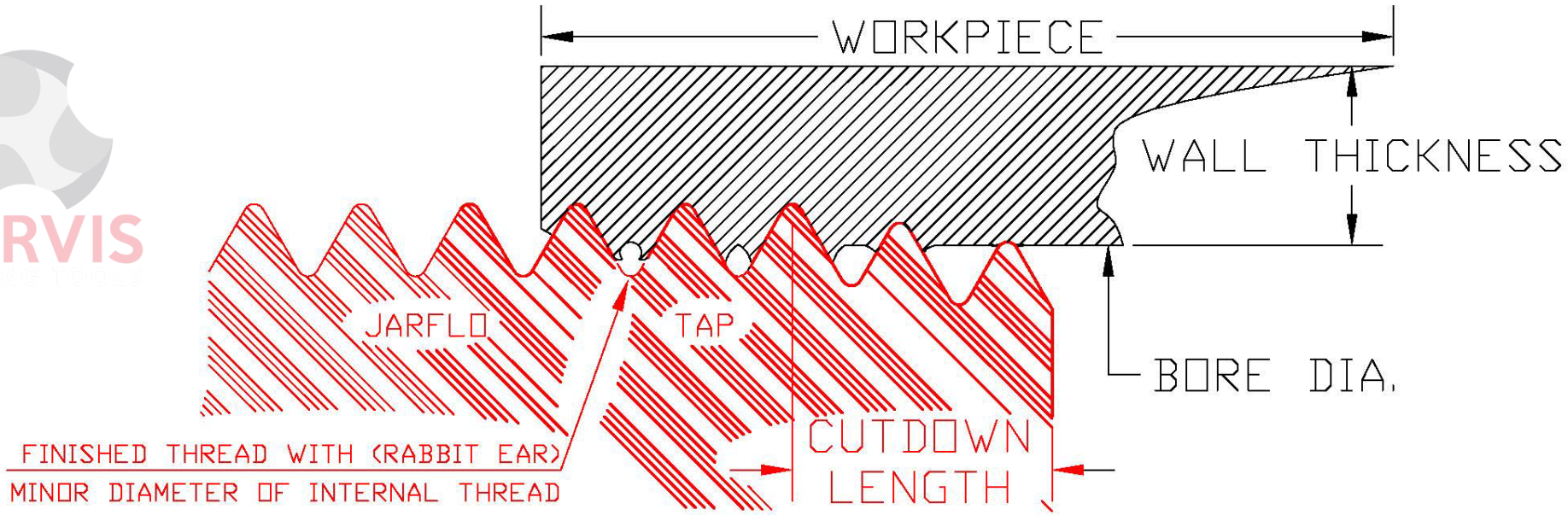


HOW DOES FORMING WORK?

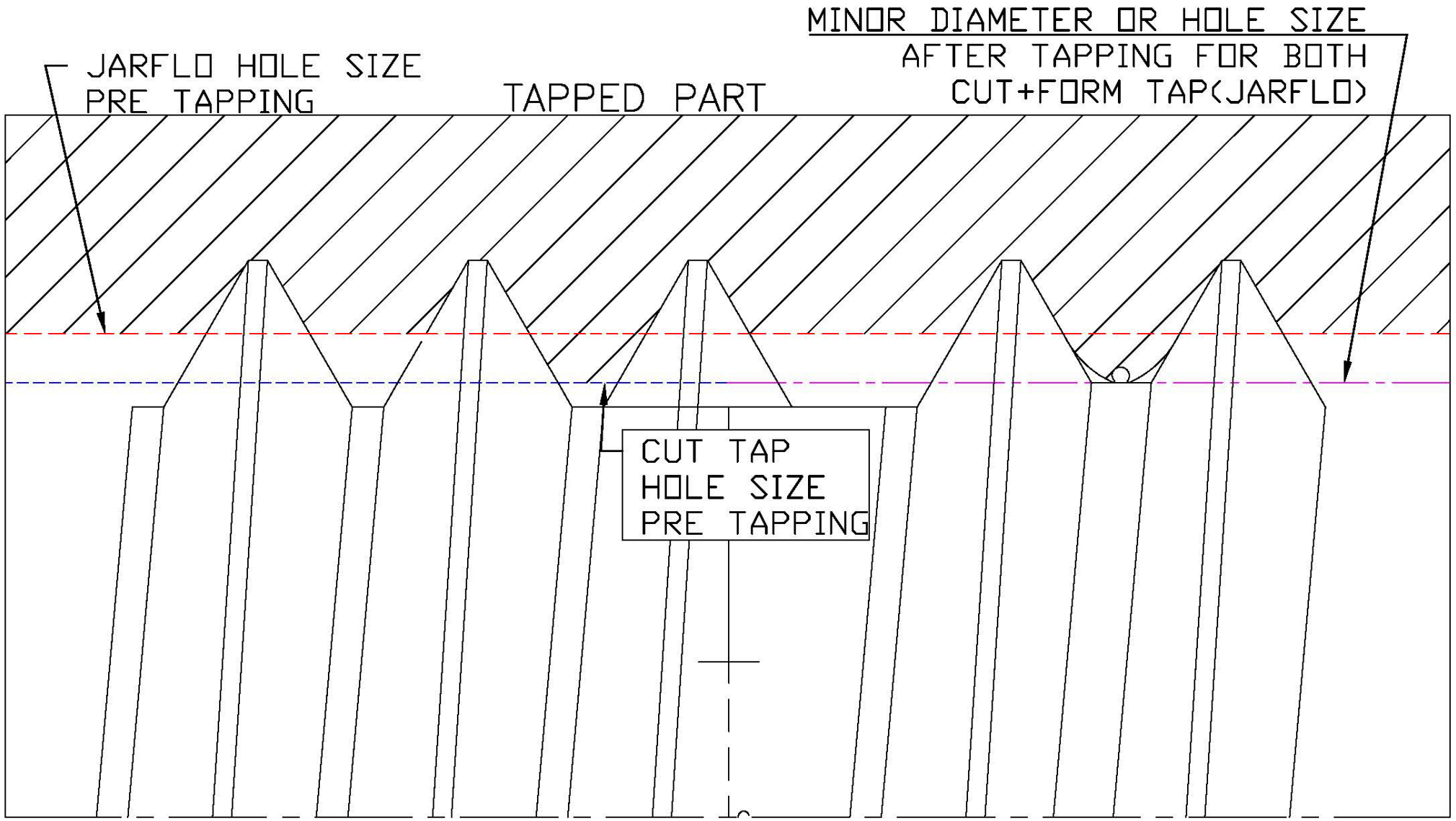


GENERAL RULE FOR WALL THICKNESS IS TO ALLOW NO LESS THAN THREE TIMES A SINGLE THREAD HEIGHT.

$$\text{SINGLE THREAD HEIGHT} = \frac{75\%\ \cos 30^\circ}{\text{T.P.I.}}$$



HOLE PREP


JARFLO HOLE SIZE
PRE TAPPING
TAPPED PART
MINOR DIAMETER OR HOLE SIZE
AFTER TAPPING FOR BOTH
CUT+FORM TAP(JARFLO)
CUT TAP
HOLE SIZE
PRE TAPPING

HOLE SIZE FORMULAS

JARVIS CUTTING TOOLS

Formula For Obtaining Tap Drill Sizes for Cutting Taps

$$\text{*Drilled Hole Size (inches)} = \text{Basic Major Dia. of thread (Inch)} - .0130 \times \frac{\text{Percentage of Full Thread}}{\text{No. of Threads per Inch}}$$

$$\text{*Drilled Hole Sizes (mm)} = \text{Basic Major Dia. of thread (mm)} - \frac{\text{Percentage of Full Thread x mm Pitch}}{76.98}$$

Formula For Obtaining Tap Drill Sizes for Thread Forming Taps

$$\text{*Drilled Hole Size (inches)} = \text{Basic Major Dia. of thread (Inch)} - .0068 \times \frac{\text{Percentage of Full Thread}}{\text{No. of Threads per Inch}}$$

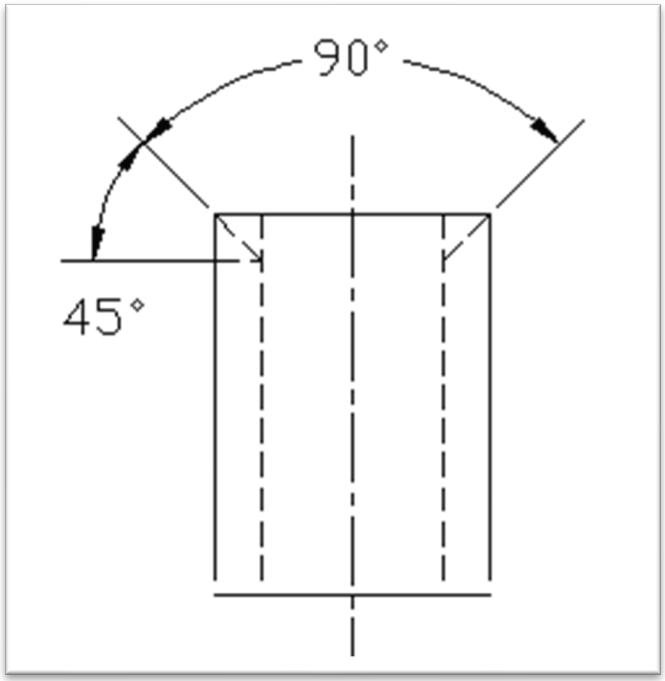
$$\text{*Drilled Hole Size (mm)} = \text{Basic Major Dia. of thread (mm)} - \frac{\text{Percentage of Full Thread x mm Pitch}}{147.06}$$

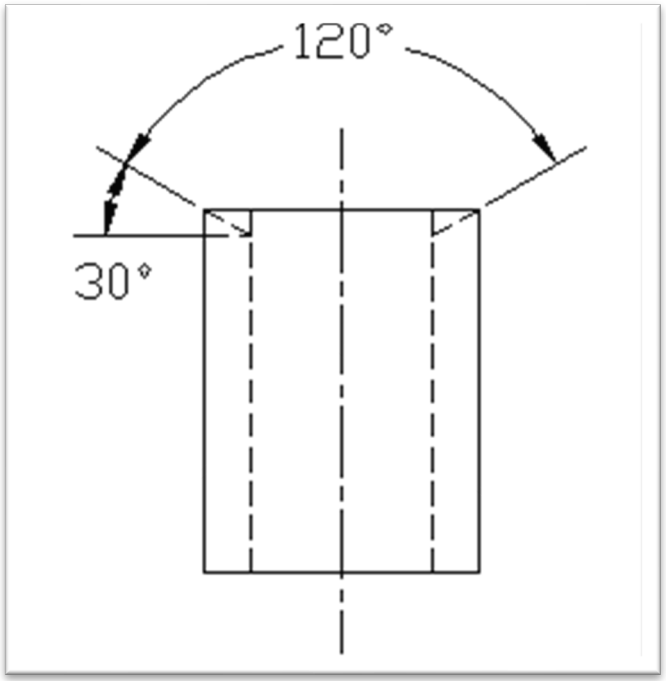
Formula For Obtaining Percentage Of Full Thread For Other Drill sizes

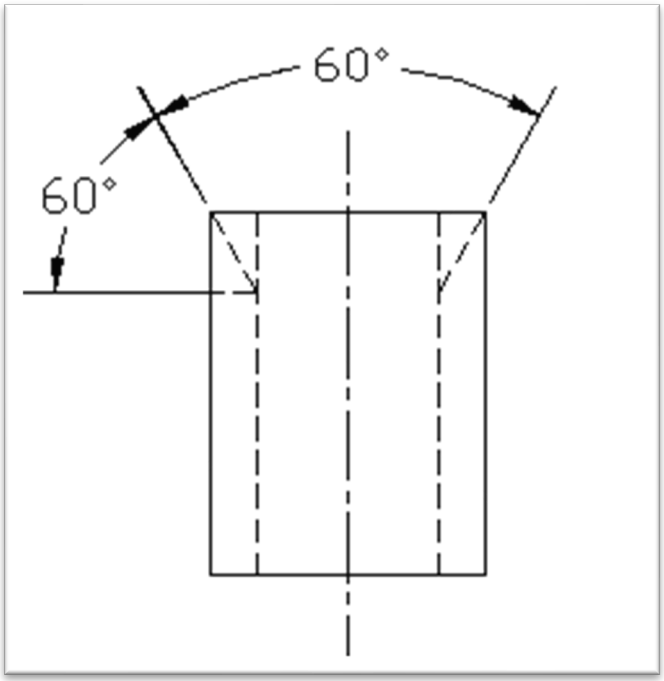
$$\text{Percentage of Full Thread} = \text{No. of Threads per inch} \times \left(\frac{\text{Basic Major Dia. Of Thread (Inch)} - \text{Drill Hole Size (inch)}}{.0130} \right)$$

$$\text{Percentage of Full Thread} = 76.98 \text{ Pitch (mm)} \times \left(\text{Basic Major Dia. (mm)} - \text{Drill Hole Size (mm)} \right)$$

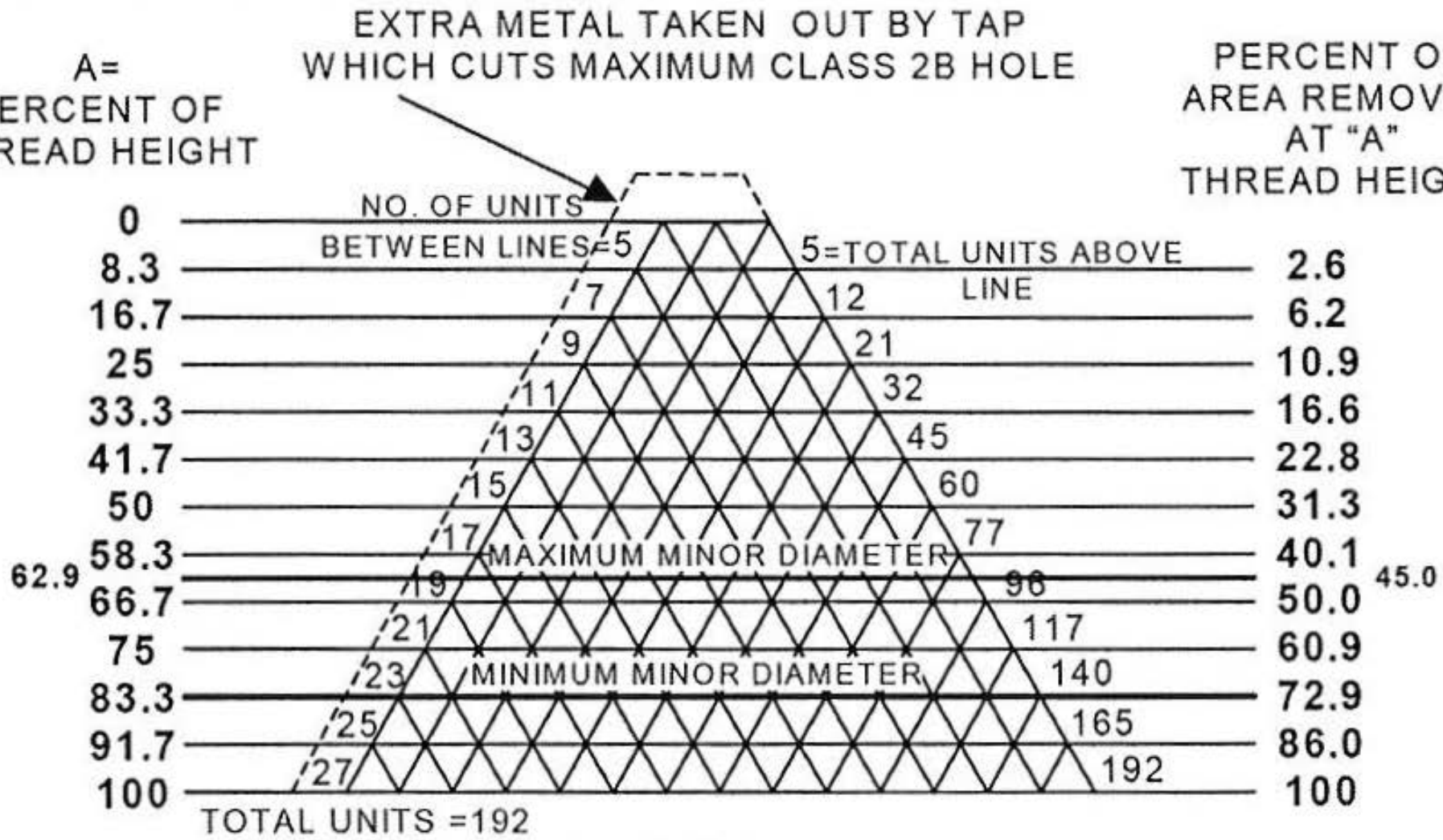
CHAMFER







Minor Diameter

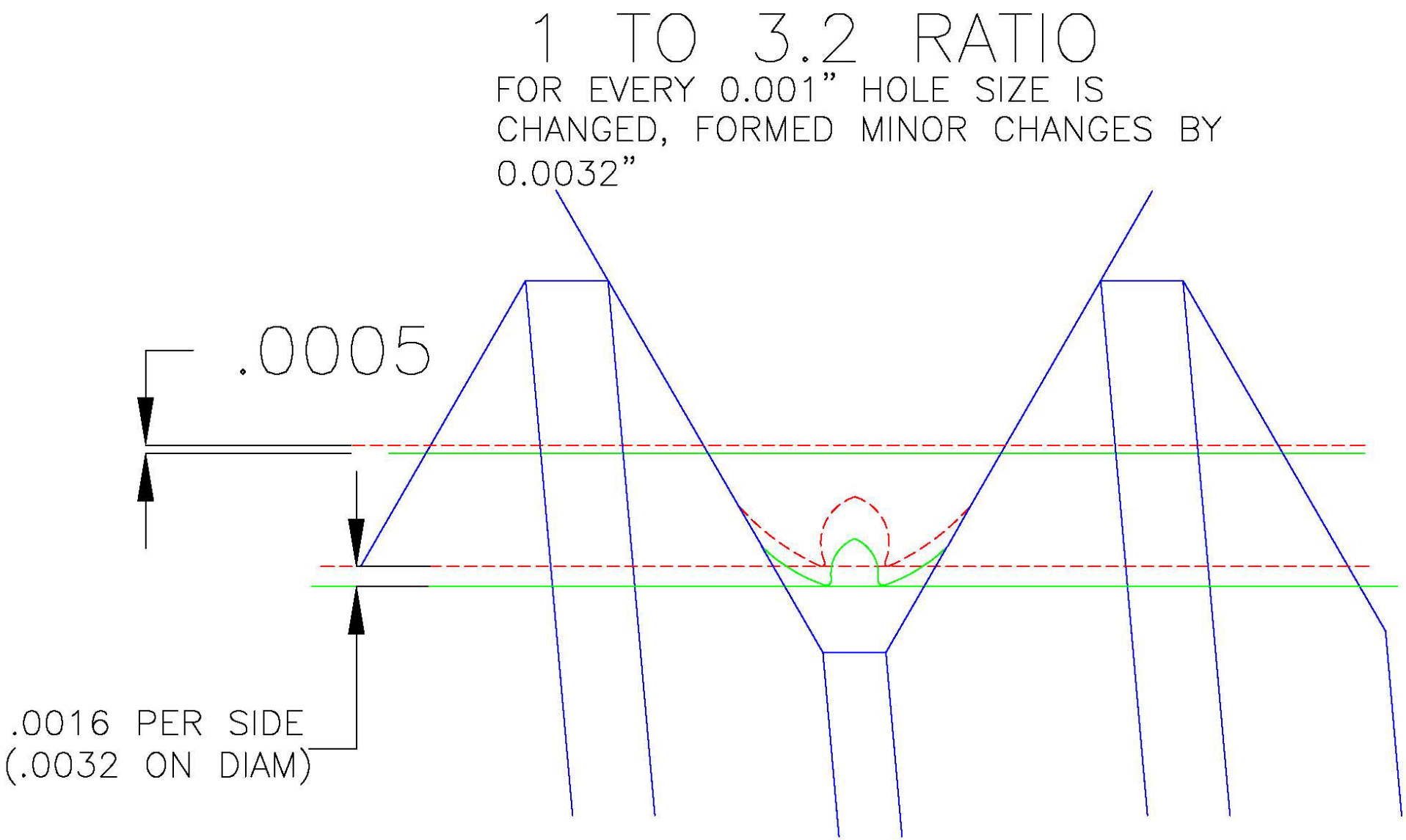


BASIC 10-24 U.N.C. THREAD

HEIGHT .02706 CLASS 2B TOL= .0043

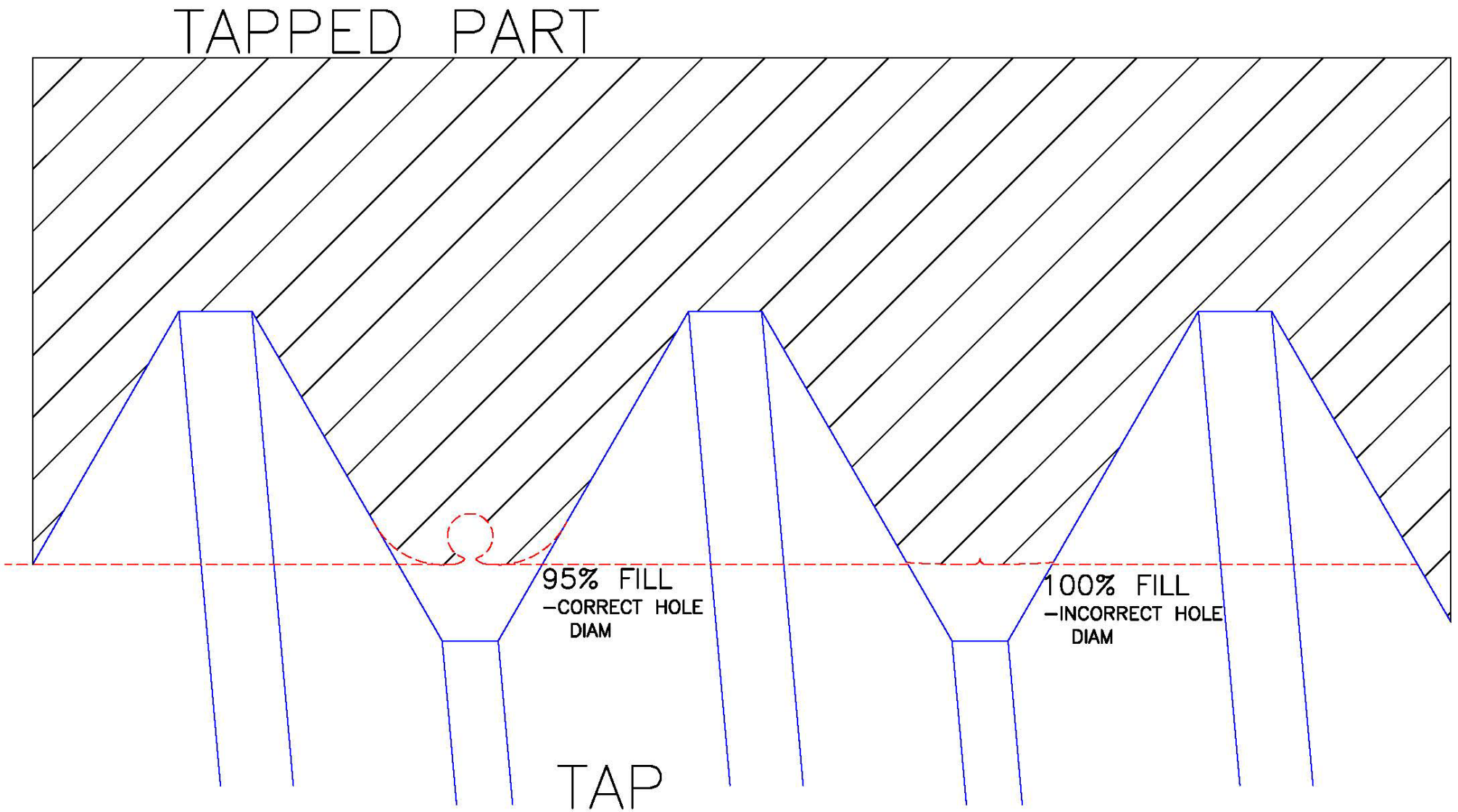
JARVIS CUTTING TOOLS

Hole Size Ratio

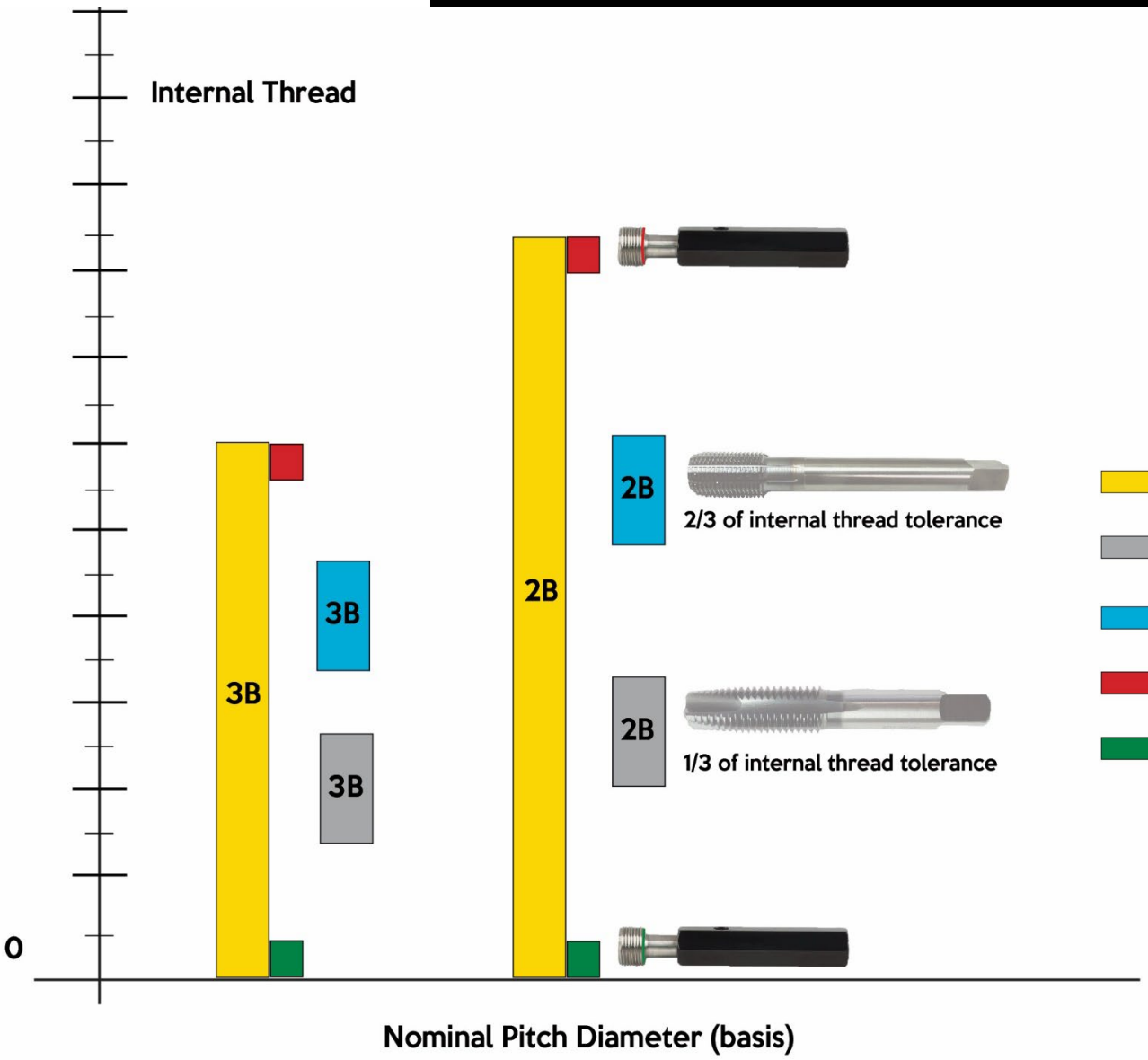


JARVIS
CUTTING TOOLS

CMD Effects



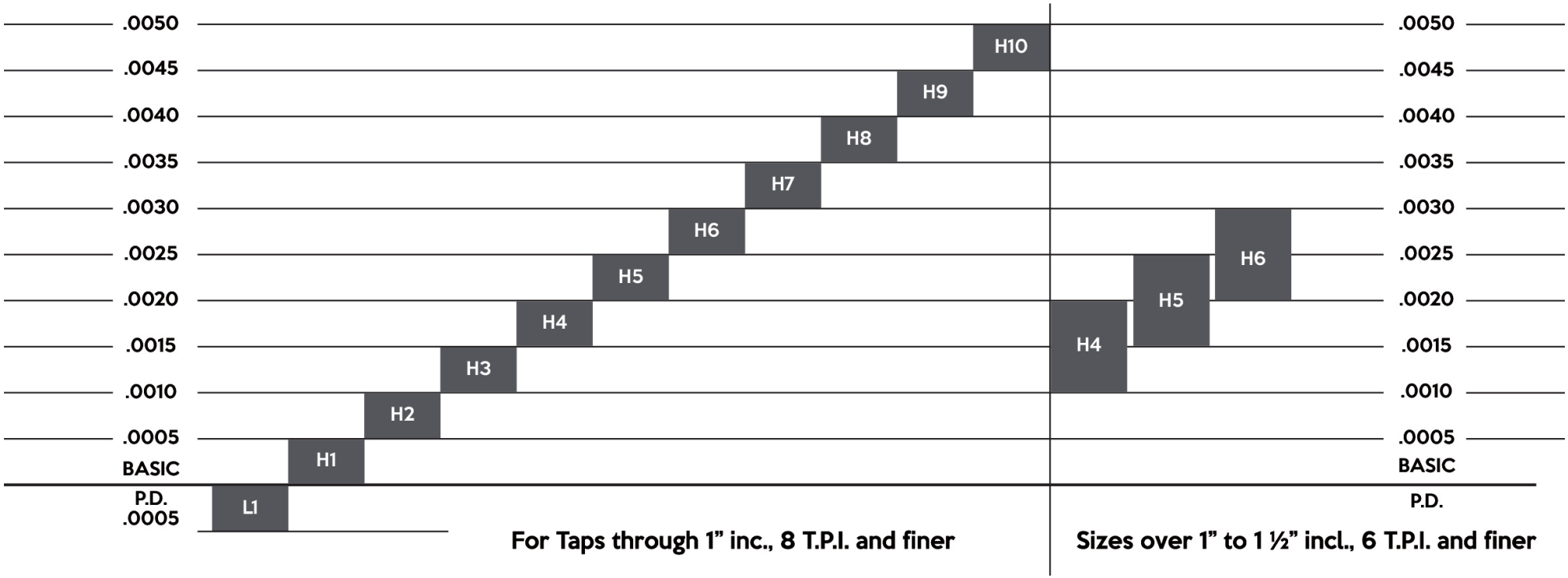
Gage Limits

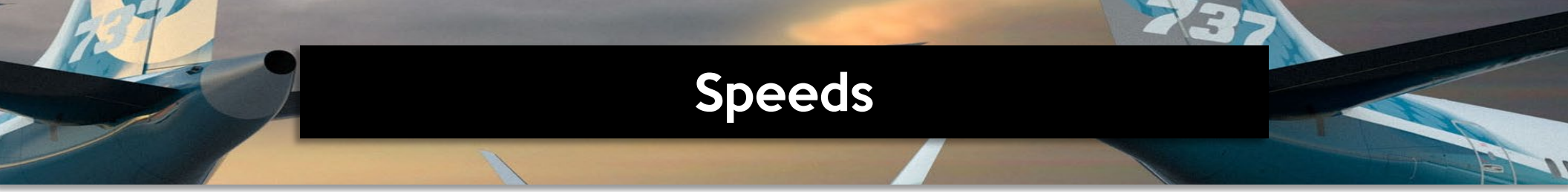


- Pitch diameter tolerance of the internal thread ASME B1.1
- Pitch diameter tolerance of the cut tap
- Pitch diameter tolerance of the form tap (Jarflo)
- Pitch diameter tolerance of the NO-GO thread plug gauge ANSI/ASME B1.2
- Pitch diameter tolerance of the GO thread plug gauge ANSI/ASME B1.2


JARVIS
CUTTING TOOLS

H-limits


.0050
.0045
.0040
.0035
.0030
.0025
.0020
.0015
.0010
.0005
BASIC
P.D.
.0005
L1
H1
H2
H3
H4
H5
H6
H7
H8
H9
H10
For Taps through 1" inc., 8 T.P.I. and finer
H4
H5
H6
Sizes over 1" to 1 ½" incl., 6 T.P.I. and finer



Speeds

Surface Ft		5	10	15	20	25	30	35	40	50	60	70	80	90	100	120	130	150
Tap Size		Revolutions per Minute (RPM)																
0	.0600	318	637	955	1275	1590	1910	2230	2545	3185	3820	4455	5095	5790	6365	7640	8275	9550
1	.0730	261	523	785	1045	1310	1570	1830	2095	2615	3140	3665	4135	4710	5230	6280	6800	7850
2	.0860	222	444	865	890	1110	1330	1555	1775	2220	2665	3110	3555	3995	4440	5330	5776	6660
3	.0990	193	385	580	770	965	1155	1350	1545	1930	2315	2700	3090	3470	3860	4630	5015	5790
4	.1120	171	341	510	630	850	1025	1195	1365	1705	2045	2390	2730	3070	3410	4090	4435	5115
5	.1250	153	306	460	610	765	915	1070	1220	1530	1835	2140	2445	2750	3055	3665	3970	4585
6	.1380	138	276	415	555	690	830	970	1105	1385	1660	1935	2315	2490	2765	3320	3595	4150
8	.1640	116	233	350	465	580	700	815	930	1165	1395	1630	1865	2095	2330	2795	3030	3495
10	.1900	100	201	300	400	500	605	705	805	1005	1205	1405	1610	1810	2010	2410	2615	3015
12	.2160	88	177	265	355	440	530	620	705	885	1060	1240	1415	1590	1770	2120	2300	2650
1/4	.2500	76	153	230	305	380	460	535	610	765	915	1070	1220	1375	1530	1835	1985	2230
5/16	.3125	61	122	185	245	305	365	425	490	610	735	855	980	1100	1220	1465	1590	1835
3/8	.3750	51	102	155	205	255	305	355	410	510	610	715	815	915	1020	1220	1325	1530
7/16	.4375	44	87	130	175	220	260	305	350	435	525	610	700	785	875	1050	1135	1310
1/2	.5000	38	76	115	155	190	230	270	305	380	460	535	610	690	765	915	995	1145
9/16	.5625	34	68	100	135	170	205	240	270	340	405	475	545	610	680	815	885	1020
5/8	.6250	31	61	90	125	155	185	215	245	305	365	430	490	550	610	735	795	915
3/4	.7500	25	51	75	100	125	155	180	205	225	305	355	410	460	510	610	660	765
7/8	.8750	23	44	66	87	109	131	153	175	219	262	306	349	392	438	526	585	655
1	1.0000	19	38	57	76	95	115	134	153	191	229	267	306	344	382	458	497	573
Pipe Tap Size																		
1/8		47	94	141	189	236	282	329	384	470	565	660	752	847	942	1130	1222	1410
1/4		35	71	106	141	177	212	248	283	354	425	495	566	638	708	850	921	1062
3/8		28	57	85	113	141	170	198	227	284	340	395	455	512	567	682	740	850
1/2		23	45	68	91	114	136	159	182	227	272	318	363	409	455	548	592	682
3/4		18	36	55	73	91	109	127	145	182	218	255	291	327	374	437	473	556
1"		15	29	44	58	73	88	102	116	145	175	204	233	262	292	350	378	436
1 1/4		12	23	35	46	58	70	81	93	115	138	162	185	208	231	277	300	347
1 1/2		10	20	30	40	50	60	70	80	100	120	140	160	180	200	241	262	302
2"		8	16	24	32	40	48	56	64	80	96	112	128	145	161	193	209	241

Formula: $RPM = \frac{3.82 \times \text{Surface feet per Minute}}{\text{Diameter}}$

Metric sizes---apply the formula

Metalforming taps (Jarflos) may be run at 1 1/2 to 2 times faster than cutting taps.

Material	Hardness (HB)	Condition	Threads per inch 8-15	16-24	26-up
			Surface Feet per Minute		
1108-1211	100-150	HR,A	60	90	120
1212-1215	150-200	HR,A,N,CD	60	90	130
11L17-12L14	200-250	N,CD	70	100	140
1006-1017	100-125	HR,A,N,CD	50	70	100
1018-1023	125-175	HR,A,N,CD	45	60	90
1024-1026	175-225	HR,N,CD	40	50	70
1513-1514	225-275	CD	30	40	60
4130-4150	175-225	HR,A,N,CD	40	50	70
4340-6150	225-275	N,CD,Q and T	30	40	60
8630-8740	275-325	N,Q and T	15	25	40
300 Series	135-185	A	40	50	70
400 Series	185-275	A,CD	30	40	60
440-501	275-325	Q and T	15	25	40
15-5PH - 17-4PH	150-200	A	20	30	50
PH13-8 - PH15-7	150-200	A	20	30	50
A286	275-325	ST	10	15	25
Inco 625,718, X750	260-300	ST	8	12	15
M252, Rene 41	250-300	ST	8	12	15
Waspaloy	325-375	ST	6	8	10
Aluminum		CD,ST and A	100	150	200+
Titanium	300-350	A	10	15	20
Leaded Brass	100-150	A,CD	100	150	200
Brass, Bronze	150-200	A,CD	80	100	150
Beryllium Copper	200-250	A,CD	40	50	80

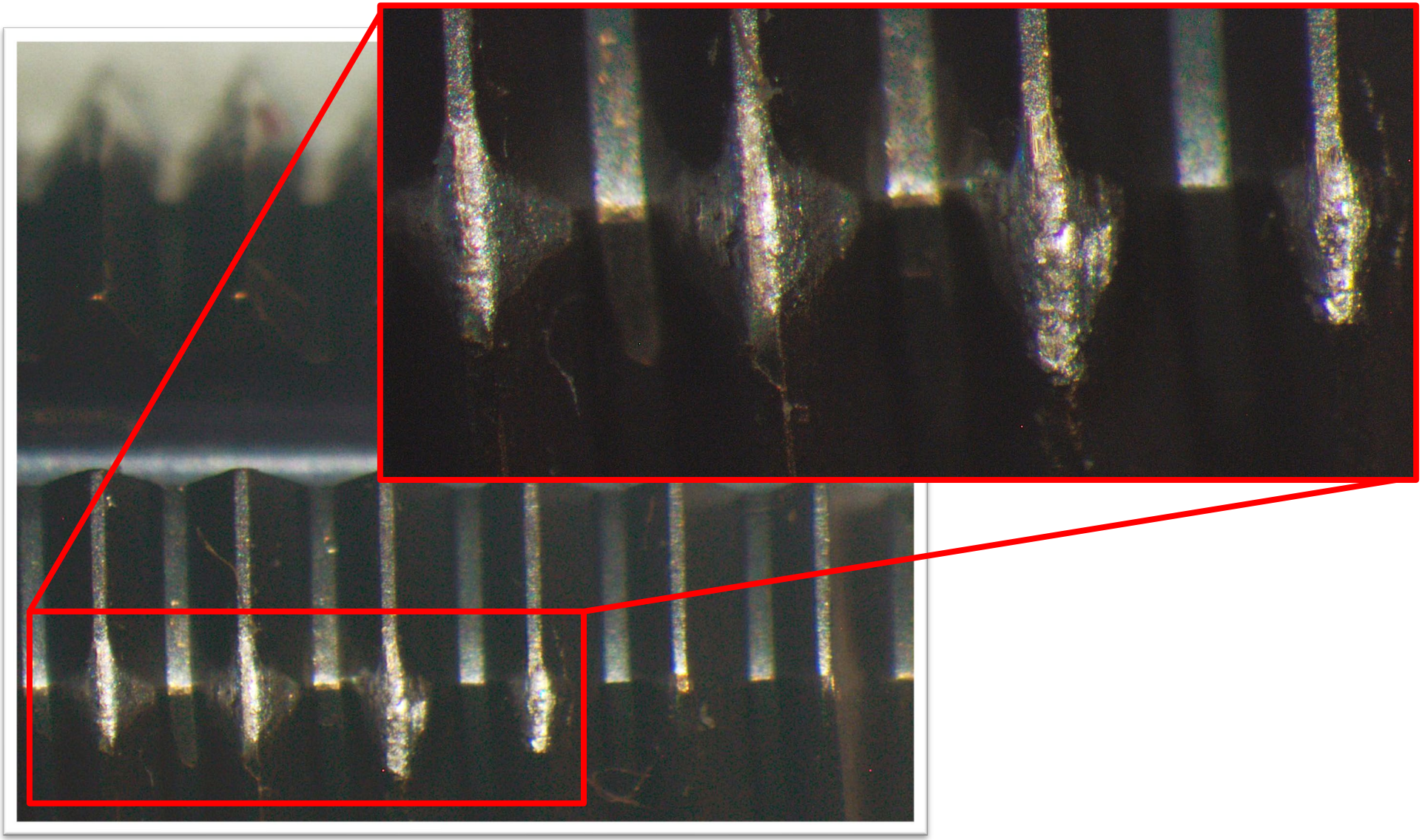
Condition:

A	Annealed
CD	Cold drawn
H	Precipitation hardened
HR	Hot rolled
N	Normalized
Q and T	Quenched and tempered
ST	Solution treated
ST and A	Solution treated and aged
HB	Brinell hardness number

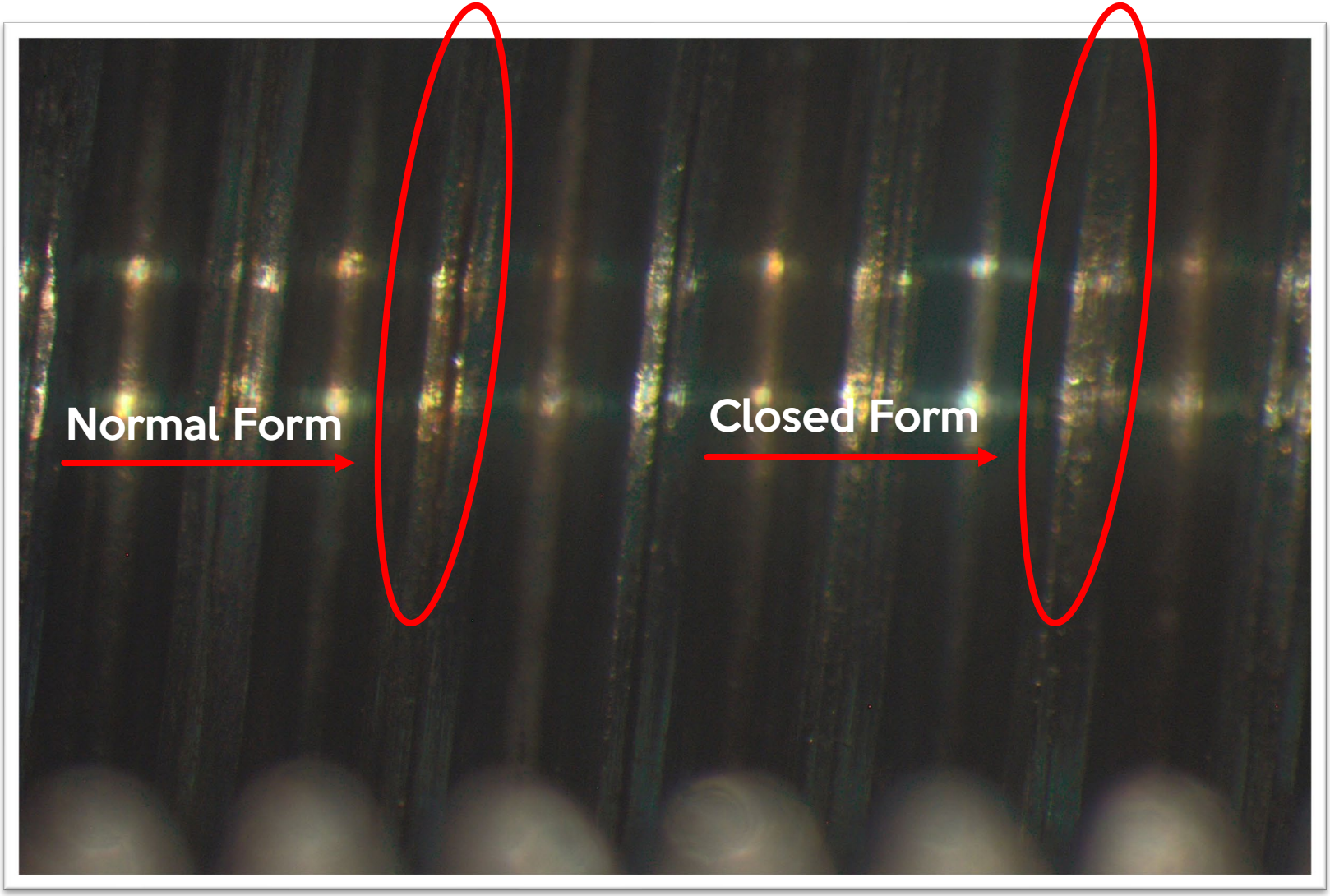
Coolant

		ADVANTAGES	DISADVANTAGES
BEST	Straight Oils	Excellent lubricity, good rust protection and sump life; easy maintenance; rancid resistance	Poor heat dissipation; increased risk of fire; limited to low-speed cutting
BETTER	Soluable oils	Good lubrication; improved cooling capacity; limited to light and medium-duty applications	More susceptible to rust problems and bacterial growth; tramp-oil and evaporation losses
GOOD	Synthetics	Excellent microbial control and rancid resistance; relatively nontoxic; good cooling qualities; easy maintenance; long service life; heavy-duty cutting	Reduced lubricity; may cause misting, foaming and dermatitis; may emulsify tramp oil; easily contaminated by other machine fluids
GOOD	Semi-Synthetics	Good microbial control and rancid resistance; relatively nontoxic; superior cutting qualities; easy maintenance; long service life	Water hardness affects stability; may emulsify tramp oil; easily contaminated by other machine fluids

Trouble Shooting



Trouble Shooting



JARVIS
CUTTING TOOLS

CONTACT