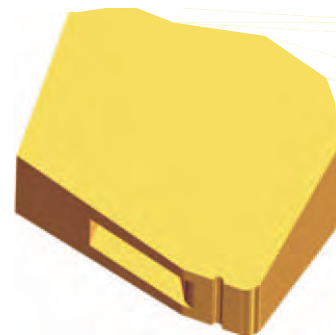
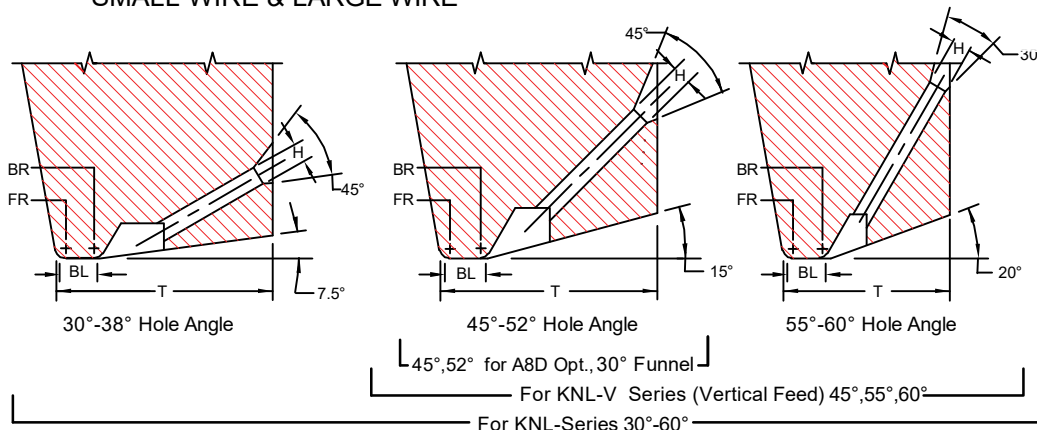


# SERIES KNL & KNL-V

## SMALL WIRE & LARGE WIRE

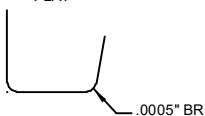
FOR AUTOMATIC BONDERS



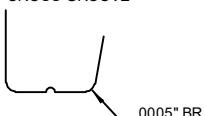
Available Vertical Hole Ø marked with X

	TD		TDF		For Vertical Hole
	in.	mm	in.	mm	
1/16	.0624	1.59	.0460	1.17	
1/16	.0624	1.59	.0590	1.50	X
	.0784	1.99	.0630	1.60	
3/32	.0784	1.99	.0720	1.83	X
	.0937	2.38	.0880	2.24	X
1/8	.1180	3.00	.0985	2.50	
	.1249	3.17	.0937	2.38	
1/8	.1249	3.17	.1180	3.00	

FLAT



CROSS GROOVE



We recommend a .0005" back radius and a cross groove or a flat bond foot when ordering tools for gold wire thermosonic bonding. For more gold wire application information see Tech Tip

### KNL-SERIES SMALL WIRE

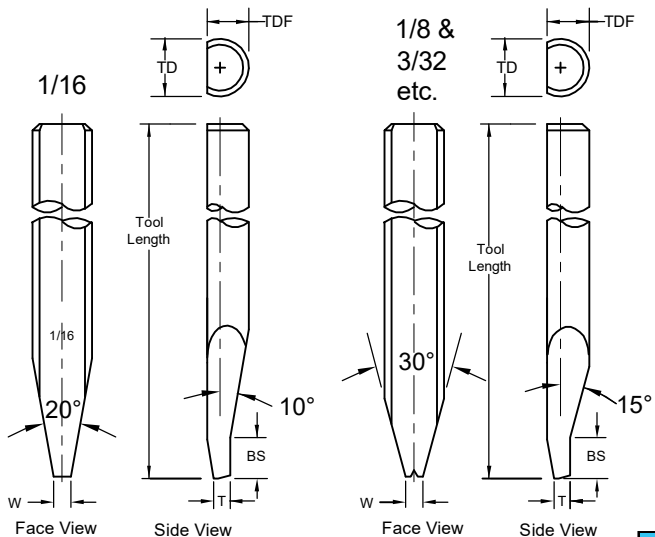
.0005" through .0020" wireØ

### KNL-SERIES LARGE WIRE

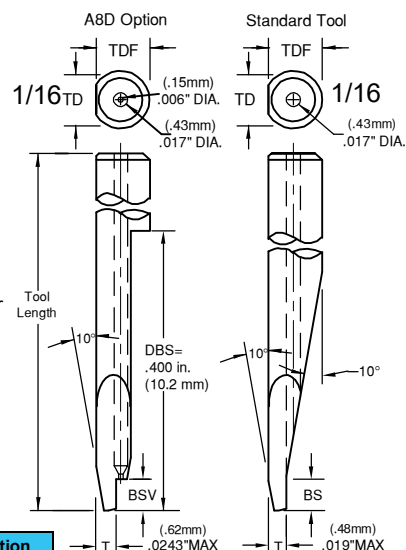
For wire diameters .0030" through .0160"

### KNL-V SERIES VERTICAL FEED DEEP ACCESS

.0005" through .0020" wireØ



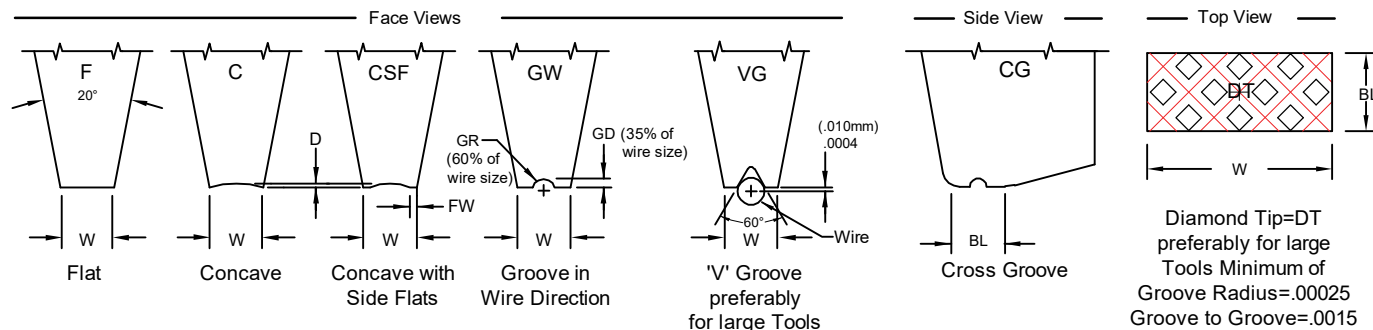
**NOTE:** We recommend our A8D option for enhanced wire control. Our standard vertical feed has slightly more clearance but less wire control. See in **Tool Options** for illustration. To order just add A8D in space 11. Not suitable for F&K and H&K machine



Standard: Ø 1/16, 45° to 52° Hole Angle : BS"=.045" (1.14mm).  
Supplies only to Standard size Ø1/16, larger tool Ø are different.  
Standard: (BS) supplied unless otherwise specified. See Tool Options #A3

Hole Angles Available with A8D Option		
Hole Angle	BSV	
	in.	mm
45°	.035	.89
52°	.050	1.27

Standard: Ø1/16 45° to 52° Hole Angle :  
BS"=.045" (1.14mm)  
Standard: (BS) supplied unless otherwise specified. See Tool Options  
No Front Angle if T=MAX



Diamond Tip=DT preferably for large Tools Minimum of Groove Radius=.00025 Groove to Groove=.0015

# SERIES KNL & KNL-V

SMALL WIRE & LARGE WIRE

ORDERING INFORMATION  
SMALL WIRE BONDING WEDGES  
FOR GOLD AND ALUMINUM WIRE

SAMPLE PART NUMBER: **M-KNL-O-X-1/16-1-45-CG-2020-M-\***

SYMBOL EXPLANATION: 1 2 3 4 5 6 7 8 9 10 11

1. MATERIAL: \_\_\_\_\_  
 M = Ceramic  
 C = Tungsten Carbide  
 T = Titanium  
 All other: See Material Selection Guide
2. SERIES: **KNL**
3. WIRE FEED: **O** = Standard Feed  
 V = Vertical Feed
4. FRONT/BACK RADIUS: See Radius Option Chart  
 \*For special Radius sizes insert an X Please specify FR/BR
5. SHANK DIA.: Please Specify Diameter \_\_\_\_\_
6. TOOL LENGTH: Please Specify Length \_\_\_\_\_
7. HOLE ANGLE: for KNL (30°, 38°, 45°, 55°, 52°, 60°), for KNL-V (45°, 55°, 60°)  
 for KNL-V with A8D Opt.(45°, 52°)

(11) See Tool Option

(10) FOOT FINISH:

- M = Matte finish (FR, BR, & Bond Flat)
- P = Polish finish (FR, BR, & Bond Flat)
- MP = Polish finish (FR, BR), and Matte finish (Bond Flat)

(9) TOOL SIZE: See Standard Chart

(8) FOOT TYPE:

- F = Flat
- C = Concave
- CSF = Concave with Side Flats  
(CSF not available with ceramic tools)
- CG = Cross Groove
- GW = Groove in wire direction  
(Please specify wire size)
- DT = Diamond Tip (Please specify Ribbon size)
- VG = V Groove (Please specify wire size)

\*NOTE: Please specify for either guillotine cut or tension break.

On V-groove tools the bond length (BL) is the same as the foot length (FL).

For special sizes or dimensions insert an (X) in the appropriate position of the part number then specify what (X) equals.

Example: M-KNL-O-X-1/16-3/4-45-CG-2020-M (X) FR=.0012, BR=.0007

RADIUS OPTION CHART	OPTION LETTER		A	B	C	D	E	F	G	H	I	J	K	L	M	N
	FRONT RADIUS	in.	.0005	.0005	.0010	.0010	.0010	.0015	.0015	.0015	.0015	.0020	.0020	.0020	.0020	.0020
	BACK RADIUS	in.	0	.0005	0	.0005	.0010	0	.0005	.0010	.0015	0	.0005	.0010	.0015	.0020
		μ	13	13	25	25	25	38	38	38	38	51	51	51	51	51

For Vertical Feed: Tmax. for Dia. 1/16 = .0190 and for A8D: Tmax.=.0243, Supplies only to Standard size Ø1/16, larger tool Ø are different.

STANDARD CHART		KNL SMALL WIRE: FOR WIRE DIAMETERS .0005" THROUGH .0020"											
TS	H	BL	D	T(30°38°)	T(45° 52°)	T(55° 60°)	W	SUGGESTED WD					
Units	in. μ	in. μ	in. μ	in. μ	in. μ	in. μ	in. μ	in. μ	in. μ				
Tolerance	±.0002 ±5	±.0002 ±5	-.0001 -2.5	±.0005 ±13	±.0005 ±13	±.0005 ±13	±.0005 ±13	±.0005 ±13	±.0005 ±13				
1505	.0015 38	.0005 13	.0002 5	.0140 356	.0120 305	.0100 254	.0025 64						
1507	.0015 38	.0007 18	.0002 5	.0140 356	.0125 318	.0100 254	.0025 64	.0005	13				
1510	.0015 38	.0010 25	.0002 5	.0140 356	.0130 330	.0100 254	.0025 64						
1513	.0015 38	.0013 33	.0002 5	.0140 356	.0130 330	.0110 279	.0025 64	.0007	18				
1515	.0015 38	.0015 38	.0002 5	.0150 381	.0130 330	.0110 279	.0025 64						
1520	.0015 38	.0020 51	.0002 5	.0150 381	.0140 356	.0110 279	.0025 64						
Tolerance	±.0002 ±5	±.0002 ±5	-.0001 -2.5	±.0005 ±13	±.0005 ±13	±.0005 ±13	±.0005 ±13	±.0002 ±5					
2010	.0020 51	.0010 25	.0002 5	.0160 406	.0140 356	.0120 305	.0040 102						
2015	.0020 51	.0015 38	.0002 5	.0160 406	.0140 356	.0120 305	.0040 102	.0007	18				
2020	.0020 51	.0020 51	.0002 5	.0170 432	.0150 381	.0130 330	.0040 102						
2025	.0020 51	.0025 64	.0002 5	.0170 432	.0150 381	.0130 330	.0040 102	.0010	25				
2030	.0020 51	.0030 76	.0002 5	.0180 457	.0150 381	.0140 356	.0040 102						
2520	.0025 64	.0020 51	.0002 5	.0170 432	.0150 381	.0140 356	.0040 102						
2525	.0025 64	.0025 64	.0002 5	.0180 457	.0160 406	.0140 356	.0040 102						
2530	.0025 64	.0030 76	.0002 5	.0180 457	.0170 432	.0150 381	.0050 127	.0013	33				
2535	.0025 64	.0035 89	.0002 5	.0180 457	.0170 432	.0150 381	.0050 127						
2540	.0025 64	.0040 102	.0002 5	.0190 483	.0170 432	.0160 406	.0050 127						
3020	.0030 76	.0020 51	.0003 8	.0200 508	.0170 432	.0150 381	.0050 127						
3025	.0030 76	.0025 64	.0003 8	.0200 508	.0170 432	.0150 381	.0050 127						
3030	.0030 76	.0030 76	.0003 8	.0200 508	.0180 457	.0160 406	.0050 127	.0015	38				
3035	.0030 76	.0035 89	.0003 8	.0210 533	.0180 457	.0160 406	.0050 127						
3040	.0030 76	.0040 102	.0003 8	.0210 533	.0190 483	.0170 432	.0050 127						
3525	.0035 89	.0025 64	.0003 8	.0220 559	.0190 483	.0170 432	.0060 152						
3530	.0035 89	.0030 76	.0003 8	.0220 559	.0200 508	.0180 457	.0060 152						
3535	.0035 89	.0035 89	.0003 8	.0230 584	.0200 508	.0180 457	.0060 152	.0020	51				
3540	.0035 89	.0040 102	.0003 8	.0230 584	.0210 533	.0190 483	.0060 152						
3545	.0035 89	.0045 114	.0003 8	.0240 610	.0210 533	.0190 483	.0060 152						
3550	.0035 89	.0050 127	.0003 8	.0240 610	.0220 559	.0200 508	.0060 152						

STANDARD CHART		KNL LARGE WIRE: FOR WIRE DIAMETERS .0030" THROUGH .0160"											
TS	H	BL	D	T(30°38°)	T(45° 52°)	T(55° 60°)	W	SUGGESTED WD					
Units	in. μ	in. μ	in. μ	in. μ	in. μ	in. μ	in. μ	in. μ	in. μ				
Tolerance	±.0005 ±13	±.0005 ±13	-.0001 -2.5	±.0010 ±25	±.0010 ±25	±.0010 ±25	±.0010 ±25	±.0010 ±25	±.0010 ±25				
4560	.0045 114	.0060 152	.0006 15	.0340 864	.0310 787	.0260 660	.0075 191	.0030	76				
6008	.0060 152	.0080 203	.0008 20	.0390 991	.0340 864	.0290 737	.0100 254	.0040	102				
7510	.0075 191	.0100 254	.0010 25	.0450 1143	.0410 1041	.0350 889	.0125 318	.0050	127				
0912	.0090 229	.0120 305	.0012 30	.0520 1321	.0490 1245	.0410 1041	.0150 381	.0060	152				
Tolerance	±.0005 ±13	±.0010 ±25	±.0002 ±5	±.0010 ±25	±.0010 ±25	±.0010 ±25	±.0010 ±25	±.0010 ±25					
01014	.0105 267	.0140 356	.0014 36	.0650 1651	.0540 1372	.0450 1143	.0175 445	.0070	178				
01215	.0120 305	.0150 381	.0016 41	.0680 1727	.0560 1422	.0460 1168	.0200 508	.0080	203				
01518	.0150 381	.0180 457	.0020 51	.0720 1829	.0640 1626	.0600 1524	.0250 635	.0100	254				
01820	.0180 457	.0200 508	.0024 61	.0900 2286	.0800 2032	.0690 1753	.0300 762	.0120	305				
02122	.0210 533	.0220 559	.0028 71	.0980 2489	.0820 2083	.0700 1778	.0350 889	.0140	356				
02424	.0240 610	.0240 610	.0032 81	.1100 2794	.0930 2362	.0830 2108	.0400 1016	.0160	406				

\*Other sizes available upon request \*All dimensions and tolerances are for reference only

TOOL SIZE=TS, WIRE DIAMETER=WD "T" To be determined according to the size of FR and BR and Hole Bore Length