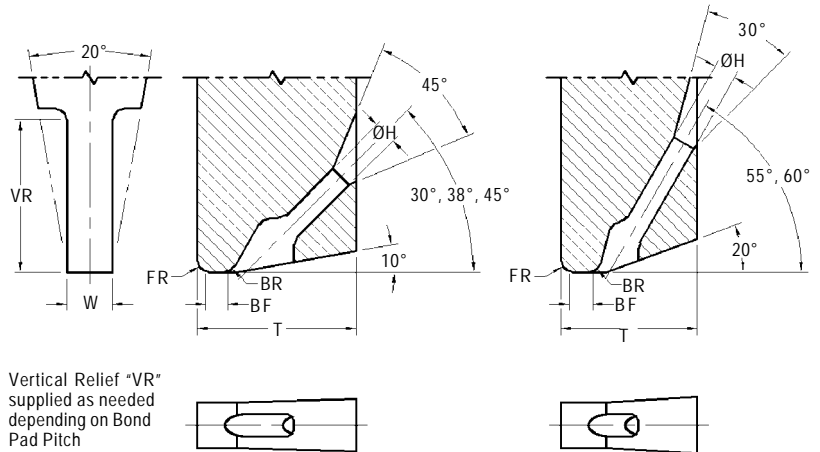
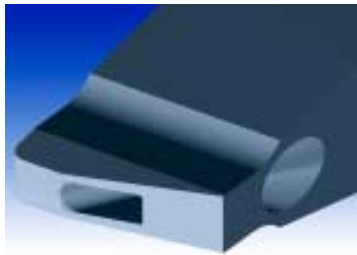
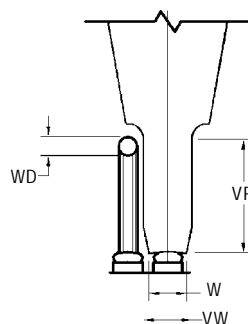


# FP SERIES - FINE PITCH BONDING TOOL

There are a number of technical challenges unique to fine pitch wire-bond process. It includes a broad mix of component technologies. A typical package may contain 200 different components ranging in size from (.008 inch X .008 inch) and .004 inches thick to (.500 inch X .500 inch). The sheer number of different sized chips and tight chip-to-chip spacing create problems in accessing the bond pads. Fine pitch wire-bonding is of particular importance in the manufacturing of these devices. Fine pitch is defined as 100 microns or less center-to-center distances between bond pads. Many devices use the latest high performance chips that typically include 4 mil pitch bond pads. Innovations in tool configurations, machine vision systems and wire-bonding ultrasonics have been critical to improved fine pitch wedge bonding



STANDARD DIMENSIONS									
Tool Styles	Wire Feed Angle	Hole / Bond Flat	Hole H in / $\mu\text{m}$ $\pm .00015 / 3.8$	Bond Flat BF in / $\mu\text{m}$ $\pm .00015 / 3.8$	Foot Width W in / $\mu\text{m}$ $\pm .0002 / 5$	Tip Thickness T 30° in / $\mu\text{m}$ $\pm .0005 / 13$	Tip Thickness T 38°/45° in / $\mu\text{m}$ $\pm .0005 / 13$	Tip Thickness T 55°/60° in / $\mu\text{m}$ $\pm .0005 / 13$	Useable Wire Diameter in / $\mu\text{m}$
FP30	30°	1507	.0015 / 38	.0007 / 18	.0030 / 76	.0140 / 356	.0140 / 356	.0120 / 305	.0005 / 13 through .0008 / 20
		1510	.0015 / 38	.0010 / 25	.0030 / 76	.0140 / 356	.0140 / 356	.0120 / 305	
		1515	.0015 / 38	.0015 / 38	.0030 / 76	.0140 / 356	.0140 / 356	.0120 / 305	
		1520	.0015 / 38	.0020 / 51	.0030 / 76	.0140 / 356	.0140 / 356	.0120 / 305	
FP38	38°	2010	.0020 / 51	.0010 / 25	.0030 / 76	.0150 / 381	.0140 / 356	.0140 / 356	.0008 / 20 through .0010 / 25
		2015	.0020 / 51	.0015 / 38	.0030 / 76	.0150 / 381	.0140 / 356	.0140 / 356	
FP45	45°	2020	.0020 / 51	.0020 / 51	.0030 / 76	.0150 / 381	.0140 / 356	.0140 / 356	.0010 / 25 through .0013 / 33
		2025	.0020 / 51	.0025 / 64	.0030 / 76	.0190 / 483	.0140 / 356	.0140 / 356	
FP55	55°	2520	.0025 / 64	.0020 / 51	.0040 / 102	.0190 / 483	.0140 / 356	.0140 / 356	.0015 / 38 through .0020 / 51
		2525	.0025 / 64	.0025 / 64	.0040 / 102	.0190 / 483	.0140 / 356	.0140 / 356	
FP60	60°	2530	.0025 / 64	.0030 / 76	.0040 / 102	.0190 / 483	.0140 / 356	.0140 / 356	.0015 / 38 through .0020 / 51
		3025	.0030 / 76	.0025 / 64	.0040 / 102	.0200 / 508	.0190 / 483	.0170 / 432	
		3030	.0030 / 76	.0030 / 76	.0040 / 102	.0200 / 508	.0190 / 483	.0170 / 432	
		3035	.0030 / 76	.0035 / 89	.0040 / 102	.0200 / 508	.0190 / 483	.0170 / 432	.0020 / 51



VR Set "A" 70 $\mu\text{m}$  to 80 $\mu\text{m}$  BPP  
W = .0030", VW = .0040", VR = .0060"

VR Set "B" 60 $\mu\text{m}$  to 70 $\mu\text{m}$  BPP  
W = .0025", VW = .0030", VR = .0060"

VR Set "C" 50 $\mu\text{m}$  to 60 $\mu\text{m}$  BPP  
W = .0020", VW = .0025", VR = .0060"  
Max HW = .0015", for WD = .0010" or less  
Oval Hole

## FP SERIES - GENERAL GUIDELINES ON HOW TO ORDER

STYLE	FEED ANGLE
FP = Fine Pitch Standard Design	30°, 38°, 45°, 55°, 60°

RADIUS SET	Wire Material	Wire Diameter	Hole Size	FR ± .0001/3	BR ± .0001/3
A	Aluminum / Gold	.0010 / 25 - .0015 / 38	.0015 / 38 - .0030 / 76	.0010 / 25	.0010 / 25
B	Gold	.0010 / 25 - .0015 / 38	.0015 / 38 - .0030 / 76	.0010 / 25	.0006 / 15
B	Aluminum	.0007 / 18 - .0010 / 25	.0015 / 38 - .0020 / 51	.0010 / 25	.0006 / 15
C	Gold	.0005 / 13 - .0010 / 25	.0015 / 38 - .0020 / 51	.0004 / 10	.0004 / 10

	MATERIAL	HOLE / BOND FLAT	TOOL LENGTH (TL)
<b>C</b>	Cermet composite for Gold Wire (recommended for Low Temperature bonding)	Will rely on specific application requirements (wire diameter used, bond pad size) – see dimension Table * For Oval Hole options please specify HH (Hole Height) & HW (Hole Width)	S = .437 / 11.1 mm
<b>TI</b>	Titanium Carbide Composite for Gold Wire		¾ = .750 / 19.05 mm
<b>W</b>	Tungsten Carbide Ultra Fine Grain for Aluminum Wire		L = .828 / 21.0 mm
			1.00 = 1.00 / 25.4 mm Longer lengths are available consult Bonder manufacturer for specifications.

FOOT OPTIONS	
<b>C</b>	Concave foot design with polished FR and BR with fine matte finish on BF (matte most commonly used with <i>Aluminum wire</i> ) for best results specify when the BF is greater than .0015"/38µm.
<b>CM</b>	Concave foot design with FR, BR and BF matte (for <i>Aluminum and Gold wire</i> )
Flat (Optional)	
<b>FM</b>	Flat foot design FR, BR and BF are matte (for <i>Gold Wire</i> ) or wire diameter less than .0013"/33µm and BF is less than .0015"/38µm
<b>CGM</b>	Cross Groove with FR and BR matte (for <i>Gold Wire</i> ) with a matte Flat BF. Most commonly used on manual and semi automatic bonders where pad size restrictions is not an issue. Not recommended for BF smaller than .0020"/50µm
<b>CCM</b>	Cross Groove with FR and BR matte (for <i>Gold Wire</i> ) with a matte Concave BF. Most commonly used on automatic bonders where wire control is critical and pad size is limited. Not recommended for BF smaller than .0020"/50µm

HOW TO ORDER	
<b>SPECIFY</b>	<b>Style/Radius Set – Material – Hole/Bond Flat – Tool Length – Foot Option</b> (For Fine Pitch application below 80µm BPP, refer to page 8 for VR sets to specify, otherwise specify VR and VW) or contact our technical support staff for assistance with your requirements. For Special Shank Style refer to page 61.
<b>EXAMPLE</b>	FP45A - W - 2020 - L - CM      180 - DEG - REV FP38B - TI - 1515 - ¾ - FM      VR = Set B FP60B - C - 2025 - L - CGM      VR = Set A FP55B-TI-1520-3/4-CGM      HH = .0020 HW=.0015 VR Set C