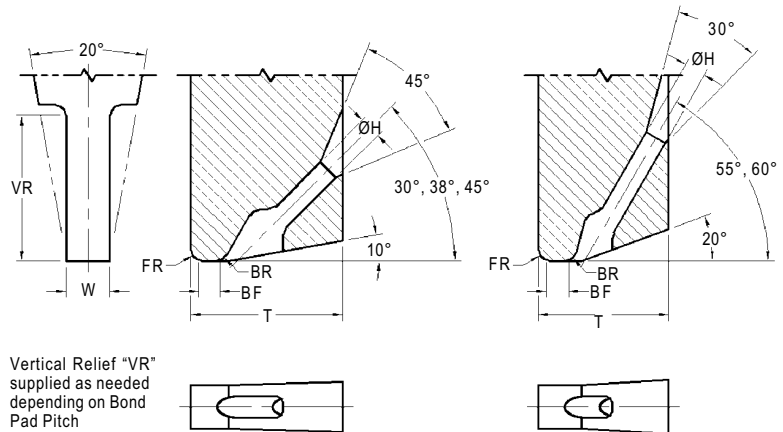
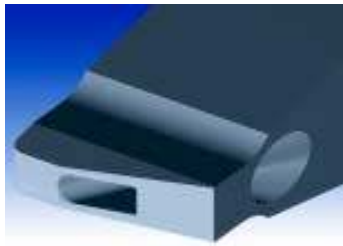
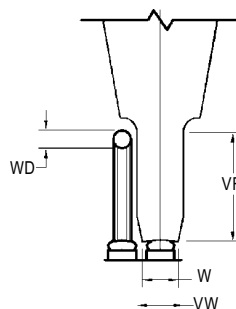


FP SERIES - FINE PITCH BONDING TOOL

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 / μm $\pm .00015/3.8$	Bond Flat BF in / μm $\pm .00015/3.8$	Foot Width W in / μm $\pm .0002/5$	Tip Thickness T 30° in / μm $\pm .0005/13$	Tip Thickness T 38°/45° in / μm $\pm .0005/13$	Tip Thickness T 55°/60° in / μm $\pm .0005/13$	Useable Wire Diameter in / μm
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	



VR Set "A" 70 μm to 80 μm BPP
W = .0030", VW = .0040", VR = .0060"

VR Set "B" 60 μm to 70 μm BPP
W = .0025", VW = .0030", VR = .0060"

VR Set "C" 50 μm to 60 μm 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)
C	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
TI	Titanium Carbide Composite for Gold Wire		¾ = .750 / 19.05 mm
W	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.

SMALL WIRE
BONDING TOOLS

FOOT OPTIONS	
C	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.
CM	Concave foot design with FR, BR and BF matte (for <i>Aluminum and Gold wire</i>)
Flat (Optional)	
FM	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
CGM	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
CCM	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	
SPECIFY	Style/Radius Set – Material – Hole/Bond Flat – Tool Length – Foot Option (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.
EXAMPLE	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