MATRIX TECHNOLOGIES PTE LTD
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Singapore 567760

Tel: +65 6484 1007 Fax: +65 6484 2898
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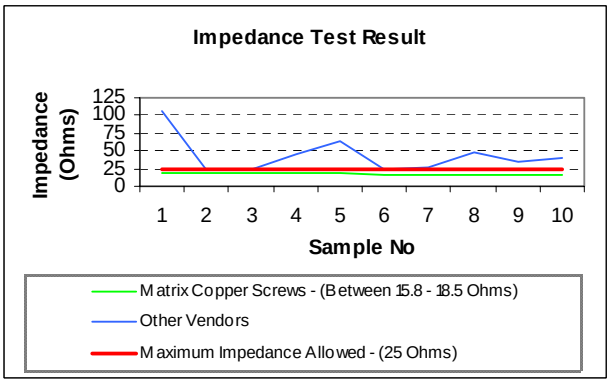
PRECISION TOOLING CENTER

106 Series – Wire Bond Clamps
COPPER CAP SCREWS (HEXAGONAL SOCKET HEAD)



A. SPECIAL SELECTED ALLOY MATERIAL AND CALIBRATED HARDNESS
Our alloy screws material are specially selected and treated to a desirable hardness whereby the screws will not break easily during wire bonding. These cap screws are able to withstand torque force up to 3.5 kgf-cm.

B. SPECIFIED COPPER PLATING
A specified minimum layer of copper is introduced over our alloy screws to maintain consistency in bonding impedance. The copper cap screw has to be replaced once it is used.

C. ENGAGEMENT LENGTH
Sharp corners and special engagement length are carefully studied and tested for maximizing the gripping contact between the screws and the torque wrench. Customers are advised to tighten the cap screws at 2.0 kgf-cm with the torque wrench. Please contact us for suitable driver bit and torque wrench.

D. ENDORSEMENT
Our copper cap screws are tested and recognized by a reputable wire-bond machine supplier and used by customers worldwide.

Ordering Code	Description	M/C Model	Additional		
			Spacer	Bush	Nut
106 - 04 - 0001	Copper Cap Screw, #080 X 4.06; OD=2.4 mm	ASM / DELVOTEC	NA	NA	NA
106 - 04 - 0002	Copper Cap Screw, M1.6 X 3.8; OD=3.4 mm	K&S 8020/8028	106 - 04 - 0002 - 1	106 - 04 - 0002 - 2	106- 04 – 0002 - 3
106 - 04 - 0003	Copper Cap Screw, #080 X 1/8"; OD=2.4 mm	ESEC	NA	NA	NA
106 - 04 - 0004	Copper Cap Screw, M2.0 X 4.0; OD=2.8 mm	KAIJO 118	NA	NA	NA
106 - 04 - 0005	Copper Cap Screw, M1.6 X 5.8; OD=2.8 mm	KAIJO 128	NA	NA	NA
106 - 04 - 0006	Copper Cap Screw, M1.6 X 4.9; OD=2.8 mm	SHINKAWA	NA	NA	NA
106 – 04 - 0007	Copper Cap Screw, M1.6 X 4.5; OD=2.4 mm	K&S 1488	NA	106 - 04 - 0002 - 2	106- 04 - 0007 - 3

Please contact us for other machine models not shown above

TECHNICAL REPORT ON COPPER CAP SCREWS

Ultrasonic coupling between capillary and transducer-horn is of major importance in order to maximize energy transfer to the bond interface. The coupling is achieved by proper clamping of the capillary into the transducer-horn opening. When ultrasonic energy flows through the transducer-horn to the capillary tool, several modes of vibration can occur. These modes of vibration (extensional, radial, torsional, etc) act as stress inducers that can reduce the coupling of the tool to the transducer-horn system. In order to maintain this coupling a clamping screw is normally used.

The screw material plays a significant role in dealing with the multiple vibratory modes present during the time ultrasonic energy flows to transducer tip (bonding cycle). Copper has been used as good dampening material to absorb stresses induced by ultrasonic energy and its vibratory modes, It is also capable of maintaining proper clamping torque during the extensive cycling imposed by wire bonder.

The reason for all the above characteristic is the " Young Modulus Value". A harder material will transfer such vibratory stress to the crest of the threads creating potential and premature damage to the clamping capabilities of the transducer-horn system. Thread will wear sooner, reducing torque and causing poor energy transfer, which is usually detected as a change of impedance. This change will impact the bond integrity directly.

(Extracted from a reputable capillary tool supply company)

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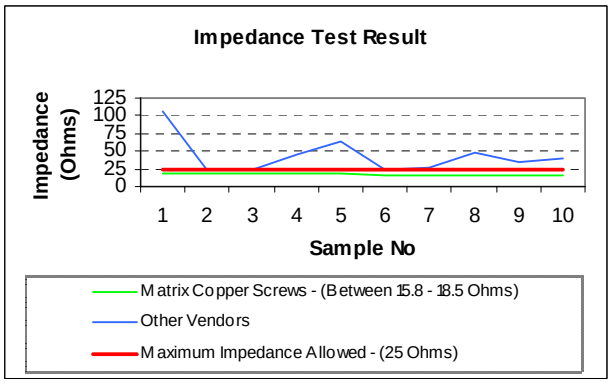
PRECISION TOOLING CENTER

106 Series – Wire Bond Clamps
COPPER CAP SCREWS (TORX® SOCKET HEAD)



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B. SPECIFIED COPPER PLATING

A specified minimum layer of copper is introduced over our alloy screws to maintain consistency in bonding impedance. The copper cap screw has to be replaced once it is used.

C. TORX® ENGAGEMENT

To prevent operators/technicians using an allen key to tighten the capillary transducer when torque wrench is not available. Usually a lot of production downtime and cost are lost while setting up a new capillary transducer horn when the cap screws ceased or broken. Customers are advised to tighten the cap screws at 2.0 kgf-cm with the torque wrench.

D. ENDORSEMENT

Our copper cap screws are tested and recognized by a reputable wire-bond machine supplier and used by customers worldwide.

Ordering Code	Description	M/C Model	Additional		
			Spacer	Bush	Nut
106 – 05 - 0001	TORX® Cap Screw, #080 X 4.06; OD=2.4 mm	ASM / DELVOTEC	NA	NA	NA
106 – 05 - 0002	TORX® Cap Screw, M1.6 X 3.8; OD=3.4 mm	K&S 8020/8028	106 - 05 - 0002 - 1	106 - 05 - 0002 - 2	106- 05 – 0002 - 3
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(Extracted from a reputable capillary tool supply company)

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PRECISION TOOLING CENTER

107 Series – Wire Bond Clamps
TONICHI TORQUE WRENCH AND DRIVER BITS

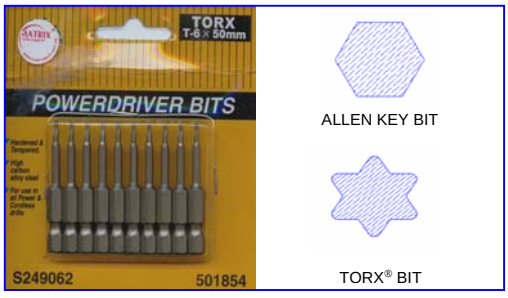
Torque wrench is used to tighten the capillary into transducer horn to avoid over torque. Over torque resulting the cap screw broken or ceased . Production downtime and cost is lost due to ceased of cap screw.

To tighten the copper screw at 2.0 kgf.cm, Tonichi Torque Driver with Rotary Slip and Micrometer Adjustable model (3RTD) is suitable. It has capacity 0.4 to 3.0 kgf.cm with graduation 0.02 kgf.cm. Bits are optional. For this purpose TORX® 6 is suitable for TORX® socket head and A/F: 1.26; A/F: 1.57 suit to hexagonal socket head. All bits have 1/4" hexagonal shank.

Ordering Code	Description
107 – 0001 – 01	TONICHI Rotary Torque Driver (3RTD)
107 – 0002 – 01	TORX® 6 bit with ¼" hexagonal shank
107 – 0002 – 02	Hexagonal bit A/F 1.26 with ¼" hexagonal shank
107 – 0002 – 03	Hexagonal bit A/F 1.57 with ¼" hexagonal shank

P/N 107-0001-01

VARIOUS TYPES OF DRIVER BIT



ALLEN KEY BIT AND TORX® BIT

♦ Please contact us for other sizes not shown above

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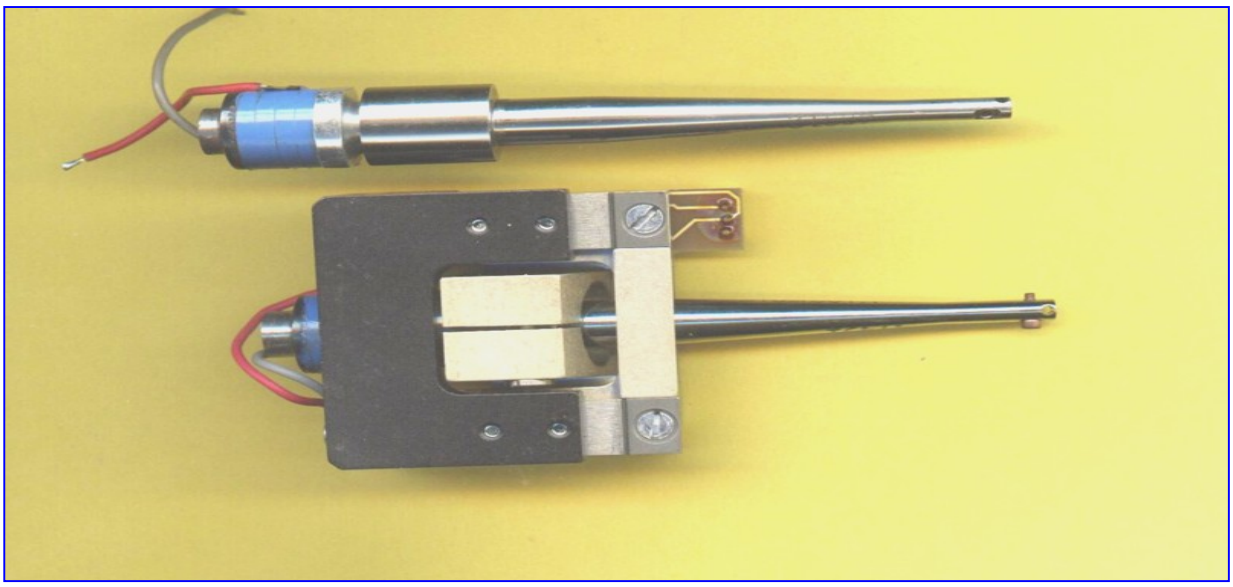
PRECISION TOOLING CENTER

107 Series - Wire-Bond Clamps
TRANSDUCER



Ordering Code	Machine Models	Reference
107 – 1001	ESEC 3006F	
107 – 1002	K&S 1488	
107 – 1003	K&S 1488 TURBO	
107 – 1004	K&S 8028	
107 – 1005	ASM, DELVOTEC, HITACHI	

♦ Please contact us for other machine models not shown above