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LABORATORY TEST REPORT:	**YB2-2715 CR**	REQUESTED BY:	**J.M. COMPAGNON**
DRAFTED BY:	**K. EILANDER**	DATES TESTED:	**Nov-2006**
RELEASED BY:	______________________ K. Eilander (Supervisor, Product Test Lab)	DATE:	**16-02-2007**

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SUBJECT: PIP Minitek R/A header solder performance

PURPOSE:
This report describes the solder performance of the Pin-in-paste Minitek R/A header according to the lead-free profile in TA-842 rev. H.

CONCLUSIONS:
All tested samples comply with the requirements.

SAMPLE DESCRIPTION:

Table 1: Test Sample Descriptions						
Item	Product Name	Part #	Lot #	# of samples	Base Mat'l	Plating
1	Minitek R/A shrouded header	10072354-G01-50LF	-	5	CuSn	min. 2 µm matte tin over min. 1.27 µm Ni
2	Minitek R/A unshrouded header	10072353-G01-25LF	-	5	CuSn	min. 2 µm matte tin over min. 1.27 µm Ni
3	Testboard holes ø0.8 mm	SK51010	12/06/01	10	FR4	SnPb

TEST DESCRIPTION:

Test Matrix: The tests performed are listed in table 2. The numbers in the columns indicate the sequence in which the tests were performed.

Table 2: Test sequence	
Test description	Group 1
Visual examination	1
Solder performance	
Reflow soldering	2
Visual examination	3

Visual examination – Samples were visually examined at a magnification of 10x for any evidence of workmanship defects and other damage that could be detrimental to the performance of the connectors. Furthermore the presence of discolouration, cracks, blistering etc. was checked.

Reflow soldering – Lead free solder paste ($Sn_{96.5}Ag_3Cu_{0.5}$) was applied to the test boards using a stencil with an aperture of 1.5x1.85 mm, a thickness of 0.150 mm and a paste depth of about 60%. Then the boards were submitted to a reflow profile according to TA-842.

Requirement: $T_{max} = 260\ ^{+0}/_{-5}$ °C

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Visual examination – Of each board the fillets were inspected from the outside and of one board a cross section had been made to evaluate the filling degree of the solder joints.

Requirement: Filling degree to be 100% from fillet to fillet (except for voids)

TEST RESULTS:

Visual examination – The samples showed warped walls, but this was not detrimental to the performance of the connectors. Furthermore no discoloration, cracks or blistering was detected.

Reflow profile – See the graph below.

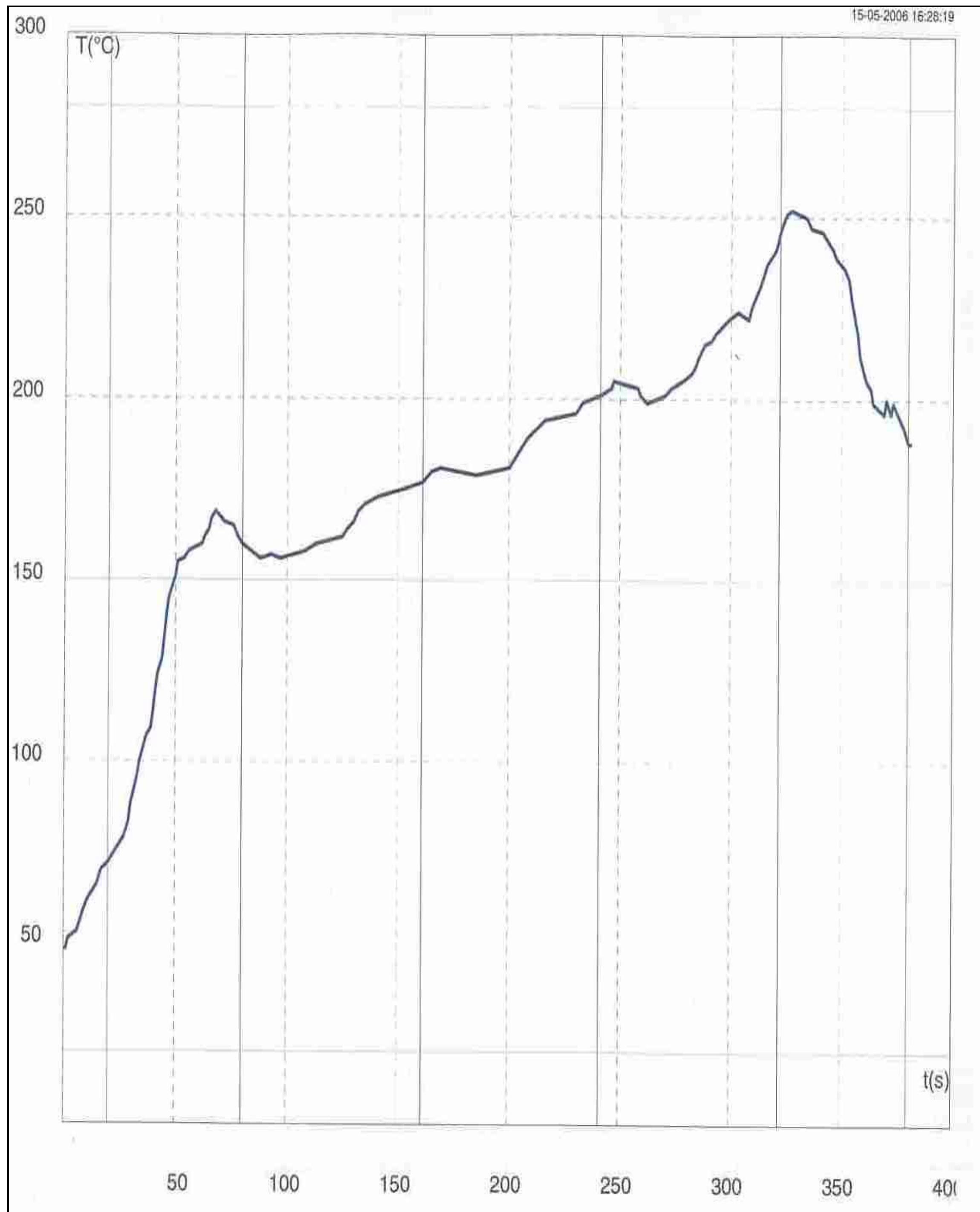

Figure 1: Reflow profile applied

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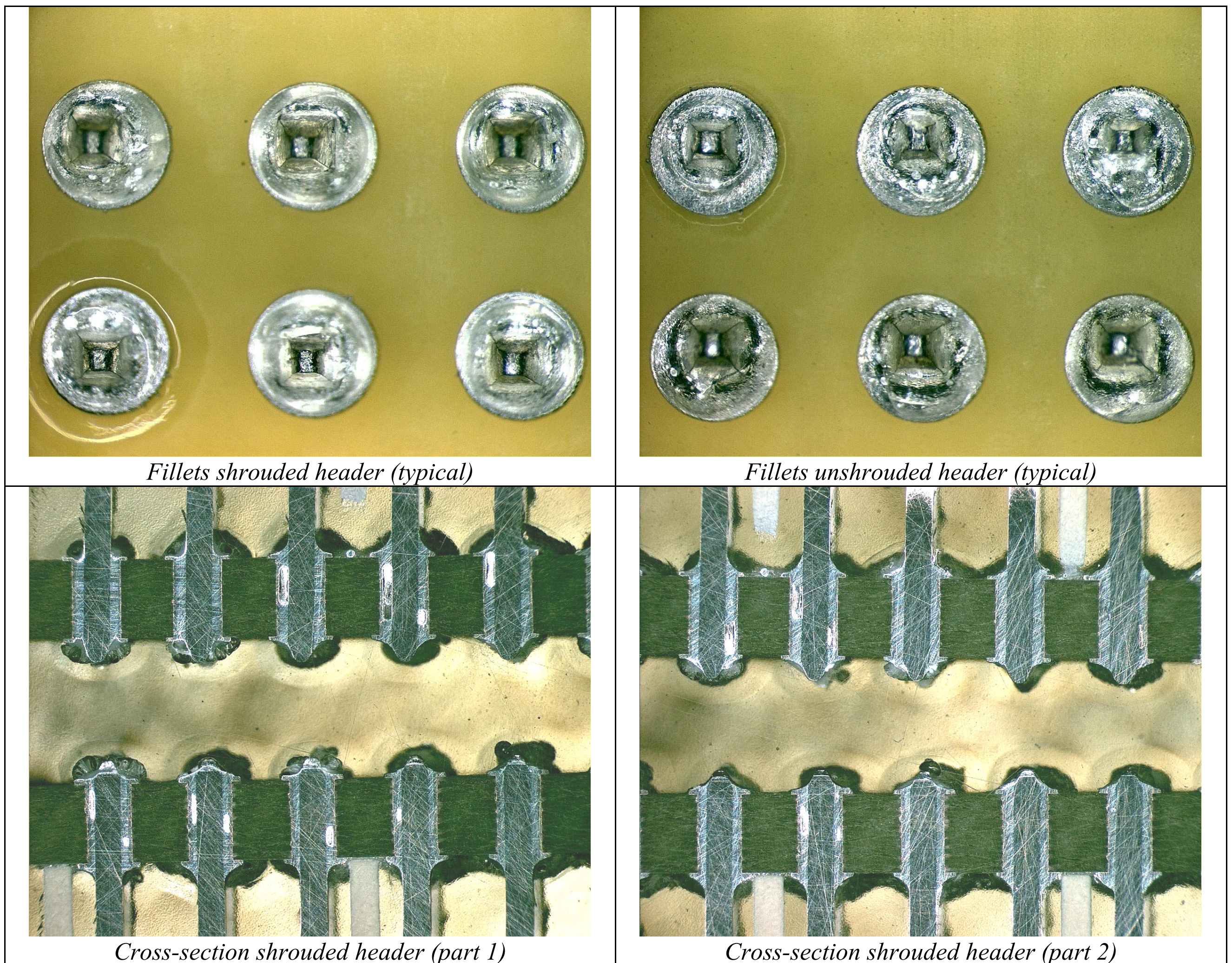
Visual inspection – The solder joints showed good fillets from the outside for both the shrouded and unshrouded version, see photos in fig. 2. In the cross sections, the filling was also good, the maximum possible. Only some joints show (sometimes large) voids. This is quite normal for lead free paste in a PIP solder process.



Fillets shrouded header (typical)	*Fillets unshrouded header (typical)*
Cross-section shrouded header (part 1)	*Cross-section shrouded header (part 2)*

Figure 2: photos of fillets and sections

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EQUIPMENT:

ITEM NAME	MANUFACTURERS NAME	CAL. NUMBER	CALIBRATION DUE DATE
Reflow oven	Dima SMRO 0403	U-003	09-11-2006
Stereo microscope	Leica MZ9.5	I-030	no cal. needed

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