DaimlerChrysler Ford GM

Part Submission Warrant

Part Name: 2.8mm, Blade Sealed | Cust. Part Number: 1F1T-14421-JA

Shown on Drawing No.: Tyco Customer Print | Org. Part Number: 1326031-5

Engineering Change Level: F | Dated: 17-Nov-2005

Additional Engineering Changes: N/A | Dated: N/A

Safety and/or Government Regulation: ☐ Yes ☑ No | Purchase Order No.: N/A | Weight (kg): 0.000215

Checking Aid Number: | Checking Aid Engineering Change Level: N/A | Dated: N/A

ORGANIZATION MANUFACTURING INFORMATION

TE CONNECTIVITY DIVISION
Supplier Name & Supplier/Vendor Code

233 Burgess Road Plant
Street Address

Greensboro | N.C. | 27409 | USA
City | Region | Postal Code | Country

CUSTOMER SUBMITTAL INFORMATION

NURSAN
Customer Name/Division

N/A
Buyer/Buyer Code

Various
Application

MATERIALS REPORTING

Has customer-required Substances of Concern information been reported? ☑ Yes ☐ No ☐ N/A

Submitted by IMDS or other customer format: 9413810 / 10

Are polymeric parts identified with appropriate ISO marking codes? ☐ Yes ☑ No ☐ N/A

REASON FOR SUBMISSION

- ☑ Initial submission
- ☐ Engineering Change(s)
- ☐ Tooling: Transfer, Replacement, Refurbishment, or additional
- ☐ Correction of Discrepancy
- ☐ Tooling Inactive > than 1 year
- ☐ Change to Optional Construction or Material
- ☐ Sub-Supplier or Material Source Change
- ☐ Change in Part Processing
- ☐ Parts produced at Additional Location
- ☐ Other - please specify

REQUESTED SUBMISSION LEVEL (Check one)

- ☐ Level 1 - Warrant only (and for designated appearance items, an Appearance Approval Report) submitted to customer.
- ☐ Level 2 - Warrant with product samples and limited supporting data submitted to customer.
- ☑ Level 3 - Warrant with product samples and complete supporting data submitted to customer.
- ☐ Level 4 - Warrant and other requirements as defined by customer.
- ☐ Level 5 - Warrant with product samples and complete supporting data reviewed at supplier's manufacturing location.

SUBMISSION RESULTS

The results for ☑ dimensional measurements ☑ material and functional tests ☐ appearance criteria ☐ statistical process package

These results meet all design record requirements: ☑ YES ☐ NO (If "NO" - Explanation Required)

Mold / Cavity / Production Process: Stamping Process

DECLARATION

I affirm that the samples represented by this warrant are representative or our parts, which were made by a process that meets all Production Part Approval Process Manual 4th Edition Requirements. I further affirm the these samples were produced at a production rate of 384, 000 /24 hours. I also certify that the documented evidence of such compliance is on file and available for review. I have noted any deviation from the declaration below.

EXPLANATION/COMMENTS:

Is each Customer Tool properly tagged and numbered? ☑ Yes ☐ No

Organization Authorized Signature: David Wilson | Date: 15-11-2014

Print Name: David Wilson | Phone No.: 336-665-4428 | Fax No.: 336-665-4571

Title: Quality | E-mail: dwwilson@tycoelectronics.com

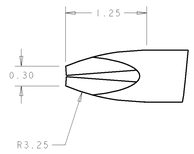
FOR CUSTOMER USE ONLY (IF APPLICABLE)

Part Warrant Disposition: ☐ Approved ☐ Rejected ☐ Other

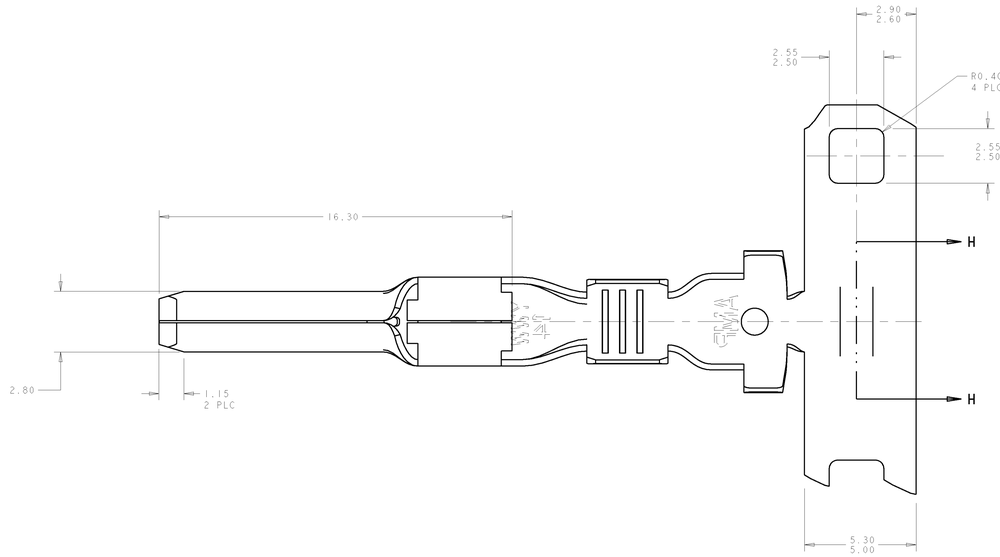
Customer Signature | Date

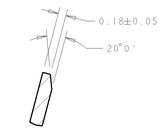
Print Name | Customer Tracking Number (optional)

Optional customer tracking number:

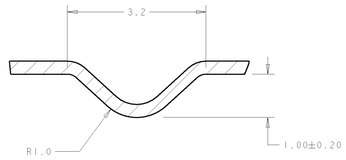


DETAIL **K**
SCALE 30:1

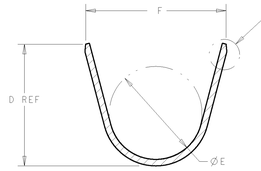




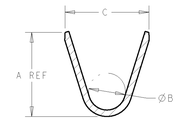
DETAIL **J**
SCALE 20:1
4 PLACES
TYPICAL



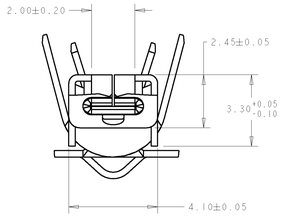
SECTION **H-H**
SCALE 20:1

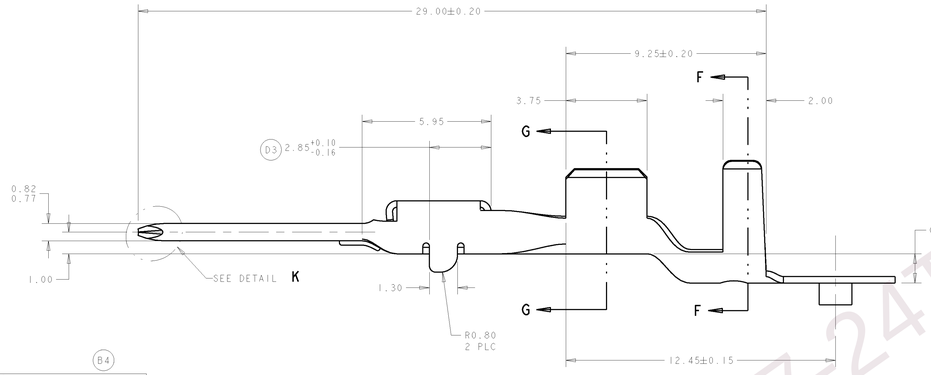


SECTION **F-F**



SECTION **G-G**





B4

TEMPERATURE SPECIFICATION REFERENCE FOR TERMINALS & COMPONENTS						
MAX TEMPERATURE = MAX TEMPERATURE RISE + MAX ENVIROMENTAL TEMPERATURE						
FORD PART NO.	IFIT-14421-EA	IFIT-14421-FA	IFIT-14421-GA	IFIT-14421-HA	IFIT-14421-JA	3F2T-14421-GA
MAX AMBIENT + MAX TEMP. RISE (degree C)	145°	145°	145°	145°	145°	145°

B3

G	F	E	D	C	B	A	GRIP SIZE	PART NO.	FORD PART NO.
0.90	5.0	3.40	4.11	2.5	0.90	2.11	22	1326031-1	IFIT-14421-EA
0.90	5.0	3.40	4.11	3.3	1.30	2.76	20	1326031-2	IFIT-14421-FA
1.10	5.6	3.80	4.54	3.3	1.30	2.76	18	1326031-3	IFIT-14421-GA
1.10	5.6	3.80	4.54	3.9	1.70	3.88	16	1326031-4	IFIT-14421-HA
1.35	6.5	4.30	5.62	3.9	1.70	3.88	14	1326031-5	IFIT-14421-JA
1.35	6.8	4.30	5.89	4.7	2.70	5.25	12	1-1326031-1	3F2T-14421-GA

A1 B2 — C1 C2 — B9

FORD ASSY PART NO	MATERIAL THICKNESS	CONDUCTOR FLAT BLANK	INSULATION FLAT BLANK	GRIP SIZE	MATERIAL TYPE	INSULATION THICKNESS	CONDUCTOR WIRE SIZE	INDIVIDUAL WIRE SEAL PART NUMBER	CONDUCTOR CRIMP INFO				INSULATION CRIMP INFO (REFERENCE)			NOMINAL PULL TEST
									C.C.W.	C.C.H. ±0.05	TOOLING SECTION	TOOLING FORM	I.C.W.	I.C.H.	TOOLING FORM VIEW	
3F2T-14421-GA	0.30	11.90	14.40	12	SEE NOTE	0.457	12 AWG	F8ZB-14603-AA	3.80	1.75	H1	D6	5.00	4.70	F	400
IFIT-14421-JA	0.30	8.90	13.80	14	SEE NOTE	0.406	14 AWG	97BG-10C930-GA	2.65	1.69	H1	D6	4.80	4.30	F	343
IFIT-14421-HA	0.30	8.90	11.30	16	SEE NOTE	0.406	16 AWG	97BG-10C930-FA	2.65	1.49	H1	D6	4.25	3.70	F	205
IFIT-14421-GA	0.30	6.50	11.30	18	SEE NOTE	0.406	18 AWG	97BG-10C930-FA	2.15	1.37	H1	D6	4.25	3.60	F	187
IFIT-14421-FA	0.30	6.50	10.20	20	SEE NOTE	0.406	20 AWG	97BG-10C930-EA	2.15	1.21	H1	D6	3.85	3.50	F	116
IFIT-14421-EA	0.30	4.90	10.20	22	SEE NOTE	0.406	22 AWG	97BG-10C930-EA	1.60	1.04	H1	D6	3.85	3.45	F	80
IFIT-14421-JA	0.30	8.90	13.80	14	SEE NOTE	0.30	14 AWG	97BG-10C930-GA	2.65	1.69	H1	D6	4.80	4.30	F	343
IFIT-14421-HA	0.30	8.90	11.30	16	SEE NOTE	0.25	16 AWG	97BG-10C930-FA	2.65	1.49	H1	D6	4.25	3.70	F	205
IFIT-14421-GA	0.30	6.50	11.30	18	SEE NOTE	0.25	18 AWG	97BG-10C930-FA	2.15	1.37	H1	D6	4.25	3.60	F	187
IFIT-14421-FA	0.30	6.50	10.20	20	SEE NOTE	0.25	20 AWG	97BG-10C930-EA	2.15	1.21	H1	D6	3.85	3.50	F	116
IFIT-14421-EA	0.30	4.90	10.20	22	SEE NOTE	0.25	22 AWG	97BG-10C930-EA	1.60	1.04	H1	D6	3.85	3.45	F	80
IFIT-14421-JA	0.30	8.90	13.80	14	SEE NOTE	0.28	2.5 MM²	97BG-10C930-GA	2.65	1.80	H1	D6	4.80	4.35	F	323
IFIT-14421-JA	0.30	8.90	13.80	14	SEE NOTE	0.28	1.5 MM²	97BG-10C930-GA	2.65	1.55	H1	D6	4.80	4.30	F	256
IFIT-14421-GA	0.30	6.50	11.30	18	SEE NOTE	0.28	1.0 MM²	97BG-10C930-FA	2.15	1.30	H1	D6	4.25	3.70	F	164
IFIT-14421-GA	0.30	6.50	11.30	18	SEE NOTE	0.28	0.75 MM²	97BG-10C930-FA	2.15	1.22	H1	D6	4.25	3.60	F	131
IFIT-14421-FA	0.30	6.50	10.20	20	SEE NOTE	0.28	0.50 MM²	97BG-10C930-EA	2.15	1.12	H1	D6	3.85	3.50	F	74
IFIT-14421-EA	0.30	4.90	10.20	22	SEE NOTE	0.24	0.35 MM²	97BG-10C930-EA	1.60	1.04	H1	D6	3.85	3.45	F	67

NOTES: UNLESS OTHERWISE SPECIFIED

GENERAL TOLERANCE
±0.3 ALL ONE PLACE DIMENSIONS
±0.10 ALL TWO PLACE DIMENSIONS
±5° ALL ANGULAR DIMENSIONS EXCEPT DRAFT

GENERAL REQUIREMENTS:

E1 D1 MATERIAL : 0.30±0.01 THK 198, TM02 HARD
FINISH : PREPLATED WITH 0.002-0.0059mm THK MATTE TIN, OVER 0.0019mm MIN THK COPPER, SHALL CONFORM TO ES-F8DB-14A229-CA WITH EXCEPTIONS.

B5 FOR CRIMPING DIMENSIONS SEE ES-F7LB-14474-BA : 12-22 AWG (0.35 - 2.50 MM²)

B6 FOR WIRE AND INSULATION GRIP SEE ES-F7LB-14474-AA : 12-22 AWG (0.35 - 2.50 MM²)

B7 FOR 22-14 AWG TERMINAL CAVITY DETAILS SEE PRINT 97BG-14421-BDA, DATED 95/11/13

B8 FOR 12 AWG TERMINAL CAVITY DETAIL CONTACT TYCO ELECTRONICS ENGINEERING.

WIRE STRAND COMPRESSOR TOOLING MUST BE USED DURING CRIMPING TO PUSH DOWN THE WIRE BRUSH IN THE TERMINAL TRANSITION AREA EQUAL TO OR BELOW THE WIRE CRIMP HEIGHT.

PART MUST CONFORM TO THE ELECTRICAL CONNECTION SYSTEM DESIGN SPECIFICATION (SDS) VER. 5, DATED 18-DEC-98 WITH THE FOLLOWING EXCEPTIONS:
REQUIREMENT EL-0001 - TESTED PER DVP&R
REQUIREMENT EL-0039 - TERMINAL BEND STRENGTH FOR IFIT-14421-EA TO BE 7.5N,
TERMINAL BEND STRENGTH FOR IFIT-14421-FA TO BE 10N,
TERMINAL BEND STRENGTH FOR IFIT-14421-GA TO BE 10N.

THE FOLLOWING SDS REQUIREMENTS ARE NOT APPLICABLE:
AA-0039,AN-0019,AN-0067,AN-0068,AN-0084,BR-0022,CV-0028,EC-0120,ED-0031, ED-0040,ED-0042,ED-0043,ED-0054,ED-0055,ED-0084,ED-0111,ED-0781,EL-0005, EL-0006,EL-0007,EL-0013,EL-0014,EL-0015,EL-0016,EL-0017,EL-0018,EL-0019, EL-0023,EL-0024,EL-0025,EL-0026,EL-0028,EL-0029,EL-0030,EL-0031,EL-0032, EL-0034,EL-0035,EL-0036,EL-0037,EL-0042,EL-0044,EL-0046,EL-0047,EL-0049, EL-0050,EL-0052,EL-0056,EL-0057,EL-0057,EL-0058,EL-0059,EL-0061,EL-0063, EL-0064,EL-0065,EL-0066,EL-0067,EL-0071,EL-0073,EL-0074,EL-0076,RL-0077, EX-0024,EX-0046,IR-0028,IT-0009,IT-0014,IT-0106,IT-0118,IT-0203,MG-0041, PW-0018,SG-0041,SG-0174,SG-0175,SG-0194,SG-0195,SG-0196,SY-0068

PART MUST CONFORM TO ES-F8DB-14A464-AA (USCAR) DATED 29-NOV-95

X.XX DENOTES BASIC DIMENSIONS. BASIC DIMENSIONS HAVE ZERO TOLERANCES AND DESCRIBE THE EXACT THEORETICAL LOCATION (TRUE POSITION) OR CONTOUR

⌖ NOTES TOLERANCE ZONE IN A RELATION TO A FEATURE

G DENOTES GAGE DESIGN. GAGE DESIGNS MUST HAVE SIGNED ENGINEERING APPROVAL PRIOR TO CONSTRUCTION AND WILL BE A CONDITION OF FINAL PART APPROVAL.

ENGINEERING APPROVAL REQUIRED FOR ALL SOURCING AND TOOLING OF THIS PART

FOR ENGINEERING APPROVED SOURCE SEE ENGINEERING RELEASE

ENGINEERING APPROVAL OF SAMPLE FROM EACH SUPPLIER IS REQUIRED PRIOR TO AUTHORIZATION OF PART PRODUCTION

CHANGES IN DESIGN COMPOSITION OR PROCESSING FROM THE PART PREVIOUSLY APPROVED FOR PART PRODUCTION REQUIRES PRIOR ENGINEERING APPROVAL

PARTS ARE TO BE FREE OF SCRATCHES, DISCOLORATION, SALT RESIDUE OR OTHER IMPERFECTIONS THAT MAY AFFECT FUNCTION OR FIT OF PART

0.2mm MAXIMUM RADIUS PERMISSIBLE ON EDGES AND FILLETS SHOWN AS SHARP FOR STAMPING PARTS.

SOURCE IDENTIFICATION MARK MUST BE PERMANENTLY APPLIED ON THE PART WITH 0.5MM LETTER SIZE FROM THE BOTTOM OF THE TOP OF THE CHARACTER AND LEGIBLE AS SHOWN.

D2 QUALIFICATION OF THE CRIMP APPLICATION TOOLING SHALL BE CONTROLLED BY THE REQUIREMENTS ESTABLISHED UNDER USCAR21

LTRS	REVISIONS			
ORIGINATOR	CHECKER	ENGR APP	MATL APP	
RELEASED IFIT-14421-EA,FA,GA,HA & JA FOR PRODUCTION AUTHORITY ARCHIVED DATE: 99/12/06 NB00-1-10978390-000				
STRAUSSER	MD BROWN	S. PRABHU		
A1 UPDATED CRIMP INFORMATION TO INCLUDE METRIC WIRE ARCHIVED DATE: 000510 NB00-E-10814740-817				
STRAUSSER	MD BROWN	S. PRABHU		
B1 ADDED PART NUMBER 3F2T-14421-GA B2 UPDATED PART NUMBER TABLE FOR ADDITIONAL PART NUMBERS B3 UPDATED GRIP INFORMATION TABLE TO INCLUDE ADDITIONAL PART NUMBERS B4 UPDATED TEMP TABLE TO INCLUDE ADDITIONAL PART NUMBERS B5 ADDED 12 AWG TO CRIMPING CALLOUT B6 ADDED 12 AWG TO INSULATION CALLOUT B7 ADDED 22-14 AWG CAVITY DETAIL NOTE B8 ADDED 12 AWG CAVITY DETAIL NOTE B9 ADDED (REFERENCE) CALLOUT TO INSULATION CRIMP INFO RELEASED 3F2T-14421-GA FOR PRODUCTION AUTHORITY ARCHIVED DATE: 020402 AE00-E11320257-000				
MD BROWN	MD BROWN	G.MLOTKIEWICZ		
C1 3.80 C.C.W WAS 1.75 FOR 12 AWG C2 1.75 C.C.H. WAS 3.80 FOR 12 AWG ARCHIVED DATE: AE00-E-11128292-019				
MD BROWN	MD BROWN	METZ		
D1 MATTE TIN WAS MATTE TIN-LEAD D2 ADD NOTE D3 2.85 +0.10/-0.16 WAS 2.85 ARCHIVED DATE: AE00-E-10814740-072				
T WOJTACKI	T WOJTACKI	---		
E1 CHANGED MATERIAL AND FINISH NOTE. MATERIAL: 198 TM02 WAS 197 1/2 HARD FINISH: 0.002-0.0059mm THK MATTE TIN OVER 0.0019mm MIN COPPER WAS 0.0008-0.0015 OVER 0.0005 ARCHIVED DATE: AELE-E-11783996-136				
DRUMMOND	D. CROWE	M. SALANTA		

REFERENCE

PART MUST COMPLY WITH MATERIAL SPECIFICATION WSS-M99P9999-A1 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT

DRAFTED IN ACCORDANCE WITH FORD MOTOR COMPANY ENGINEERING CAD AND DRAFTING STANDARDS CURRENT AT INITIAL RELEASE

3RD ANGLE PROJ. DIMENSIONS ARE IN MILLIMETERS

B1

3F2T-14421-GA
IFIT-14421-JA
IFIT-14421-HA
IFIT-14421-GA
IFIT-14421-FA

CAD TYPE	CAD LOC.	CAD FILE DRW DTMC IS MASTER
OPER. NO. N/A	UNIT N/A	DRAWING IFIT-14421-EA
DESIGN TYCO	DETAIL TYCO	TITLE TERMINAL-WIRE SNAP ON-MALE SHT 1 OF 1
CHECKED TYCO	SAFETY N/A	
SCALE 10:1	DATE	DIVISION PLANT

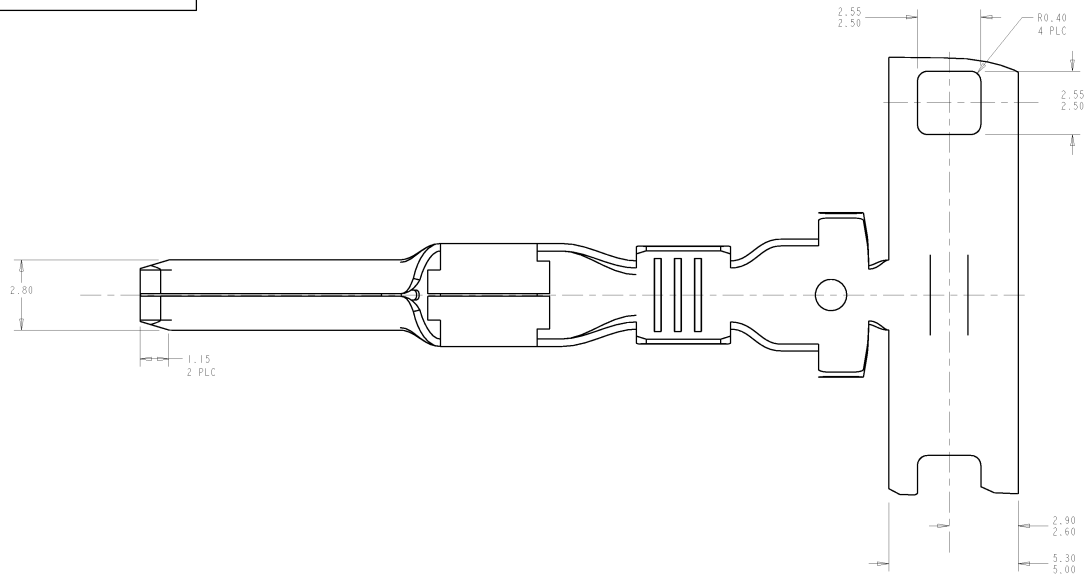
Ford Motor Company

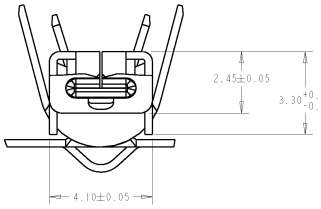
DRW SIZE A0/E

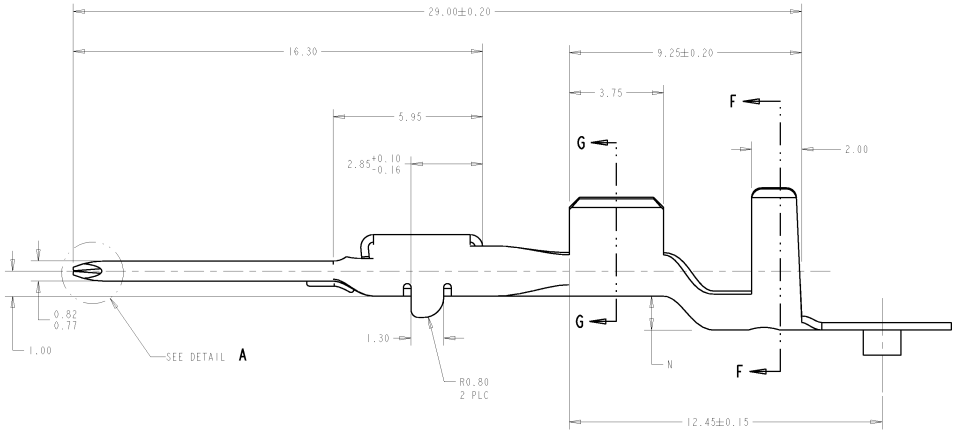
LOC	DIST
GE	00

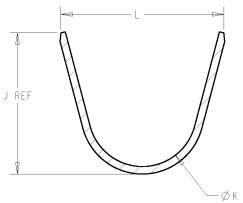
REVISIONS

P	LTR	DESCRIPTION	DATE	DWN	APVD
	D	REVISED PER EC 0K40-0405-02	17APR2002	AH	TW
	D1	REVISED PER EC 0K40-0248-03	02SEP2003	AH	TW
	E	REVISED PER 0K40-0074-04	23MAR2004	AG	TW
	F	REVISED PER ECR 05-003800	17NOV2005	DLD	JLT

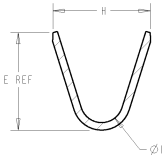




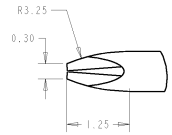




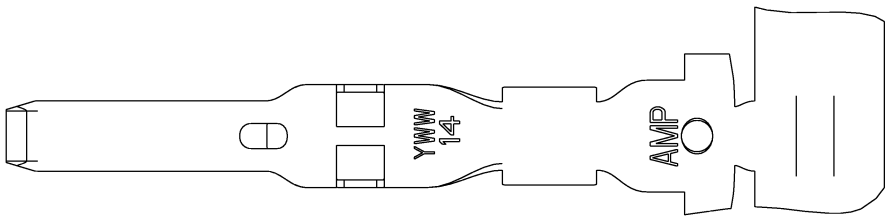
SECTION F-F



SECTION G-G



DETAIL A
SCALE 20:1

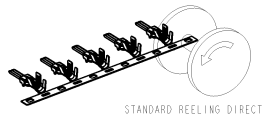


3	1-1326031-1 REELED FOR AMP APPLICATORS							12 AWG	1-1326031-2
2	1.35	6.8	4.30	5.89	4.7	2.7	5.25	12 AWG	1-1326031-1
3	1326031-5 REELED FOR AMP APPLICATORS							14 AWG	1-1326031-0
	1326031-4 REELED FOR AMP APPLICATORS							16 AWG	1326031-9
	1326031-3 REELED FOR AMP APPLICATORS							18 AWG	1326031-8
	1326031-2 REELED FOR AMP APPLICATORS							20 AWG	1326031-7
	1326031-1 REELED FOR AMP APPLICATORS							22 AWG	1326031-6
2	1.35	6.5	4.30	5.62	3.9	1.70	3.88	14 AWG	1326031-5
	1.10	5.6	3.80	4.54	3.9	1.70	3.88	16 AWG	1326031-4
	1.10	5.6	3.80	4.54	3.3	1.30	2.76	18 AWG	1326031-3
	0.90	5.0	3.40	4.11	3.3	1.30	2.76	20 AWG	1326031-2
	0.90	5.0	3.40	4.11	2.5	0.90	2.11	22 AWG	1326031-1
REELING	N	L	ØK	J	H	ØF	E	WIRE SIZE	PART NO.

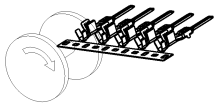
4. QUALIFICATION OF THE CRIMP APPLICATION TOOLING SHALL BE CONTROLLED BY THE REQUIREMENTS ESTABLISHED UNDER USCAR 21.

5. LOOSE END SPLICING TO BE USED.

1. MATERIAL: 0.30 THICK COPPER ALLOY, PREPLATED WITH 0.0008 MINIMUM THICK MATTE TIN (ELV COMPLIANT).

2. 

STANDARD REELING DIRECTION

3. 

REVERSE REELING DIRECTION

THIS DRAWING IS CONSIDERED AN UNPUBLISHED WORK PROTECTED BY COPYRIGHT AND TRADE SECRET LAWS OF THE UNITED STATES. NEITHER THE RECEIPT NOR ANY INFORMATION CONTAINED HEREIN SHALL BE DISCLOSED OR USED WITHOUT THE PRIOR WRITTEN CONSENT OF TYCO ELECTRONICS CORPORATION, HARRISBURG, PA. IT SHALL NOT BE LOANED, COPIED OR REPRODUCED, NOR SHALL ITS CONTENTS OR SUBJECT MATTER BE DISCLOSED TO ANY THIRD PARTY WITHOUT SUCH CONSENT. ALL RIGHTS RESERVED. ANY CONFLICT OF LAWS RULES SHALL BE RESOLVED IN FAVOR OF THE LAWS OF THE COMMONWEALTH OF PENNSYLVANIA. ANY LITIGATION ARISING OUT OF OR CONNECTED WITH THIS NOTICE SHALL TAKE PLACE IN A FEDERAL OR STATE COURT OF COMPETENT JURISDICTION LOCATED IN DAUPHIN COUNTY, PENNSYLVANIA, AND SHALL BE GOVERNED BY THE LAWS OF THE COMMONWEALTH OF PENNSYLVANIA.

DIMENSIONS: mm

TOLERANCES UNLESS OTHERWISE SPECIFIED:
1 PLC ±
1 PLC ±0.3
2 PLC ±0.10
3 PLC ±
4 PLC ±
ANGLES ±4°

MATERIAL 1

FINISH 1

DWN	D. STRAUSSER	28APR99
CHK	D. BROWN	28APR99
APVD	D. BROWN	28APR99

PRODUCT SPEC: SAE/USCAR-2 8/97
APPLICATION SPEC: 114-13013
WEIGHT: -

AMP Tyco Electronics
Harrisburg, PA 17105-3608

NAME: 2.8mm BLADE, SEALED

SIZE	CAGE CODE	DRAWING NO	RESTRICTED TO
A1	00779	C-1326031	-

CUSTOMER DRAWING

SCALE 10:1 SHEET 1 OF 1 REV F

PRODUCT / TOOLING APPROVAL LAB
WINSTON-SALEM N.C.

AUTHOR	: Ron Fortner
REQUEST	: 201111.133
PART DESC.	: 2.8mm Blade, Sealed
PART	: 1326031-5
TOOL	: 714149
CAVITY	: 1 out die
PRINT REV.	: E
METHOD	: Scope # T2993-0006
VENDOR	: Bldg. #253 / David Wilson
DATE	: 11/21/2011
FILENAME	: 11133p00.MES

** ALL DIMENSIONS IN MILLIMETERS **

LABEL = MEASUREMENT LABEL
DESC = FEATURE DESCRIPTION
NOM.VAL = NOMINAL VALUE
UPPER = UPPER TOLERANCE OR UPPER LIMIT OF A RANGE
LOWER = LOWER TOLERANCE OR LOWER LIMIT OF A RANGE
HM = HOW MEASURED DEVICE
ACT.VAL = ACTUAL MEASURED VALUE
DEV>TOL = DEVIATION GREATER THAN UPPER OR LOWER TOLERANCE

NOTES

LABEL	DESC	NOMINAL	UPPER	LOWER	FN	HM	ACTUAL	DEV>TOL
A		RANGE	2.550	2.500	LXX	SCOP	2.519	
B	**TPLT**	0.400	0.100	0.100	MAE	SCOP	0.400	
B	**TPRT**	0.400	0.100	0.100	MAE	SCOP	0.400	
B	**BTLT**	0.400	0.100	0.100	MAE	SCOP	0.400	
B	**BTRT**	0.400	0.100	0.100	MAE	SCOP	0.400	
C		RANGE	2.550	2.500	LYY	SCOP	2.521	
D		RANGE	2.900	2.600	LXX	SCOP	2.750	
E		RANGE	5.300	5.000	LXX	SCOP	5.092	
F	**TOP**	1.150	0.100	0.100	LXX	SCOP	1.239	
F	**BOT**	1.150	0.100	0.100	LXX	SCOP	1.250	
G		2.800	0.100	0.100	LYY	SCOP	2.821	
H		29.000	0.200	0.200	LXX	SCOP	29.200	
J		9.250	0.200	0.200	LXX	SCOP	9.234	
K		3.750	0.100	0.100	LXX	SCOP	3.765	
L		2.000	0.100	0.100	LXX	SCOP	1.900	
M		12.450	0.150	0.150	LXX	SCOP	12.383	
N	**LT**	0.800	0.100	0.100	MAE	SCOP	0.850	
N	**RT**	0.800	0.100	0.100	MAE	SCOP	0.700	
P		1.300	0.100	0.100	LXX	SCOP	1.303	
Q		1.350	0.100	0.100	LYY	SCOP	1.268	
R		1.000	0.100	0.100	LYY	SCOP	1.001	
S		RANGE	0.820	0.770	LYY	SCOP	0.780	
T		2.850	0.100	0.160	LXX	SCOP	2.70	
U		5.950	0.100	0.100	LXX	SCOP	5.895	
V		16.300	0.100	0.100	LXX	SCOP	16.325	
W		2.450	0.050	0.050	LYY	SCOP	2.465	
X		3.300	0.050	0.100	LYY	SCOP	3.200	

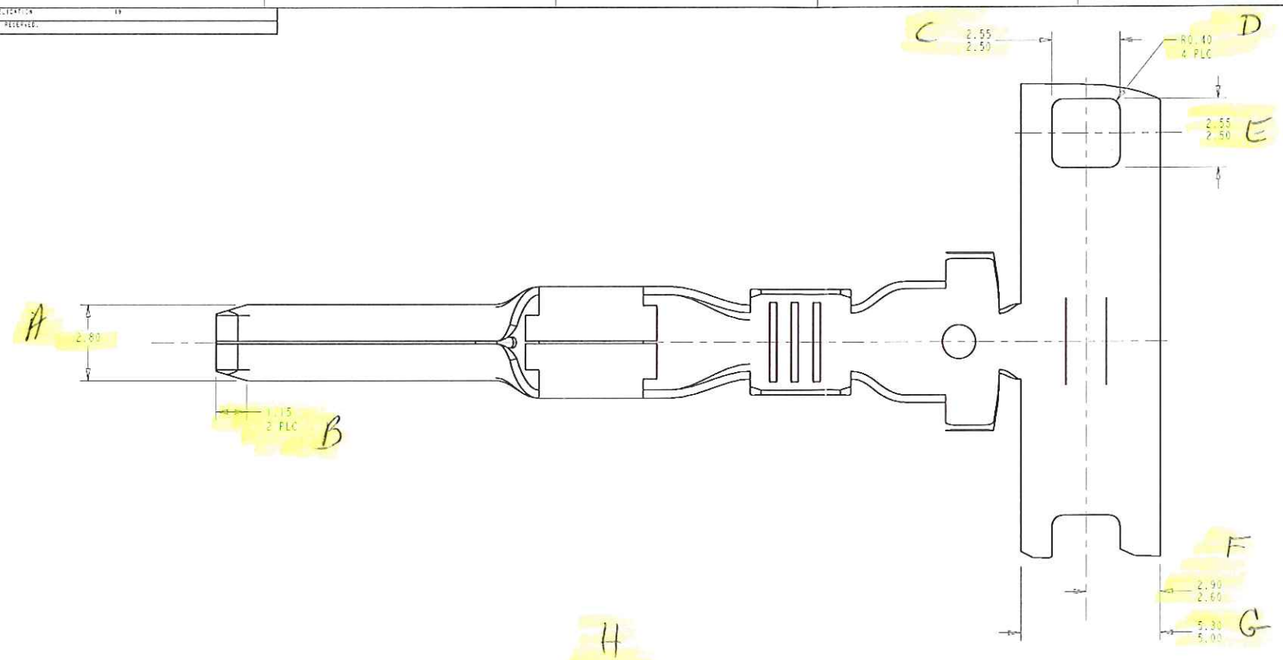
LABEL	DESC	NOMINAL	UPPER	LOWER	FN	HM	ACTUAL	DEV>TOL
Y		4.100	0.050	0.050	LXX	SCOP	4.086	
Z		3.250	0.100	0.100	MAE	SCOP	3.250	
AA		0.300	0.100	0.100	LYY	SCOP	0.200	
AB		1.250	0.100	0.100	LXX	SCOP	1.231	
AC		6.500	0.300	0.300	LXX	SCOP	6.800	
AD		4.300	0.100	0.100	MAE	SCOP	4.400	
AE		3.900	0.300	0.300	LXX	SCOP	3.706	
AF		1.700	0.100	0.100	MAE	SCOP	1.600	

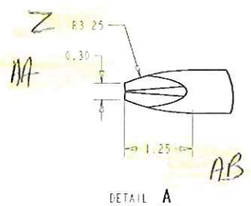
THIS DRAWING IS UNPUBLISHED. RELEASED FOR PUBLICATION 19

LOC	DIST
GE	00

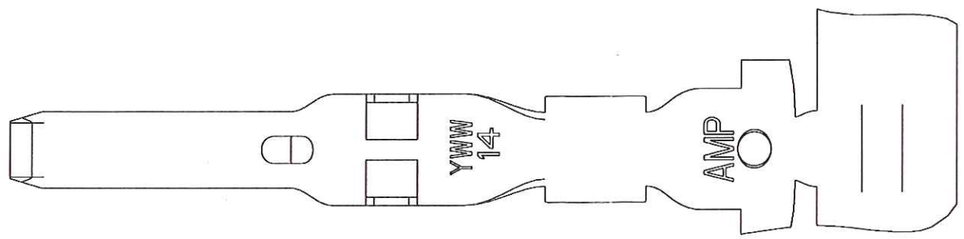
REVISIONS

P	LTR	DESCRIPTION	DATE	DWN	APVD
	D	REVISED PER EC 0K40-0435-02	17APR2002	AH	T&
	D1	REVISED PER EC 0K40-0248-03	02SEP2003	AH	T&
	E	REVISED PER CK40-0074-04	23APR2004	AG	T&
	F	REVISED PER ECR 05-003830	17NOV2005	DLD	JLT

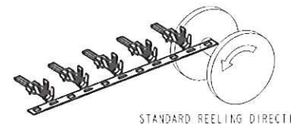




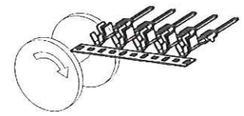
DETAIL A
SCALE 20:1



1. MATERIAL: 0.30 THICK COPPER ALLOY, PREPLATED WITH 0.0008 MINIMUM THICK MATTE TIN (ELV COMPLIANT).

2. 

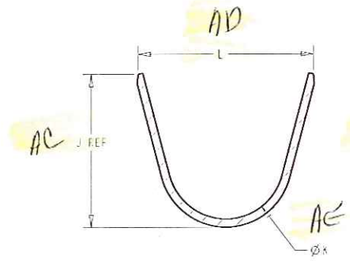
STANDARD REELING DIRECTION

3. 

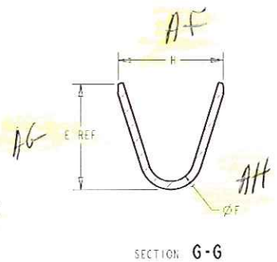
REVERSE REELING DIRECTION

4. QUALIFICATION OF THE CRIMP APPLICATION TOOLING SHALL BE CONTROLLED BY THE REQUIREMENTS ESTABLISHED UNDER USCAR 21.

5. LOOSE END SPLICING TO BE USED.



SECTION F-F



SECTION G-G

3	1-1326031-1 REELED FOR AMP APPLICATORS							12 AWG	1-1326031-2
2	1.35	6.8	4.30	5.88	4.7	2.7	5.25	12 AWG	1-1326031-1
	1326031-5 REELED FOR AMP APPLICATORS							14 AWG	1-1326031-0
3	1326031-4 REELED FOR AMP APPLICATORS							16 AWG	1326031-9
	1326031-3 REELED FOR AMP APPLICATORS							18 AWG	1326031-8
	1326031-2 REELED FOR AMP APPLICATORS							20 AWG	1326031-7
	1326031-1 REELED FOR AMP APPLICATORS							22 AWG	1326031-6
2	1.35	6.5	4.30	5.62	3.9	1.70	3.88	14 AWG	1326031-5
	1.10	5.6	3.80	4.54	3.9	1.70	3.88	16 AWG	1326031-4
	1.10	5.6	3.80	4.54	3.3	1.30	2.76	18 AWG	1326031-3
	0.90	5.0	3.40	4.11	3.3	1.30	2.76	20 AWG	1326031-2
	0.90	5.0	3.40	4.11	2.5	0.90	2.11	22 AWG	1326031-1
REELING	N	L	ØK	J	H	ØF	E	WIRE SIZE	PART NO.

DRN: D. STRAUSSER 28APR99
CHK: D. BROAN 28APR99
APVD: D. BROAN 28APR99
PRODUCT SPEC: 108-1/USCAR-2 8/97
APPLICATION SPEC: 114-13013
WEIGHT: -
CUSTOMER DRAWING

AMP Tyco Electronics Harrisburg, PA 17105-3608

NAME: 2.8mm BLADE, SEALED

SIZE A1 | CAGE CODE 00779 | DRAWING NO. C-1326031 | RESTRICTED TO -

SCALE 10:1 | SHEET 1 OF 1 | REV F

SUMCO LLC

An ISO 9001:2008 & 14001Certified Company

1351 S. Girls School Road
Indianapolis, IN 46231
DUNS: 83-296-2588

Date Tested	Job Number	Order Number
03/31/11	05840	
Alloy	Size	Your Order
197	.0118" X 1.456"/PN704900-4	36106933

SHIP TO:

PROPERTIES AND TESTING

Round #	Plating Material	Units	Plating Specification Min	Plating Specification Max	Actual Data Min	Actual Data Max	Solderability Test
59668	Matte Tin	µ"	31.5	63	37	51	
	Copper	µ"	19.7	–	20	30	
59902	Matte Tin	µ"	31.5	63	40	44	
	Copper	µ"	19.7	–	20	20	
59776	Matte Tin	µ"	31.5	63	39	53	
	Copper	µ"	19.7	–	20	40	
58779	Matte Tin	µ"	31.5	63	39	50	
	Copper	µ"	19.7	–	20	30	
59908	Matte Tin	µ"	31.5	63	35	49	
	Copper	µ"	19.7	–	30	30	
		µ"			0	0	
		µ"			0	0	
		µ"			0	0	
		µ"			0	0	
		µ"			0	0	
		µ"			0	0	
		µ"			0	0	
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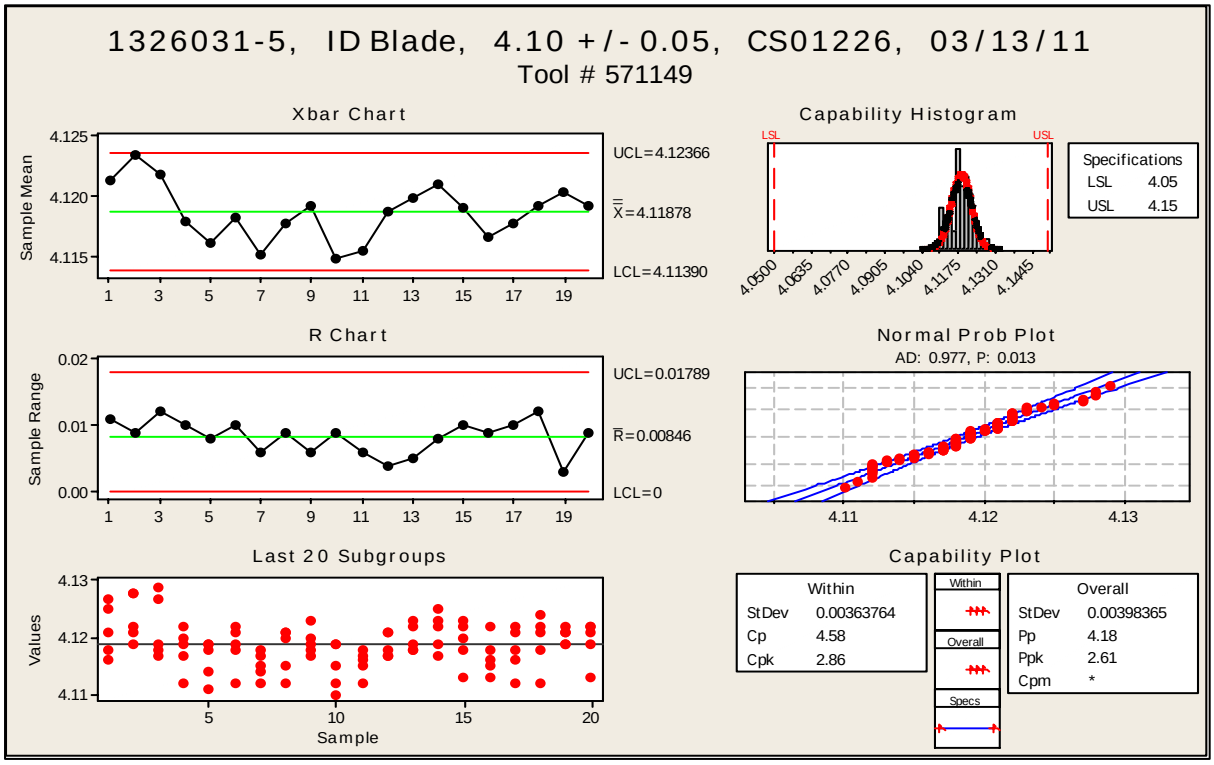
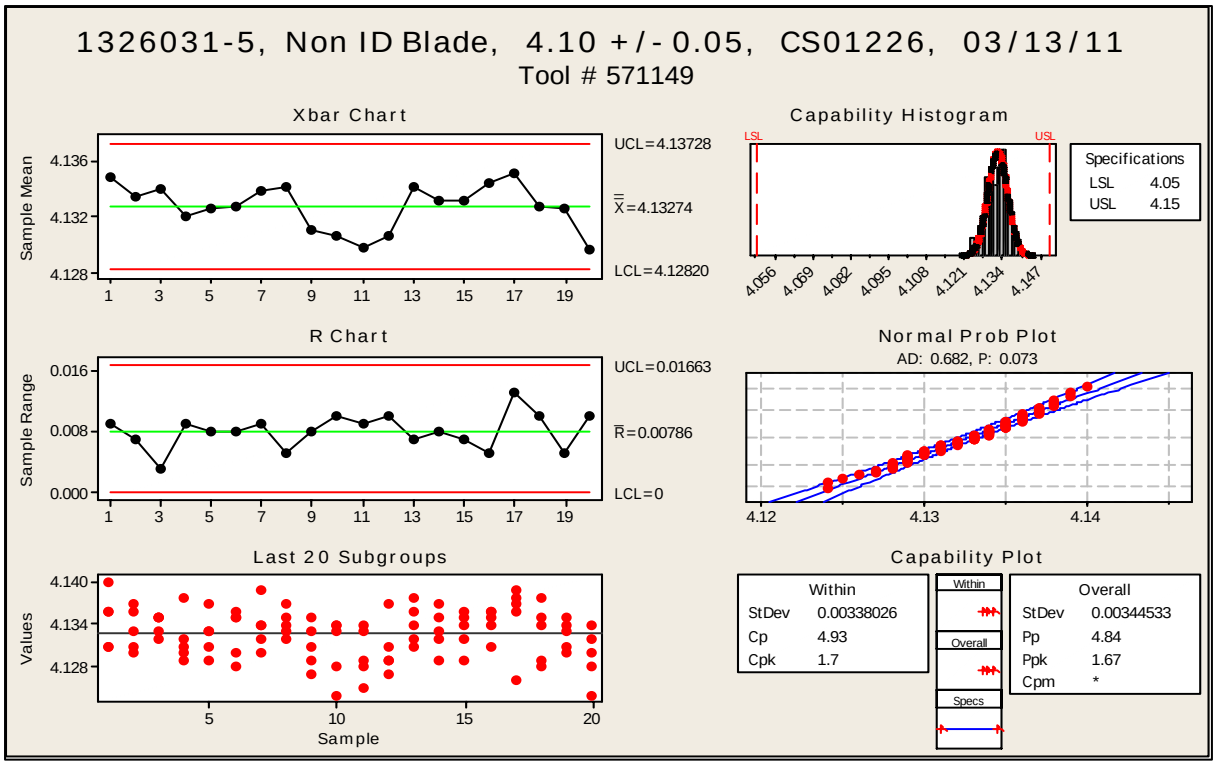
		µ"			0	0	
		µ"			0	0	
		µ"			0	0	
		µ"			0	0	
		µ"			0	0	
		µ"			0	0	

(1) Plating thickness per ASTM B568
(2) Copper Plating per Tyco 112-300-2
2a) Plating Process Name: Copper Sulfate Electroplate
2b) Plating Bath Supplier: NA
2C) Plating Bath Name: NA - Generic Copper Sulfate Solution
(3) Matte Tin Plating per Tyco 112-65-1
3a) Plating Process Name: Tin Electroplate
3b) Plating Bath Supplier: OMG
3C) Plating Bath Name: Reel Satin 2544 LF
(2) Adhesion Test per ASTM B571 - Performed on all plated product and rejected if test failed.
(3) Solderability Test per ASTM B678 - Pass/Fail for those products requiring solderability testing.

We hereby certify that the material described in this report has been tested and the results are shown above.

Quality Manager: Amy Schultz


1326031-5, ID Blade, 4.10 +/- 0.05, CS01226, 03/13/11
Tool # 571149
Xbar Chart
Sample Mean
UCL=4.12366
X=4.11878
LCL=4.11390
Capability Histogram
LSL
USL
Specifications
LSL 4.05
USL 4.15
R Chart
Sample Range
UCL=0.01789
R=0.00846
LCL=0
Normal Prob Plot
AD: 0.977, P: 0.013
Last 20 Subgroups
Values
Sample
Capability Plot
Within
StDev 0.00363764
Cp 4.58
Cpk 2.86
Overall
StDev 0.00398365
Pp 4.18
Ppk 2.61
Cpm *
Specs


1326031-5, Non ID Blade, 4.10 +/- 0.05, CS01226, 03/13/11
Tool # 571149
Xbar Chart
Sample Mean
UCL=4.13728
X=4.13274
LCL=4.12820
Capability Histogram
LSL
USL
Specifications
LSL 4.05
USL 4.15
R Chart
Sample Range
UCL=0.01663
R=0.00786
LCL=0
Normal Prob Plot
AD: 0.682, P: 0.073
Last 20 Subgroups
Values
Sample
Capability Plot
Within
StDev 0.00338026
Cp 4.93
Cpk 1.7
Overall
StDev 0.00344533
Pp 4.84
Ppk 1.67
Cpm *
Specs

ID Blade	Non ID Blade
4.127	4.136
4.121	4.131
4.116	4.14
4.125	4.131
4.118	4.136
4.119	4.131
4.122	4.13
4.128	4.136
4.121	4.133
4.128	4.137
4.118	4.133
4.127	4.135
4.129	4.135
4.117	4.132
4.119	4.135
4.12	4.131
4.117	4.13
4.112	4.129
4.122	4.132
4.119	4.138
4.114	4.133
4.119	4.131
4.118	4.133
4.119	4.129
4.111	4.137
4.112	4.135
4.118	4.128
4.119	4.13
4.121	4.136
4.122	4.135
4.114	4.132
4.112	4.134
4.118	4.134
4.115	4.139
4.117	4.13
4.112	4.137
4.121	4.135
4.115	4.132
4.121	4.134
4.12	4.133
4.123	4.131
4.118	4.129
4.12	4.127
4.117	4.135
4.119	4.133
4.119	4.134
4.11	4.133
4.119	4.124
4.115	4.134
4.112	4.128

4.115	4.133
4.116	4.134
4.117	4.128
4.112	4.125
4.118	4.129
4.117	4.131
4.121	4.127
4.121	4.129
4.118	4.129
4.117	4.137
4.118	4.134
4.122	4.131
4.123	4.138
4.118	4.136
4.119	4.132
4.117	4.129
4.125	4.137
4.123	4.132
4.122	4.133
4.119	4.135
4.118	4.129
4.122	4.132
4.12	4.136
4.113	4.134
4.123	4.135
4.118	4.135
4.116	4.136
4.122	4.131
4.115	4.136
4.113	4.134
4.121	4.139
4.122	4.126
4.112	4.137
4.116	4.138
4.118	4.136
4.121	4.128
4.112	4.135
4.118	4.138
4.122	4.134
4.124	4.129
4.122	4.134
4.121	4.131
4.119	4.135
4.119	4.133
4.121	4.13
4.119	4.128
4.122	4.124
4.121	4.132
4.113	4.134
4.122	4.13

tyco Electronics

Variable Data Gage R & R Study

PART NO. :	1326031-5	GAGE NAME:	Mitutoyo	OPERATOR A:	Fran Baker
PART DESC. :	2.8 mm Blade Sealed	GAGE NO. :	755083-13 FV	OPERATOR B:	W. Campell
SPEC. :	4.10 +/- 0.05	GAGE TYPE:	Micrometer	OPERATOR C:	J. Lashmit
TOL. SPREAD :	0.1000				

DEFINE INTENDED PURPOSE OF GAGE SYSTEM: (X)	Attribute Gauging:		QIP Inspection:		SPC:	X

	Operator A - Fran Baker				Operator B - W. Campell				Operator C - J. Lashmit			
	Trial 1	Trial 2	Trial 3	Range	Trial 1	Trial 2	Trial 3	Range	Trial 1	Trial 2	Trial 3	Range
1	4.1320	4.1350	4.1330	0.0030	4.1350	4.1360	4.1370	0.0020	4.1320	4.1330	4.1370	0.0050
2	4.1370	4.1380	4.1310	0.0070	4.1340	4.1320	4.1300	0.0040	4.1350	4.1330	4.1310	0.0040
3	4.1130	4.1170	4.1140	0.0040	4.1190	4.1190	4.1200	0.0010	4.1160	4.1100	4.1150	0.0060
4	4.1230	4.1220	4.1230	0.0010	4.1210	4.1190	4.1260	0.0070	4.1200	4.1210	4.1200	0.0010
5	4.1310	4.1340	4.1360	0.0050	4.1370	4.1370	4.1360	0.0010	4.1370	4.1350	4.1320	0.0050
6	4.2570	4.2500	4.2510	0.0070	4.2510	4.2520	4.2490	0.0030	4.2500	4.2520	4.2510	0.0020
7	4.1250	4.1210	4.1260	0.0050	4.1260	4.1250	4.1330	0.0080	4.1330	4.1300	4.1300	0.0030
8	4.1360	4.1310	4.1340	0.0050	4.1360	4.1400	4.1320	0.0080	4.1310	4.1290	4.1300	0.0020
9	4.1230	4.1270	4.1120	0.0150	4.1310	4.1280	4.1140	0.0170	4.1170	4.1150	4.1160	0.0020
10	4.1370	4.1380	4.1350	0.0030	4.1360	4.1340	4.1330	0.0030	4.1330	4.1350	4.1320	0.0030
Avg.	4.1414	4.1413	4.1395		4.1426	4.1422	4.1410		4.1404	4.1393	4.1394	
R	0.1440	0.1330	0.1390		0.1320	0.1330	0.1350		0.1340	0.1420	0.1360	

	1	2	3	4	5	6	7	8	9	10
Part Avg.	4.1344	4.1334	4.1159	4.1217	4.1350	4.2514	4.1277	4.1332	4.1203	4.1348

RESULTS SUMMARY

XBARa =	4.1407	RBARa =	0.0055
XBARb =	4.1419	RBARb =	0.0054
XBARc =	4.1397	RBARc =	0.0033

XdoubleBAR =	4.1408
RdoubleBAR =	0.0047
XBARdiff =	0.0022
UCLr = 0.0122	LCLr = 0.0000

	% Variation	% Tolerance
REPEATABILITY - EQUIPMENT VARIATION (EV)	6.6%	14.44%
REPRODUCIBILITY - APPRAISER VARIATION (AV)	2.5%	5.42%
REPEATABILITY & REPRODUCIBILITY (R & R)	7.0%	15.42%
PART VARIATION (PV)	99.8%	219.60%
TOTAL VARIATION (TV)	22.01%	220.14%

SIGNAL-TO-NOISE RATIO :	14.2
DATA CATEGORIES :	20.1

CONCLUSION:

NOTE: Reference AIAG Measurement System Analysis (MSA) for acceptance criteria.

Marginal gaging system with Gage R&R of **15.4%** (tolerance method)

Alternate calculation: **Accept** gaging system with Gage R&R of **7.0%** (variation method)

Accept gaging system with Data Categories of **20.1**

Gaging system **acceptable** based upon R&R and /or Data Category values.

Note: Engineering and Management authorization required for "Marginal" Gaging system.

DEFINE GAGE PROCEDURE:

Place recept in micrometer and measure box with . Zero micrometer and measure all recpt the same each time.

REMARKS:

RR01226

Evaluator — Date: 3/14/2011

Engineering and Management Authorization for "Marginal" — Date:

Certificate of Registration

QUALITY MANAGEMENT SYSTEM - ISO/TS 16949:2009

This is to certify that:

TE Connectivity
Global Automotive Division
Americas North
233 Burgess Road
Greensboro
North Carolina
27409
USA

Holds Certificate No: **TS 514458-000**

and operates a Quality Management System which complies with the requirements of ISO/TS 16949:2009 for the following scope:

Design and manufacture of electrical interconnecting devices for the automotive industry.

For and on behalf of BSI:

VP Regulatory Affairs, BSI Group America Inc.

Originally Registered: **02/11/2010** Latest Issue: **03/29/2011** Expiry Date: **02/10/2013**

IATF Number: 0097555

Certificate No: **TS 514458-000**

Location	*Registered Activities*
TE Connectivity Global Automotive Division Americas North 233 Burgess Road Greensboro North Carolina 27409 USA	Stamping, molding and assembly. Including the following remote support functions: TE Connectivity Global Automotive Division Americas North Troy, MI Design and Development. TE Connectivity Global Automotive Division Americas North Middletown, PA Design and Development, Product Testing and Customer Service. TE Connectivity Global Automotive Division Americas North Winston-Salem, NC Design and Development, Product Testing and Calibration, Business Office (Quote Process) and Purchasing. TE Connectivity Global Automotive Division Americas North Markham, ON Canada Design and Development and product testing (optics lab). TE Connectivity Global Automotive Division Americas North Harrisburg, PA Provision of Product Testing to TE Connectivity Manufacturing Sites.

Originally Registered: **02/11/2010** Latest Issue: **03/29/2011** Expiry Date: **02/10/2013**

IATF Number: 0097555

TYCO ELECTRONICS GAD-AN
NORTH CAROLINA LABORATORIES SCOPE OVERVIEW

SERVICE	EQUIPMENT		TYPICAL PROCEDURES
Product/Tooling Approval Laboratory 3800 Reidsville Road, Winston-Salem, NC 27101			
Layout Inspection	Leitz Toolmakers Microscopes Starrett Coordinate Meas. Machine Mycrona Vision/Contact CMM Mitutoyo Hand Measuring Devices Micro-Vu Vertex Vision/Contact Measuring Center		AAP129, AAP165, AWP127-LB
Cross-Sectioning	Low speed saws Polishing/grinding equipment		ASTM E3
SERVICE	**EQUIPMENT**		**TYPICAL PROCEDURES**
Product Reliability Center 3800 Reidsville Road, Winston-Salem, NC 27101			
Electrical, High Current			
Current Cycling	Hewlett-Packard 6032A	System Power Supply	TIN 109-51, SAE/USCAR-2
Current Surge	Wavetek 395, Kepco ATE 15-50M	Current Pulsing Station	Customer/Product Specific
Maximum Current Rating	T System	Portable Data Acquisition System	SAE/USCAR-2
Millivolt Drop	READA System		SAE/USCAR-2, EIA 364-6B, IEC 60512-2-2
T-rise at Rated Current	READA System		SAE/USCAR-2, EIA 364-70A Method 1
T-rise vs. Current Curve	T System		SAE/USCAR-2, EIA 364-70A Method 2
Resistive Load Verification	Agilent 60502B and 6681A	Programmable loads & power supplies	Customer/Product Specific
Electrical, Low Current			
Termination Resistance, Dry Circuit	READA System, Buttons System, H-P Micro-Voltmeter	Portable Data Acquisition System Hand Probe	SAE/USCAR-2, -17 & 20, EIA 364-23A, IEC 60512-2-1
Electrical, Voltage			
Breakdown Voltage	Associated Research 4271m13, EDNA System, Quadtec	HiPot Dielectric Tester	EIA 364-20B, IEC 60512-4-1
Dielectric Withstanding Voltage			SAE/USCAR-2, -17 & -20, EIA 364-20B, IEC 60512-4-1
Insulation Resistance	GenRad 1644-A, Quadtech	Megohm Bridge, Dielectric Analyzer	SAE/USCAR-2, -17 & -20, EIA 364-21C, IEC 60512-3-1
Electrical, RF			
Insertion Loss	Agilent 8753ES	Network Analyzer	SAE/USCAR-17
VSWR	Agilent 8753ES	Network Analyzer	SAE/USCAR-17

Environmental			
Heat Age	Blue M Models Such as OV490A-2, POM966E, POM206EX, HS3802FG, POM336B-1, CW5512F-1, POM336EX, Despatch LEB1-76-4	Oven	SAE/USCAR-2 & -20, EIA 364-17B, IEC 60512-11-9
Humidity / Temp. Cycling	Thermotron F-52-CHMV ESPEC ETH37 4DW CSZ Models CTH-32-15-15-S/WC CTH-16-705-705-S/W ZH-16-2-2-H/AC CVH-16-3-3-H/WC Blue M Electric Models FR-256PB, FR-366PB LRM386E CSZ ZH-8	Temperature / Humidity Chamber	SAE/USCAR-2 & -20, EIA 364-31B, IEC 60512-11-3, IEC 60512-11-12
Immersion	Blue M Electric OV490A-2, GenRad 1644-A	Oven, Megohm Bridge	SAE/USCAR-2
Pressure / Vacuum Leak	Ashcroft 415P-20, Ashcroft 4116P	Precision Gauges	SAE/USCAR-2
Salt Spray	Harshaw 4100-000-003	Salt Fog Chamber	SAE/USCAR-2 (Aug 97) EAI 364-26B, ASTM B117
Submergible Air Leak	Ashcroft 415P-20, Ashcroft 4116P	Precision Gauges	SAE/USCAR-2
Temp. Cycling	Blue M Models VRC30-PS-6WE VRC12-PC-4WE GOP 1004-12-2TPE CSZ Models Z-16-2-2-H/AC Z-8-1-1-H/AC BAV-1.6-033-033-H/A	Temperature Cycling Chamber	Customer/Product Specific
Thermal Shock	-Ransco 7103-1 -ESPEC TSA-70H-W -Thermotron ATS-100-3-3-LN2 ATS-150-H-3-3-LN2 -CSZ VTS-2.6-705-705-S/W VTS-3.3-705-705-S/A -Envirotronics SV2-2-2-3	Thermal Shock Chamber	SAE/USCAR-2 & -20, EIA 364-32C, IEC 60512-11-4
High Pressure Washing (Hot & Ambient)	Landa Pressure Washer, Wika Pressure gage	Pressure washer set-up	Customer Specific
Dust Testing	Triton	Dust Chamber	PF-9688, Customer Specific
Air Leak Detector	Furness – Sovereign	Leak Detector	Customer Specific

Mechanical			
Drop	n/a	n/a	Ford SDS #40
Durability	AMP Inc. 37517	Cycling Machine	SAE/USCAR-2, EIA 364-9C, IEC 60512-9-1
Mechanical Shock	AVCO SM105MP Vibration Machines	Mechanical Shock Tester High Frequency Vibration Machines	SAE/USCAR-2 EIA 364-27B IEC 60512-6-3
Torque	Snap-On TQJE1000	Torque Tester	TIN 109-183, Customer/Product Specific
Vibration – Low	LAB LVH18-100	Low-Frequency	Mil Std 202 Method 201A
Frequency		Vibration Machine	EIA 364-28A Test Cond. I
Vibration – High Frequency	Unholtz-Dickie Models SA30-560/ST MA250D-206 Ti000-14 206 LDS V850	High-Frequency Vibration Machine	SAE/USCAR-2 & -20 EIA 364-28D, IEC 60512-6-4
Miscellaneous			
Audible Feedback	Bruel & Kjaer 1561725	Sound Meter (db)	TIN 109-133, SDS #EL-0017, Customer Specific
Thermal Imaging	Nikon Laird 3AS	Infrared Camera	Application Specific
Tensile / Compression			
Axial Pull Test	Instron 4502	Tensile / Compression Machine	SAE/USCAR-2 & -17
Bend Force			SAE/USCAR-2
Bend, Crimp			SAE/USCAR-2
Connector - Connector Engage / Disengage			SAE/USCAR-2, EIA 364-13B IEC60512-13-1
Connector Lock Strength Integrity			SAE/USCAR-2 & -17
Connector Mechanical Integrity			SAE/USCAR-2
Contact Insertion			SAE/USCAR-2, TIN 109-41
Contact Retention			SAE/USCAR-2, TIN 109-41
Crimp Tensile			SAE/USCAR-2, EIA 364-8B, IEC 60512-16-4 & -20
Engaging Force			SAE/USCAR-2, TIN 109-35
Force vs. Deflection			TIN 109-98
Insulated Crimp			SAE/USCAR-2
Latch Depression			SAE/USCAR-2
Lock Insertion & Removal Forces			SAE/USCAR-2 & -17
Misc. Component Engage / Disengage			SAE/USCAR-2 & -17
Contact Normal Force			TIN 109-98
Panel Retention			TIN 109-41

Secondary Lock Strength			SAE/USCAR-2, TIN 109-35,
Separating Force			USCAR-2, TIN 109-98
Spring Rate			Ford SDS #32
Staging Latch Strength			SAE/USCAR-2, Ford SDS #32
Tensile			SAE/USCAR-2, EIA 364-8B, IEC 60512-16-4 & -20
Terminal Assurance Retention			SAE/USCAR-2, TIN 109-14
Terminal Insertion / No False Lock-up			SAE/USCAR-2, TIN 109-14
Terminal Push Thru			SAE/USCAR-2, TIN 109-14
Unmating Force			SAE/USCAR-2, EIA 364-13B, IEC 60512-13-1
SERVICE	**EQUIPMENT**		**TYPICAL PROCEDURES**
Electromechanical Components Laboratory 3920 Reidsville Road, Winston-Salem, NC 27101			
Electrical, APT			
Pull-in/Drop-out Voltage	Markenrich Tester	APT	VTEST-0001
Pull-in/Drop-out Current	Markenrich Tester	APT	VTEST-0001
Operate/Release time	Markenrich Tester	APT	VTEST-0001
Contact Voltage Drop	Markenrich Tester, CVD Tester	APT	VTEST-0001
Contact Resistance	Markenrich Tester, CVD Tester	APT	VTEST-0001
Contact Bounce	Markenrich Tester	APT	VTEST-0001
Coil Resistance	Markenrich Tester	APT	VTEST-0001
Electrical, Durability			
Overload and Endurance	Life Test Monitor	L.T.M.	Customer Specific
Current Cycling	Power Supplies	L.T.M.	Customer Specific
Flasher Testing	Power Supplies, Temp Chambers, Flasher Tester	Flasher Test Set-up	Customer Specific VTEST-0055 & 0056
Continuous Current Overload	Life Test Monitor	L.T.M.	Customer Specific
Millivolt Drop Testing	Power Supplies, Agilent 34970A, Millivolt LTMs	Millivolt Drop Testers	VTEST-0001, Customer Specific
Load Soak	Power Supplies Temp Chambers	Load Soak Set-up	VTEST-0003
Electrical, Coil			
Coil Over/Under Voltage	Power Supplies Multi-meters	Coil Over/Under Voltage Test Set-up	Customer Specific
Coil Temperature Rise	YEW Chart Recorder/ Power Supplies/Temp. Chambers, Agilent 34970A	Coil Temperature Rise Test Set-up	Customer Specific
Coil Input (power)	Power Supply/Multi-meter	Coil Power Test Set-up	Customer Specific

Electrical, Voltage			
Breakdown Voltage	Kikusui Tos 8650, Quadtech Guardian 2530, Quadtech Sentry 30	Hipot Tester	EIA 364-20B, IEC 60512-4-1
Dielectric Testing	Kikusui Tos 8650, Quadtech Guardian 2530, Quadtech Sentry 30	Hipot Tester	VTEST-0001
Insulation Resistance	Quadtech Guardian 2530, Quadtech Sentry 30	IR Tester	EIA 364-21C, IEC 60512-3-1, VTEST-0001
Circuit Breaker			
Short Circuit AC	Short Circuit Tester	Short Circuit Tester	Customer Specific
Calibration- Circuit Breakers	Model F-EDC12159	Circuit Breaker Calibration	Customer Specific
Current Cycling Endurance	Power Supplies/LTM/ pneumatic cycler.	Circuit Breaker Cycler Set-up	Customer Specific
Environmental			
Humidity / Temp. Cycling	Thermotron/Tenney Chambers/LTM	Humidity / Temp. Cycling Set-up	EIA 364-31B, IEC 60512-11-3, IEC 60512-11-12
Thermal Shock	Thermal Shock Chambers @ 3800RR	Thermal Shock Chambers	EIA 364-32C, IEC 60512-11-4
Dust	Dust Chamber	Dust Test Chamber	VTEST-0011
Salt Fog	Harshaw 4100-000-003	Salt Fog Chambers	EIA 364-26B, ASTM B117
Temp. Cycling	LTM/Power supplies/Temp Chamber	Temp. Cycling Set-up	Customer/Product Specific
Mechanical			
Drop	Drop Tester	Drop Test Set-up	VTEST-0008
Mechanical Shock	AVCO SM105MP Vibration Tables @ 3800RR	Mechanical Shock Tester High-Frequency Vibration Machines	EIA 364-27B IEC 60512-6-3
Vibration – Low Frequency	LAB LVH18-100 @ 3800 RR	Low-Frequency Vibration Machines	EIA 364-27B IEC 60512-6-3
Vibration – High Frequency	Vibration Tables at 3800RR	High-Frequency Vibration Machine	EIA 364-28D, BTEST-0010 IEC 60512-6-4
Mechanical Life Cycling	Power Supplies/ Counter	Mechanical Life Cycling Test Set-up	Customer Specific Technical Data Book
Mechanical, Miscellaneous			
Audible Sound	Sound Meter / Sound Chamber	Audible Sound Test Set-up	VTEST-0017
Tensile/Compression			
Panel Retention	Insertion 4502 @ 3800RR	Tensile / Compression Machine	TIN109-41
Tensile	Instron 4502 @ 3800RR	Tensile / Compression Machine	EIA 364-8B, IEC 60512-16-4 & -20
Cover Retention	Instron 4502 @ 3800RR	Tensile / Compression Machine	VTEST-0005
Thermal retention	Instron 4502 @ 3800RR	Tensile / Compression Machine	VTEST-0004

SERVICE	EQUIPMENT	TYPICAL PROCEDURES
Materials and Processes Laboratory 3800 Reidsville Road, Winston-Salem, NC 27101		
Metallographic Sample Preparation	Embedding Media, polishing compounds, LECO AP-200 polisher	ASTM E3
Optical Examination of Cross-Sectioned Materials	Nikon Epiphot Metallograph	TIN 109-52, Method 2 ASTM E112
Vickers Hardness	Micromet Microhardness Tester	ASTM E384, ASTM E92
Knoop Hardness	Micromet Microhardness Tester	ASTM B758, ASTM E384
Rockwell Hardness	Wilson Series 500 Hardness Tester	ASTM E18, ASTM 1842
Coercive Force	Forster Coercive Force Tester	ASTM A867, ASTM A848
Tensile Testing – Materials	United TM-10 Tensile Tester	TIN 109-79, ASTM E8
Differential Scanning Calorimetry (DSC)	Mettler DSC 20 Differential Scanning Calorimeter	TIN 109-172, ASTM D3417
Scanning Electron Microscopy (SEM) Surface Characterization	AMRAY 1830i Scanning Electron Microscope	Application Specific
Elemental Analysis – Qualitative and Quantitative Energy Dispersive Spectroscopy	EDAX International EDS Detector PV9700/43 with Phoenix Software	Application Specific, ASTM E1508
Fourier Transform Infrared (FTIR) Material Identification	Nicolet 5PC FTIR with IR-Plan analytical microscope	Application Specific, ASTM E1252, ASTM E334
Melt Viscosity	Kayeness (Dynisco) Capillary Rheometer	ASTM D3835, TIN 109-57, TIN 103-2915
Melt Flow Rate	Dynisco Melt Indexer	ASTM D1238, TIN 118-1952
Melt Volume Rate	Dynisco Melt Indexer	ISO 1133, TIN 118-4440
Moisture Content	Computrac Vapor Pro	TIN 118-1953
Solderability	Multicore Solder Must II	MIL-STD 883C, TIN 109-11

Certificate of Registration

QUALITY MANAGEMENT SYSTEM - ISO 9001:2008

This is to certify that:

Sumco, LLC
1351 South Girls School Road
Indianapolis
Indiana
46231
USA

Holds Certificate No: **FM 556796**

and operates a Quality Management System which complies with the requirements of ISO 9001:2008 for the following scope:

Electroplating of coil stock material and component parts for the automotive and commercial industries.

For and on behalf of BSI:

President, BSI America, Inc.

Originally Registered: **12/01/2009** Latest Issue: **02/22/2010** Expiry Date: **11/30/2012**