DELPHI

PPAP SUBMISSION

FCI Italia : 54001431
FCI: 54001431
FORD : F8VB-14474-AA

DCL / PCL = AE2/AE2
Date: 7/31/12

Terminal (2.8mm) Wire Snap On Female

Delphi formerly FCI USA INC-MVL
11823 Lenape Drive
Mount Union, Pennsylvania 17066

DaimlerChrysler Ford GM

Part Submission Warrant

Part Name	TERMINAL WIRE SNAP ON FEMALE (2.80mm)	Customer P/N	F8VB-14474-AA
Shown on Drawing No.	F8VB-14474-AA	Org. P/N:	54001431
Engineering Change Level (PCL):	AE2 (AE2)	Dated	07/31/12
Additional Engineering Changes	NA	Dated	NA
Safety and Government Regulation:	☐ Yes ☑ No	Purchase Order No. NA	Weight (kg) 0.0077
Checking Aid No.	NA	Checking Aid Engineering Change Level NA	Dated NA

ORGANIZATION MANUFACTURING INFORMATION

DCS ITALIA - DELPHI
Supplier Name & Supplier/Vendor Code

Strada del Francese 137
Street Address

Turin | Piemonte | 10156 | Italy
City | Region | Postal Code | Country

CUSTOMER SUBMITTAL INFORMATION

NURSAN
Customer Name/Division

Burak Ozkaya
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: IMDS # 371774368 / 1

Are Polymeric parts identified with appropriate ISO marking codes: ☑ Yes ☐ No ☐ N/A

REASON FOR SUBMISSION (check at least one)

- ☑ 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 pkg

These results meet all design record requirements: ☑ Yes ☐ NO (If "NO" - explanation required)

Mold/ Cavity/ Production Process: d-471c Progressive Stamping Die

DECLARATION

I affirm that the samples represented by this warrant are representative of our parts which were made by a process that meets all Production Part Approval Process Manual 4th Edition Requirements. I further affirm that these samples were produced at the production rate of 211221 / 8 hours. I also certify that documented evidence of such compliance is on file and available for review. I have noted any deviations from this declaration below

EXPLANATION/COMMENTS

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

Organization Authorized Signature: B. M. Ris. Date: 11/12/12

Print Name:	Roberto Bortoloni	Phone:	+39 011 4519703	Fax. No.:	+39 011 4701986
Title:	Quality Engineer	E-mail:	roberto.bortoloni@delphi.com		

FOR CUSTOMER USE ONLY (IF APPLICABLE)

Part Warrant Disposition: ☐ Approved ☐ Rejected ☐ Other

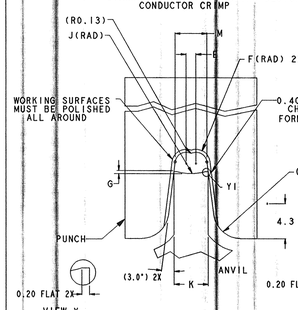
Customer Signature: Date:

Print Name: Customer Tracking Number (optional):

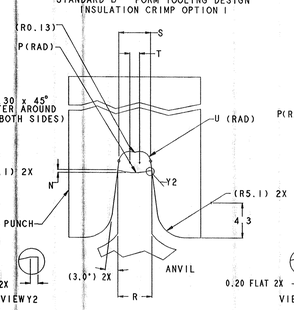
CABLE # SEAL (CS) UNSEALED (US)	WIRE SIZE AWG	WIRE SPEC AWG	WIRE SIZE METRIC	WIRE SPEC METRIC	CONDUCTOR CRIMP HEIGHT AWG (SECT Z-Z) (+/-0.05)	CONDUCTOR CRIMP HEIGHT METRIC (SECT Z-Z) (+/-0.05)	CONDUCTOR CRIMP WIDTH (SECT Z-Z) (+/-0.10)	INSULATION CRIMP HEIGHT AWG (SECT Z-Z) (+/-0.05)	INSULATION CRIMP HEIGHT METRIC (SECT Z-Z) (+/-0.05)	INSULATION CRIMP WIDTH (SECT Y-Y) (+/-0.10)	INSULATION CRIMP OPTION	INS GRIP FORM TYPE SECD-D
US	22	ESB-MIL123-A	0.35	ES-AUST-1A348-AA	1.10	1.10	1.85	1.75	1.65	2.60		1
CS	18		0.75/1.00		1.30	1.30/1.40		4.00	2.10	3.30		3
US	20		1.25		1.20	1.25	2.05	3.85	2.00			1
	18		0.75/1.00		1.35	1.30/1.40		2.35	2.10/2.30	2.60		1
CS	20		0.50		1.20	1.25		2.20	2.00		OPTION 2	1
	14		2.00/2.50		1.70	1.80*/1.90		4.40	4.10*/4.35*	4.10		3
	16		1.50		1.50	1.40*	2.50	4.25	4.05*/4.15*			3
US	14		2.00/2.50		1.70	1.80*/1.90		2.70	3.00*/3.10	3.20		1
	16		1.50		1.50	1.40*		2.60	2.55*/2.65			1
US	2(18-20)		2(.50/1.00)		VARIABLE	VARIABLE	3.05	VARIABLE	VARIABLE	4.30	OPTION 1	2
CS	12		3.00		1.95	1.95	3.45	4.80	4.40	4.30		3
US	12		3.00					3.40	3.30	4.15	OPTION 2	1
CS	10		5.00/6.00		N/A	N/A	3.45	N/A	N/A	N/A		3
	12		4.00		N/A	N/A		N/A	N/A			3
US	10		5.00/6.00		2.25	2.40*/2.50*		4.20	4.30	4.20	OPTION 1	1
	12		4.00		1.95	2.05		USE 12 GA TERMINAL	3.90			1

*NOT VERIFIED TO USCAR-21

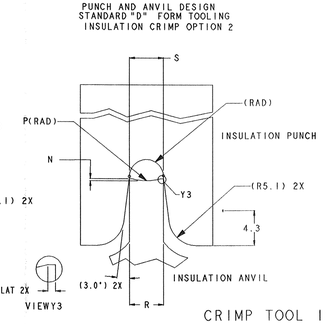
STANDARD"B" FORM TOOLING DESIGN
CONDUCTOR CRIMP



STANDARD"B" FORM TOOLING DESIGN
INSULATION CRIMP OPTION 1



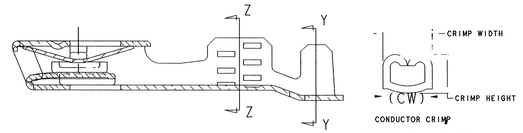
PUNCH AND ANVIL DESIGN
STANDARD "D" FORM TOOLING
INSULATION CRIMP OPTION 2



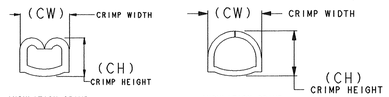
CRIMP TOOL INFORMATION (REF. ONLY)

CRIMP TOOL INFORMATION, (REFERENCE ONLY)

CRIMP WIDTH	CORE/ INSULATION	INSULATION CRIMP OPTION	E ±0.03	F ±0.03	G ±0.03	J ±0.03	K ±0.03	dim OFFSET BETWEEN AXES	M ±0.03	N ±0.03	P ±0.03	R ±0.03	S ±0.03	T ±0.03	U ±0.03
1.85	CONDUCTOR	---	0.83	0.48	0.11	2.31	1.79	---	1.78	---	---	---	---	---	---
2.05	CONDUCTOR	---	0.92	0.53	0.12	2.56	1.99	---	1.97	---	---	---	---	---	---
2.45	CONDUCTOR	---	1.09	0.63	0.16	3.06	2.38	---	2.36	---	---	---	---	---	---
2.60	INSULATION	2	---	---	---	---	---	0.00	---	0.18	3.25	2.53	2.50	N/A	N/A
3.05	CONDUCTOR	---	1.36	0.79	0.22	3.81	2.96	---	---	---	---	---	---	---	---
3.20	INSULATION	2	---	---	---	---	---	0.40	---	0.23	4.00	3.11	3.08	N/A	N/A
3.30	INSULATION	2	---	---	---	---	---	0.60	---	0.24	4.12	3.20	3.17	N/A	N/A
3.45	CONDUCTOR	---	1.54	0.89	0.26	4.31	3.35	---	3.32	---	---	---	---	---	---
4.10	INSULATION	2	---	---	---	---	---	0.80	---	0.32	5.12	3.98	3.94	---	---
4.15	INSULATION	2	---	---	---	---	---	0.40	---	0.33	5.19	4.03	3.99	---	---
4.20	INSULATION	1	---	---	---	---	---	0.80	4.04	0.33	5.25	4.08	4.04	1.87	1.08
4.30	INSULATION	2	---	---	---	---	---	1.10	---	0.34	5.38	4.17	4.13	---	---
4.30	INSULATION	1	---	---	---	---	---	0.60	---	0.34	5.38	4.17	4.13	1.92	1.11

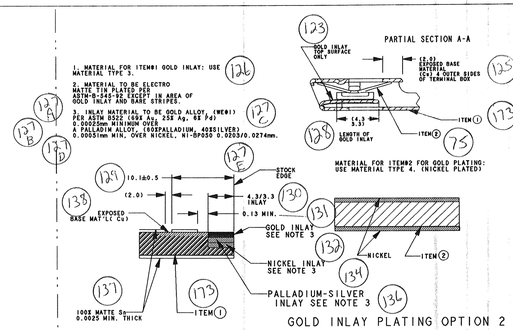


SECTION Z-Z (CH)

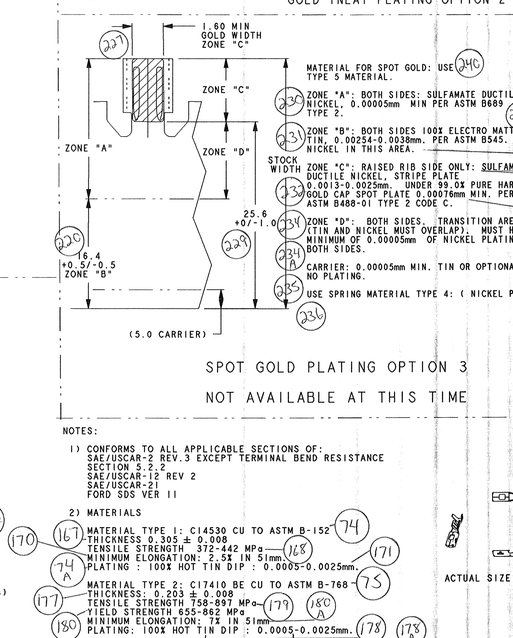


SECTION Y-Y

SECTION Y-Y



GOLD INLAY PLATING OPTION 2



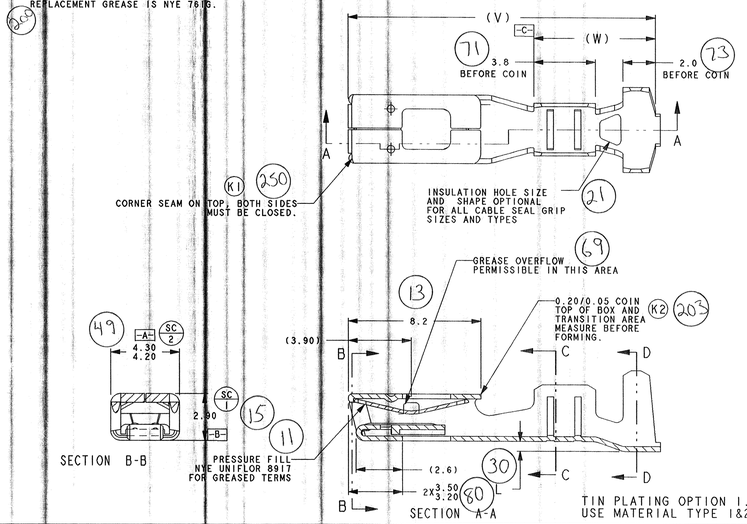
SPOT GOLD PLATING OPTION 3

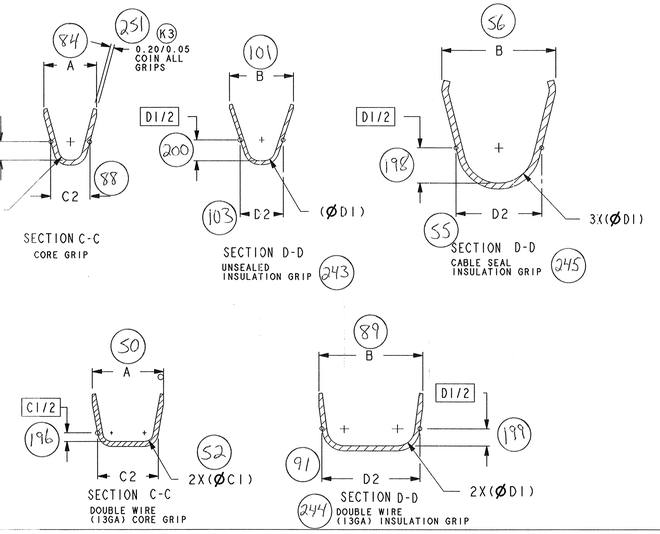
NOT AVAILABLE AT THIS TIME

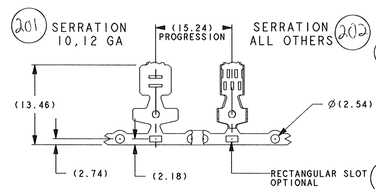
TABLE - I - TERMINAL GRIP DIMENSION TABLE

FORD PART NO.	FCI PART NO.	METRIC WIRE	AWG WIRE	GRIP STAMP	PLATING	CABLE/WIRE SEALED CS/US	GREASED	A+/-0.30	B+/-0.30	(C1)	C2+/-0.30	(D1)	D2+/-0.30	L+/-0.10	V± 0.5 0.3	W±0.30	GRIP STAMP
XF2T-14474-CA	54002231	0.35	22	22	TIN	US	NO										
0U5T-14474-HBA	F079410	0.35	22	22	TIN	US	761G	2.6	3.2	0.76	1.7	1.40	2.10	0.00	19.0	7.5	22
BU5T-14474-HAA 2	F067210	0.35	22	22	TIN	US	8917										
9U5T-14474-KA	54001879	0.50,0.75 1.00	18,20	18	GOLD INLAY	CS	NO										
0U5T-14474-GBA	F969410	0.50,0.75 1.00	18,20	18	TIN	CS	761G										
AU5T-14474-CAA 2	F703600	0.50,0.75 1.00	18,20	18	TIN	CS	8917	3.0	5.1	1.00	1.9	3.00	3.70	0.60	19.5	8.0	18
XL3T-14474-DA	54001840	0.50,0.75 1.00	18,20	18	TIN	CS	NO										
AU5T-14474-ZA 1	F393500	0.50,0.75 1.00	18,20	18	GOLD INLAY	CS	NO										
AU5T-14474-XA 1	F993500	0.50,0.75 1.00	18,20	18	GOLD INLAY	US	NO										
BU5T-14474-GA	54001876	0.50,0.75 1.00	18,20	18	GOLD INLAY	US	NO										
F8VB-14474-BA	54001839	0.50,0.75 1.00	18,20	18	TIN	US	NO	3.0	3.8	1.00	1.9	1.75	2.70	0.00	19.0	7.5	18
0U5T-14474-JBA	F179410	0.50,0.75 1.00	18,20	18	TIN	US	761G										
BU5T-14474-JAA 2	F167210	0.50,0.75 1.00	18,20	18	TIN	US	8917										
YF1T-14474-CA	54001311	1.50/1.70 2 WIRE	14/16 2 WIRE	13	TIN	US	NO										
0U5T-14474-KBA	F279410	1.50/1.70 2 WIRE	14/16 2 WIRE	13	TIN	US	761G	4.60	6.6	1.50	3.7	2.55	6.00	0.60	19.0	7.5	13
BU5T-14474-KAA 2	F267210	1.50/1.70 2 WIRE	14/16 2 WIRE	13	TIN	US	8917										
9U5T-14474-JA	54001448	.50/2.50	14,16	14	GOLD INLAY	CS	NO										
0U5T-14474-EBA	F769410	.50/2.50	14,16	14	TIN	CS	761G										
4L3T-14474-AA 2	54001439	.50/2.50	14,16	14	TIN	CS	8917	3.8	6.1	1.45	2.3	3.80	4.60	0.80	19.5	8.0	14
XL3T-14474-AA	54001432	.50/2.50	14,16	14	TIN	CS	NO										
AU5T-14474-AAA 1	F003500	.50/2.50	14,16	14	GOLD INLAY	CS	NO										
AU5T-14474-YA 1	F013500	.50/2.50	14,16	14	GOLD INLAY	US	NO										
BU5T-14474-HA	54001446	.50/2.50	14,16	14	GOLD INLAY	US	NO										
F8VB-14474-AA	54001431	.50/2.50	14,16	14	TIN	US	NO	3.8	4.7	1.45	2.3	2.25	3.20	0.40	19.0	7.5	14
0U5T-14474-LBA	F379410	.50/2.50	14,16	14	TIN	US	761G										
BU5T-14474-LAA 2	F367210	.50/2.50	14,16	14	TIN	US	8917										
XL3T-14474-CA	54001220	3.00	12	12	TIN	CS	NO										
0U5T-14474-FBA	F869410	3.00	12	12	TIN	CS	761G	5.2	6.6	2.30	3.2	4.30	5.20	1.10	19.5	8.0	12
4L3T-14474-CA 2	54001221	3.00	12	12	TIN	CS	8917										
7L7T-14474-EA	54001227	3.00	12	12	TIN	US	NO										
0U5T-14474-MBA	F479410	3.00	12	12	TIN	US	761G	5.2	5.2	2.30	3.2	3.00	3.80	0.40	19.0	7.5	12
BU5T-14474-MAA 2	F467210	3.00	12	12	TIN	US	8917										
XF2T-14474-BA	54001018	2.00/6.00	10	10	TIN	US	NO										
0U5T-14474-NBA	F579410	2.00/6.00	10	10	TIN	US	761G	5.2	6.5	2.30	3.2	3.20	4.00	0.80	19.0	7.5	10
BU5T-14474-NAA 2	F567210	2.00/6.00	10	10	TIN	US	8917										

1. SPOT GOLD PLATING IS NOT AVAILABLE AT THIS TIME.
2. NYE UNIFLOR 8917 GREASE IS NOT TO BE USED FOR NEW PRODUCTION AFTER 07/31/2012. REPLACEMENT GREASE IS NYE 761G.







NOTES:

1) CONFORMS TO ALL APPLICABLE SECTIONS OF:
SAE/USCAR-2 REV.3 EXCEPT TERMINAL BEND RESISTANCE SECTION 5.2.2
SAE/USCAR-12 REV 2
SAE/USCAR-21
FORD SDS VER 11

2) MATERIALS

MATERIAL TYPE 1: C14530 CU TO ASTM B-152
THICKNESS 0.305 ± 0.008
TENSILE STRENGTH 372-442 MPa
MINIMUM ELONGATION: 2.5% IN 51mm
PLATING : 100% HOT TIN DIP : 0.0005-0.0025mm.

MATERIAL TYPE 2: C17410 BE CU TO ASTM B-768
THICKNESS: 0.203 ± 0.008
TENSILE STRENGTH 758-897 MPa
YIELD STRENGTH 655-862 MPa
MINIMUM ELONGATION: 1% IN 51mm
PLATING: 100% HOT TIN DIP : 0.0005-0.0025mm.

MATERIAL TYPE 3: C14530 CU TO ASTM B-152
THICKNESS 0.305 ± 0.008
TENSILE STRENGTH 324-394 MPa
MINIMUM ELONGATION: 2.0% IN 51mm
PLATING : SEE SPECIAL PLATING SECTION FOR INLAY GOLD.

MATERIAL TYPE 4: C17410 BE CU TO ASTM B-768
THICKNESS: 0.203 ± 0.008
TENSILE STRENGTH 758-897 MPa
YIELD STRENGTH 655-862 MPa
MINIMUM ELONGATION: 1% IN 51mm
PLATING: SULFMATE DUCTILE NICKEL 0.0013-0.0025mm. TO ASTM B689 TYPE 2.

MATERIAL TYPE 5: C14530 CU TO ASTM B-152
THICKNESS 0.305 ± 0.008
TENSILE STRENGTH 372-442 MPa
MINIMUM ELONGATION: 2.0% IN 51mm
PLATING : SEE SPECIAL PLATING SECTION FOR SPOT GOLD.

3) THE APEX 2.80mm TERMINAL IS SYMMETRICAL ABOUT CENTERLINE AND CAN BE INSERTED 180°

4) DIMENSIONAL TOLERANCE:
1 PLACE ±0.25
2 PLACE ±0.10
ANGULAR ±3°

5) DRAWING CONFORMS TO AVP - (T401/T406)-001

6) SEE USCAR DRAWING EWCAP-001 FOR DIRECT CONNECT MATING BLADE INFORMATION

7) ANNUAL QUALITY REQUIREMENTS:
FCI SPECIFICATION #AQA-001 INSTEAD OF ANNUAL LAYOUT & ANNUAL PV REQUIREMENTS OF QS-9000 SECTION 2
IT IS PERMISSIBLE TO PERFORM CONTINUOUS CONFORMANCE PER

8) VENDOR,TOOL,GRIP & WEEK CODES MUST BE PRESENT & LEGIBLE

9) "SC" DESIGNATES SPC DIMENSION (2)

10 "K" INDICATES IN PROCESS INSPECTION FOR DIMENSIONS OR SPECIFICATIONS (3)

11) CAVITY SPECIFICATIONS, SEE SHEET # 2

ACTUAL SIZE

	4L3T-14474-AA	
	9U5T-14474-KA	
	9U5T-14474-JA	BU5T-14474-NAA
DU5T-14474-NBA	8U5T-14474-HA	BU5T-14474-MAA
DU5T-14474-MBA	8U5T-14474-GA	BU5T-14474-LAA
DU5T-14474-LBA	XF2T-14474-CA	BU5T-14474-KAA
DU5T-14474-KBA	XF2T-14474-BA	BU5T-14474-JAA
DU5T-14474-JBA	XL3T-14474-DA	BU5T-14474-HAA
DU5T-14474-HBA	XL3T-14474-CA	AU5T-14474-CAA
DU5T-14474-GBA	XL3T-14474-AA	7L7T-14474-EA
DU5T-14474-FBA	F8VB-14474-AA	YF1T-14474-CA
DU5T-14474-EBA	F8VB-14474-BA	4L3T-14474-CA

LTRS	REVISIONS			
ORIGINATOR	CHECKER	ENG APP	MATL APP	
	REVISED AND REDRAWN AFTER INTERNAL REVISION 1			
AC1	ADDED METRIC EQUIVALENT WIRE CODES			
AC2	REMOVED CRIMP INFORMATION AND VIEWS			
	AELE-E-11786306-131			
B	QUE	RJC		
AD1	REVISED SHEET TWO; ADDED POGO PIN INFORMATION, NOTES, VIEWS.			
AD2	REVISED UN-SEALED VIEWS, ADDED 18.60 DIM.			
AD3	UPDATED SHEET 1 TO SDS STANDARDS.			
AD4	RELEASED P/N BU5T-14474-HAA,JAA,KAA LAA,MAA,NAA			
	AELE-E-11786306-159			
B	QUE	RJC		
	RELEASED DU5T-14474-EBA, FBA, GBA, HBA, JBA, KBA, LBA, MBA, NBA			
AE1	ADDED NOTE TO NOT USE 8917 GREASE			
AE2	RECTANGULAR CARRIER HOLE IS NOW OPTIONAL.			
	AELE-E-11786584-562	20120731		
B	QUE	RJC	J. PITTENGER	

REFERENCE	FCI - AUTOMOTIVE (7362) FOR INFORMATION CONTACT FCI AUTOMOTIVE (7362)		
PART MUST COMPLY WITH MATERIAL SPECIFICATION WSS-M99P9999-A1 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT			
DRAFTED IN ACCORDANCE WITH FAO ENGINEERING DRAFTING STANDARD CURRENT AT INITIAL RELEASE		3RD ANGLE PROJ DIMENSIONS IN MILLIMETERS	
CAD TYPE	CAD LOC.	CAD FILE	DRM IS MASTER
X-PROE	N/A		
OPER. NO.	UNIT	DRAWING	F8VB-14474-AA
DESIGN VB	DETAIL RS	TITLE	TERMINAL - (2.80MM) WIRE SNAP ON FEMALE
CHECKED SSS	SAFETY		
SCALE 4:1	DATE 20041215	DIVISION	
		PLANT	

SHT 1 OF 2

DRW SIZE A0/E

J O B H E A D E R

CUSTOMER.....	FORD
PART NUMBER.....	F8VB-14474-BA (54001839)
B/P NUMBER.....	F8VB-14474-AA
PART NAME.....	TERM (2.80MM) WIRE SNAP ON FEM
PO NUMBER.....	
LOG NUMBER.....	D471A839
TOOL/MOLD NUMBER...	D471A
FIXTURE NUMBER.....	N/A
LAYOUT TYPE.....	FULL
JOB STATUS.....	Final Sign-Off
RESPONSIBILITY.....	PA
CHECK DATE.....	11-5-12
INSPECTED BY.....	JG/rk

GENERAL TOLERANCE	1 POS	2 POS	3 POS	4 POS	5 POS	ANGLE
	0.25000	0.10000	0.00000	0.00000	0.00000	3.00

PRECISION.....	5
UNIT OF MEASURE....	MM
JOB DATE.....	11-6-12
REV. LEVEL & DATE...	AE2 7/31/12
# PIECES.....	1
TOTAL FEATURES.....	84
MATERIAL.....	C14530 & C17410
SIGMA.....	3.0
TOLERANCE PERCENT..	80%
SHRINK FACTOR.....	0.0

COMMENTS: FULL LAYOUT
18 GAGE
NON CABLE SEALED TIN

D471A839/F8VB-14474-BA (54001839)/TERM (2.80MM) WIRE SNAP ON FEM/Final Sign-Off/FORD/AE2 7/31/12/11-6-12

ROW DETAIL

BAL#	/ DESC	NOMINAL	MEASURED
FEATURE		TOLERANCE +/-	OUT TOL
8	NOTE	//TOOL ID: "A" PRESENT	
			PRESENT
11	A NOTE	//PRESSURE FILL NOTE SEE NOTE 2 FOR REPLACEMENT GREASE 761G PRESENT	
			PRESENT
13	B	8.2	8.10400
		+/- 0.25000	
13	F	8.2	8.10500
		+/- 0.25000	
15	B	2.90	2.87900
		+/- 0.10000	
15	F	2.90	2.86200
		+/- 0.10000	
21	NOTE	//INSULATION HOLE SIZE AND SHAPE OPTIONAL FOR CABLE SEAL APPL	
			NOT APPL.
30		0.00	0.00950
		+/- 0.10000	
		"L" STEP	
44	NOTE	//WEEK CODE ID "42" PRESENT	
			PRESENT
46	NOTE	//GRIP CODE ID "18" PRESENT	
			PRESENT
47	NOTE	//VENDOR ID "FCI" PRESENT	
			PRESENT
49	B	4.20/4.30	4.23500
Min/Max			
49	F	4.20/4.30	4.25100
Min/Max			
50	NOTE	//DOUBLE CORE GRIP NOT THIS GRIP TYPE	
			NOT APPL.
52	NOTE	//DOUBLE CORE GRIP NOT THIS GRIP TYPE	
			NOT APPL.
55	NOTE	//D2 SEALED INS. GRIP TYPE 3 NOT THIS GRIP TYPE	
			NOT APPL.
56	NOTE	//SEALED INS GRIP TYPE 3 NOT THIS GRIP TYPE	
			NOT APPL.
69	NOTE	//GREASE OVERFLOW NOTE	
			NOTED
71	B	3.80	3.89200
		+/- 0.25000	
		BEFORE COIN	
71	T	3.80	3.88500
		+/- 0.25000	
		BEFORE COIN	

BAL# / DESC FEATURE	NOMINAL TOLERANCE +/-	MEASURED OUT TOL
73 B	2.0 +/- 0.25000 BEFORE COIN	1.99200
73 T	2.0 +/- 0.25000 BEFORE COIN	1.97900
74 A_NOTE	//BODY PLATING OPTION 1: HOT TIN DIP	CONFORMS
74 NOTE	//BODY MATERIAL: C14530 TO ASTM B152	CONFORMS
75 NOTE	//MATERIAL FOR ITEM 2 GOLD PLATING USE MATERIAL TYPE 4	NOT APPL.
75 NOTE A	//SPRING MATERIAL ITEM 2 - C17410 BE CU TO ASTM B-768	CONFORMS
80 BOT Min/Max	3.20/3.50 2X	3.27600
80 TOP Min/Max	3.20/3.50 2X	3.25700
84	3.0 +/- 0.30000 "A"	3.20400
88	1.9 +/- 0.30000 C2	1.97200
89 NOTE	//DOUBLE WIRE GRIP INS TYPE 2 NOT THIS GRIP TYPE	NOT APPL.
91 NOTE	//DOUBLE WIRE GRIP INS TYPE 2 NOT THIS GRIP TYPE	NOT APPL.
101	3.8 +/- 0.30000 "B" UNSEALED INS TYPE 1	3.59100
103	2.70 +/- 0.30000 "D2" UNSEALED INS TYPE 1	2.66500
123 NOTE	//GOLD PLATING OPTION 2 DOES NOT APPLY	NOT APPL.
125	//GOLD PLATING OPTION 2 DOES NOT APPLY	NOT APPL.
126	//GOLD PLATING OPTION 2 DOES NOT APPLY	NOT APPL.
127 A-E	//GOLD PLATING OPTION 2 DOES NOT APPLY	NOT APPL.

BAL# / DESC FEATURE	NOMINAL TOLERANCE +/-	MEASURED OUT TOL
128 NOTE	//GOLD PLATING OPTION 2	DOES NOT APPLY NOT APPL.
129 NOTE	//GOLD PLATING OPTION 2	DOES NOT APPLY NOT APPL.
130 NOTE	//GOLD PLATING OPTION 2	DOES NOT APPLY NOT APPL.
131 NOTE	//GOLD PLATING OPTION 2	DOES NOT APPLY NOT APPL.
132 NOTE	//GOLD PLATING OPTION 2	DOES NOT APPLY NOT APPL.
134 NOTE	//GOLD PLATING OPTION 2	DOES NOT APPLY NOT APPL.
136 NOTE	//GOLD PLATING OPTION 2	DOES NOT APPLY NOT APPL.
137 NOTE	//GOLD PLATING OPTION 2	DOES NOT APPLY NOT APPL.
138 NOTE	//GOLD PLATING OPTION 2	DOES NOT APPLY NOT APPL.
151 NOTE	//RECTANGULAR SLOT OPTIONAL	NOTED
167	0.30500 +/- 0.00800 BODY MATERIAL THICKNESS	0.30480
168 Min/Max	372.00000/442.00000 BODY - TENSILE STRENGTH	384.72984
170 MINIMUM	2.5 PERCENT MIN ELONGATION IN 51.0 MM	3.00000
171 Min/Max	0.0005/0.0025 BODY PLATING THICKNESS MM	0.00058
173 NOTE	//GOLD PLATING OPTION 2	NOT APPL.
177	0.20300 +/- 0.00800 SPRING -THICKNESS	0.20320
178 A MAX Min/Max	.0005/0.0025 SPRING PLATING THICKNESS- mm	0.00203
178 A MIN Min/Max	.0005/0.0025 SPRING PLATING THICKNESS- MM	0.00102

BAL# / DESC FEATURE	NOMINAL TOLERANCE +/-	MEASURED OUT TOL
178 NOTE	//SPRING MATERIAL PLATING OPTION 1 : 100% HOT TIN DIP	CONFORMS
179 MAX Min/Max	758.00000/897.00000	847.57739
	SPRING - TENSILE STRENGTH MPa	
179 MIN Min/Max	758.00000/897.00000	832.40513
	SPRING - TENSILE STRENGTH MPa	
180 MINIMUM	7.0	11.00000
	MIN ELONGATION 7% IN 50MM	
180 MAX Min/Max	655.00000/862.00000	785.50907
	SPRING - YIELD STRENGTH MPa	
180 MIN Min/Max	655.00000/862.00000	769.64716
	SPRING - YIELD STRENGTH MPa	
181 A-D	//MAtl TYPE 3	NOT APPL.
182 A-F	//MATL TYPE 4 DOES NOT APPLY	NOT APPL.
183 A THRU D	//MATL TYPE 5 DOES NOT APPLY	NOT APPL.
196	//DOUBLE CORE GRIP NOT THIS GRIP TYPE	NOT APPL.
197 Set On Size	.50	0.50000
	1/2 C1	
198 NOTE	//SEALED INS GRIP TYPE 3 NOT THIS GRIP TYPE	NOT APPL.
199 NOTE	//DOUBLE WIRE GRIP INS TYPE 2 NOT THIS GRIP TYPE	NOT APPL.
200 Set On Size	.875	0.87500
	1/2 D1	
201 NOTE	//SERRATION TYPE 10 & 12 GA 2 SERRATIONS DOES NOT APPLY	NOT APPL.
202 NOTE	//SERRATION ALL OTHERS	CONFORMS
203 MAX Min/Max	0.05/0.20	0.10910
	COIN TOP OF BOX AND TRANSITION AREA MEASURE BEFORE FORMING	

D471A839/F8VB-14474-BA (54001839)/TERM (2.80MM) WIRE SNAP ON FEM/Final Sign-Off/FORD/AE2 7/31/12/11-6-12

ROW DETAIL - (Continued)

BAL# / DESC FEATURE	NOMINAL TOLERANCE +/-	MEASURED OUT TOL
203 MIN Min/Max	0.05/0.20	0.10890
	COIN TOP OF BOX AND TRANSITION AREA MEASURE BEFORE FORMING	
220 NOTE	//SPOT GOLD PLATING OPTION 3 DOES NOT APPLY	NOT APPL.
227 227-229-240	//FOR SPOT GOLD PLATING OPTION 3 DOES NOT APPLY	NOT APPL.
243 NOTE	//UNSEALED INSULATION GRIP CONFORMS	CONFORMS
244 NOTE	//DOUBLE WIRE INSULATION GRIP DOES NOT APPLY	NOT APPL.
245 NOTE	//CABLE SEAL INSULATION GRIP DOES NOT APPLY	NOT APPL.
250 NOTE	//CORNER SEAM ON TOP, BOTH SIDES, MUST BE CLOSED.	CONFORMS
251 CORE L Min/Max	.05/0.20	0.12510
	COIN ALL GRIPS	
251 CORE R Min/Max	.05/0.20	0.11520
	COIN ALL GRIPS	
251 INS L Min/Max	0.05/0.20	0.11330
	COIN ALL GRIPS	
251 INS R Min/Max	0.05/0.20	0.14010
	COIN ALL GRIPS	

TOTAL # OF FEATURES	84	
LESS BASIC DIMENSIONS	2	
LESS EMPTY NOTES		0
LESS N/A DIMENSIONS		33
REPORTED DIMENSIONS		49
# DIMENSIONS IN TOLERANCE		49
# DIMENSIONS OUT OF TOLERANCE		0
% DIMENSIONS IN TOLERANCE		100.00%
% DIMENSIONS OUT OF TOLERANCE		0.00%
CUMULATIVE DIMENSIONS	49	
CUMULATIVE % (PIST) IN TOLERANCE	100.00%	

D471A839/F8VB-14474-BA (54001839)/TERM (2.80MM) WIRE SNAP ON FEM/Final Sign-Off/FORD/AE2 7/31/12/11-6-12

OUT OF TOLERANCE SUMMARY

BAL# / DESC	NOMINAL	MEASURED
FEATURE	TOLERANCE +/-	OUT TOL

No Out Of Tolerance Features To Report For This Group.

Aurubis

SOLD TO	SHIP TO		
4564037555 FCI USA, INC ACCOUNTS PAYABLE DEPARTMENT 825 OLD TRAIL ROAD ETTERS, PA 17319	FCI AUTOMOTIVE AMERICAS 11823 LENAPE DRIVE MT. UNION, PA 17066	**76416-375558** SHIP VIA: DATE: 10/1/2012 TIME: 10:35:24 AM	DIST: 50 ENT.DATE: 2012/07/10 ORD.DATE: 2012/07/10 REQ.DATE: 2012/09/25 PRM.DATE: 2012/09/28 MRP CODE: 50720800

PRD CD: A02122 PRAC #: 170008 ALLOY: 1453	C-DC-DW: CUST PO#: PO 76564 GOVT CON:	PPD/COLL: PPD CUST P/N: 47129 AFFIDAVT: X	BASIS: COMX PAGE: 1

1.1600 .01200
H08 SN/TE COPPER STRIP *TINNED*
P/N 47129 MMC 5/29/09
ASTM B152/B152M-09 (CHEMISTRY ONLY)

ORDER QTY
55000

*HOLD FOR RELEASE

	PACK NUMBER	COIL NUMBER	GROSS	TARE	NET	GROSS	TARE	NET	PIECES
			****** KILOGRAMS ******			********** POUNDS **********			
	341928	576139AB	1134	41	1093	2500	90	2410 8089	4
	342029	576114A	918	43	875	2024	93	1931 8090	3
	342030	576114A	916	42	874	2020	93	1927 8091	3
	342031	576114A	916	42	874	2021	93	1928 8092	3
	342032	576114B	604	41	563	1332	90	1242 8093	2
	342033	576114B	883	42	841	1948	93	1855 8094	3
Page 1 Totals	6		5372	250	5122	11845	552	11293	18
76416-375558 Totals	6		5372	250	5122	11845	552	11293	18

CERTIFICATION REPORT

Aurubis

SOLD TO	SHIP TO	ENTRY - BOL
FCI USA, INC ACCOUNTS PAYABLE DEPARTMENT 825 OLD TRAIL ROAD ETTERS, PA 17319	FCI AUTOMOTIVE AMERICAS 11823 LENAPE DRIVE MT. UNION, PA 17066	**76416-375558** ALLOY 1453

PRODUCT DESCRIPTION	QUANTITY ORDERED		CUSTOMER ORDER NO.
1.1600 .01200 H08 SN/TE COPPER STRIP *TINNED* P/N 47129 MMC 5/29/09 ASTM B152/B152M-09 (CHEMISTRY ONLY)	PCS. LBS. 55000	PCS. 6 LBS. 11293 DATE 10/1/2012 TIME 10:35:23 AM	PO 76564 GOVT CONTRACT NO.

COIL NUMBER	576139AB	576114A	576114B			
COMPOSITION - %						
Copper - includes Ag	99.95	99.95	99.95			
Phosphorous	.006	.005	.005			
Tin	.016	.012	.012			
Tellerium	.0086	.01	.01			
PROPERTIES						
Tensile Str. (ksi)	58.8	55.8	55.8			
Elongation (%) in 2 inches	3.0	3.0	3.0			
Coating Thickness (µin)	25.00	23.00	53.00			

WE HEREBY CERTIFY that these test results were obtained from samples taken from coil(s), which were produced for the purchase order stated. These samples have been subjected to the tests called for by the customer and /or ASTM specification(s).

This product was manufactured in compliance with all applicable government and safety constraints on restricted, toxic, and hazardous materials and complies to the Restriction of Hazardous Substances Directive (RoHS) 2002/95/EC and the Consumer Product Safety Improvement Act of 2008.

Aurubis Buffalo, Inc. product Material Safety Data Sheets (MSDS) provides component information for all hazardous materials in conformance with the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Thomas C. Pilkington

Technical Department

MATERION
BRUSH PERFORMANCE ALLOYS
606 Lamont Road, Elmhurst, IL 60126 TEL: 630-832-9650

For inquiries regarding this shipment, contact:

Ship-to: FCI USA, LLC
11823 Lenape Drive
Mount Union PA 17066-9733

Sold-to: FCI USA, LLC
11823 Lenape Drive
Mount Union PA 17066-9733

Packing List

Repeat printout	09/18/2012
Delivery Number:	80609634
Delivery Created:	08/20/2012
Order Number:	366150
Customer PO Number:	po69427
Customer No.:	14033
Payment Terms:	Net 60 Days
Incoterms:	FCA Shipping Point - Collect
Carrier:	YRC Worldwide Freight
Bill of Lading No.:	YRC 318-782797-7
No. of Containers:	1 Skid
Gross Weight:	1198 LBS

Made in the USA

Item Plnt	Material Description	Quantity	Weight
10 CH	620000859 Line Item 10 STRIP 17410 HT .00800 X .2200	1102 LBS	1102 LBS
	Pure Hot Tin Dip Plated .00004" - .00008" per side.		
	Batch 1190544	1102 LBS	1102 LBS

Lot 80548

With the following configuration:

Alloy	17410
Temper	HT
Customer Spec Nbr	ASTM-B-768
Gauge	0.00800 "
Gauge Plus	0.00025 "
Gauge Minus	0.00025 "
Width	0.22000 "
Width Plus	0.00300 "
Width Minus	0.00300 "
Type of Edge	Slit
Type of Length	Coil
Plating	SN

MSDS Website: www.materion.com/msds/A10

MATERION
BRUSH PERFORMANCE ALLOYS
606 Lamont Road, Elmhurst, IL 60126 TEL: 630-832-9660

Packing List

Repeat printout	09/18/2012
Delivery Number:	80609634
Delivery Created:	08/20/2012
Order Number:	366150
Customer PO Number:	po69427
Customer No.:	14033

Ship-to: FCI USA, LLC
11823 Lenape Drive
Mount Union PA 17066-9733

Item Plnt	Material Description	Quantity	Weight
	Type of Length	Coil	
	Plating	ELECTRO TIN / MATTE	

MSDS Website: www.materion.com/msds/A10

MATERION
BRUSH PERFORMANCE ALLOYS
606 Lamont Road, Elmhurst, IL US 60126

Material Certificate

Date
09/18/2012
Purchase order item/date
po69427 / 08/15/2012
Delivery item/date shipped
80609634 000010 / 08/20/2012
Order item/date
366150 000010 / 08/15/2012
Customer nbr Customer part nbr
14033 47121
Customer spec
ASTM-B-768
Rev Type Comp Class Grade

FCI USA, LLC
11823 Lenape Drive
Mount Union PA 17066-9733
US

Our Material: 620000859 STRIP 17410 HT .00800 X .2200
Your Material: 47121

Materion Brush testing for chemistry composition, mechanical and physical properties were tested at our laboratory in Elmore OH. or as necessary, outside laboratories under control of the Elmore Quality Department.
This material was inspected and tested and is conforming as required in accordance with the noted part, specification, drawing and revision. The test methods for these tests are available for review by the buyer.

This is to certify that during the manufacturing process, examination, testing, and packaging, our products do not come in contact with mercury or any of its compounds nor with any mercury-containing devices employing a single boundary of containment.

Pure Hot Tin Dip Plated .00004" - .00008" per side.

Batch 0001190544 / Quantity 1107 LBS

Characteristic	Unit	Value	Specification Limits Lower	Upper
CDA (UNS) Alloy	-	C17410		
ASTM Temper	-	TH04		
Dimensional Attributes				
Gauge	"	0.00800		
Gauge Plus	"	0.00025		
Gauge Minus	"	0.00025		
Width	"	0.2200		
Width Plus	"	0.00300		
Width Minus	"	0.00300		
Mechanical/Physical Properties				
Tensile	ksi	120.7 122.9	110.0	130.0
Yield @ 0.2% Offset	ksi	111.6 113.9	100.0	120.0
Elongation (4D)	%	11.0	7.0	17.0
Hardness Scale		HV		
Hardness		264.0	230.0	280.0
Percent IACS	%	52.4 52.9	45.0	60.0

MATERION
BRUSH PERFORMANCE ALLOYS
606 Lamont Road, Elmhurst, IL US 60126

FCI USA, LLC
11823 Lenape Drive
Mount Union PA 17066-9733
US

Delivery item/date
80609634 000010 /
08/20/2012

Bend 1 Direction	-	LONGITUDINAL		
Bend 1 Angle	DEG	90	90	90
Bend 2 Direction	-	TRANSVERSE		
Bend 2 Angle	DEG	90	90	90
Percent IACS	%	52.4 52.9	45.0	60.0

Chemistry Composition

Beryllium	%	0.34		
Fe+Si+Al	%	0.04		
Cobalt	%	0.53		
Iron	%	0.01		
Silicon	%	0.01		
Aluminum	%	0.02		
Tin	%	< 0.01		
Zinc	%	< 0.01		
Chromium	%	< 0.01		0.01
Alloy Balance	-	COPPER		

Lot Identification

Heat Number	-	80834
Coil Number	-	SINGLE
Prod Order/Pc/Lot Nbr.	-	100702246

Kevin Russell

Quality Representative - Kevin Russell

CERTIFICATE OF SPECIFICATION

Marjan, Inc.
44 Railroad Hill Street
Waterbury, CT 06708
PH: (203) 573-1742 - FX: (203) 755-9263

Marjan Hot Tinning, Inc.
1801 Albright Road
Montgomery, IL 60538
PH: (630) 906-0053 - FX: (630) 906-0058

DATE OF RECEIPT	ORDER NO.	MARJAN WORK ORDER NO.
7-19-12	CH4500311063	C12178

CUSTOMER Materion Brush, Inc.

SPECIFICATION Material to be hot dip tin coated with 100% pure tin to a thickness of .00004/.00008"

CERTIFICATE OF ☐ TEST ☐ COMPLIANCE (1)

Item	DESCRIPTION OF MATERIAL: Material & Dimensions	Quantity (lbs.)	Coating Thickness (micro-inches)	SOLDERABILITY (2): Flux Used	Aging	Results
	.008 x 3.156"	4,651	40-80			
	Alloy 17410					
	HT 806341					

(1) This report is a certificate of compliance. The material furnished on this order complies with requirements of the specification shown.

(2) Only when required.

Number M3-1
Rev. No. 0

This is to certify that to the best of our knowledge and belief, the values shown are correct and true and that the material complies with the requirements of the specification shown.

Inspection Dept.

CERTIFICATE OF REGISTRATION

Having been audited in accordance with requirements of

ISO/TS 16949:2009

SRI Quality System Registrar, Seven Fields, Pennsylvania, USA, hereby grants to:

Aurubis Buffalo, Inc.

Registration of the management system at its location:

70 Sayre Street
Buffalo, New York, USA

The conditions for maintaining this certificate of registration are set forth in the SRI registration agreements R20.3 and R20.4.

Scope of ISO/TS 16949:2009 registration:	"Manufacture of copper and copper alloy, sheet, strip, cups, phosphor bronze, specialty alloys, and tinned strip for connectors."
Exclusions:	Product Design and Development
Initial SRI registration date:	December 29, 2003
Current registration period:	October 3, 2011 through December 20, 2012

Signed for SRI:

Christopher H. Lake, President & COO

Certificate Date: October 3, 2011
Certificate Number: 010406
IATF Certificate Number: 0094280
Registration Number: 0276-01

Buffalo Manufacturing Unit
70 Sayre Street Buffalo, NY 14207

Work Instruction

Title: Laboratories Scope		**WI Number** WI-0622 **Revision:** 7
Process: Process Product/Validation Verification **Area:** Chem/Sheet Mill Labs	***Approved & Released Work Instruction***	**Implementation Date:** 07/13/2006
Unit: **ISO/TS Book:**		**Review Period -** 365 **Days**

Purpose:
To provide the Scope of the Buffalo Plant's Chemical and Sheet Mill Labs.

Responsibilities:
It is the responsibility of the Technical Director and all laboratory employees to comply and fully support this scope.

Work Instructions:
Scope:

The Laboratories at the Buffalo Plant are ISO/TS16949:2002 Certified (SRI Certificate No. 005889) captured labs and do not profit from any testing of customer product. The scope of our laboratories covers the type of inspection and tests performed.

Chemistry / Metallurgical

Technology	Range, when necessary	Methods Used	Product Types	Remarks
Optical Emission Spectrometry		ASTM E 1251	Copper & Copper Alloys	
Micro Hardness		ASTM E 384	Copper & Copper Alloys	Vickers Scale
Rockwell / Rockwell Superficial		ASTM E18	Copper & Copper Alloys	
Tension		ASTM E8	Copper & Copper Alloys	Flat Products
Grain Size		ASTM E112	Copper & Copper Alloys	Comparison Method
Conductivity		ASTM E 1004	Copper & Copper Alloys	%IACS
Surface Roughness		ASME B.46.1	Copper & Copper Alloys	
Tin Thickness		ASTM B568	Copper & Copper Alloys	Tin coating over Copper
Hydrogen Embrittlement		ASTM B577	Copper & Copper Alloys	

Inspection and Testing:

All inspection and testing will be performed in accordance with the Buffalo Plant ISO/TS16949:2002 documentation and the Scope of Accreditation.

7.0 Associated Documents:

8.0 Document Revision History:

Revision: 7	**Date Created:** 09/15/2005 **Date of Last Revision:** 07/13/2006	**Last Approval Date:** 07/13/2006

Document Author: Thomas Pilkington	**Document Manager:** David Oldman

9.0 Reason for Change:

Revision:	Sec/Para Changed	Change Made:	Date
1	N/A	Initial Issue of Document	9/15/05
4	Work Instructions	Deleted the reference to the Lab Accredidation	3/24/06
5	W.I.	Add Scope chart	3/28/06
6	n/a	Remove O.A.B.	6/23/06
7	Work Instructions - Scope	Changed the Certificate Number	7/12/06

10.0 Notification List:

TS_ALL, TS_Chemical Lab, TS_Sheet Mill Lab

11.0 Approvals:

First Approver's Signature

Name: Parker Finney
Title: Director Technical

Jul 13, 2006 07:25:24 AM EDT - Approved by: Parker Finney/Copper/Buffalo/Outokumpu

Document History Section

BUREAU VERITAS
Certification

MATERION BRUSH PERFORMANCE ALLOYS

606 LAMONT ROAD
ELMHURST, IL, 60126 USA

Bureau Veritas Certification certifies that the Management System of the above organization has been audited and found to be in accordance with the requirements of the management system standards detailed below

Standards

ISO 9001:2008

Scope of certification

DISTRIBUTION OF STRIP, ROD, WIRE, BAR, PLATE, INGOT, AND TUBE PRODUCTS. PROCESSING TO INCLUDE SLITTING, CUTTING, TENSION LEVELING, RE-COILING, AND TRAVERSE WINDING

Certification cycle start date: **10 September 2012**

Subject to the continued satisfactory operation of the organization's Management System, this certificate expires on: **9 September 2015**

Original certification date: **22 July 1994**

Certificate No. **US005114-1**

Certification Authority

Local office: *Bureau Veritas Certification North America, Inc.*
390 Benmar Drive, Houston, Texas, USA
www.us.bureauveritas.com/bvc

ANAB ACCREDITED

Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organization. To check this certificate validity please call **+281-310-3080**

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

BRUSH WELLMAN INC.
READING METALLURGICAL LABORATORY
Shoemakersville Road
Shoemakersville, PA 19555
Darwin Evangelista Phone: 610 562 6612

MECHANICAL

Valid To: December 31, 2010 Certificate Number: 0339.02

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following tests on metals and alloys, primarily beryllium alloys in strip, and rod and wire metal forms:

In-House Method	Test	Test Method
QCT-003	Tensile	ASTM E8, E345
QCT-036	Rockwell Hardness HRC, HRB, HR30N, HR15N, HR30T, HR15T	ASTM E18
	Microhardnesss	
QCT-033, 034	Vickers	ASTM E384
	Ductility	ASTM B820
QCT-012	90° Bend	----------
QCT-002	180° Bend	----------
QCT-035	Conductivity	----------
QCT-011	Solderability	----------
QCT-008	Scroll	----------
	Metallography	
QCT-009	Grain Size	ASTM E112, E930, E1181
QCT-009	Microetching	ASTM E407
QCT-009	Preparation	ASTM E3

CERTIFICATE

This is to certify that

Marjan, Inc.
Nasco, Inc.

44 Railroad Hill Street
Waterbury, CT 06722
United States of America

with the organizational units/sites as listed in the annex

has implemented and maintains a **Quality Management System**.

Scope:
The coating of hot tin, hot tin lead and hot tin silver on ferrous and non ferrous metal strip at Marjan, Inc. The slitting, edging, traverse winding and cutting to length of coiled metal strip at Nasco, Inc.

Through an audit, documented in a report, it was verified that the management system fulfills the requirements of the following standard:

ISO 9001 : 2008

Certificate registration no.	10001660 QM08
Date of original certification	1998-11-23
Date of revision	2011-03-31
Date of certification	2011-03-31
Valid until	2014-03-30

UL DQS Inc.

Ganesh Rao
President

Annex to Certificate
Registration No. 10001660 QM08

Marjan, Inc.
Nasco, Inc.

44 Railroad Hill Street
Waterbury, CT 06722
United States of America

Location	Scope
10005742 **Marjan Hot Tinning, Inc.** **1801 Albright Drive** **Montgomery, IL 60538** **United States of America**	The off-site facility located in Montgomery, IL performs the following functions: receiving, receiving inspection, hot coating, packing, shipping, purchasing, contract review, handling complaints, corrective/preventive action, training, calibration, customer-supplied product.

This annex (edition:) is only valid in connection with the above-mentioned certificate.

CERTIFICATE

This is to certify that

Marjan Hot Tinning, Inc.

1801 Albright Drive
Montgomery, IL 60538
United States of America

has implemented and maintains a **Quality Management System**.

Scope:
The coating of hot tin, hot tin lead and hot tin silver on ferrous and non ferrous metal strip.

Through an audit, documented in a report, it was verified that the management system fulfills the requirements of the following standard:

ISO 9001 : 2008

Certificate registration no.	10005742 QM08
Excerpt from Certificate Registration No.	10001660 QM08
Date of original certification	1998-11-23
Date of revision	2011-03-31
Date of certification	2011-03-31
Valid until	2014-03-30

UL DQS Inc.

Ganesh Rao
President

Accredited Body: UL DQS Inc., 1130 West Lake Cook Road, Suite 340, Buffalo Grove, IL 60089 USA

marjan, inc

44 Railroad Hill Street
P.O. Box 2420
Waterbury, CT 06722-2420
PH: (203) 573-1742
FX: (203) 755-9263

A6711 ISO 9001

Midwest Location:
Marjan Hot Tinning, Inc.
1801 Albright Road
Montgomery, IL 60538
PH: (630) 906-0053
FX: (630) 906-0058

May 13, 2003

TO:

FROM: William Strobel

SUBJECT: Lab Equipment at Marjan, Inc. Waterbury Location

Equipment	Used For
* Solder pots	Solderability
* Micro Hardness Tester	To check material hardness
* Superficial Hardness Tester	To check material hardness
*AA Machine	To check elemental composition
* Binocular Microscope	Grain Structure examination
* Air oven	Age samples for testing
* Tensile Cut Machine	Prepare samples for tensile test
* Tensile Machine	Check tensile strength of material
* E Comet Grinder/Polisher	Prepare samples for examination of grain structure
* Spring Back Tester	Test spring back strength of materials

We are an ISO 9001:2000 certified company, our regristar being U.L. Equipment calibrated and/or verified internally and/or external service suppliers.

Sincerely,

William Strobel
Plant Manager

aqa INTERNATIONAL

ACCESSIBLE. UNDERSTANDABLE. REGISTRATION.

CERTIFICATE OF REGISTRATION

AQA International, LLC attests that

FCI MVL

11823 Lanape Drive
Mount Union, PA 17066

with a scope of :

Design & Manufacture of Electrical Terminals

has established a Quality Management System that is in conformance with the International Quality System Standard

ISO 9001:2008

"Further clarifications regarding the scope of this certificate and the applicability of ISO 9001:2008 requirements may be obtained by consulting the organization."

Certificate No.:	CA00011836
Initial Registration:	03/07/2011
Registration Date:	03/07/2011
Expiration Date:	03/06/2014
Last Modified:	03/07/2011

CEO, AQA INTERNATIONAL

World Headquarters
501 Commerce Drive, NE
Columbia, SC 29223 USA
www.aqainternational.com

ANAB ACCREDITED

NA Automotive Group Quality Lab

FCI Automotive - North America, a division of FCI USA, Inc.
28100 Cabot Drive Suite 100
Novi, MI 48377
&
11823 Lenape Dr.
Mt. Union, PA 17066

1. Scope:

This Laboratory Scope is in accordance to the Quality System Requirements of ISO/TS 16949, and the ISO 17025 Standard. FCI performs inspection only on products produced by FCI Automotive. The scope of our Laboratory covers the type of inspection performed, the work instructions and specifications followed and the equipment used in performing the inspections. Additionally, this Laboratory performs calibration of equipment (company and privately owned) used in the measurement of FCI product. The scope covers the calibration of said equipment, the work instructions and specifications followed.

2. Responsibility:

It is the responsibility of the Quality Manager, Group Lab Supervisor, and all dimensional lab employees to comply and fully support this scope.

3. Inspection:

All inspection will be performed in accordance with print specification(s) and WQA304 (Dimensional Layout Inspection). Calibration will be performed per WTSP11 (Control of Inspection, Measuring and Test Equipment), WQA200 (Inspection, Measuring & Test Equipment) and WQA201 (Gage Calibration and Control Log).

4. Dimensional Measurement:

Equipment	Reference Standard	Procedure / Methods / Specifications
CNC Vision System	Outside Source NIST Traceable	Manufacturer's Instruction Manual
Omis / ROI Manual Vision System	1545-WQE Ram Optical 4" Glass Master	Manufacturer's Instruction Manual WQA322: Create a Program on the Deltronic WQA274: Deltronic Calibration Procedure
Profilometer	Outside Source NIST Traceable 1545-WQE Ram Optical 4" Glass Master	Manufacturer's Instruction Manual
.061-.750 Pin Gage Set .011 - .060 Plug Gage Set .0115 - .0605 Plug Gage Set	1562-WQE 125 Microinch Test Patch 1553-WQE 16.1 and 119.5 Microinch Test Patch	Manufacturer's Instruction Manual
Optical Comparator	1501-WQI Laser Scan Micrometer 1500-WQI Calibration Set for Laser Mic	Manufacturer's Instruction Manual WQA209: Master Disks and Plugs
Hardness Tester	Outside Source NIST Traceable	WQA215: Optical Comparators (Projectors)
Thickness Gages-Sheffield	Outside Source NIST Traceable	Manufacturer's Instruction Manual
0-12" Height Master	1516-WQE Master Gage Block Set	WQA285: Thickness Gages
Indicators: Dial (.00005 - .0005) and Test (Drop)	1516-WQE Master Gage Block Set	WQA214 Micrometer Height Gages
Surface Plate	1516-WQE Master Gage Block Set	WQA226 Indicators
0-6" Digital Caliper	Outside Source NIST Traceable	Print Specification
0-8" Height Gage	1516-WQE Master Gage Block Set	Print Specification

0-24" Height Gage	1516-WQE Master Gage Block Set	Print Specification
Gage Blocks	1516-WQE Master Gage Block Set	Print Specification
2" Ring Gages	1563-WQE Outside Source Nist Traceable	Print Specification
Weights – LB & Gram	1697-WQE & 1512-WQE Outside Source Nist Traceable	Print Specification
0-3" Digital Micrometer's	1508-WQE Outside Source Nist Traceable	Print Specification
	1516-WQE Master Gage Block Set	Print Specification

5. Analytical Analysis:

Equipment	Reference Standard	Procedure / Methods / Specifications
Analytical Balance Mettler PM400	1511-WQE Gram Weight Set	WQA210 Master Weight Set Gram

6. Calibration:

Micrometers: Outside and Inside Standard. Digital and Special Anvil Ect.	1516-WQE Master Gage Block Set Micrometer End Measuring Rods 1693-WRTE	WQA228: Standard Outside Micrometers WQA229: Inside Micrometers WQA233: V-Anvil Inside Micrometers (Tri-Anvil) WQA234: Tri-Anvil Inside Micrometers (Bore) WQA237: Digital O.D. Micrometers WQA238: LCD Electronic Digital O.D. Micrometers
Thickness Gages-Sheffield Feeler Gage Sets	1516-WQE Master Gage Block Set	WQA285: Thickness Gage WQA238: Thickness Gages Sets (Feeler Gages)
Calipers Dial and Digital	1516-WQE Master Gage Block Set 1517-WQE 2" Ringmaster	WQA230: Vernier and Digital Calipers
Video Vision System	1545-WQE Ram Optical 4" Glass Master	WQA274: Deltronic Calibration Procedure (Video)
Height Gages	1516-WQE Master Gage Block Set	WQA217: Height Gages (Vernier or Digital) WQA214: Micrometer Height Gages
Angle Plates	Surface Plate Layout	WQA218: Right Angle Plates
V-Blocks	Surface Plate Layout	WQA219: V-Blocks
Pin Gages	1501-WQI Laser Scan Micrometer	WQA220: Plain Plug Gages
Check Fixtures	1516-WQE Master Gage Block Set	WQA225: Check Fixtures and Functional Gages and Functional Gages
Indicators	1516-WQE Master Gage Block Set	WQA226: Indicators
Bore Gages	Ring Masters	WQA227: Dial Bore Gages
Depth Gages	1516-WQE Master Gage Block Set	WQA231: Micrometer Depth Gages
Beam Balances/Gram Scales	1511- WQE Gram Weight Set	WQA232: Beam Balances WQA210: Meter Weight Gram Set
Radius Gages	1562-WQE Optical Comparator	WQA235: Radius Gage Sets (Fillet Gages)
Compression / Force Gage	1508-WQA Master Weights and Hangers	WQA284: Chatillion Calibration
Thread Measuring Wires	1501-WQI Laser Scan Micrometer	WQA216: Thread Measuring Wires
Production Scales Up to 100 LBS.	9023-WQE Master Pound Weights	WQA250: Master Weights Pounds