HellermannTyton GmbH Internal Remarks: PB-Nr.: **11710**	Part- Description: **T18R-HS-BK-C1**

DAIMLERCHRYSLER Ford GM

Part Submission Warrant

Part Name **CLIP-WIR** Cust. Part Number **1M5T-14613-AA(FORD)**

Shown on Drawing No. **1M5T-14613-AA** Org. Part Number **111-01950**

Engineering Change Level **EOSE-E-11109892-000** Dated **28.06.2000**

Additional Engineering Changes **n/a** Dated

Safety and /or Government Regulation ☐ Yes ☒ No Purchase Order No. **111-01950** Weight (kg) **0,0003**

Checking Aid No. **n/a** Checking Aid Engineering Change Level **n/a** Dated **n/a**

ORGANIZATION MANUFACTURING INFORMATION

HellermannTyton GmbH DUNS: 315430892
Supplier Name & Supplier/Vendor Code

Großer Moorweg 45
Street Adress

Tornesch | 25436 | Germany
City | Region | Postal Code | Country

Production location: Germany

CUSTOMER SUBMITTAL INFORMATION

Nursan Elektrik Donanım Sanayi ve Ticaret A.Ş.
Customer Name/Division

Mrs.Didem Karabaş
Buyer/Buyer Code

FORD
Application

MATERIALS REPORTING

Has customer-required Substances of Concern information been reported? ☐ Yes ☐ No ☒ n/a

Submitted by IMDS or other customer format: **1165262**

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
- ☐ Supplier or Material Source Change
- ☐ Change in Part Processing
- ☐ Parts Produced at Additional Location
- ☐ Other – please specify below

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 organization´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 **Serial mold/ Injection moulding**

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 300000 / 24 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: **Enclosures:Control plan,flow chart,capability study,FMEA,R&R Gage,IMDS-print, certificate of analysis.**

Is each Customer tool properly tagged and numbered? ☐ Yes ☐ No ☒ n/a

Organization Authorized Signature i.A. i.A. Date *28.11.2014*

Print Name i.A. O. Pracht i.A. Salim Icer Phone No. +49 4122 701 360 FAX No. +49 4122 701 241

Title QIM/ Quality technician E-mail o.pracht@hellermanntyton.de

FOR CUSTOMER USE ONLY (IF APPLICABLE)

PPAP Warrant Disposition: ☐ Approved ☐ Rejected ☐ Other

Customer Signature Date

Print Name Customer Tracking Number (optional)

Appendix C – Production Part Approval, Dimensional Results

Production Part Approval
Dimensional Test Results

DAIMLERCHRYSLER Ford GM

ORGANIZATION:	HellermannTyton GmbH	PART NUMBER:	**1M5T-14613-AA(FORD)**
SUPPLIER/VENDOR CODE:	DUNS: 315430892	PART NAME:	**CLIP-WIR**
INSPECTION FACILITY:	QS Laboratory	DESIGN RECORD CHANGE LEVEL:	**1M5T-14613-AA/EOSE-E-11109892-000/28.06.2000**
		ENGINEERING CHANGE DOCUMENTS:	**n/a**

ITEM	DIMENSION / SPECIFICATION	SPECIFICATION / LIMITS			ORGANIZATION MEASUREMENT RESULTS (DATA)			OK	NOT OK
					mean	**min**	**max**		
1	3,80	±0,50			3,80	3,77	3,89	☒	☐
2	1,00	±0,20			1,02	0,99	1,07	☒	☐
3	4,60	±0,40			4,53	4,33	4,63	☒	☐
4	2,50	±0,20			2,49	2,44	2,53	☒	☐
5	100,00	±5,00			102,88	101,64	104,25	☒	☐
6	5,00	±0,50			4,75	4,60	4,90	☒	☐
								☐	☐
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Blanket statements of conformance are unacceptable for any test results.

SIGNATURE		DATE
i.A. O. Pracht	QIM	28.06.2011
i.A. Salim Icer	Quality technician	28.06.2011

Appendix D – Production Part Approval, Material Test Results

Production Part Approval
Material Test Results

DaimlerChrysler Ford GM

ORGANIZATION: HellermannTyton GmbH SUPPLIER/VENDOR CODE: DUNS: 315430892	PART NUMBER: **1M5T-14613-AA(FORD)** PART NAME: **CLIP-WIR**
MATERIAL SUPPLIER: *CUSTOMER SPECIFIED SUPPLIER/VENDOR CODE: *If source approval is req´d, include the Supplier (Source) & Customer assigned code.	DESIGN RECORD CHANGE LEVEL: **1M5T-14613-AA/EOSE-E-11109892-000/28.06.2000** ENGINEERING CHANGE DOCUMENTS: **n/a** NAME of LABORATORY:

ITEM	MATERIAL SPEC. NO. / REV	SPECIFICATION / LIMITS			SUPPLIER TEST RESULTS (DATA)	OK	NOT OK
7	**PA66**				**is PA66 according 7 WSS-M99P23-B**	☒	☐
8	**restricted substances**				**restricted substances according WSSM99P9999-A1**	☒	☐
						☐	☐
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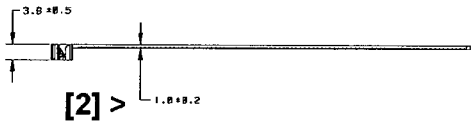
Blanket statements of conformance are unacceptable for any test results.

SIGNATURE	TITLE	DATE
i.A. O. Pracht	QIM	28.06.2011
i.A. Salim Icer	Quality technician	28.06.2011

LTRS	REVISIONS			
ORIGINATOR	CHECKER	ENGR APP	MATL APP	
RELEASED EDSE E 111089892 888 (*) DATE: 888628 CAD:Y				
LEAR	LEAR	BMISTRY	LEAR888638	

[1] >

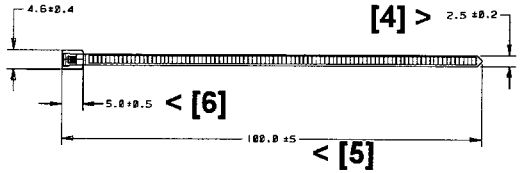


[2] >

PERSPECTIVE VIEW
(SCALE 1:1)

[3] >

[4] >



NOTES

THE MASTER SOURCE OF INFORMATION FOR THIS DRAWING IS IN A PE COMPUTER DATABASE. CHANGES ARE NOT PERMITTED WITHOUT JOINT AUTHORISATION FROM THE WORLDWIDE FASTENER STANDARDS COMMITTEE AND THE RELEVANT ENGINEERING CAD ACTIVITY.

CHANGES AFFECTING DESIGN, COMPOSITION OR PROCESSING OF THE PART PREVIOUSLY APPROVED FOR PRODUCTION, REQUIRE PRIOR APPROVAL FROM FORD PRODUCT ENGINEERING REF. Q101.

ENGINEERING APPROVAL OF PRODUCTION SAMPLES FROM EACH SUPPLIER REQUIRED PRIOR TO AUTHORIZATION OF INITIAL PRODUCTION. FOR SAMPLE REQUIREMENTS SEE ENGINEERING RELEASE.

DIMENSIONS AND INSTRUCTIONS WHICH ARE NOT DEFINED ARE LEFT TO THE SUPPLIERS DISCRETION PROVIDING THE FUNCTION OF THE PART IS NOT IMPAIRED

SUPPLIERS REF. NR. TO BE PLACED IN A SUITABLE LOCATION. SIZE TO SUIT MANUFACTURER BUT MUST BE CLEARLY VISIBLE.

NOT TO BE ISSUED OUTSIDE FORD/F.M.C.LTD/FORD-WERKE A.G. OR USED FOR MANUFACTURING PURPOSES WITHOUT THE APPROVAL OF "A. RAYMOND"

GENERAL TOLERANCE: ±0.3

DESIGN OF FEATURES AT MANUFACTURERS DISCRETION PROVIDED PUSH IN AND PULL OUT REQUIREMENTS ARE MET.

PLASTIC PARTS MATERIAL IDENTIFICATION SYMBOL >...PA...< TO BE LOCATED AS SHOWN. SIZE TO SUIT MANUFACTURER BUT MUST BE CLEARLY VISIBLE.

[7] >

MATERIAL: PA6.6
GENERAL: WSS-M99P23-B

[8] >

REFERENCE

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

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

3RD ANGLE PROJ
DIMENSIONS ARE IN MILLIMETERS

CAD TYPE	CAD LOC.	CAD FILE	DATA
F-PDGS	GIDS	1M5T-14613-AA	IS MASTER
OPER. NO.	UNIT	DRAWING	1M5T-14613-AA
DESIGN LEAR	DETAIL BERTRANDT	TITLE	SHT 1 OF 1
CHECKED LEAR	SAFETT	CLIP WIR	
SCALE 2:1	DATE 888638	DIVISION / PLANT	

DRW SIZE A1/D

CONTROL PLAN

Production Part Approval Process

Control Plan Category: ○ Prototype ○ Pre-Launch ◉ Production	Key Contact Name: ML Lim (+65) 6852 8582	Date (Orig): 01-Jun-2001	Date (Rev): 23-Mar-2010 (009)	Page: 1 of 2
Control Plan Number: HTPL-CP-SCT	Core Team: Sulaiman; Chia WH and Othman;	Customer Engineering Approval / Date (If Req'd): - / -		
Part Number / Latest Change Level: T18R		Customer Quality Approval / Date (If Req'd): - / -		
Part Name / Description: Standard Cable Ties	Supplier / Plant Approval / Date: -	Other Approval / Date (If Req'd): - / -		
Supplier / Plant: HellermannTyton Pte. Ltd.	Supplier Code: -	Other Approval Date (If Req'd): -		

Part / Proc #	Process Name / Operation description	Machine, Device, Jig, Tools For Mfg.	Characteristics: No.	Characteristics: Product	Characteristics: Process	Special Char. Class	Methods: Product / Process Specification / Tolerance	Methods: Evaluation / Measurement Technique	Methods: Sample Size	Methods: Sample Freq.	Methods: Control Method	Reaction Plan
1	Raw Material Receiving Inspection	-	-	Material Specification	-	-	HTAP-SPEC-01	HTAP-WI-WH	Batch	Every Material Delivery	COA	Return to Supplier
		RoHS Status	-	Polyamid	-	-	RoHS Directive	External Lab	NA	Yearly	Approved Material RoHS Registry	Report to Supplier.
			-	Masterbatch	-	-	RoHS Directive	External Lab	NA	By batch	Approved Mbatch RoHS Registry	Return to Supplier
2	Raw Material Preparation	-	-	Raw Material Identification	-	-	Manufacturing Detail List	Visual	Every Pack	Every Pack	Work Order	Report to Shift Leader for action
3	Material Drying	Dehumidifier	-	-	Equipment Setting	-	Molding Chart	N.A.	N.A.	Every Shift	Daily Monitoring Checklist	Work Order
4	Material Mixing	Auto-mixer	-	-	Equipment Setting	-	HTAP-SPEC-01	N.A.	N.A.	Every Tool Change	Process Quality Control Form	Work Order
5	Injection Moulding	Injection Moulding Machine	-	-	Injection Moulding Parameter Setting	-	Moulding Chart	N.A.	N.A.	Every Shift	Daily Monitoring Checklist	Adjustment
6	Dimensional Measuring	Venier Caliper ★	-	Cable Tie	Measurement of Cable Tie	-	Refer to Drawing	NA	1 shot	for 1st Article Inspection and PPAP Submission	1st Article Report PPAP Report	Call meeting to review if result is not positive
	In-process Inspection	-	-	VMI	-	-	HTAP-SPEC-01	Visual or Measurement HTAP-WI-QC	1 shot	2 hrly	Process Quality Control Form	Defect report
7	Functional Test (Manual)	-	-	Insertion Test Slip Back Test	-	-	No Functional Failure	Manual HTAP-WI-QC	1 shot	4 hrly	Process Quality Control Form	Defect report
8	Automated Process	Automated Packaging Machine	1 2	Water dozing Sealing	Water dosage Sealing Temp	-	HTAP-SPEC-01 NA	In-Process Audit	2 sample	Once a week	Water dosage check report	Defect report

CONTROL PLAN

Production Part Approval Process

Control Plan Category	Key Contact Name	Date (Orig)	Date (Rev)	Page
○ Prototype ○ Pre-Launch ○ Production	ML Lim (+65) 6852 8582	01-Jun-2001	23-Mar-2010 (009)	2 of 2
Control Plan Number HTPL-CP-SCT	**Core Team** Sulaiman; Edward and Othman;	**Customer Engineering Approval / Date (If Req'd)** - / -		
Part Number / Latest Change Level T18R		**Customer Quality Approval / Date (If Req'd)** - / -		
Part Name / Description Standard Cable Ties	**Supplier / Plant Approval / Date** -	**Other Approval / Date (If Req'd)** - / -		
Supplier / Plant HellermannTyton Pte. Ltd.	**Supplier Code** -	**Other Approval Date (If Req'd)** -		

			Characteristics				Methods					
Part / Proc #	Process Name / Operation description	Machine, Device, Jig, Tools For Mfg.	No.	Product	Process	Special Char. Class	Product / Process Specification / Tolerance	Evaluation / Measurement Technique	Sample Size	Sample Freq.	Control Method	Reaction Plan
9	Packaging	-	-	Packaging Specification	-	-	Packaging HTAP-WI-PRD	N.A.	1 pack	2 hrly	Process Quality Control Form	Report to Shift Leader for action
10	Out-going Inspection	-	-	VMI	-	-	Single Sampling Normal Inspection Lvl II AQL 0.025	N.A.	By plan	Daily	Release Note	Reject Note
11	Loop Tensile Test	Tensile Testing Machine	-	Loop Tensile Strength	-	◇	HTAP-SPEC-01	Tensile Testing Process HTAP-WI-QC	4 pcs	Daily	Test Report @ SPC & Cpk Study	Defect report
12	Loom Test	-	-	Application	-	◇	No Application Failure	Manual HTAP-WI-QC	10 pcs	Monthly	Test Report	Defect report
13	Water Dosage Check	Weighing Scale	-	Water	Weighing weight of water	-	HTAP-SPEC-01	-	2 samples	Once a week	Water Dosage Check Report	Defect report
14	Stand-Alone Water Doser (Optional Process)	Water Doser Equipment	-	Water	Water Dosing	-	HTAP-SPEC-01		Every Pack	Every Pack	In-Process Manufacturing System Audit	Defect report
15	RoHS Status	-	-	Finished Goods			RoHS Directive	External Lab	NA	Yearly	Approved Material RoHS Registry	Report to Quality Manager
16	Layout Inspection & Testing	Venier Caliper & Tensile Tester	-	Finished Goods	Measurement & Testing	-	As per Drawing	Tensile Testing Process HTAP-WI-QC	Dim & Test (1 shot)	Yearly	Layout Inspection & Testing Summary Report	Report to Quality Manager
17	Finished Goods Release	-	-	Part Code, Quantity	-	-	Stock Movement Form	HTAP-WI-WH	All	Daily	Stock Movement Form	Reject Note
18	Finished Goods Storage	Warehouse	-	Product Identification	FIFO	-	HTAP-WI-WH	Visual	On-going	On-going	FIFO colour code	Report to W/H Supervisor

★ : Gage Repeatability & Reproducibility study performed on this equipment.

@ : SPC & Cpk study conduct on all Automotive Products (moulds)

PROCESS FLOW DIAGRAM

Production Part Approval Process

Family name	Date (Orig.)	Prepared by
Injection Moulding of Cable Ties	17-Jan-2000	ML Lim
Part Number	**Revision Code** / **Date (Rev.)**	**Title**
T18R	- / 28-Oct-2010	Quality Manager
Part Name	**Page**	**Phone Number**
Standard Cable Ties	1 of 1	(+65) 6852 8582

Cross Functional Team Members

Sulaiman Kasan, Othman, Chia WH, ML Lim

Step #	Ops	Move	Store	Insp	Operation description	Item #	Product Characteristics	Item #	Control Characteristics
	●	➡	▼	■					
1					Raw Material Receiving Inspection		Material Specification		COC / COA
2					Raw Material Preparation		Material Specification		Manufacturing Details
3					Raw Material Drying		Moisture Content		Moisture Test Report
4					Material Mixing		Material Specification		Manufacturing Details
5					Injection Moulding		Production Process		Process Control & Maintenance
6					Dimension Measurement & In-process Inspection		General Quality Characteristics		Process Quality Control Form
7					Functional Test (Manual)		Functionality		Process Quality Control Form
8					Automated Process		Automated Equipment		Process Control & Maintenance
9					Packaging		Packaging Specification		Process Quality Control Form
10					Out-going Inspection		General Quality Characteristics		Release Note
11					Loop Tensile Test		Loop Tensile Strength		Test Report
12					Loom Test		Application		Test Report
13					Water Dosage Check		Quality Inspection		Test Report
14					Stand alone Water Dosing (optional)		Water Dosing		IPMA
15					RoHS Status		Finished Goods		RoHS Report
16					Layout Inspection & Testing		Finished Goods		Test Report
17					Finish Goods Release		Production Process		Stock Movement Form
18					Finish Goods Storage		Warehouse Process		FIFO

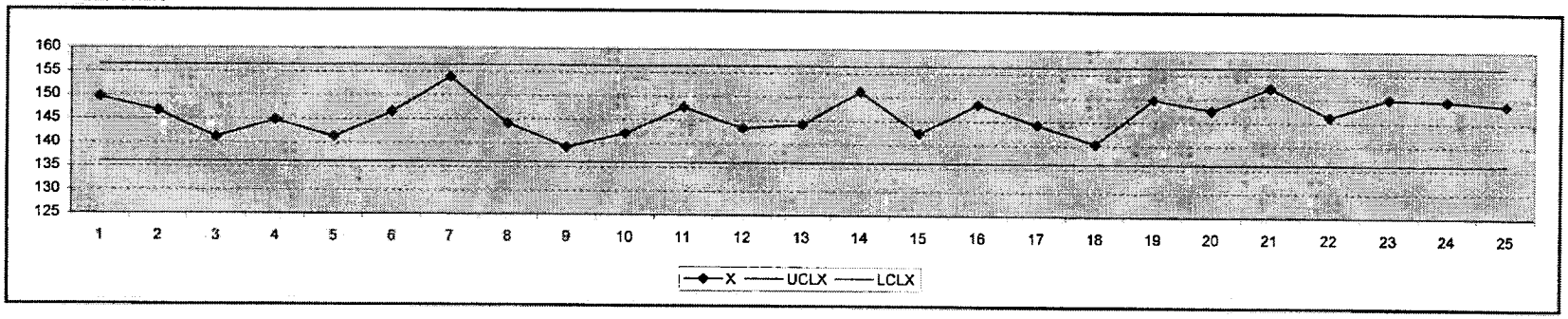
PROCESS CAPABILITY STUDY

Loop Tensile Pull Test (Xbar - R Chart)

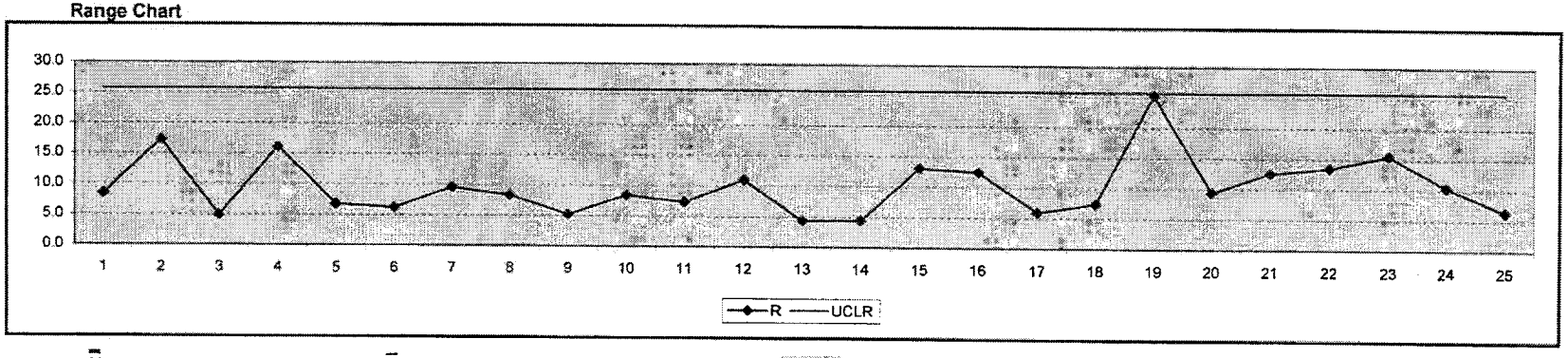
Product/Mould : T18R

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	149	153	144	144	144	149	148	140	140	140	145	137	142	153	138	156	143	137	164	142	151	144	156	146	152
	146	151	142	137	143	143	158	149	136	139	147	146	144	149	138	147	142	144	148	150	159	141	141	146	146
	154	136	139	153	137	149	156	144	141	147	152	148	147	151	151	143	148	140	138	151	147	154	153	157	148
X	150	147	141	145	141	147	154	144	139	142	148	143	144	151	142	148	144	140	150	148	152	146	150	150	149
R	8.5	17.3	4.9	16.1	6.8	6.2	9.6	8.3	5.2	8.4	7.3	11.0	4.3	4.4	13.1	12.5	6.0	7.4	25.3	9.4	12.6	13.5	15.5	10.4	6.4

Xbar Chart



Range Chart



$\bar{\bar{X}}$	146	$\bar{R}$	10.02	A_2	1.02	d_2	1.69
$UCL_{\bar{X}}$	156	UCL_R	26	D_4	2.57		
$LCL_{\bar{X}}$	136	LCL_R	0.00	D_3	0.00		

Process Capability

Process Standard Deviation = $\bar{R} / d2$ = 5.927

LSL 80

$C_{pk} = \bar{\bar{X}} - LSL / 3\sigma_{R/d2}$ **3.726**

Process Performance

Process Standard Deviation = $\sqrt{\sum (X_i - \bar{\bar{X}})^2 / n-1}$ = 3.942

LSL 80

$P_{pk} = \bar{\bar{X}} - LSL / 3\sigma_s$ **5.602**

POTENTIAL FAILURE MODE AND EFFECTS ANALYSIS

Production Part Approval Process — ○ Design FMEA — ◉ Process FMEA

○ System ○ Subsystem ◉ Component

Part Number: Standard Cable Tie	Design or Process Responsibility: Manufacturing	Prepared by: ML Lim	FMEA Number: HTPL-FMEA-SCT
Model Year(s) / Vehicle(s): T18R	Key Date: -	Original FMEA Date: 06-Mar-2009	Telephone #: (+65) 6852 8582
Core Team: Sulaiman, Othman, Chia WH, Tay KY			FMEA Revision Date: 21-Feb-2011

Process Function/ Requirements	Potential Failure Mode	Potential Effect(s) of Failure	Sev	Class	Potential Cause(s) / Mechanism(s) of Failure	Occ	Current Process Controls Prevention	Current Process Controls Detection	Det	RPN	Recommended Actions	Responsibility & Target Completion Date	Actions Taken	Sev	Occ	Det	RPN
1. Raw Material Receiving Inspection	High moisture in material	Gas, Bubbles, Flash, Fail visual inspection	4		Torn bag, material exposed	2	Material Certificate, Proper handling	Visual	8	64	None						
2. Raw Material Preparation	High moisture in material	Gas, Bubbles, Flash, Fail visual inspection	4		Dryer malfunction	2	Dryer Preventive Maintenance	Daily Monitoring Checklist, Visual inspection	8	48	None						
	Insufficient masterbatch	Lighter color tone	3		Weighing scale out of calibration	2	Annual verification	Visual inspection	5	30	None						
	Contaminant in material	Discoloured ties, Fail visual inspection	4		Dryer not clean during Job Change	3	Job Change Checklist	Verification by Technician, Visual inspection	6	72	None						
	Contaminant in material	Discoloured ties, Fail visual inspection	4		Mixer not clean during Job Change	3	Job Change Checklist	Verification by Technician, Visual inspection	6	72	None						
	Contaminant in material	Contaminated ties, Fail visual inspection	4		Metal contaminant in regrind	3	Magnets in hopper	Visual inspection	2	24	None						
3. Raw Material Drying	Water content out of spec	Failed Brittleness, Insertion & Tensile Test.	4		Raw material process related issue	3	Analysis of raw material water content	Verification by Technician	5	60	None						
4. Raw Material Mixing	No mixing	Short, Flash, Fail visual inspection	4		No input of material (virgin or regrind)	3	No Input Alarm	Visual inspection	6	72	None						
	Flash	Tight insertion, fail visual inspection	3		Sticking related problem at machine	4	Highly suspected Alarm did not t activate and mold did not stop when sticking	Visual inspection	6	72	As the m/c had been replaced with new machine, we could not verify the m/c condition Need further	Edward Tan 29-Jan-07	No re-occurrence after one month of monitoring	3	3	5	45
		Tight insertion, fail visual inspection	3		Sticking related problem at machine	4	Prevention via mold protection alarm device	Visual inspection	6	72	Re-adjust the sensitivity of the mold protection alarm setting	Edward Tan 8D9001 09-Jan-09	No re-occurrence after one month of monitoring	3	3	4	36
		fail visual inspection	3		Cutter or roller loose its sharpness	4	Verify gate cut condition in every set-up	Visual inspection	6	72	New preventive maintenance to physical check the roller condition	Edward Tan 8D9007 29-Jul-09	No Flash was observed after monitor it for a period	3	3	4	36
		fail visual inspection	3		Material over packed during insertion process	4	Verify via cushioning alarm	Visual inspection	6	72	Defect produced at IM#06, not compatible tp produce T18L, switch to new m/c (IM#22)	Sulaiman FTSL-QC-005 04-Aug-10	No Flash was observed after monitor it for a period	3	3	4	36
	Excess Burr	Fail visual inspection	3		Sticking related problem at machine	4	Mold Preventive Maintenance, Set limits for parameter	Visual inspection	7	84	Optimize mold parameter with lower nozzle and manifold temperature by 20 to 30 deg C	Edward Tan FTSL-09-06 18-Jun-09	No re-occurrence after monitor for a period	3	3	5	45
			3		Sticking related problem at machine	4	Mold Preventive Maintenance, Set limits for parameter	Visual inspection	7	84	Incorporate the cushioning control alarm function	Edward Tan Fujitsu 170909 08-Oct-09	No re-occurrence after monitor for a period	3	3	4	36
			3		Material over packed during insertion process	4	Mold Preventive Maintenance, Set limits for parameter	Visual inspection	7	84	- Change m/c from 6 to 22 (new m/c) - Perform 100% inspection	Sulaiman FTSL-QC-005 04-Aug-10	No re-occurrence after monitor for a period	3	3	4	36
	Short	Tie not full length, fail visual inspection	2		Insufficient pressure, insufficient metering	4	Mold Preventive Maintenance, Set limits for parameter	Visual inspection	6	48	Installed Defect Detection Device to detect short and re-optimize the mold parameter setting	Edward Tan 08-Aug-07	No re-occurrence after one month of monitoring	2	3	5	30
			2		machine start/stop due to minor adjustment	4	TDDD to detect short tie	Visual inspection	6	48	Engineering to re-program the TDDD device to stop at one count detection	Sulaiman 22-Sep-10	No re-occurrence after one month of monitoring	2	3	5	30
			2		machine start/stop due to minor adjustment	4	Mold Preventive Maintenance	Visual inspection	6	48	- install "PDDD" for long term solution	Sulaiman 8D10014 06-Dec-10	No re-occurrence after one month of monitoring	2	3	5	30
	Burnt	Fail visual inspection	3		Oxidized layer of material formed along the wall of the injection barrel	6	Purge barrel with PP Material	Visual inspection	8	72	Evaluate new purging material (eg: HDPE material) in replacing the current PP Material	Edward Tan 11-Dec-06	No re-occurrence after one month of monitoring	3	4	4	48

Process Function/ Requirements	Potential Failure Mode	Potential Effect(s) of Failure	Sev	Class	Potential Cause(s) / Mechanism(s) of Failure	Occ	Current Process Controls Prevention	Current Process Controls Detection	Det	RPN	Recommended Actions	Responsibility & Target Completion Date	Actions Taken	Sev	Occ	Det	RPN
5 & 6. Injection Moulding / In-Process Inspection	Missing Pawl	Fail visual inspection	4		material stuck on the mold insert during moulding	3	Mold Preventive Maintenance	Visual inspection	6	72	- Isolated incident. Awareness of the defective is communicated to all shop floor staff - Due to pawl stuck on the mold. New injection nozzle was installed to resolve the problem. - Highly suspected it was due to rotation and barrel temp faulty. Brought down tooling for serving. - Suspected it was due to processing temp too high. New cooling water supply to	SK 28-Mar-06 Edward Tan 16-Aug-07 Edward Tan 25-Mar-08 Edward Tan 28-Mar-08	No missing pawl was observed after monitor it for a period No re-occurrence after monitor for a period No re-occurrence after one month of monitoring No re-occurrence after one month of monitoring	4	3	4	48
			4			3			5	60	Occurred intermittently where molded pawl sticked on the mold	Edward Tan 02-Sep-08 TSD5-0901/HT01	This old mold had been replaced by new mold and no pawless defects was observed	3	4	3	36
			4			3			5	60	-Installed cooling circuit on head block and optimized molding parameter - Plan to put in place an image capturing device to	Edward Tan 02-Oct-08 SD5013	No missing pawl was observed after the CA	3	4	4	48
			4		The thin hinge design of this mold make it more sensitive in molding)	3			5	60	-Change new insert for cav3/4/9 - Plan to install image capturing device to detect pawless	Edward Tan SD5015 04-Nov-08	No missing pawl was observed after the CA	4	4	3	48
			4		inconsistent molded material stuck on insert	3			5	60	- Installed image capturing device to detect pawless	Edward Tan SD8002 31-Mar-09	No further feedback by customer	4	4	3	48
			4			3			5	60	- Installed image capturing device to detect pawless	Edward Tan SD9009 04-Dec-09	No further feedback by customer	4	4	3	48
			4		Change of mat'l	3	Purge barrel with PP Material		5	60	- Engineering dismantled "On & Off" switch and modified certain program to enable the said device function w/o switch	Sulaiman SD10013 06-Dec-10	No further feedback by customer	4	4	3	48
	Insertion Failure (Pawless)	Test Failure	4		Manual Inserton Test during DAM stage	3	Lack of further information and defective samples	Manual Insertion	5	60	- Purge WIH & Rework inventory (result: no balanced inventory)	ML Lim SD10001 26-Feb-09	No further feedback by customer	3	4	4	48
	Insertion Failure (Slip)	Test Failure	4		Lack of further information, root cause cannot be identify	3	Manual Insertion Test during DAM stage	Manual Insertion	5	60	Focus inspection will be carried out during manual insertion	Sulaiman SD10005 05-Jul-10	No further feedback by customer	3	4	4	48
	Insertion Failure (Slip)	Test Failure	4		mold misalignment related issue	3	Manual Insertion Test during DAM stage	Manual Insertion	5	60	Introduce misalignment check in trouble shooting guide	Sulaiman SD10005 05-Jul-10	No further feedback by customer	3	4	4	48
	Pawl do not back	Test Failure	4		Head insert dirty after a long run	3	Manual Insertion Test during DAM stage	Manual Insertion	5	60	Introduce daily cleaning to prevent recurrance	Sulaiman SD10005 21-Jul-10	No further feedback by customer	3	4	4	48
	Deform Pawl	Fail visual inspection	4		material stuck on the mold insert during moulding	3	Routine maintanance	Visual inspection	6	72	Tool brought down for servicing & cavity 2&1 insert was replaced	Edward Tan 30-Jul-08 FQA-30-7-08	No pawl deform was observed after the CA	3	3	4	36
	Dirty Cable Tie	Fail visual inspection	3		Machine Parameter setting related issue	3	Mold Preventive Maintenance, Set limits for parameter	Visual inspection	3	27	Purge the machine barrel with PP material and clean it with 'Almighty cleaner'	SK 20-Oct-07	No re-occurrence after monitor for a period.	3	2	3	18
			3		Root Cause cannot be identified	3			3	27	Highly suspected to be due to initial start-up. Alert and retrained TechOns	SK SD9003 13-Apr-09	No re-occurrence after monitor for a period.	3	2	2	12
	Black Contamination	Fail visual inspection	3		Machine Parameter setting & Process related issue	3	mold & machine routine set-up	Visual inspection	3	27	Monitor mold & machine set-up parameter, purging process & raw mat'l preparation	Edward Tan 03-Jun-08 SD8007	No re-occurrence after monitor for a period.	3	2	2	12
		Fail visual inspection	3		Material related issue	3			3	27	Suspect presence of impurities in material line	Edward Tan 09-Sep-09 SD9006	No similar failure was observed after monitor for a period	3	3	2	18
		Fail visual inspection	3		Equipment Related issue	3			3	27	Rubber pad installed at the crusher chute was torn	Sulaiman 02-Jun-10 SD10004	No re-occurrence after monitor for a period.	3	2	3	18
	Sticking in mould	Part damage, mould damage, fail visual inspection	8		Excessive mould temperature, excessive holding pressure, mold wear	3	Mold Preventive Maintenance, Set limits for parameter	Visual inspection, mold protection alarm	3	72	None						

Process Function/ Requirements	Potential Failure Mode	Potential Effect(s) of Failure	Sev	Class	Potential Cause(s) / Mechanism(s) of Failure	Occ	Current Process Controls Prevention	Current Process Controls Detection	Det	RPN	Recommended Actions	Responsibility & Target Completion Date	Actions Taken	Sev	Occ	Det	RPN
	Black Spot	Fail visual inspection	3		Oxidized layer of material formed along the wall of the injection barrel	4	Purge barrel with PP Material	Visual inspection	6	72	-Evalute new purging material (eg. HDPE material) in replacing the current PP Material. -Black impurities was found but could not determine what it is. Focus inspection will be introduce to contain the problem	Edward Tan 11-Dec-08 Sulaiman 01-Apr-09	No re-occurrence after one month of monitoring No further feedback from customer on black spot after monitor for one month	3	3	3	27
											- Establish method and procedure to purge manifold	Edward Tan 15-Oct-08 SD8012	No further feedback from customer on black spot after monitor for one month	3	3	3	27
											- Scheduled to clean the injection screw before next run	Sulaiman 22-Jul-09 SD8033	No re-occurrences after monitor for one month	3	3	3	27
	Head Cut	Part damage, fail visual inspection	3		Misaligned feeding	5	Cutting guide	Visual inspection	5	75	Eng to install sensor to detect misaligned feeding with alarm to indicate misaligned feeding	Edward Tan	Sensor and alarm installed, machine auto stop when misaligned feeding detected	3	4	4	48
			3			5			5	75	Root cause cannot be identified, detection mechanisms are deemed adequate, need further monitoring.	Edward Tan 24-Jul-08 DAR-24-7-08	No further feedback from customer on headcut after monitor for one month	4	4	4	64
			3			5			5	75	Ties not properly fed into cutter. New sensor will be install to detect double feeding.	Edward Tan 09-Sep-08 SD8009	No further feedback of head cut defects after fine tune the current sensor setting	4	4	3	48
			4			5	Runner bend		4	80	Runner bend cause improper feeding, optimize parameter setting	Edward Tan 12-Sep-09 PCHPB-9009	No Head Cut was observed after the CA	3	4	3	36
			4			5	TDDD switch-off that resulted in runner bend could not be detected		4	80	Runner bend cause improper feeding	Edward Tan 16-Mar-10 SD10003	No Head Cut was observed after the CA	3	4	3	36
			3		cable tie bend in the shot form before cutting	5	Cutter routine maintenance		4	80	Tightened the gap of detection device from 4.2 to 3.5mm	Sulaiman SD10009 12-Aug-10	No Head Cut was observed after the CA	3	4	3	36
	Foreign Particle	Failed visual inspection	5		cutting drum rubbing with hopper	4	Routine maintenance	Visual Inspection	3	60	-Added lock nut to secure the shock absorber	Edward Tan 30-Nov-08	No re-occurrence was observed within a month	5	2	2	20
	String	Failed visual inspection	5		Machine Parameter setting related issue	4	Molding Chart, Daily Monitoring Checklist	Visual Inspection	3	60	New setting was established and will become a standard molding setting specification	Edward Tan 3-Jan-07	No re-occurrence was observed within a month	5	3	3	45
			5			4			3	60	Special process was established to perform focus inspection	Edward Tan 22-Apr-08 SD8006	No re-occurrence after monitor for one month	5	3	3	45
			5			3			3	45	Fine tune manifold temp to optimize the setting	SK 08-Sep-08 SD8011	No re-occurrence after monitor for one month	5	3	3	45
	Difficult to be during assembly process	Failed application	7		New mold with improved tensile strength	3	First article buy-off	Inserton Test (every 4 hrs interval)	3	63	Fine-tune the first article buy-off process (eg: verify the product dimension after tooling rectification)	Edward Tan Jul-05	No re-occurrence was observed within a month	7	2	3	42
	Gas/Bubble	Fail visual inspection	4		High moisture in material	2	Dryer Preventive Maintenance, Material Certificate	Visual inspection	6	48	None						
	Discoloration	Fail visual inspection	4		previous pellets trapped in the material feeding system	3	Cleaning all section of material feeding system	Visual inspection	5	60	Operators involved have been identified and retraining	SK 27-Feb-08	Monitor for a period and no further similar complaint from customer	4	3	4	48
			4		Ageing related issue	4	Storage and Inventory control		5	80	CS & WH supervisor to beware of inventory planning and monitor the ageing status	CS & WH Resp. 11-Sep-08 SD8010	No feeback from customer after CA	4	4	4	48

Process Function/ Requirements	Potential Failure Mode	Potential Effect(s) of Failure	Sev	Class	Potential Cause(s) / Mechanism(s) of Failure	Occ	Current Process Controls Prevention	Current Process Controls Detection	Det	RPN	Recommended Actions	Responsibility & Target Completion Date	Actions Taken	Sev	Occ	Det	RPN
			4		Change of mat'l	4	Purge to clean barrel		5	80	During initial set-up, on-hold first 2 cartons for re-screen.	Sulaiman, 8D10010 14-Sep-10	No feeback from customer after CA	3	4	4	48
	Sharp Remain Gate	Fail visual inspection	4		Machine Parameter setting related issue	4	Molding Chart, Daily Monitoring Checklist	Visual Inspection	3	48	New set of cutter was installed and optimize the machine cutting setting	Edward Tan 02-Oct-07	Monitor for a period and no further similar compaint from customer	4	2	3	24
	Tie Breaking	Fail functional test	5		Machine Parameter setting related issue	4	Molding Chart, Daily Monitoring Checklist	Tensile Test	3	60	(a)Introduced Bend Test to simulate end-user application (b) Reviewed the temp profile and optimum the setting.	ML Lim 30-Jan-09 Edward Tan 30-Jan-08	No re-occurrence was observed from customer end after monitor for one month	5	3	2	30
	Bad Finished (excess molding)	Fail visual inspection	4		Machine Parameter setting related issue	4	Molding Chart, Daily Monitoring Checklist	Visual Inspection	4	64	New standard molding chart with specification control was put in-placed since Jan-08	Edward Tan 07-Jan-08	No re-occurrence was observed from customer end after monitor for one month	4	3	2	24
	Wrong setting	Short, Flash	4		Improper setting by new Technician	2	Molding Chart, Daily Monitoring Checklist	Verification by Shift Leaders	7	56	None						
7. Functional Test (manual)	Failed manual test	Insertion, Slip Back & Brittleness Test	3		Raw material process related issue	3	Analyst raw material manufg status (COA)	Investigate by Engineering / Quality staff	4	36	None						
8. Automated Process	Parts not conditioned	Parts too dry	5		Dosier malfunction, Water level low	3	Dosier Preventive Maintenance	Water checks every 2 hrs	6	90	None						
	Wrong conditioning	Parts wrong moisture level	5		Dosier malfunction, Wrong setting	3	Dosier Preventive Maintenance, Job Change Checklist	Water checks every 2 hrs	6	90	None						
	Wrong date code	No traceability	3		Technician error	4	Shift handover verification	Lot number checks every 2hrs	6	72	None						
	Parts dropped	Wrong pack quantity	3		Transfer problem	4	Autopack Operation Checksheet	Pack Weight Inspection	6	72	None						
9. Packaging	Missing label	Wrong identification of product	3		Operator error	4	Packing Instruction, Shift handover verification	Label checks every 2hrs	6	72	Enhances the work process in rework area. Briefed all Leaders & Tech	SK 09-Jul-08 8D8008	No re-occurrence was observed after monitor for one months	4	2	4	32
	Pack Shortage	Delivery performance	5		Happened during Job Change where floor counter was not re-set	4	Technician was trained to carry out the task as per WI	In-Process Manufacturing System Audit (twice a week)	4	80	As shift leader to counter check the work done by Tech during the job change stage	SK 25-Aug-08	No re-occurrence was observed after monitor for two months	5	2	4	40
			5		Carton weight tolerance setting related	4	Current tolerance setting	Weighing frequency - every carton	4	80	New carton weight tolerance setting was revised	SK 23-Jun-08 MRR:08047	No re-occurrence was observed after monitor for a period	4	2	4	32
			5		Mechanical related issue during transfer	4	Weighing check	Periodic sample weighing	4	80	100% weighing on each pack	ET 8D8014 03-Nov-08	No re-occurrence was observed after monitor for a period	3	2	4	24
	Mixed Product	Wrong identification of product	3		Technician error	5	Tech to check before proceed with the new job change	Once there is a new job change	4	60	Tech was alerted and incident report was raised	Sulaiman 25-Aug-08	No re-occurrence was observed	3	4	3	36
	Mixed Product	Wrong identification of product	3		Rework / Warehouse error	5	Human related error	Visual self inspection	4	60	Visual Aid - 10001 display to alert Rework & WH personnel	ML Lim 003-1501 0KWNVL	No re-occurrence was observed	3	3	3	27
	Physical part and label content not tally	Wrong identification of product	3		Re-paste label due to change of carton box	5	Visual inspection	Visual self inspection	4	60	Keep record of re-issue of label as an evident for future traceability	Sulaiman 8D10012 15-Oct-2010	No re-occurrence was observed	3	3	3	27
10. Out-Going Inspection	Packaging	Wrong or incorrect Label	3		Human handling related issue	4	Training and alert Operator of the incident	IPMA audit	4	48	None						
	Visual defect	Short	2		Escapes from In-Process Inspection	5	Training and alert Operator of the incident	IPMA audit	4	60	None						
11. Tensile Test	Failed Test	Brittleness	3		Raw Material related issue	2	Raw Material (COA)	Inspect every Lot of COA's data	4	40	None						

Process Function/ Requirements	Potential Failure Mode	Potential Effect(s) of Failure	Sev	Class	Potential Cause(s) / Mechanism(s) of Failure	Occ	Current Process Controls Prevention	Current Process Controls Detection	Det	RPN	Recommended Actions	Responsibility & Target Completion Date	Actions Taken	Sev	Occ	Det	RPN
◇			5		Step to step sequence of trouble shooting	2	Under investigation	Pre-conditioning brittleness test (every 4 hrs interval	4	40	- Engineering to create Trouble Shooting Guide - Introduce low climatic test	Edward Tan ML Lim	Trouble shooting Guide created Low climatic test	5	2	3	30
12 Loom Test ◇	Failed Test	Loose or Break Cable Tie	5	◇	End user Wrong application of Tension Tool	1	Conduct Loom Test to simulate end user application	10 pcs of conditioned shot for each mould	1	5	None						
13 Water Dosage Check	Excess water	Affect tie functionality	6		Parameter setting related issue	2	Doser Preventive Maintenance, Job Change Checklist	- Visual water checks every 2 hrs - Water weight measurement once a week	5	60	Human related issue due to auto packaging machine down	Sulaiman 04-Dec-09 8D9010	No re-occurrence was observed after monitor for a period	6	2	4	48
14 Stand-Alone Water Doser (Optional)	Parts not conditioned	Parts too dry	6		Doser malfunction, Water level low	3	Doser Preventive Maintenance	Water checks every 2 hrs	6	90	None						
	Wrong conditioning	Parts wrong moisture level	5		Doser malfunction, Main switch wrong setting	3	Doser Preventive Maintenance, Job Change Checklist	- Visual water checks every 2 hrs - Water weight measurement once a week	6	90	Permanent cover for the water dosing pump will be added to prevent any manipulation of setting.	Chia WH 18-May-07	No re-occurrence was observed	5	4	3	60
15 RoHS Status (Optional)-Perform once a year	Contained banned substances	Cable Tie failed RoHS standard	5		Raw material related issue	3	Monitoring of RoHS declaration status of raw material suppliers	External SGS RoHS Report & raw material suppliers declaration letters	1	15	None						
16 Layout inspection & Testing (Optional)- Perform once a year	Measurement or Testing out-of-spec	Product failures	5		Material, Process parameter setting, Machine maintenance related issue	2	In-coming material COA Inspection, IPMA audit and routine M/C maintenance program	SCAR & CPAR	2	20	None						
17 Finished Goods Release	Check goods against document	Physical goods and document not tally	4		Human disciplinary related issue	3	Training and alert Operator of the incident	IPMA audit	2	24	None						
18 Finished Goods Storage	First In First Out (FIFO)	Not practising	3		Human disciplinary related issue	1	Training and alert W/H staff of the incident	W/H Supervisor routine check	2	6	None						

◇ special characteristic

REPEATIBILITY AND REPRODUCIBILITY ANALYSIS REPORT

NON DESTRUCTIVE TEST

Specimen	Cable Tie	Gage name	Vernier Caliper	Plant	HTPL
Characteristic	Dimension(B) : 4.6 ±0.2	Gage number	0037147	Coord by :	ML Lim
Tolerance	0.40 Units mm	Gage type	CD-8 Mitutoyo	Date :	06-Dec-2010

OPERATOR		P		A		R		T				RESULTS
TRIAL #		1	2	3	4	5	6	7	8	9	10	AVG
A	1	4.62	4.62	4.63	4.63	4.61	4.63	4.63	4.55	4.63	4.59	A_1
	2	4.63	4.63	4.64	4.63	4.61	4.62	4.62	4.55	4.63	4.59	A_2
	3	4.62	4.62	4.63	4.62	4.61	4.63	4.63	4.56	4.62	4.58	A_3
Average		4.62	4.62	4.63	4.63	4.61	4.63	4.63	4.55	4.63	4.59	X_A **4.6137**
Range		0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	R_A **0.0090**
B	1	4.62	4.62	4.63	4.62	4.62	4.62	4.63	4.56	4.61	4.59	B_1
	2	4.62	4.63	4.61	4.61	4.63	4.64	4.63	4.58	4.62	4.57	B_2
	3	4.63	4.63	4.63	4.62	4.62	4.62	4.62	4.58	4.61	4.59	B_3
Average		4.62	4.63	4.62	4.62	4.62	4.63	4.63	4.57	4.61	4.58	X_B **4.6137**
Range		0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.02	0.01	0.02	R_B **0.0140**
C	1	4.63	4.63	4.63	4.62	4.62	4.63	4.61	4.58	4.62	4.59	C_1
	2	4.64	4.62	4.62	4.63	4.63	4.62	4.62	4.58	4.63	4.59	C_2
	3	4.63	4.63	4.63	4.63	4.62	4.63	4.61	4.58	4.62	4.58	C_3
Average		4.63	4.63	4.63	4.63	4.62	4.63	4.61	4.58	4.62	4.59	X_C **4.6167**
Range		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	R_C **0.0090**
PART		4.6267	4.6256	4.6278	4.6233	4.6189	4.6267	4.6222	4.5689	4.6211	4.5856	R_{PART} = 0.0589

$R = R_A + R_B + R_C$ / No of operators: 0.0090 + 0.0140 + 0.0090 / 3 = R = 0.0107

X_{DIFF} = [Max $(X)_{ABC}$] - [Min $(X)_{ABC}$] : 4.6167 - 4.6137 = X_{DIFF} = 0.0030

$UCL_R = R * D_4 = 0.0107 * 3.270 = UCL_R$ = 0.0349

$LCL_R = R * D_3 = 0.0107 * 0.000 = LCL_R$ = 0.0000

FROM DATA SHEET: R = 0.0107 X_{DIFF} = 0.0030 R_{PART} = 0.0589

Measurement Unit Analysis	Total Variation Method	Tolerance Method
Repeatibility : Equipment Variation (EV) $EV = R * K_1$ **EV =** 0.0063 (Trials = 3, K_1 = 0.5908)	% EV = 100[EV/TV] **% EV = 25.64**	% EV = 100[EV/(tol/6)] **% EV = 9.45**
Reproducibility : Appraiser Variation (AV) $AV = [(X_{DIFF} * K_2)^2 - (EV^2 / nr)]^{1/2}$ (n parts, r trials) **AV=** 0.0011 (Oper = 3, K_2 = 0.5231)	% AV = 100[AV/TV] **% AV = 4.34**	% AV = 100[AV/(tol/6)] **% AV = 1.60**
Repeatibility & Reproducibility (R & R) $R\&R = (EV^2 + AV^2)^{1/2}$ **R&R=** 0.0064	%R&R=100[R&R/TV] **%R&R = 26.01**	%R&R=100[R&R/(tol/6)] **% R&R= 9.59**
Part Variation (PV) $PV = R_{PART} * K_3$ PV= 0.0237 (Parts = 10, K_3 = 0.403)	% PV = 100[PV/TV] **% PV = 96.56**	
Total Variation (TV) $TV = (R\&R^2 + PV^2)^{1/2}$ **TV=** 0.0246	**CONCLUSION:**	
Number of Distinct Categories (ndc) ndc = 1.41(PV / GRR) **ndc =** 5.24 (ndc be at least 5 or greater)	Gage is min acceptable (Tolerance Method, %R&R of 9.59)	

- Under 10% error	Gage system is satisfactory.
- 10% to 30% error	May be acceptable based upon importance of application, cost of gage, cost of repairs, etc.
- Over 30% error	Gage system is not satisfactory. Identify the causes and take corrective action.

FORM: DOC-QA-11-B

Frequency of carried out GR&R : Bi-Annually

Reviewed By : ML Lim

Date : 06-Dec-2010

MDS Report
Substances of assemblies and materials

1. Company and Product Name

1.1 Supplier Data

Name [ID]:	**Hellermann Tyton GmbH [511]**
DUNS Number:	**31-543-0892**
Street/Postal Code:	**Großer Moorweg 45**
Nat./ZipCode/City:	**DE 25436 Tornesch**
Supplier Code:	**31-543-0892**
Contact Person:	**Frank Bethmann**
- Phone:	**04122-701222**
- Fax No.:	**04122-701241**
- e-mail address:	**f.bethmann@hellermanntyton.de**

1.2 Product Identification

Part/Item No.:	**1M5T-14613-AA**
Article Name:	**T18R-HS-BK**
Report No.:	**-**
Date of Report:	**-**
Purchase Order No.:	**11101950**
Bill of Delivery No.:	**-**
Development Sample Report:	**No**
IMDS ID / Version:	**1165262 / 13**
Node ID:	**79566548**
MDS Status (Change Date):	**Internally released (02/12/2008)**
Recipient Company (Org Unit) [ID]:	**Nursan Elektrik Donanim Sanayi ve Ticaret A.S. [18239]**
Recipient Status (Change Date):	**accepted (02/13/2008)**
Accepted by:	**SERDAR YAPRAK**

2. Recyclate Information

Since IMDS release 3.0, recyclate information is stored on the reference to certain materials.

MDS Report

Substances of assemblies and materials

Materials which are subject to legal prohibitions must not be included!
Dangerous substances formed or released during use must also be declared
Please note: GADSL list for substances that require declaration

3. Characterization of the Component

Part/Item No.:	**1M5T-14613-AA**	Report No.:	**-**
Article Name:	**T18R-HS-BK**	IMDS ID / Version:	**1165262 / 13**
		Node ID:	**79566548**

Tree Level	Article Name / Article Name / Name / Substance name	Part/Item No. / Item- /Mat.-No. / Material-No. / CAS No.	IMDS ID / Version	Quantity	Weight [g]	Portion [%]	Portion (from - to) [%]	Classif. / GADSL, SVHC	Parts Marking / Recyclate (Indust./Consumer) / Application
1	T18R-HS-BK	1M5T-14613-AA	1165262 / 13		0.3				Not Applicable
├2	PA66		68176345 / 2		0.3			5.1.b	No
├3	PA66	-				99			
├3	Carbon black	1333-86-4				0.55			
├3	Further Additives, not to declare	system				0.45			

This is an uncontrolled copy of a document created by IMDS. End of the report.

A 18/1
RM 003

Ascend Performance Materials LLC
Nylon Plastics and Polymers
3000 Chemstrand Road
Pensacola, Fl 32533
Telephone: (850) 968-7000

ASCEND PERFORMANCE MATERIALS BVBA
30 Tuas Road
Singapore, 638492

Certificate Date: 19-OCT-10
Delivery No: 0381947414
Shipped Qty: 37,467.986 Lbs
(16,995.478 Kgs)
Customer P.O. No: 4503915829

Certificate of Analysis

This certifies that Nylon Resin shipped to you from Ascend Performance Materials LLC has been tested and found to meet required specifications.

The material purchased was produced under a Quality System that meets TS16949 + ISO9002 criteria.

This Vydyne/Ascend nylon resin meets the relevant requirements of Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment ("RoHS Directive") and Directive 2002/96/EC on waste electrical and electronic equipment ("WEEE Directive").

If you have any questions or concerns about this letter, please call the Ascend Performance Materials LLC Customer Service Department at 1-888-927-2363.

This product meets the requirements of the following specifications: ASTM D4066 PA0121, GMP.PA66.018, WSK-M4D648A, MS-DB41 CPN1899, FMVSS 302*

Material Type: VYDYNE 22HSP BLACK **Batch No:** YJ01VY22 **Date of Mfg:** 01-OCT-2010

Ascend Performance Materials LLC Specification

Lot Data Property	Test Method	Min	Max	Result	Units
Relative Visc.	ASTM D789[9.34]	45.0	51.0	47.7	N/A
Visoosity Num. Sulfuric	ISO 307	136.9	148.2	142.2	N/A
Moisture	ASTM D6869	0.08	0.20	0.13	%
Strength @ Yld	ISO 527-1,2 / 1A	78		85	MPa
Nom. Str.@ Brk	ISO 527-1,2 / 1A	16		23	%