EMS TECHNOLOGIES CO., LTD

EMS presentation

By Louis Chen

2021.1.20

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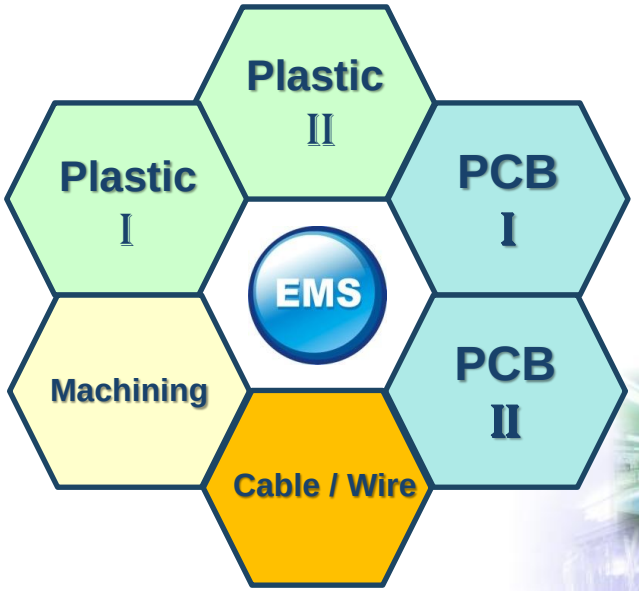
https://youtu.be/EX76BKtof84

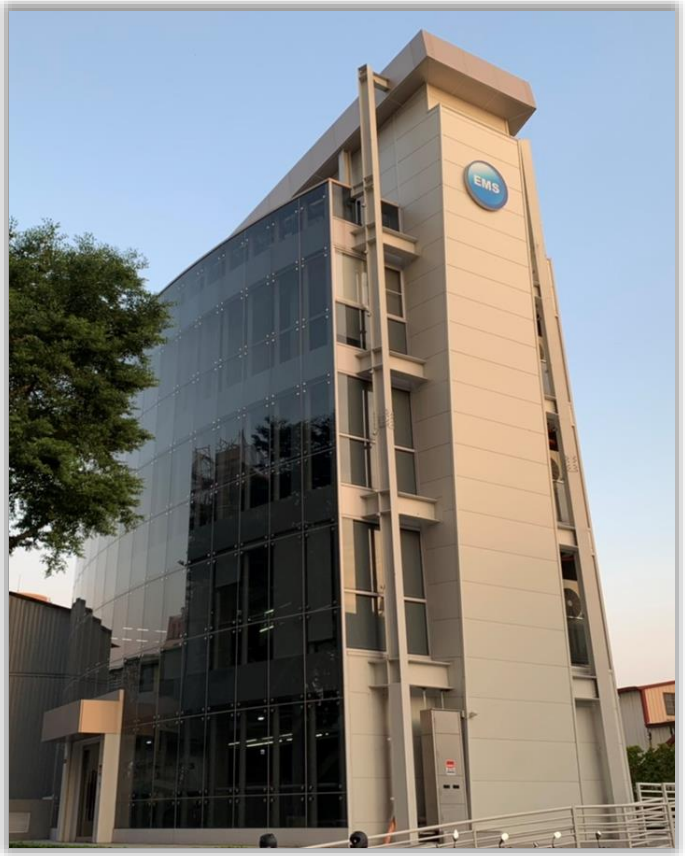
Mega factory V.S. EMS Group



About EMS Group

EMS group headquarter is located in central Taiwan.

- Total Sales Revenue in 2021: US$50 million
- Workers : 500 people (320 in Taiwan + 180 in China)
- Facilities : 42,500 square meters (All facilities)



Taiwan Facilities

Our facilities are located in central Taichung.

- **Workers : 320 people**
- **Facilities : Total 22,000 square meters**
- **Taiwan Capabilities Include:**
  - **Printed Circuit Board Assemblies**
  - **Tight Tolerance Machined Parts**
  - **Injection Molded Plastics**
  - **Metal Stampings**
  - **Turnkey Assemblies**

China Facilities

Our facilities are located in Dongguan, China.

- Workers : 180 people
- Facilities : Total 20,500 square meters
- China Capabilities Include:
  - Cable Assemblies
  - Power Cords
  - Wire Harnesses
  - Over molded Assemblies
  - Custom connectors

EMS PCB Capabilities

ISO 9001 Certified

SMT Capabilities:

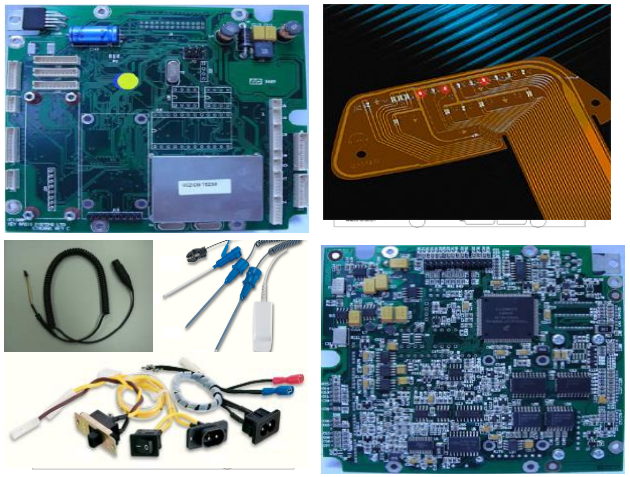
- PCB Size (MAX)：510mm × 460mm.
- PCB Thickness (MIN)：0.1mm.
- Chip Size (MIN) ：0201 / 0402
- BGA Size (MAX)：50mm × 50mm
- Min. μ - BGA Pitch：0.3 mm

Industries we served:

- *Industrial Control Board*
- *Marine Control System*
- *Fitness Equipment Control Board*
- *Automotive LED Module*
- *Telecommunications*
- *Reverse engineer*
- *Turnkey (PCBA + Enclosure + cable)*

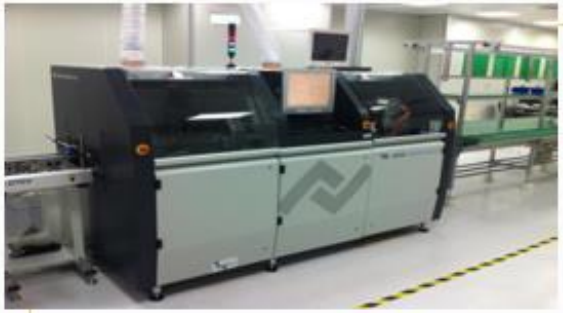
Equipment:

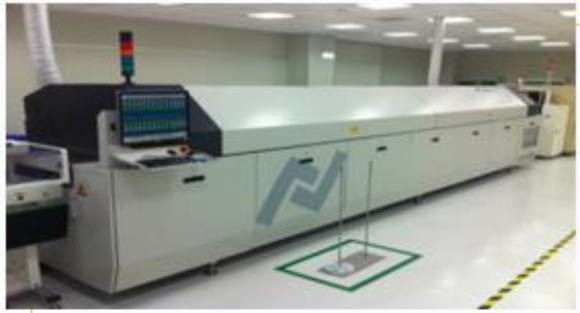
- High speed RoHS SMT lines x 6
- N2 SMT RoHS reflow lines x 2
- DIP components insert lines x 2
- Final assembly / Testing lines x 3
- Special process line x 1
  (Silicon / Plastic mold potting, conformal coating, etc.)



EMS PCB Facility (I & II)

ISO 9001 Certified





EMS Plastic Capabilities

TS – 16949 Certified

Plastic Molding Capabilities:

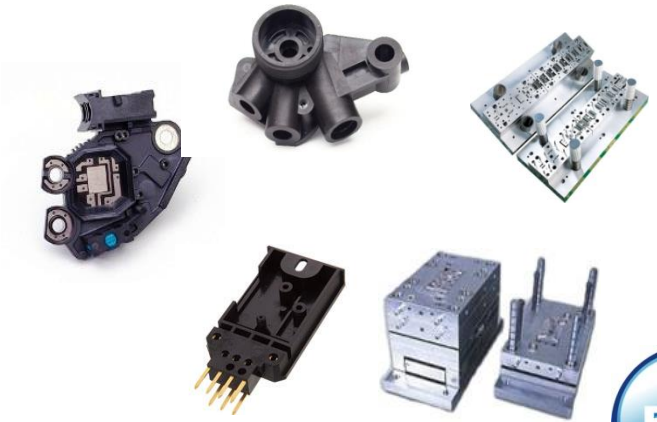
- Mold Design
- Precise Mold Making
- 2-shot Molding
- Insert Molding
- Over Molding
- Peek Molding

Industries we served:

- *Medical Parts*
- *Industrial Parts*
- *Precision Gear Parts*
- *Components for Optics*
- *2-Shot Molding Parts*

Equipment:

- AGIE Charmless CNC EDM x 2
- AGIE Charmless/ Sodick CNC Wire cut x 2
- Horizontal Injection Machine 35-350 Tons x 33
- Vertical Injection Machine 35-55 Tons x 7
- Mould Temperature Control Machine x 6
- Central Material Feed & Drying System x 1
- OKAMOTO CNC Grinder x 1
- TATUNG/ SEEDTEC Grinder x 5
- MAKINO Milling Machine x 3
- 3 MM Projector MICRO VU/TOKYO SEIMTUS x 3



EMS Plastic Facility (I & II)

TS – 16949 Certified

EMS

EMS Machining Capabilities

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Plastic Molding Capabilities:

- CNC Lathes
  Max. Part size- ϕ300mm*600mm
- CNC Machining Centers
  Max. working size- 1100mm * 500mm
- CNC External Cylindrical Grinders
  (Accuracy, 0.001mm; Max. size- 280mm*520mm)
- CNC Inner Cylindrical Grinders
  Accuracy, 0.001mm for geometric dimensions
- Surface Grinders

Industries we served:

- *Automobile parts*
- *Industrial parts*
- *Parts for optics molds*
- *Bicycle industry*

Equipment:

- CNC Lathes ……....13
- CNC Machining Centers……....8
- CNC Machining Center + Robot….6
- 4 Axis Machining Center……3
- 5 Axis Machining Center……..…3
- Cylinder Grinding Machine……..3
- Surface Grinding Machine……2
- CMM (TESA)……...2

EMS Machining Facility

TS – 16949 Certified

EMS Work Flow System

Production Cycle_MOT & QC_Working Check List

131025-V0.
140701-V4.

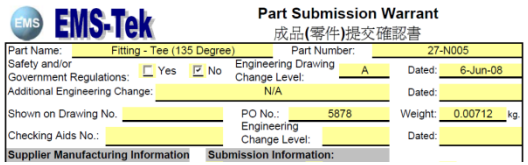
Product Quality Planing Stage	Check Data / Output Document	PCB(A)		Plastic		Metal	
		MOT	QC	MOT	QC	MOT	QC
Introduction	A-1. RFQ-Feasibility in New Project Development evaluation	V		V		V	
	A-2. BOM List	V		▲		▲	
	A-3. PCB Spec & Gerber	V					
A. RFQ Evaluation Stage	A-4. Ass'y picture、2D/3D drawing (Tolerance Criteria)	V		V		V	
	A-5. Material/Specification、Cosmetic/Surfacer Finish、Packaging...etc.	V		V		V	
	A-6. Drawing CC (Critical Characteristic) & SC (Special Characteristic) study	V		V		V	
	A-7. Golden Sample	▲		▲		▲	
	A-8. Ass'y Procedure (SOP or WI)	▲					
	A-9. Function Test requirement review.	▲					
	A-10. Ensure inspection requirement and quality level of the new project.	▲		▲		▲	
B. PO Checking (Engineering SPEC Confirmation) Stage	B-1. Final BOM List	V		▲		▲	
	B-2. Final PCB Spec & Gerber	V					
	B-3. Final Ass'y picture、2D/3D drawing (Tolerance Criteria).	V		V		V	
	B-5. Final Material/Specification、Cosmetic/Surfacer Finish、Packaging...etc.	V		V		V	
	B-5. CC & SC (Drawing) confirmation	V		V		V	
	B-6. Final Ass'y Procedure (SOP)	V		▲		▲	
	B-7. Final Quality Standard Inspection Procedure (SIP)	V		V		V	
	B-8. Ass'y & Test Fixture confirmation	▲		▲		▲	
	B-9. Firmware、Test Procedure confirmation	▲		▲		▲	
	B-10. Circuit Schematic (Only for function test or debug requirement)	V					
	B-11. Final Control Plan	V		V		V	
C. Pilot Run (Initial Sample Production) Stage	C-1. Meeting for Preproduction.	V	◎	V	◎	V	◎
	C-2. Initial Sample Inspection Report (ISIR) released	V		V		V	
	C-3. Standard Inspection Procedure (SIP) validated	V	◎	V	◎	V	◎
	C-4. PSW submit and approval (PPAP related doc requested from customer)	V		V		V	
	C-5. Production Flow Chart and SOP release	V	◎	V	◎	V	◎
	C-6. Components Approcal for IQC	V					
	C-7. Pilot Run review meeting (Quality / Yield Rate / Defect analysis...etc.)	V	◎	V	◎	V	◎
D. Mass Production Stage	D-1. First article inspection report	V	◎	V	◎	V	◎
	D-2. On site inspection record and checking report		V		V		V
	D-3. Standard Inspection Procedure (SIP) review	V	◎	V	◎	V	◎
	D-4. Flow Chart review	V	◎	V	◎	V	◎
	D-5. Facility Control (OQC) check list and inspection		V		V		V
	D-6. EMS-IQC/OQC report released and put on file	◎	V	◎	V	◎	V
E. Continuous Feedback, Improvement and Corrective Action	E-1. Regular on site inspection record and check report		V		V		V
	E-2. Product SIP and production SOP revised after ECN released	V	◎	V	◎	V	◎
	E-3. After ECN, re-check the First article inspection report or On site inspection record.		V		V		V
	E-4. Customer Complaint Handling (RMA) flow definition and execution		V		V		V
	E-5. Update to (SOP/SIP/PFMEA/Flow Chart) after 8D report	V	◎	V	◎	V	◎
	E-6. Verification to (First article inspection / PPM monitor / On site inspection...etc.) of corrective action after execute the corrective action of 8D report		V		V		V
	E-7. Facility (OQC) check list and inspection		V		V		V
	E-8. EMS-IQC/OQC report release and put on file	◎	V	◎	V	◎	V

Remarks: 'V' = Must 、 ▲= Optional 、 ◎ = Double Check

EMS QC & PPAP documents

Following PPAP process to ensure the quality

- Part Submission Warrant
- Material Certification
- First Article Inspection
- Potential Failure Mode & Effects Analysis
- Control Plan
- Production Process Flow Chart
- Cpk
- Gauge R & R

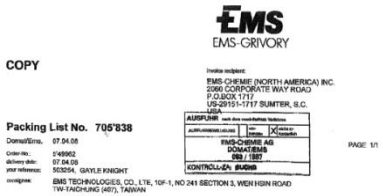


EMS-Tek

Part Submission Warrant
成品(零件)提交確認書

Part Name:	Fitting - Tee (135 Degree)	Part Number:	27-N005
Safety and/or Government Regulations:	☐ Yes ☑ No	Engineering Drawing Change Level:	A
		Dated:	6-Jun-08
Additional Engineering Change:	N/A	Dated:	
Shown on Drawing No.		PO No.:	5878
		Weight:	0.00712 kg.
Checking Aids No.:		Engineering Change Level:	
		Dated:	

Supplier Manufacturing Information | Submission Information:



EMS
EMS-GRIVORY

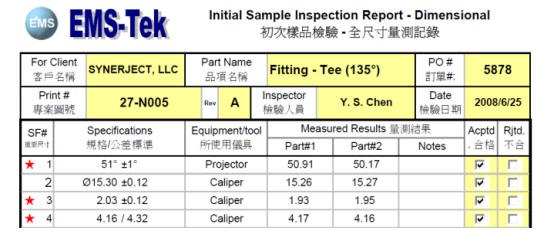
COPY

EMS-CHEMIE (NORTH AMERICA) INC.
2060 CORPORATE WAY ROAD
P.O.BOX 1717
US-29151-1717 SUMTER, S.C.
USA

Packing List No. 705'838

EMS-CHEMIE AG
DOMAT/EMS
093 / 1907

BMS TECHNOLOGIES, CO., LTE, 10F-1, NO 241 SECTION 3, WEN HSIN ROAD
TW-TAICHUNG (407), TAIWAN

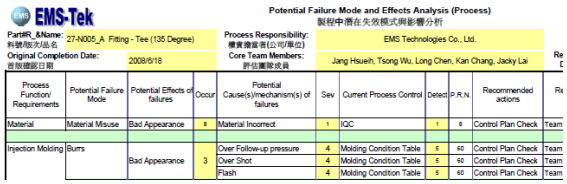


EMS-Tek

Initial Sample Inspection Report - Dimensional
初次樣品檢驗 - 全尺寸量測記錄

For Client 客戶名稱	SYNERJECT, LLC	Part Name 品項名稱	Fitting - Tee (135°)	PO # 訂單#:	5878
Print # 專案圖號	27-N005	Rev A	Inspector 檢驗人員	Y. S. Chen	Date 檢驗日期	2008/6/25

SF#	Specifications 規格/公差標準	Equipment/tool 所使用儀具	Measured Results 量測結果 Part#1	Part#2	Notes	Acptd 合格	Rjtd. 不合
★ 1	51° ±1°	Projector	50.91	50.17		☑	☐
2	Ø15.30 ±0.12	Caliper	15.26	15.27		☑	☐
★ 3	2.03 ±0.12	Caliper	1.93	1.95		☑	☐
★ 4	4.16 / 4.32	Caliper	4.17	4.16		☑	☐

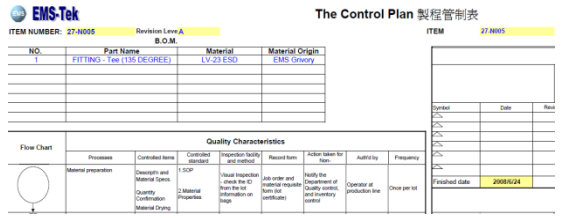


EMS-Tek

Potential Failure Mode and Effects Analysis (Process)
製程中潛在失效模式與影響分析

Part#R_&Name: 27-N005_A Fitting - Tee (135 Degree)
Original Completion Date: 2008/6/18
Process Responsibility: EMS Technologies Co., Ltd.
Core Team Members: Jang Hsueih, Tsong Wu, Long Chen, Kan Chang, Jacky Lai

Process Function/ Requirements	Potential Failure Mode	Potential Effects of failures	Occur	Potential Cause(s)/mechanism(s) of failures	Sev	Current Process Control	Detect	P.R.N.	Recommended actions
Material	Material Misuse	Bad Appearance	8	Material Incorrect	1	IQC	1	8	Control Plan Check
Injection Molding	Burrs	Bad Appearance	3	Over Follow-up pressure	4	Molding Condition Table	5	60	Control Plan Check
				Over Shot	4	Molding Condition Table	5	60	Control Plan Check
				Flash	4	Molding Condition Table	5	60	Control Plan Check



EMS-Tek

The Control Plan 製程管制表

ITEM NUMBER: 27-N005 Revision Level A
ITEM 27-N005

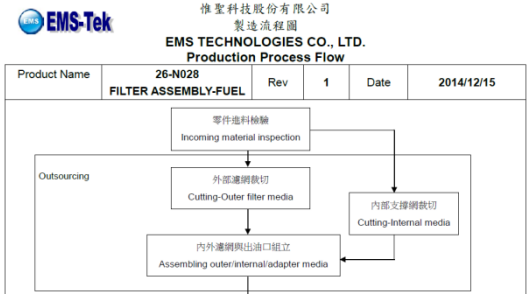
B.O.M.

NO.	Part Name	Material	Material Origin
1	FITTING - Tee (135 DEGREE)	LV-23 ESD	EMS Grivory

Quality Characteristics

Flow Chart

Finished date 2008/6/24



EMS-Tek

惟聖科技股份有限公司
製造流程圖
EMS TECHNOLOGIES CO., LTD.
Production Process Flow

Product Name	26-N028 FILTER ASSEMBLY-FUEL	Rev	1	Date	2014/12/15

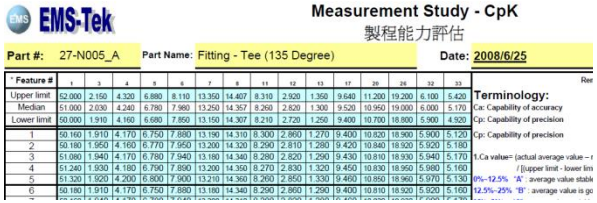
零件進料檢驗
Incoming material inspection

Outsourcing

外部濾網裁切
Cutting-Outer filter media

內部支撐網裁切
Cutting-Internal media

內外濾網與出油口組立
Assembling outer/internal/adapter media



EMS-Tek

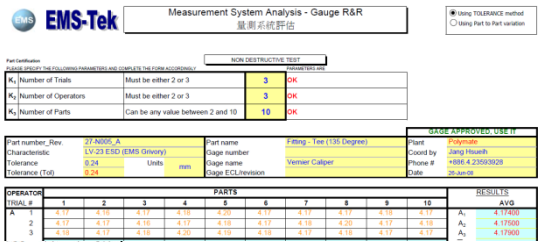
Measurement Study - CpK
製程能力評估

Part #: 27-N005_A Part Name: Fitting - Tee (135 Degree) Date: 2008/6/25

* Feature #	1	3	4	5	6	7	8	11	12	13	17	26	32	33
Upper limit	52.000	2.150	4.320	6.880	8.110	13.350	14.407	8.310	2.920	1.350	9.640	11.200	19.200	6.100	5.420
Median	51.000	2.030	4.240	6.780	7.980	13.250	14.357	8.260	2.820	1.300	9.520	10.950	19.000	6.000	5.170
Lower limit	50.000	1.910	4.160	6.680	7.850	13.150	14.307	8.210	2.720	1.250	9.400	10.700	18.800	5.900	4.920
1	50.160	1.910	4.170	6.750	7.880	13.190	14.310	8.300	2.860	1.270	9.400	10.820	18.900	5.900	5.120
2	50.180	1.950	4.160	6.770	7.950	13.200	14.320	8.290	2.810	1.280	9.420	10.840	18.920	5.920	5.180
3	51.080	1.940	4.170	6.780	7.940	13.180	14.340	8.280	2.820	1.290	9.430	10.810	18.930	5.940	5.170
4	51.240	1.930	4.180	6.790	7.890	13.200	14.350	8.270	2.830	1.320	9.450	10.830	18.950	5.980	5.160
5	51.320	1.920	4.200	6.800	7.900	13.210	14.360	8.260	2.850	1.330	9.460	10.850	18.960	5.970	5.130
6	50.180	1.910	4.170	6.750	7.880	13.180	14.340	8.290	2.860	1.290	9.400	10.810	18.920	5.920	5.160

Terminology:
Ca: Capability of accuracy
Cp: Capability of precision
Cp: Capability of precision

1.Ca value= (actual average value --
/ [(upper limit - lower lim
0%~12.5% "A" : average value stabl
12.5%~25% "B" : average value is go



EMS-Tek

Measurement System Analysis - Gauge R&R
量測系統評估

NON DESTRUCTIVE TEST

K_1 Number of Trials	Must be either 2 or 3	3	OK
K_2 Number of Operators	Must be either 2 or 3	3	OK
K_3 Number of Parts	Can be any value between 2 and 10	10	OK

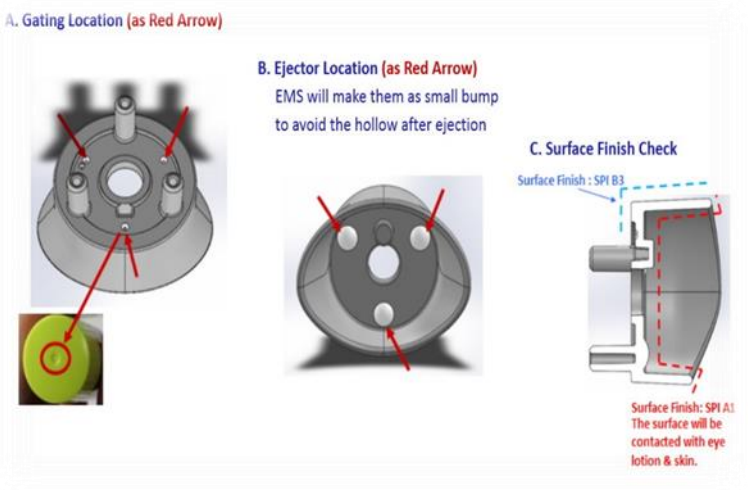
Part number_Rev.	27-N005_A	Part name	Fitting - Tee (135 Degree)	Plant	Polymatic
Characteristic	LV-23 ESD (EMS Grivory)	Gage number		Coord by	Jang Hsueih
Tolerance	0.24 Units mm	Gage name	Vernier Caliper	Phone #	+886.4.2359/3928
Tolerance (Tol)	0.24	Gage ECL/revision		Date	26-Jun-08

GAGE APPROVED, USE IT

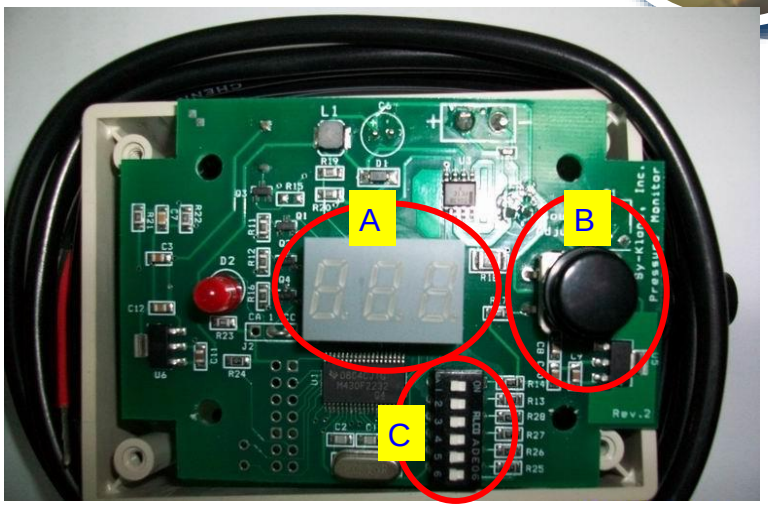
OPERATOR	PARTS										RESULTS
TRIAL #	1	2	3	4	5	6	7	8	9	10	AVG
A 1	4.17	4.16	4.17	4.18	4.20	4.17	4.17	4.17	4.16	4.17	A_1 4.17400
2	4.17	4.17	4.16	4.17	4.18	4.17	4.18	4.20	4.17	4.18	A_2 4.17500
3	4.18	4.17	4.18	4.20	4.19	4.18	4.17	4.18	4.17	4.17	A_3 4.17900

EMS Engineering Support

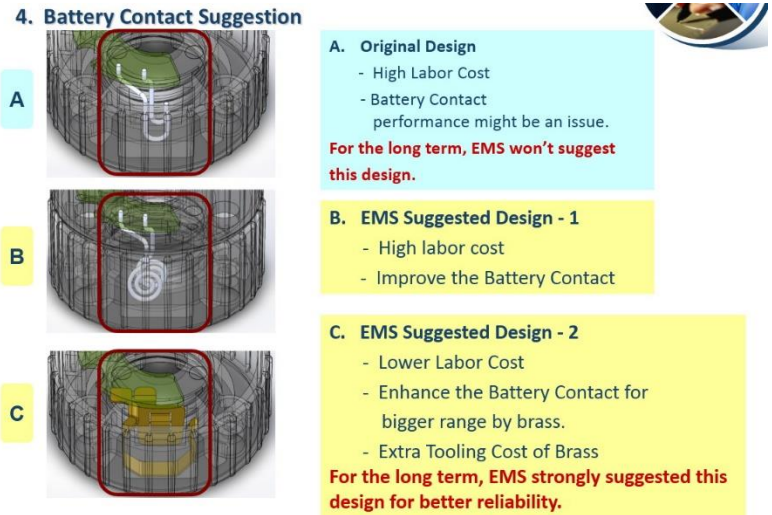
1. Design for Mfg & Assy (DFM/DFA)



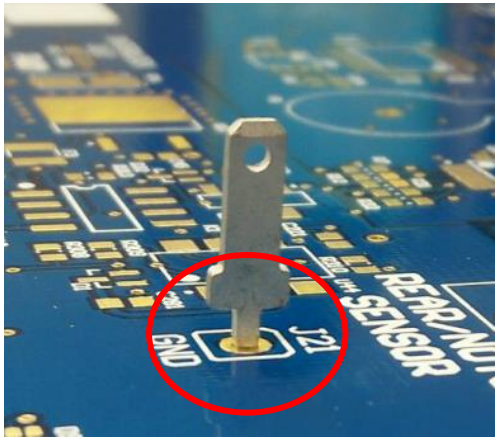
1. Qualified equivalent parts for cost saving



2. Design suggestions for customers



2. Efficient & Effective Manufacturing



Preliminary Production Plan

Housekeeper for your every project!!!

EMS-Tek

Tooling (Product) Scheduling　模具(產品)時程進度規劃

General Information 基本資訊							
For Client 客戶名稱		Project Name 專案名稱	Board Cover & Lens Tooling (1+1 Cavity Mold)		PO/Contract 訂單合約序	600697	Initiat'n Date 啟動日期 2011/2/17
Print # 專案圖號	TA-MO-02-NY01001-01 Rev 1	Sp'l Requests 特殊要求	NAK 80 steel for 1+1 cav. family tooling w/ SPI-A2; PC clear material				PM 專案負責人 Ryan

專案序號 NPD#: NY01001

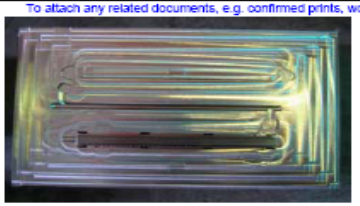
No.	Tasks/Operations 工作任務	Start D. 啟始日	Finish D. 預完日	Plan Schedule & Actual Progress 計畫進度與實際進度	Repnd. 擔當者	Actual FD 實際完成日	Remarks 備註
1	Tooling Designrt 模具設計	2011/2/25	2011/3/7		EMS	Mar.07	NA
2	Mold Base Machining 模座加工	2011/3/8	2011/3/14		EMS	Mar.14	NA
3	Mold Core Machining 模仁加工	2011/3/3	2011/3/11		EMS	Mar.11	NA
4	NC Machining CNC加工	2011/3/11	2011/3/21		EMS	Mar.21	NA
5	Wire-Cutting Machining 線切割	2011/3/18	2011/3/23		EMS	Mar.24	NA
6	Electrical Discharge Machining 放電加工	2011/3/22	2011/3/31		EMS	Mar.31	NA
7	Polishing+Clamping 仕上(合模)	2011/3/30	2011/4/8		EMS	Apr.08	Including polishing
8	T1 Trial T-1試模	2011/4/11	2011/4/12		EMS	Apr.12	T1 samples
9							

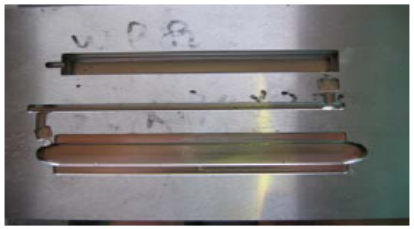
Plan Schedule & Actual Progress 計畫進度與實際進度: 2 | 18 19 20 21 22 23 24 25 26 27 28 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 8 11 12

Notes 說明: ·····▸ Plan 計畫進度; ——▸ Executed 執行進度; * By Day/Month/Year, Mark milestone date 依長短以日/月/年, 標示里程碑日期

ADDENDUM 附件

To attach any related documents, e.g. confirmed prints, work photos, and/or trial-inspection reports. 檢附任何相關確認圖紙, 工作進度照片, 及/或測試/檢驗告書等文件資料.





- **Offer the tool drawing before tooling start.**
- **Weekly report the tooling status.**
- **Offer the photos for each stage of tooling.**

EMS

Q & A

Thank You!