



EMnex

2024. 3

Tel : 031-8003-5947(, Fax : 031-8003-4715

Home Page : <http://www.emnex.co.kr> Address ; Samsung 1-ro 3-gil, Hwaseong-si, Gyeonggi-do, Korea, 18448

EMnex : Next Electronics Manufacturing Service

Contents

- 1. Company Summary**
- 2. Company History**
- 3. Main Certification Status**
- 4. Organization**
- 5. Main manufacturing items**
- 6. Manufacturing place**
- 7. Major Manufacturing Facilities**
- 8. Manufacturing Operations Plan**
- 9. Quality Process**
- 10. Design & Technology**
- 11. Manufacturing process diagram**
- 12. Emnex Business**

1. Company Summary

- EMNEX is specializing in the manufacture of electronic products that supply customers with best quality and service in the best condition with pleasant production environment.

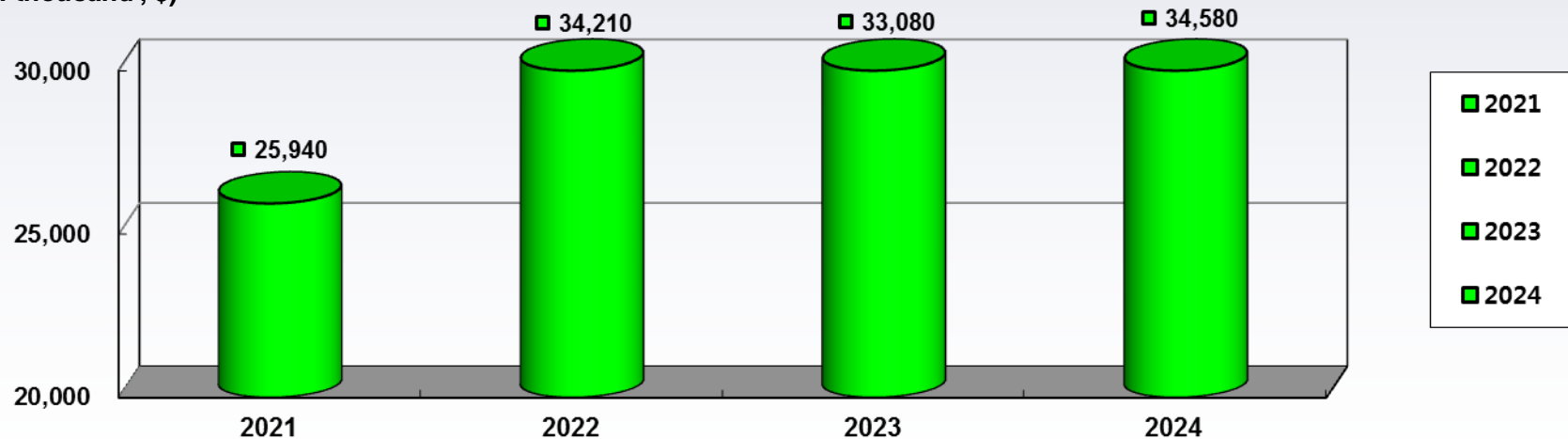


■ Company Contents



- Address : Samsung 1-ro 3-gil, Hwaseong-si, Gyeonggi-do, Korea, 18448
- Number of employees : 106 people (Now a days)
- Representative : Young Wook Choi
- Business Status : Place_2,600m², Total floor space is 4,900m²
New build start First basement level up to 4th aboveground Floors
- Turnover : '21yr: \$25,940,000, '22yr: \$34,210,000 '23yr: \$33,080,000 '24yr: \$34,580,000 (expected).
- Main Products : Controller (robot & elevator & railway vehicle), Driver (Servo, Stepping, inverter), X-RAY generator, Energy (BMS, ESS, Inverter..) , Communication , Industrial Camera module .etc
- Home Page : www.emnex.co.kr [₩1,330/ \$)

(Unit : thousand , \$)



EMNEX Partnership

Industrial equipment



Power Electronics & Defense



Medical



Others





2. Company History

- 1999 yr. Incorporation, Designated as a partner company of Samsung Electronics Co., Ltd. (Manufacturing and PCB Artwork)
- 2008 yr. Establishment of Research Institute (Attached)
- 2009 yr. Selected as a promising medium Company – by Gyeonggi-do Governor
Selected as an INNOBIZ Company _ Small and Medium Business Administration a director
- 2011yr. Enterence New building (2011, 10) basement 1st , aboveground floor 4th (Total floor space is 4,900m²)
- 2013 yr. Parts and material specializing company _ Ministry of Commerce, Industry and Energy
Hyundai Rotem Co.,Ltd, PWA “A grade” Registered as a certified company (GQR-2015)
- 2014 yr. ERP SYSTEM operation.
- 2015 yr. Hanwha System Co.,Ltd Registered as a defense industry company
- 2016 yr. Hanwha Precision Machinery Co.,Ltd, QSA/ QPA Pass (quality) , manufacturing
Factory registration ; PSE (Japan) , CCC (China), UL (U.S.A), CSA (Canada)
- 2018 yr, ISO 9001 Certification (2018 yr, SAI GLOBAL), KSQ ISO9001

- 2019 yr, KSQ 9100 (AS 9100) Certification (2018 yr, KIWA KOREA) ,
[AS9100 ; certification defining the design and manufacture standard aerospace products including parts, components
and assemblies]
SEMES Co.,Ltd SSQ Quality Certification,
LG Electronics Co.,Ltd , Registered as a certified company, Robot PWA manufacturing start
- 2020 yr, Hanhwa Aerospace Co.,Ltd, KF-21 , (Defense industry) registered as a certified company , PWA manufacturing start
Collins Co.,Ltd (USA) Registered as a certified company
- 2021 yr, 3D X-RAY inspection M/C purchase
Flying Probe ICT purchase
X-RAY SMD component counter purchase
- 2023 yr, XRF (for ROHS , Hazardous Materials Analyzer) purchase

3. Main Certification Status



[Research & Development Center]



[ISO9001 certification]



[AS 9100 certification]



[Promising Small and Medium Business]
GyeongGi-Do Korea]

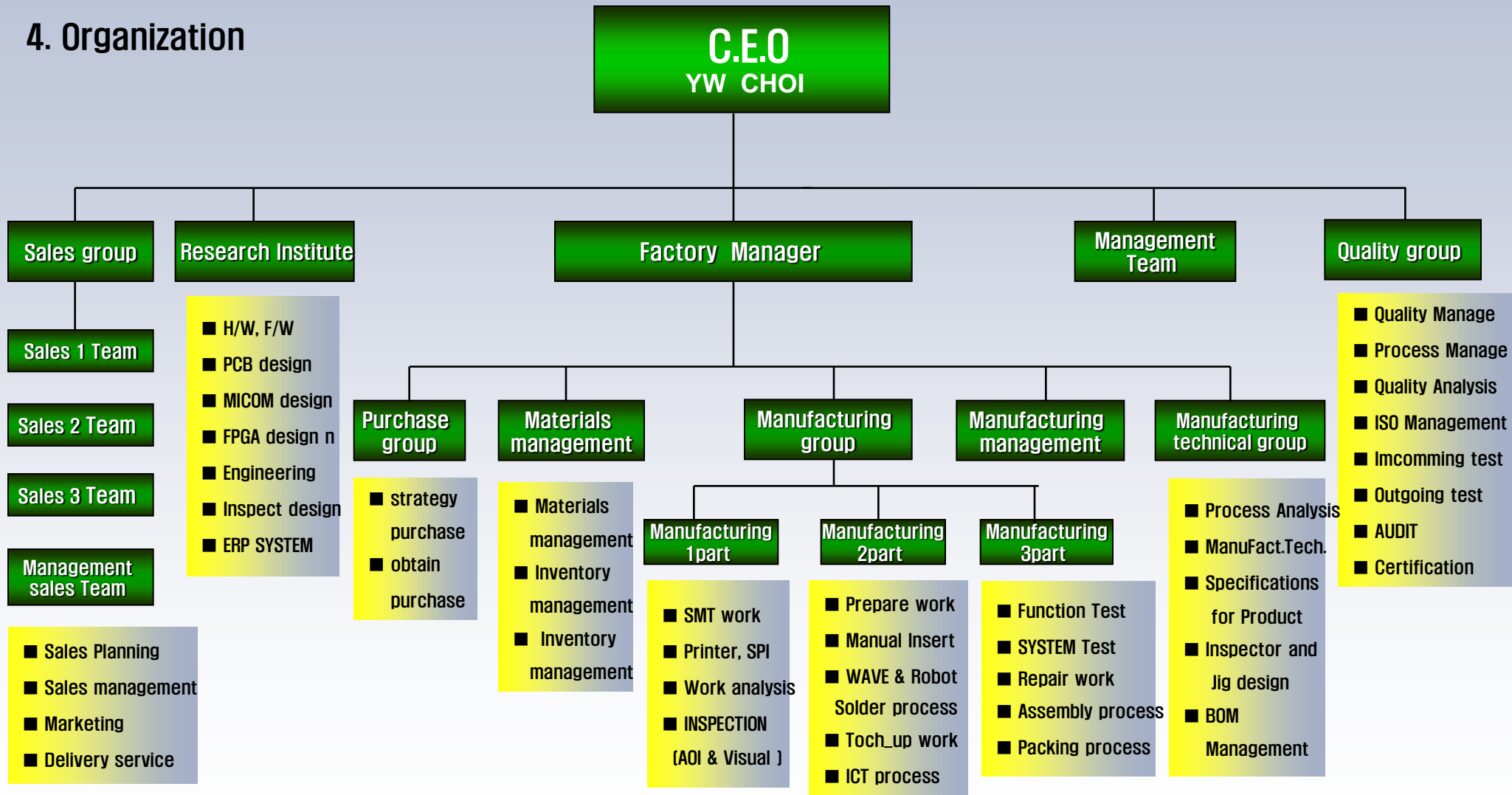


[INNOBIZ COMPANY]



[Parts and material specializing company]

4. Organization



5. Main manufacturing items

Controller & Driver for Industry

Robot controller series for Industrial (30 items)

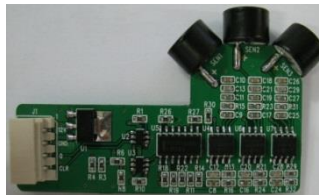


EMNEX is equipped from Samsung Electronics Co., Ltd (SEC), Samsung Display Co., Ltd. (SDC) with controller and 4 axis servo pack, 6-axis controller, AGV controller, Jetting Driver, etc... (PBA and SET products)

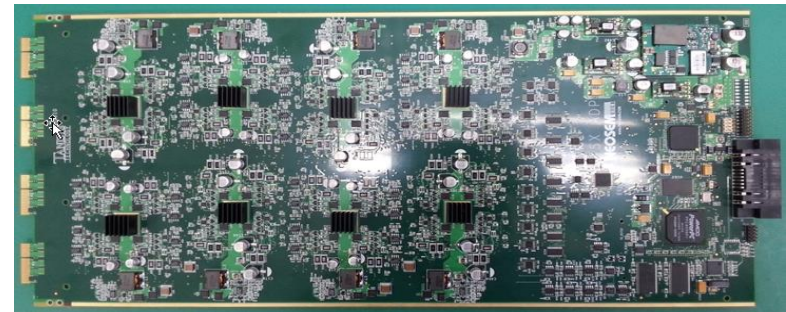
Application



■ Motor driver and AGV controller etc..



■ InkJet system & for display and Test B'D etc for Semiconductor

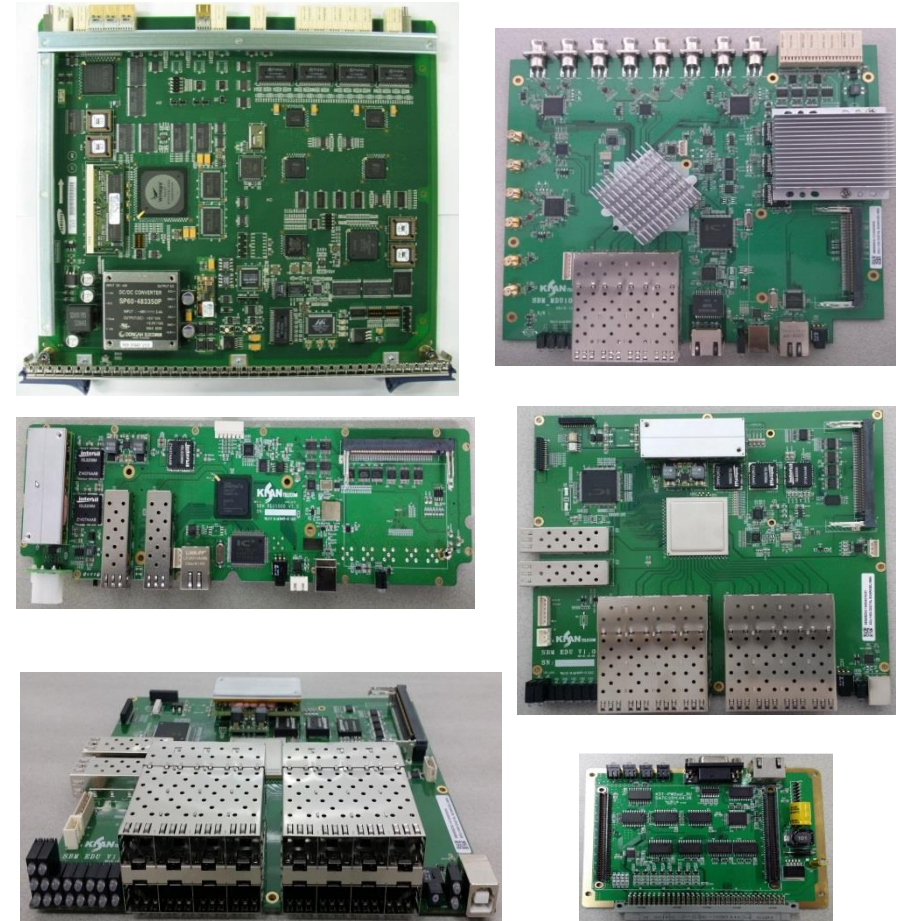


■ Elevator controller and Railway vehicle control B'D



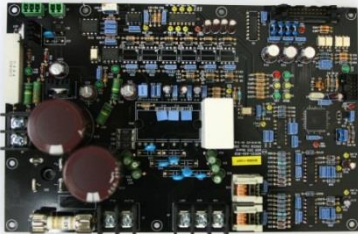
Communication

■ Optical transmission switching B'D for LTE

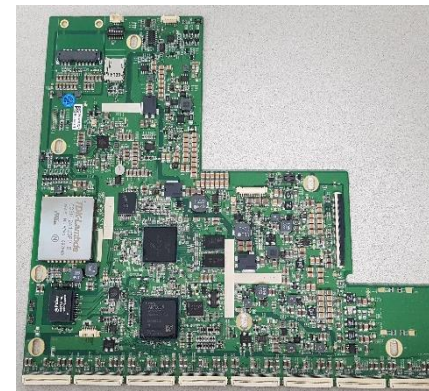


Medical

■ X-RAY generator and Sensor B'D



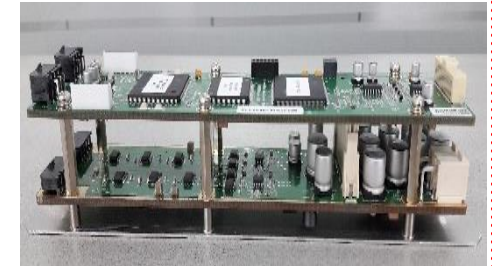
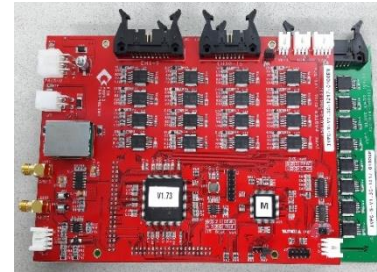
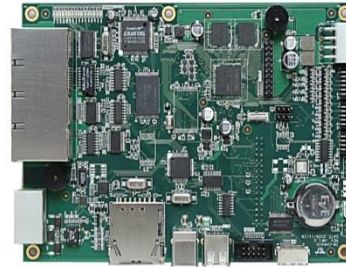
■ Battery Management System (BMS) and Medical Measure B'D



Other

■ Power control System and Laser detector

■ Industrial camera modules, SMT, AOI, SPI controller, etc...



6. Manufacturing place

Material warehouse



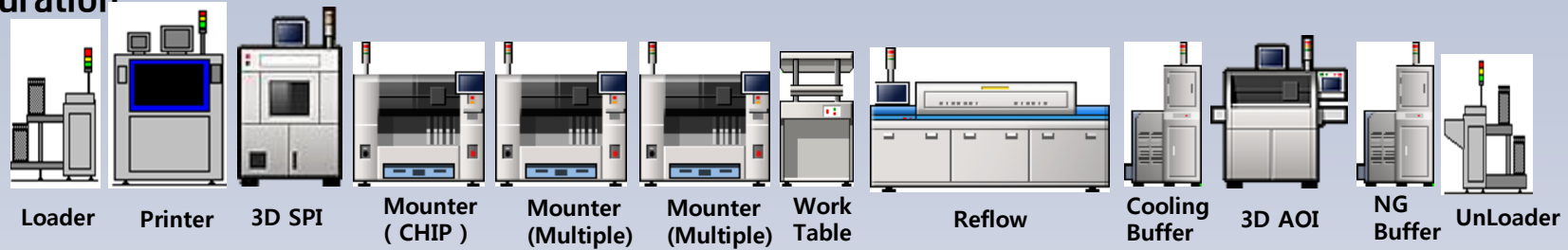
SMT Line (4 Line)

For PB-Free (ROHS)

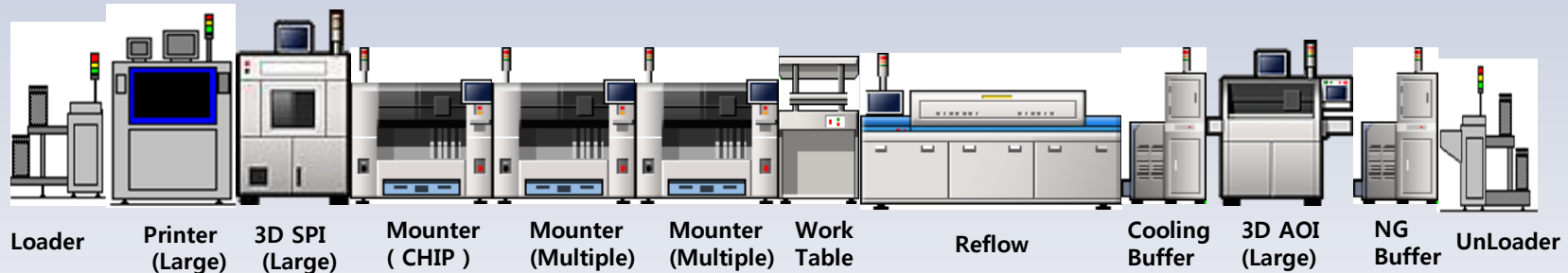


SMT Line configuration

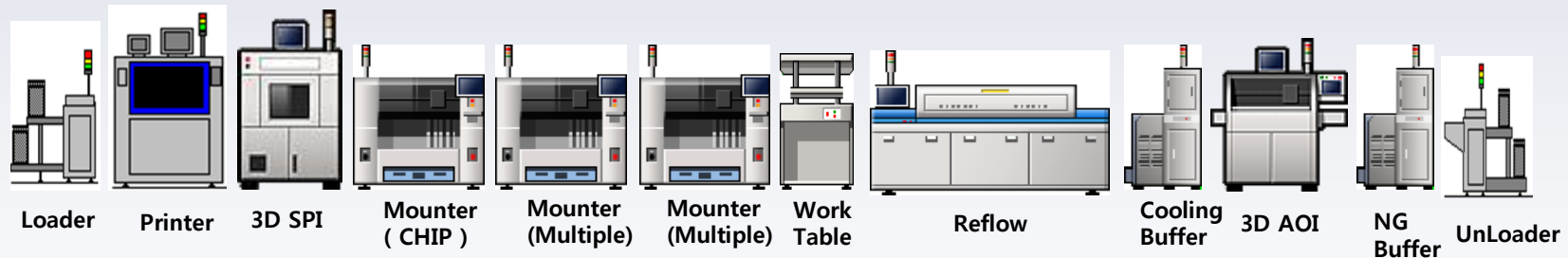
(1) A_Line (Standard, FULL)



(2) B_Line (Larged Full type)



(3) C_Line (Standard, FULL)



(4) D_Line (Standard type)



■ Manual Insert Line (DIP 4 Line)

For Lead_Free



■ TEST Line



■ Test Line



■ Test Line



■ BGA Rework Station



■ Selective Robot Soldering Line



■ Customer Line



■ Coating system Line



■ Ceiling type humidifying system



■ Squeegee blade washer and inspector



■ 3D CT
X-RAY
inspection
M/C



■ Flying
ICT
Tester



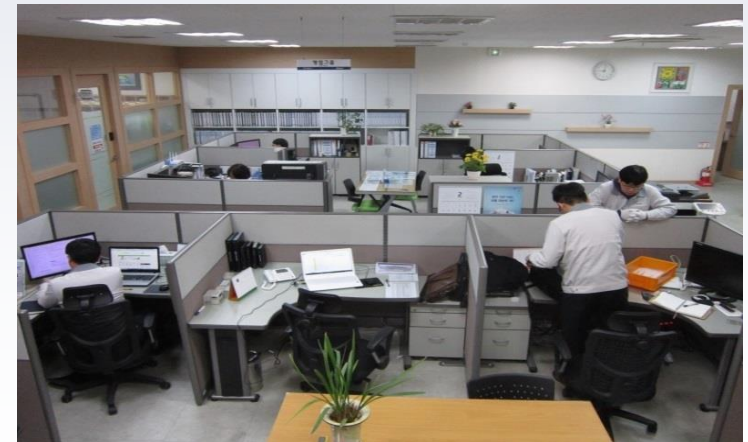
■ Small Clean Room



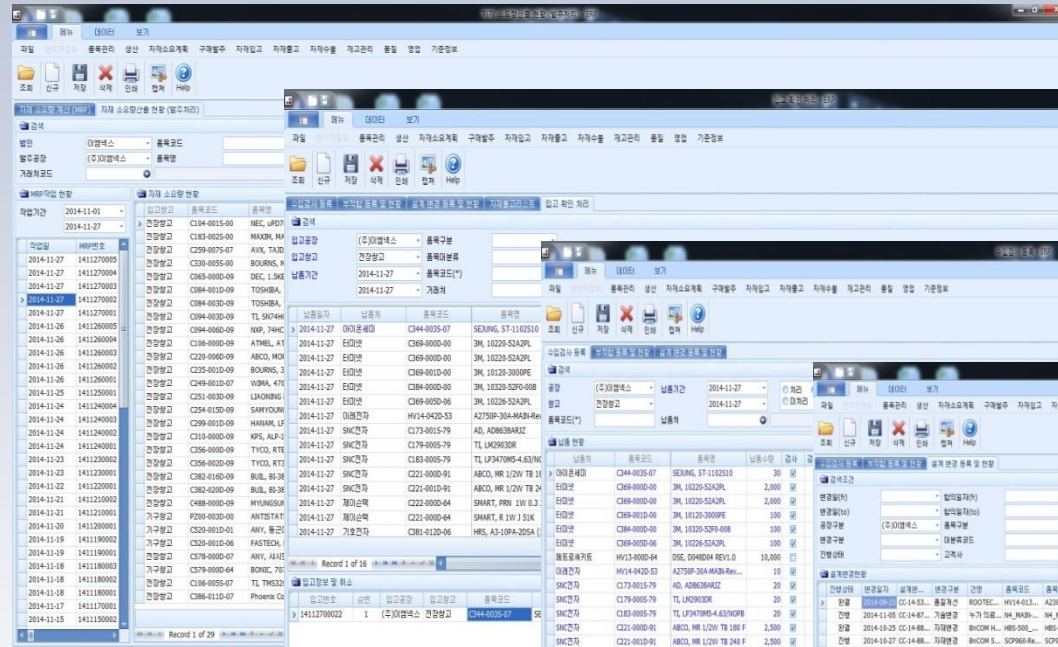
■ PBA water washing M/C and
Deionized (D/I) water maker



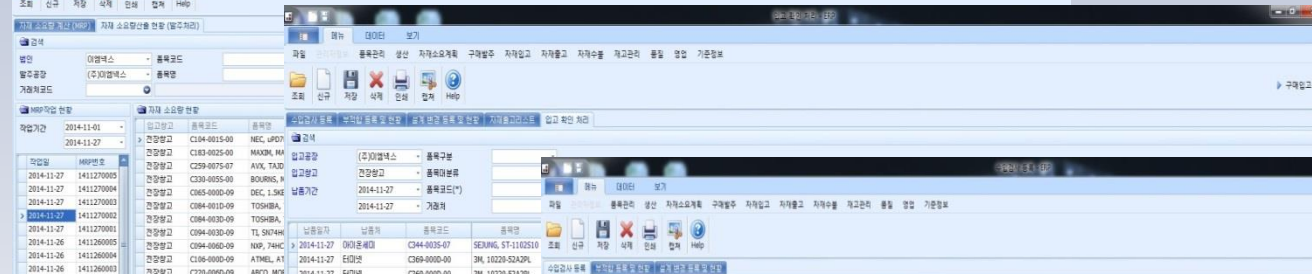
■ Sales Office



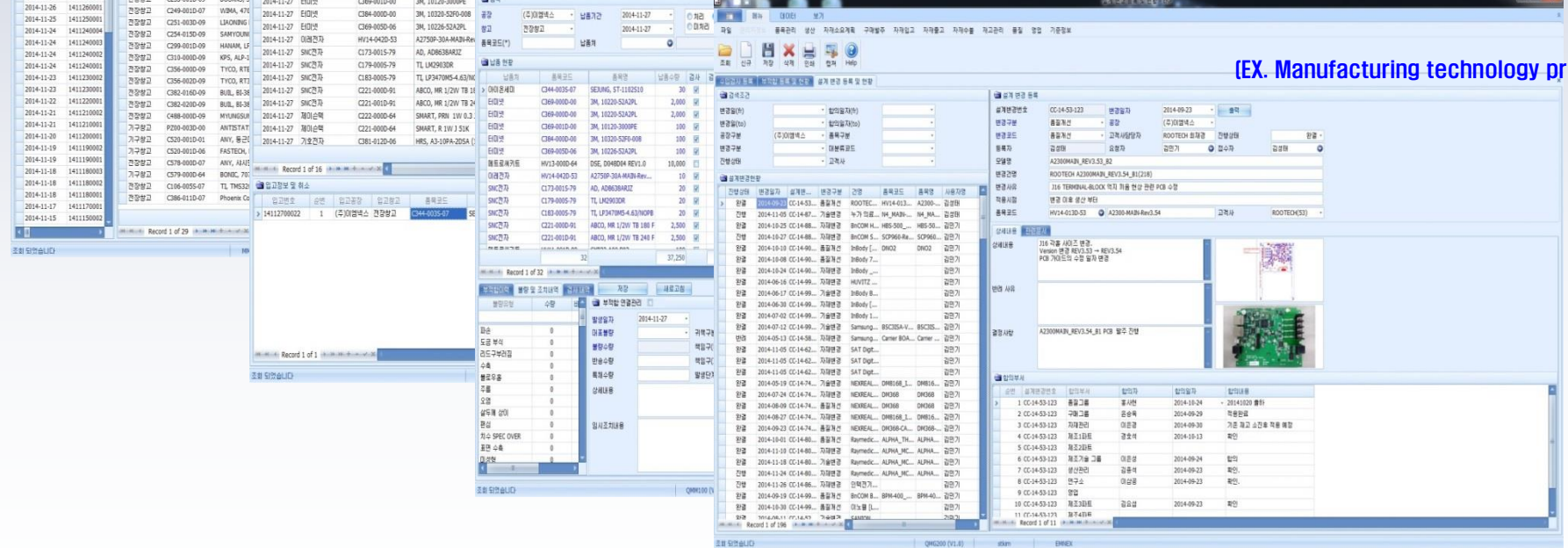
EMNEX ERP SYSTEM construct and Usage (example) _ EMNEX own code system of establishing.



(EX. Purchase order program)



(EX. Materials management program)



(EX. Quality Management program)

(EX. Manufacturing technology program)

7. Major Manufacturing Facilities

[1/2]

Division	Equipment name	Number	Equipment Maker	Etc.. (SPEC)
SMT Line (4 Line)	Standard type mounter (SMT)	4	Hanwha Techwin	SM471 (2 units), SM471plus (2 units)
	Multi type mounter (SMT)	8	Hanwha Techwin	SM482 (5 units), SM482plus (3 units)
	SCREEN Printer	4	Sj Tech	H-520S (3 units) , HP-850S (1 unit)
	Reflow M/C	4	Heller Korea	Heller MK1810III(4 units), RoHS
	Solder cream checker (3D SPI)	4	Ko Young Technology	Aspire-3 (3D SPI) 1 unit, KY8020-2L (3 units),
	Vision inspector (Included 3D AOI)	5	Ko Young Technology	Zenith (3D AOI _In-Line) (4 Units
	Router	1	Impact Enterprise	RRS-3100S (PCB Cutter, 500 x 500)
	Nitrogen generator (N2)	2	Kyultron	N2 GENERATOR (3 Set)
	Ceiling injection Humidification system	25	Sell Ricoh	HU-CONSTM System, Humidity maintenance, Installation all the field
	Etc., equipment	24	NC Master, viscometer, squeegee blade washer, squeegee blade tester, Mask washer, LCR Meter system, etc	
IMT (Dip) Line (Auto Soldering) (4 Line)	Auto Soldering Machine	4	Shin Myung	SAS-620 (2units), SAS680LP (2 units)
	PCB washer	1	Aqueous (USA)	Pure water maker (DI WATER) and PCB washer
	ICT M/C	2	OKANO(Japan), Samsung Electronics Co.	AT-01 (2 units)
Robot Soldering Line (1 Line)	Selective Robot Soldering	2	InterSelect (Germany)	2 port (Used fuel, Non fuel possible)
	Pointer Robot soldering	1	MEIKO TECH (Japan)	1 point Robot soldering machine
Test / Assembly / Packaging Line	Function Cell Line	10	self-production	Inspection / Simple assembly process
	ROOM for set assembly and Inspection.	6	Customer room	Specified customers room
Automatic coating system (1 Line)	3 Conformal Coated System	3	PVA (USA) , NANOJET	3 Conformal Coated Robot System
	Underfill M/C	1	Core Tech	Underfill reflow

Division	Equipment name	Number	Equipment Maker	Etc.. (SPEC) [2/2]
Materials warehouse	Baking OVEN	2	Byum jin / Core Tech	Bare PCB dryer
	Micro Dry	3	Seli Richo	Main material dehumidifier
	High speed Micro Dry	10	Seli Richo	Main material dehumidifier (After opening rapidity dehumidification function)
	Vaccum Packaging	1	JS pac	Vacuum packaging equipment
Inspector & Environmental equipment	3D CT X-RAY inspection M/C	1	SEC	Micro 3D CT X-Ray
	Flying Probe ICT Tester	1	EMERIX	
	Microscope Inspector	2	SOME TECH	CAMSCOPE
	40 times magnifying microscope system	4	Sehyun Trading	Attach to Monitor function, capture possible
	X-RAY SMD Component Counter	1	Nano Dream	
	Thermal shock tester	1	Byum jin	-20~80 ° c (Medium Chamber)
	BGA Rework	1	REGEN i	BGA Reballing (BK-1450)
	Digital tensile strength meter	1	Yu Yu	Soldering removable test (component)
	Large high temperature chamber	1	ALL THREE	0 °C - 80 °C [400 x 300 x 250cm]
	XRF (Hazardous Materials Analyzer) [for ROHS]	1	Hitachi (japan)	EA1000Ⅲ
	Thermo-hygrostat	6	Kiturami (Heating Cooling/Dehumidification)	PVU 50T7P1 (6 unit), Lage Type (120 m ²)
	Static Tester	2	Shinhan High Tech	ESC-670 (Shoe Tester)
	Ion blower	16	DIT	For the removal of static electricity (2P, 3P)
Clean Room	Small clean room	1	Clean Booth – Class 1,000, HEPA FILTER (1492 x 572 x 75T)	
Other measuring instruments	Measuring instrument and etc..	60	BGA REWORK equipment, Calibrator, label printer, AC, DC POWER., Analog Tester, Oscilloscope, illuminometer, surface resistance meter, reel counter, static test (HANDY), etc...	

8. Manufacturing Operations Plan

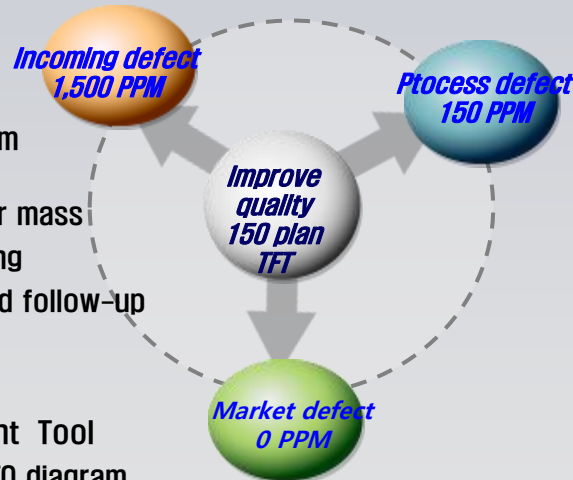
Content		2024 yr.	2025 yr.	2026 yr.	The present
Equipment and Line operation	SMT Line (4 Line)	<ul style="list-style-type: none"> ● SMT, 4 Line operate ● 1 Shifts 	<ul style="list-style-type: none"> ● SMT 5 Line review ● 2 Shifts review 	<ul style="list-style-type: none"> ● SMT 6 Line review ● 2 Shifts operate 	1) A, D Line ; Standard type 2) B, C Line : Large type
	DIP Line (4 Line)_ Wave	<ul style="list-style-type: none"> ● 4 Line operate ● Pb (2) , Pb free (2) 	<ul style="list-style-type: none"> ● 4 Line review ● Pb (1) , Pb free (3) 	<ul style="list-style-type: none"> ● 4 Line review ● Pb (1) , Pb free (3) 	1) A, B Line : Pb Line 2) C, D Line ; Pb Free (ROHS)
	Selective Solder Line (1 Line)	<ul style="list-style-type: none"> ● 1 Line operate ● Selective (1) 	<ul style="list-style-type: none"> ● 2 Line review ● Selective (2) 	<ul style="list-style-type: none"> ● 2 Line operate ● Selective (3) 	1) Robot solder line operation 2) All used for Pb/ Pb Free
	Function Cell Line (10 Line)	<ul style="list-style-type: none"> ● Function 10 Cell Line ● Test & Repair room 	<ul style="list-style-type: none"> ● Function 14 Line 	<ul style="list-style-type: none"> ● Function 17 Line 	1) Function design 2) Repair room (BGA Reball)
	Set test & assembly (6)	<ul style="list-style-type: none"> ● Customer set room (6) [Set test & assembly] 	<ul style="list-style-type: none"> ● Customer set room (9) [Set test & assembly] 	<ul style="list-style-type: none"> ● Customer set room (9) [Set test & assembly] 	Customer set room (6) (space : 120 m ²)
	Automatic coating line	<ul style="list-style-type: none"> ● Auto coating system [2 Line] 	<ul style="list-style-type: none"> ● Auto coating system [2 Line] 	<ul style="list-style-type: none"> ● Auto coating system [2 Line] 	3 Conformal Coated Robot System
Man power operation	Manufacturing	45	50	55	
	Purchase / Materials	4/ 7 (11)	12	13	
	Quality / Manufactuein Management	7/ 2 (9)	10	10	
	Manufacturing technology (Eng.)	7	8	9	
Total operation manpower		72	80	87	

9. Quality Process

■ Quality improvement 150 Operation

Quality improvement **150** Operation

- market defect zero
- process defect 150ppm
- incoming defect 1,500ppm
- New customers and after mass production. Strengthening preventives activities and follow-up mass production
- Analysis & Improvement Tool
 - type analysis – PARETO diagram
 - Trend management – PPM management chart
- Way of Activity
 - Weekly quality meeting : Every Tuesday
 - Progress check meeting : Monthly
 - Progress report : Monthly



■ Quality improvement strategy

- Customers require, Quality is 'zero defect' levels.

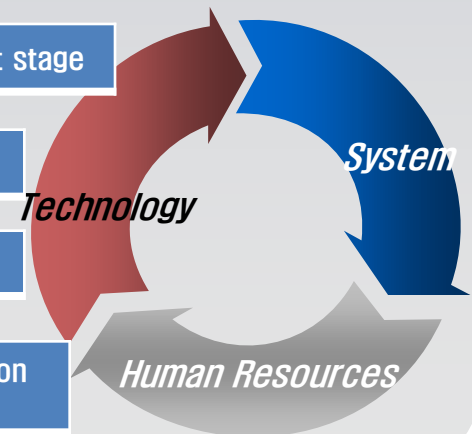
- There is no defect in LOT but in case of one critical defect, require quality improvement report.
- In order to meet customer demand rather than simple 'Reduction of defects' requires uniform manufacturing.

1. Improve quality in development stage

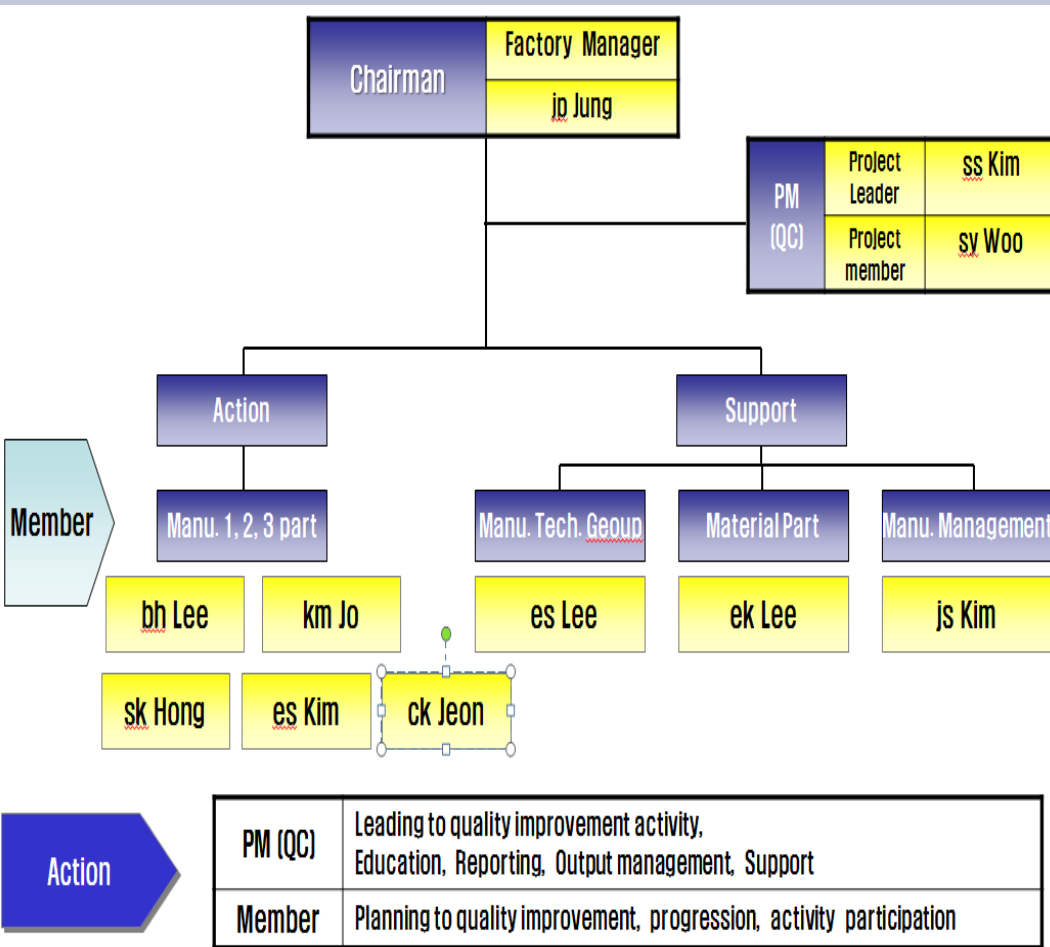
2. Improve manufacturing quality

3. Customer quality satisfaction

4. One Team (strength cooperation among the members)



Quality Improvement Promotion Organization



Quality improvement plan

Development ~ Initial products quality stabilization

Initial quality stabilization of manufacturing products

- The time transfer production, Check the history and Issue point
- Share Issue point in development stage [quality, manu. technology, 1/2/3 part]
- When launching of new model products, Concentration for process quality

Manufacturing quality stabilization

Improve process quality

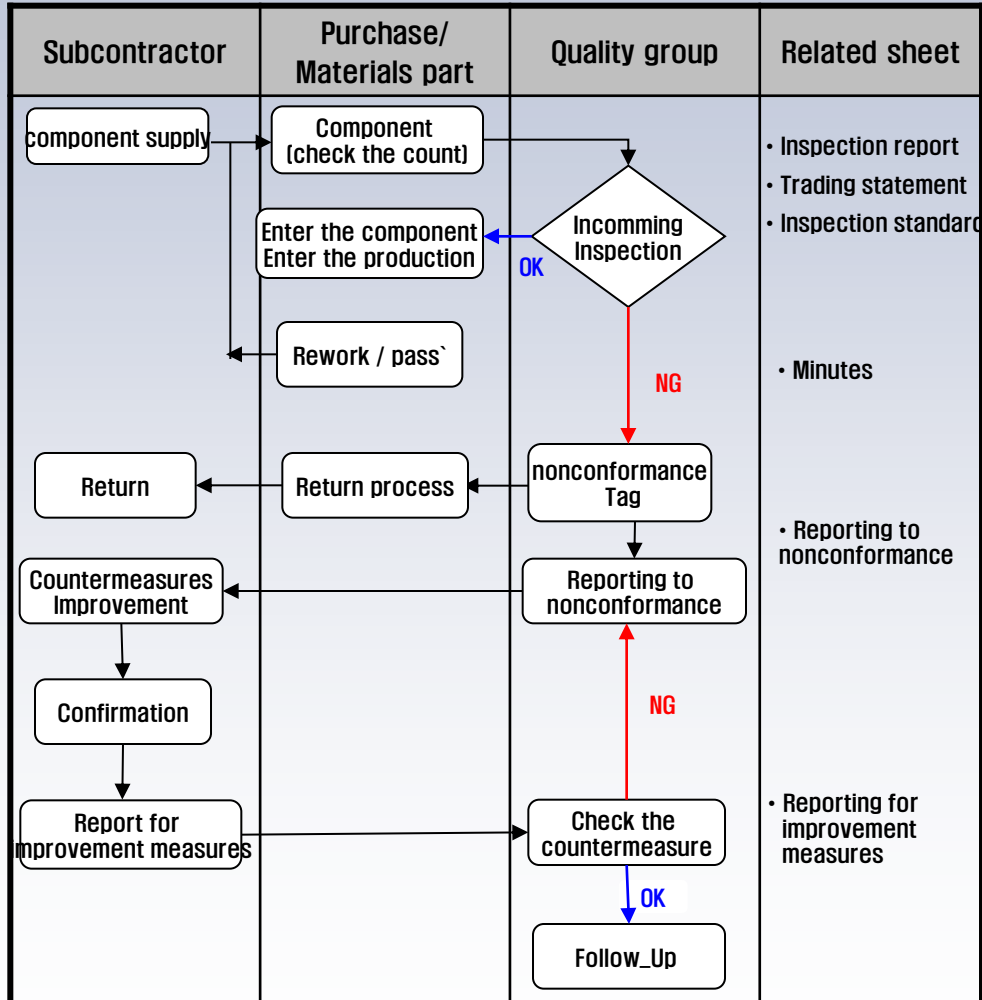
- Establish countermeasure to recurrence prevention from worst defect analysis
- Establish countermeasure after analysis, of the defect of operator error
 - ① Operator quality awareness
 - ② Check the system
 - ③ Operation environment (3-way 5S)
 - ④ Operator's body, psychological state

Customer Satisfaction

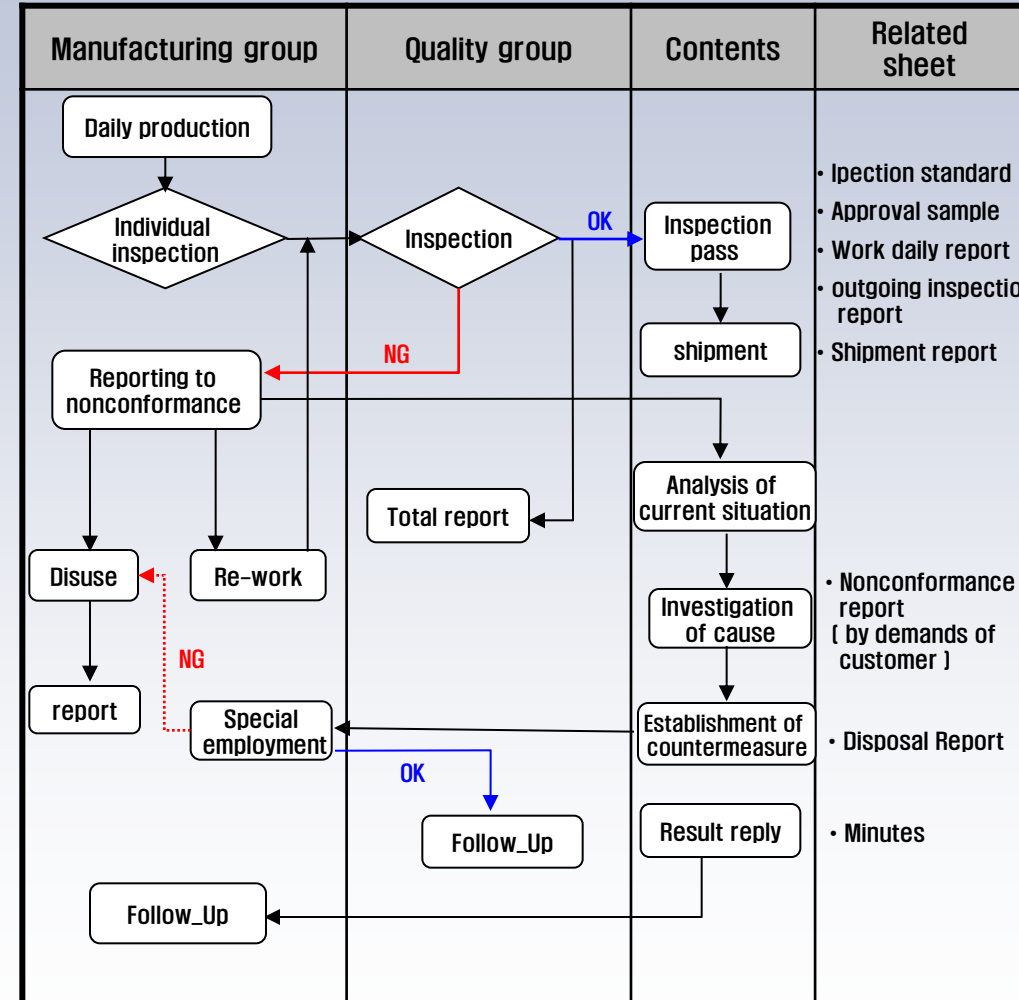
Establish a customer satisfaction process

- Establishing a plan and improve problems by surveying customer satisfaction.
- Establishing quality differentiation plan to applied to manufacturing line
- Establishing 3-way 5S operation plan to maintain manufacturing line need to ask the customer .

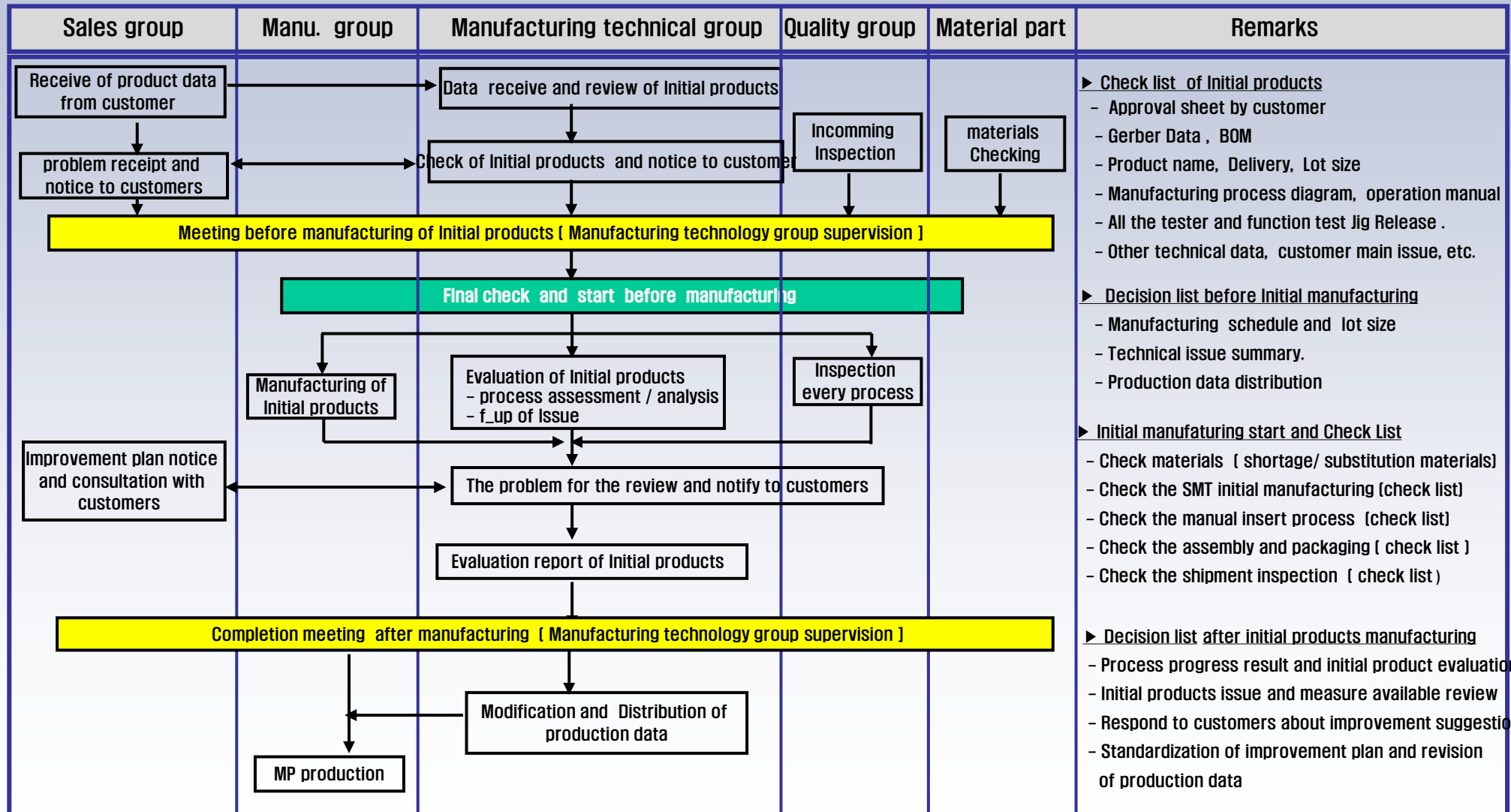
Incomming Inspection Process




Outgoing Inspection Process



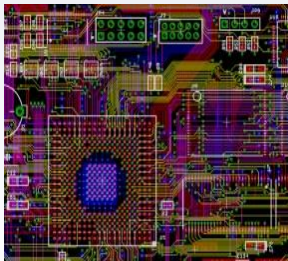
Quality process of Initial products



Check sheet for Initial products

 [주] 한터기술 HUNTER TECHNOLOGY		<h1>초도품 성적서</h1>		<div>신규 생산</div>		품질 승인 	
검사일자	2014-11-26					11월 26일 11월 26일	
모델명	HTMC502J-MVB-Rev.B	LOT수	46		납사양	유연납	
고객사	한터기술	Line	B-Line		검사자	김상순	
NO	Check 사항	OK	NG	해당없음	비고		
1	기술변경 및 생산자료 (PL, 작업지도서) 최신VER 확인	○			VER: (HTMC502J-MVB-Rev.B)		
2	PCB 외관불량(매턴 벗겨짐, 흠, 오염) 없을 것	○					
3	PCB 피두셜 마크, Guide V-Cut 누락 없을 것	○					
4	PCB 극성 Silk Print 오류 없을 것	○					
5	SPI 과납, 소납, 틀어짐 등 없을 것	○					
6	부품 미출 시 고객사 승인 여부 확인			○			
7	부품 Package 오류 없을 것	○					
8	부품 Spec 오류 없을 것	○					
9	SMT 미삽 이상 없을 것	○			23절 (TOP - R1,R17,R31,R53,R54, R55,R56,R57,R58,R62,R64,R66, BOTTOM - C40,R83,R84,R85,R89,R90, R93,R101,R106,R108,R111)		
10	SMT 오삽(피터검사) 이상 없을 것	○					
11	SMT 역삽(극성) 이상 없을 것	○					
12	PCB 랜드 대비 자재 Package 오류 없을 것 (납땜 상태)	○					
13	마스크 개구부 사이즈 대비 랜드 오류 없을 것	○					
14	랜들링(수합) 실장 POINT 이상 없을 것 (중점관리 POINT)	○					
15	컨베이어 통과 후 PSR 벗겨짐, 오염등 PCB상태 이상없을 것	○					
16	BGA 오삽, 역삽, 미삽, 들뜸 등 없을 것	○			XC3S1400AN-4FGG676I (U4) AT91SAM9260B-CU (U5)		
17	BGA 외관상태 (땀납 및 IC 갈라짐) 이상 없을 것	○			XC3S1400AN-4FGG676I (U4) AT91SAM9260B-CU (U5)		
18	QFP 부위 소납, 쇼트, 납땜불성 이상 없을 것			○			
19	Oscillator 극성 이상 없을 것	○			SCO-103A 24MHz, 3.3VDC (OSC1)		
20	LED 점등, 색상, 납땜 상태 이상 없을 것	○			SSC-GR101 : Green (LD1,LD2,LD3,LD4,LD5,LD6,LD7,LD8)		
21	부품 리드 부식 없을 것 -> 존재 시 냉면 여부 확인	○					
22	매거진 간섭으로 인한 PCB 파손 없을 것	○					
23	HEADER PIN 부품 리드 평탄도 이상 없을 것(냉면 확인)	○			A2-6PA-2.54-DSA 2.54mm (HD1) A2-2PA-2.54-DSA 2.54mm (HD2) A1-20PA-2.54DSA,2.54mm (HD3)		
중점관리항목 (고객사 요구사항)		2. 유사 부품 주의. TP578601DCQ [Ref* U2] TP578618DCQ [Ref* U1]					
NO	문제점	임시조치	개선 요청사항	담당자	참고자료	개선여부	
1	AT91SAM9260B-CU (U5) 1번 표식 IC상에 2개가 존재하여 작업시 실장 위치 혼동됨	Mouser 실물 확인후 실장 진행	정품자재 인지 확인 필요.				
2	Crystal SSP-T7-F, 32.768KHz (XT3) 현품표 없이 수기 입고됨. 용량값 표기가 안되어 있음	사급자재	현품표 부착 및 용량값등 정확함 정보 기입 요청.				

10. Design & Technology



● PCB artwork (design)

- ☐ NX7/ NX70/ NX700 PLC PCB ARTWORK
- ☐ ROBOT Controller PCB ARTWORK
- ☐ Servo Driver PCB ARTWORK
- ☐ OLED Encapsulation Inkjet driver (SG1024)
- ☐ LCD Encapsulation Inkjet driver (V1, V2, V3)
- ☐ Elevator controller board
- ☐ SMART GLASS Controller

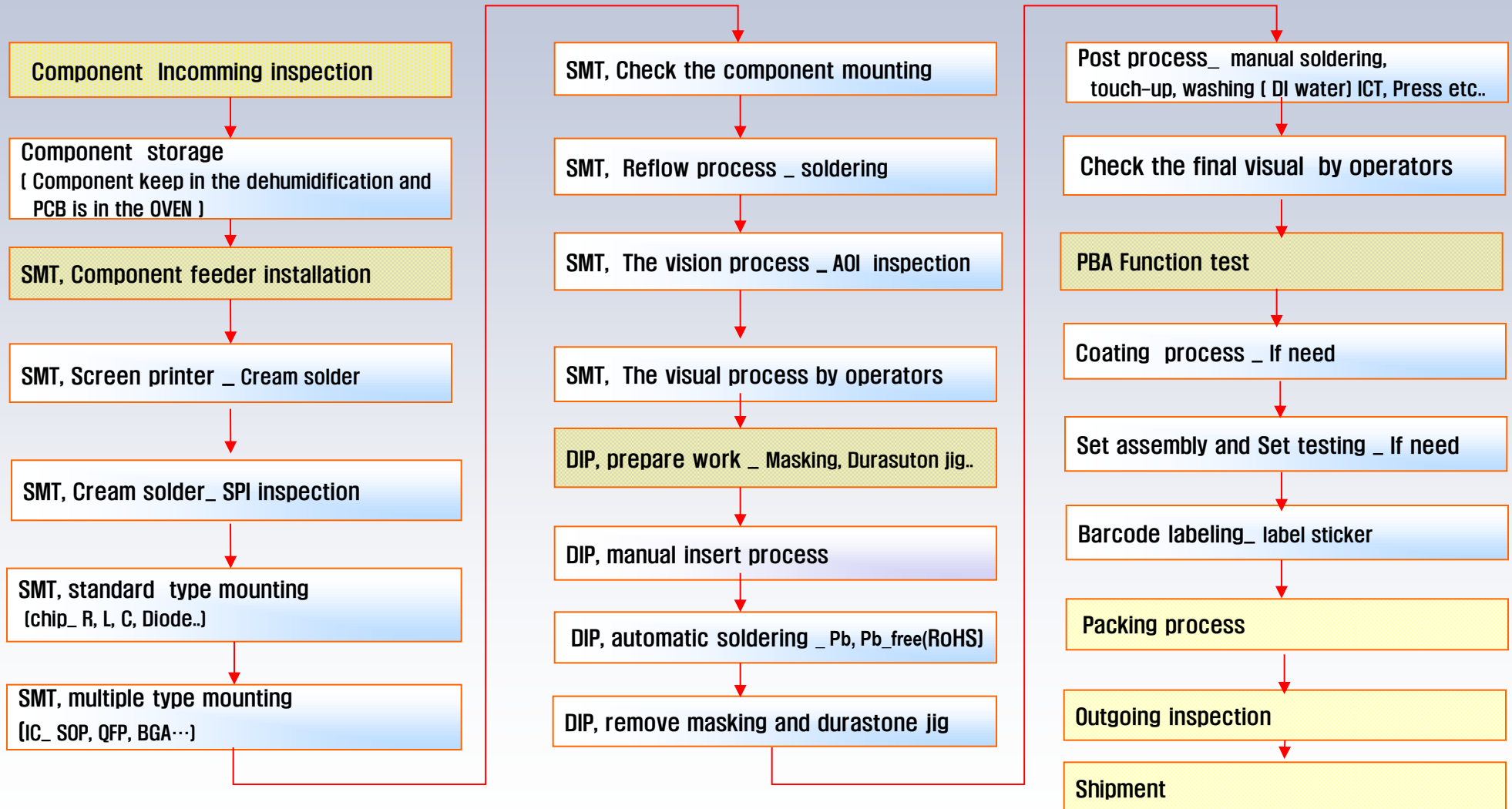
● Inspection equipment and function jig

- ☐ PLC positioning module inspection equipment
- ☐ Firmware download Jig design
- ☐ Inkjet driver function jig design
- ☐ Elevator controller function jig design
- ☐ LED Power mass production process jig design

● Plan and Engineering (technology)

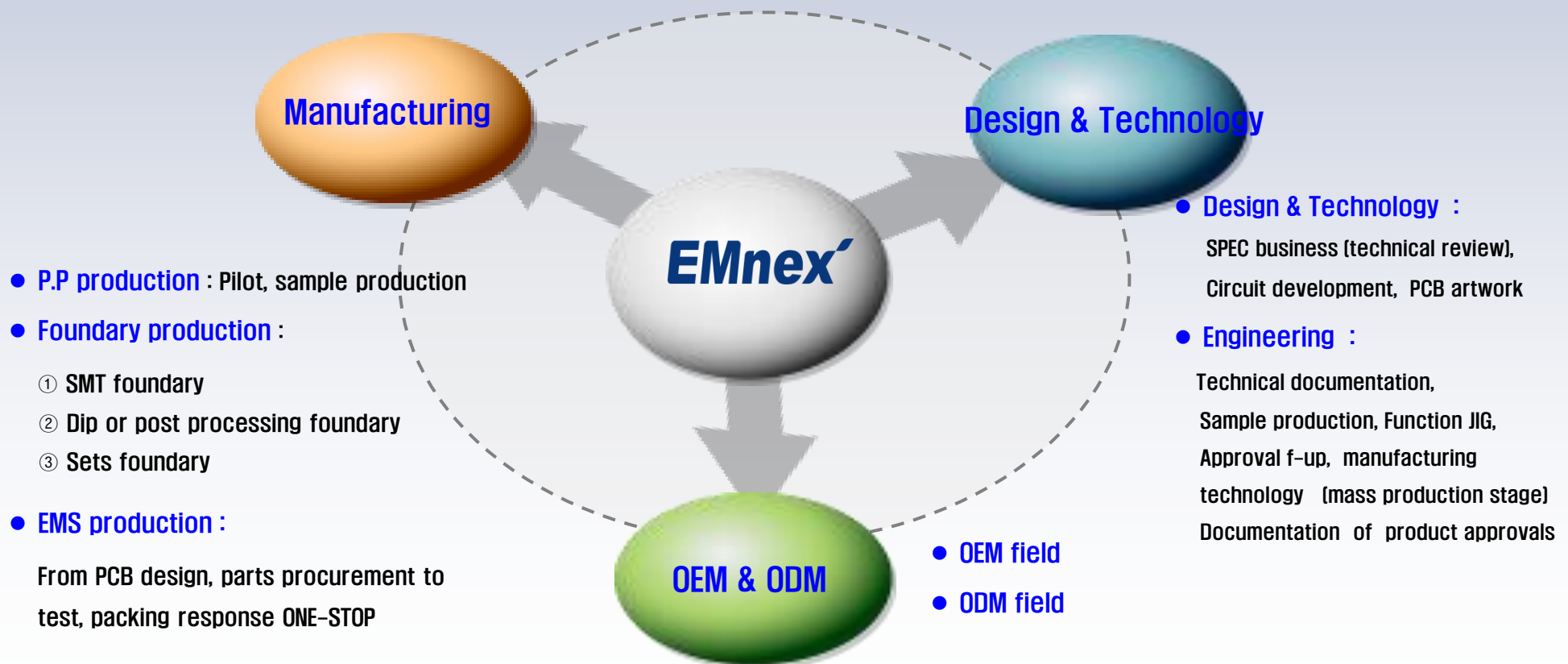
- ☐ NX70/ NX700 PLC Engineering and CE/ UL approval
- ☐ I/O ASIC Development (circuit -> FPGA -> ASIC)
- ☐ Ultrasonic docking control module development.
- ☐ EtherCAT I/F & SERCOS module engineering
- ☐ Phase control B'D engineering
- ☐ AGV control system engineering
- ☐ Laser detector control system engineering
- ☐ Ultrasound Docking B'D development.
- ☐ OLED Inkjet driver (SG1024 driver) engineering
- ☐ LCD Inkjet driver (Jet driver V1, V2) engineering
- ☐ OLED Inkjet driver (Jet driver V3) engineering
- ☐ Elevator controller board development.
- ☐ SMART GLASS Controller development.
- ☐ LED Power module development.
- ☐ OLED KM Driver (KM V1,V2,V3) engineering
- ☐ Pulse DC Generator development .
- ☐ etc

11. Manufacturing process diagram



12. EMNEX Business

EMNEX is capable of handling PCB artwork, parts purchase, assembly (SMT_ DIP process), testing, set assembly, packaging, and it supports from small lot production to mass production as below.



■ etc.. (subsidiary facility)

3rd rest ground



Cafeteria



Table tennis court



Place of education



Women's rounge





Thank you!

