

FOCUSING

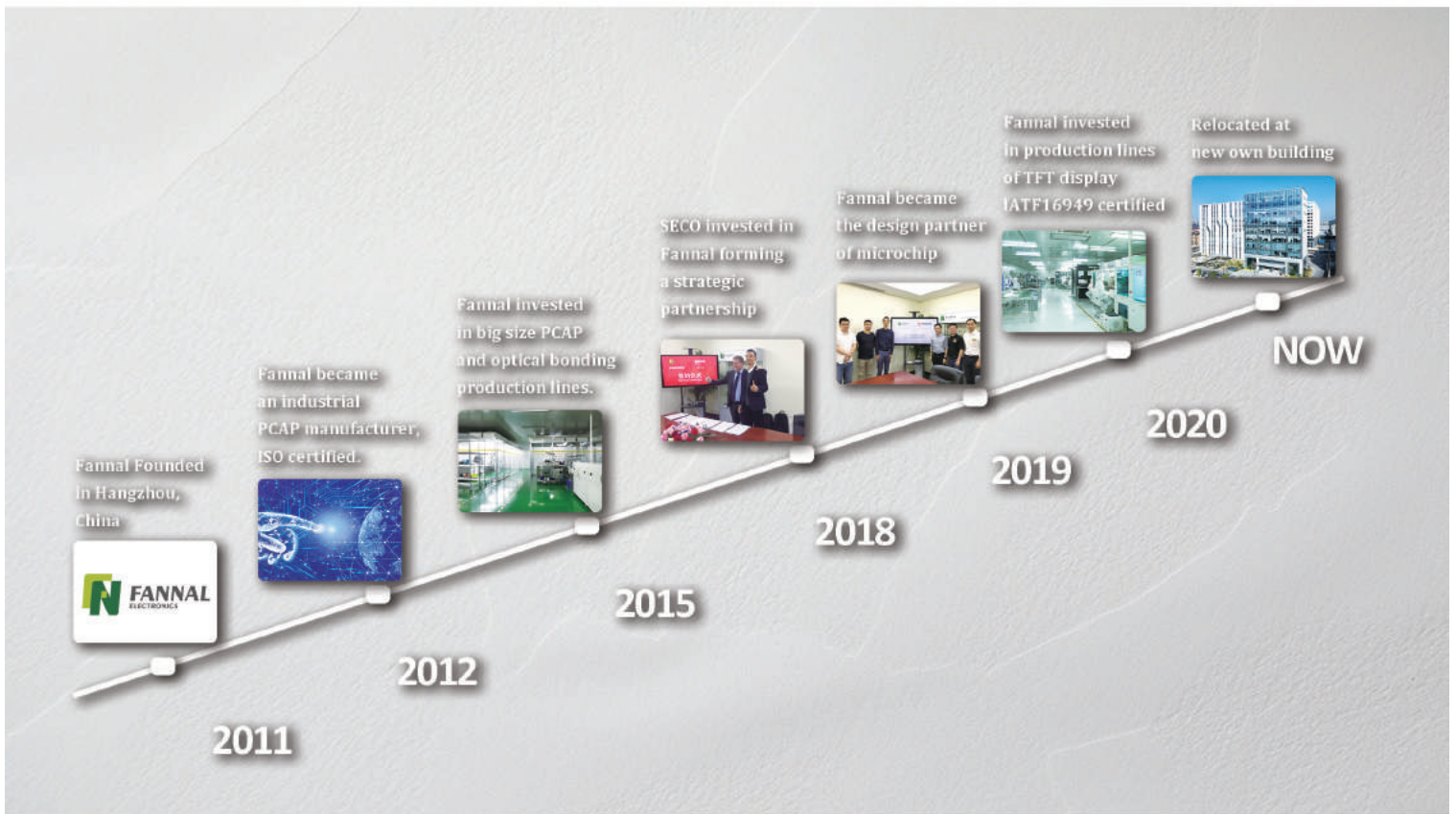
EFFICIENCY

STANDARDIZATION



# TOTAL SOLUTION FOR TOUCH DISPLAY







# OVER 13 YEARS

## TOUCH DISPLAY FOR INDUSTRIAL



One-stop shop for  
touch screen/  
displays/  
Optical bonding



In-house  
engineering  
& production



Flexible and  
quick support  
system



Long-term  
stable supply

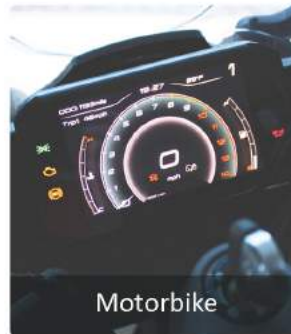
## Dedicated to Industrial Application Products



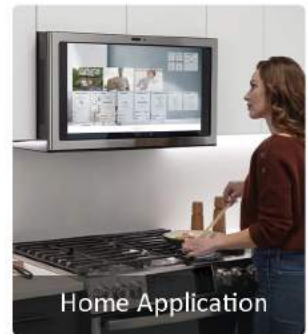
Automotive



Outdoor



Motorbike



Home Application



Industrial panels



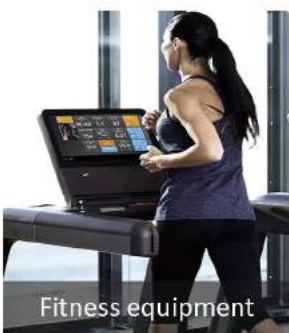
Vending machines



Transportation



Medical equipment



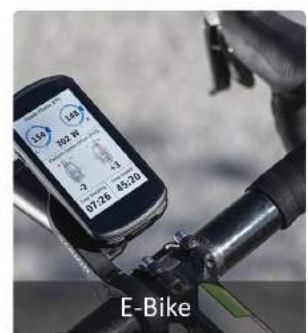
Fitness equipment



Payment Systems



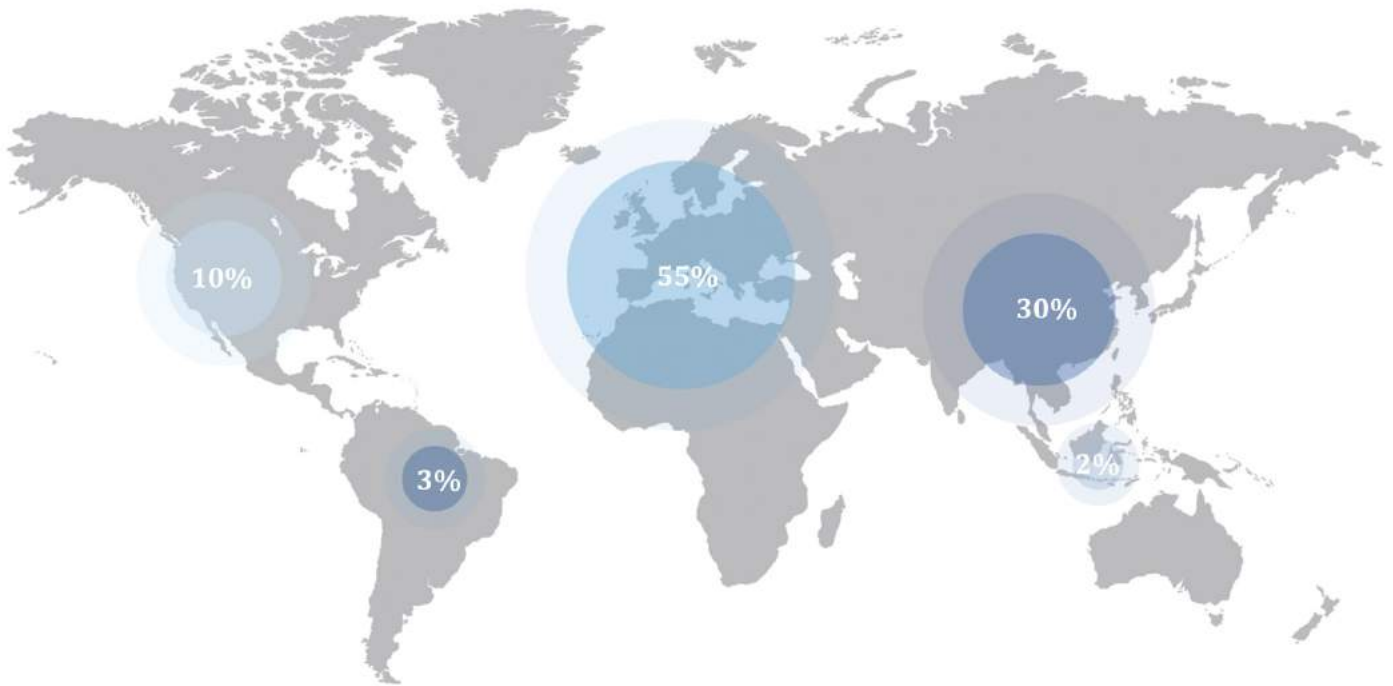
Engineering Plant



E-Bike

# GLOBAL SHARE

Our business covers more than  
**40+** countries & regions worldwide



North America	South America	Europe	China	APAC
Share	Share	Share	Share	Share
10%	3%	55%	30%	2%



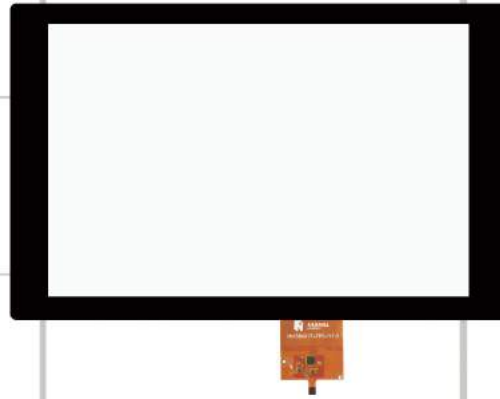
# PROJECTED CAPACITIVE TOUCH TECHNOLOGY

Structure: GG, GFF  
Size: 1.8" ~ 55"

Touch with Water  
Salt Water, Sweat

Meet EMI / RFI  
Standards

Linux, Windows,  
IOS and Android



Customization on  
Cover: AG/AR/AF,  
Meet impact test

Multi-touch Solution

True Touch with  
Gesture and Palm  
Rejection

Finger, Glove and  
Passive Pen Input



ILITEK **EETI** GOODIX **FocalTech**



Touch Button



Knob Touch



Touch with Water  
Sweat Alert



Thick Gloves Support  
MAX 5mm



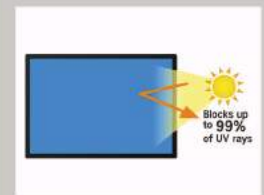
EMI Shielding



Wide temp touch  
-40°C~85°C



Wooden touch



UV blocking touch

## In-house Manufacturing





# PROJECTED CAPACITIVE TOUCH TECHNOLOGY

Main Material: Glass, PMMA, PC, Glass is the most commonly used.

Impact Resistant



Glass Thickness: Max 10mm

**Table 1 – Relation between IK code and impact energy**

IK code	IK00	IK01	IK02	IK03	IK04	IK05	IK06	IK07	IK08	IK09	IK10
Impact energy, J	*	0,14	0,2	0,35	0,5	0,7	1	2	5	10	20
* Not protected according to this standard.											
NOTE 1 When higher impact energy is required, the value of 50 J is recommended.											

Ingress Protection: Max IK10

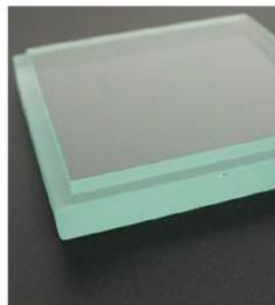
## Custom Shaped and Printing



Polishing



CNC the holes



CNC step



3D cover



Anti-UV printing



Ceramic printing

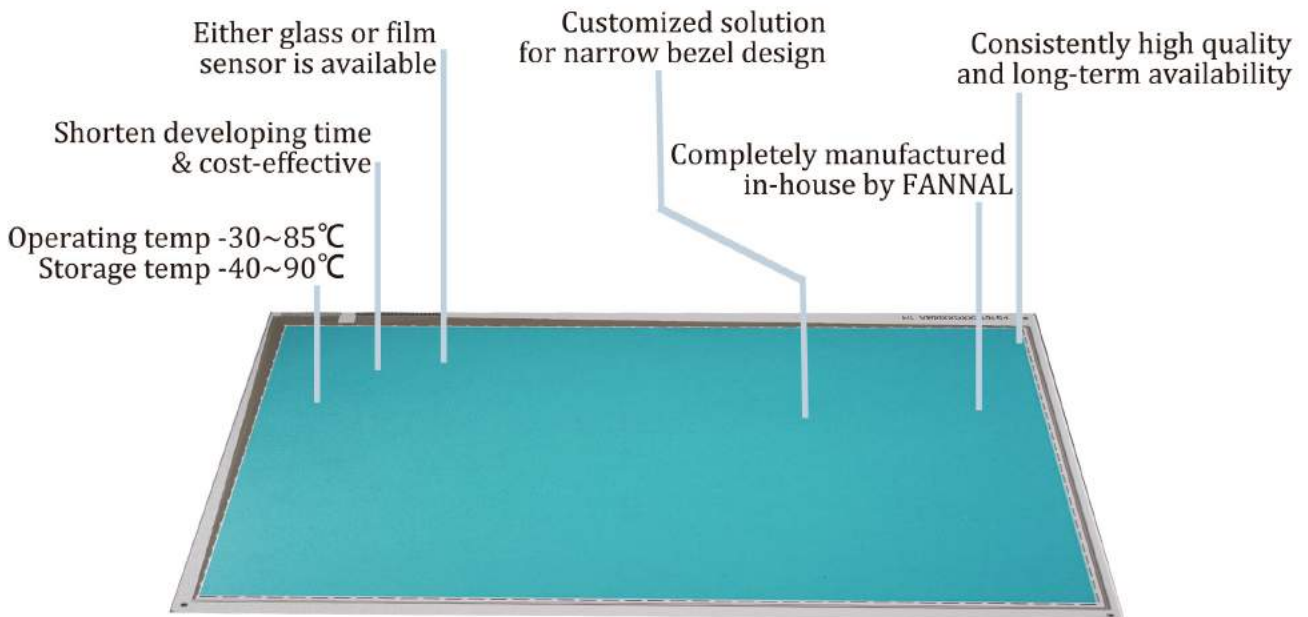


Colored



shape

# TOUCH SENSOR IN-HOUSE MANUFACTURING



## Sensor Technologies:

<p>ITO(X,Y)</p> <p>Glass</p>	<p>ITO(X)</p> <p>Glass</p> <p>ITO(Y)</p>	<p>ITO(X)</p> <p>Pet film</p> <p>Bonding</p> <p>ITO(Y)</p> <p>Pet film</p>
<p><b>Single ITO(SITO)</b></p> <p>SITO are more accurate for rugged environments, water and salt-water immunity, and use with glove or stylus.</p>	<p><b>Dual-layer ITO(DITO)</b></p> <p>DITO sensors are customizable with a glass lens with optional back printing, optically bonded to the sensor. They are a low-cost solution, which provides high resolution and accuracy.</p>	<p><b>FilmFilm (F/F)</b></p> <p>Since the film base material is soft, it can be used not only for flat surfaces but also for touch sensors with curved surface designs that are not suitable for glass sensors. The size and shape are also available upon request.</p>

## In-house Manufacturing



WASHING



INK PRINTING



LASER



# TFT DISPLAY



## Customizations

### LCD Panel

Size:1.77"~15.6"  
Custom panel  
Cooperators:  
BOE/INNOLUX/JDI  
Hannstar/TIANMA  
Type:IPS/TN/LTPS



### Interface Design

Shape and Length,  
PIN Definitions and Pitches,  
Electromagnetic Shielding,  
Circuit Optimization.



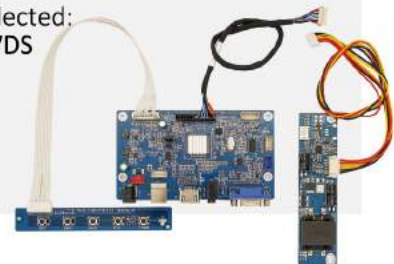
### Back Light

Backlight Frame material  
options: Metal/Plastic/  
Metal&Plastic integration  
Lifetime up to 50K Hours  
High brightness up to  
30000cd/m<sup>2</sup>



### Driver Board

Interface can be selected:  
RGB/VGA/HDMI/LVDS



## In-house Manufacturing



Cell Cutting



Cell Automatic Cleaning Line



Automatic polarizer attachment



Automatic COG/FOG Bonding



# TFT DISPLAY

## Bar Display

Size	2.68	3.99	6.86	7.00	8.80	10.25	10.25	10.25
Resolution	376x960	480x960	480x1280	280x1424	480x1920	1920x720	1280x480	720x1600
Active Area	26.508x67.68	39.18x94.032	60.192x160.512	33.6x170.88	54.72x218.88	243.648x91.368	243.8x91.44	106.92x237.6
Aspect Ratio	2:5	5:12	3:8	1:5	1:4	8:3	8:3	9:20
Module size(mm)	31.2x76.6x2.05	42.9x102.08x2.15	72.42x173.79x6.5	38.2x171.47x3.4	64.0x231.1x4.65	253.09x105.93x6.63	258.6x107.0x6.36	115.1x250.8x10.4
Viewing angle(L/R/U/D)	85/85/85/85	85/85/85/85	85/85/85/85	80/80/80/80	85/85/85/85	85/85/85/85	85/85/85/85	85/85/85/85
Power Supply Voltage(LCD)	2.8V	2.8V	3.3V	3.3V	3.3V	3.3V	3.3V	3.3V
Power Consumption(B/L)	24.8mW	496mW	2976mW	1024mW	2640mW	7560mW	6588mW	4392mW
Operating Temperature	-20~70	-20~70	-20~70	-20~70	-20~70	-30~85	-30~85	-30~80
Storage Temperature	-30~80	-30~80	-30~80	-30~80	-30~80	-40~90	-40~90	-30~80
Brightness	550	350	1000	450	600	750	1000	600
Contrast Ratio	1500	1500	1500	1000	800	1500	1000	1000
Interface	TTL/MIPI	TTL/MIPI	MIPI	MIPI	MIPI	LVDS	LVDS	MIPI

## Round Display

Size	2.10	2.76	3.40	3.54	4.00	5.00
Resolution	480x480	480x480	800x800	800x640	720x720	1080x1080
Active Area	53.28x53.28	70.128x70.128	87.6x87.6	92.0x72.0	101.52x101.52	127.008x127.008
Aspect Ratio	1:1	1:1	1:1	9:7	1:1	1:1
Module size(mm)	56.18x59.71x2.22	73.03x76.48x2.3	94.9x96.95x2.18	97.6x83.79x4.0	105.6x109.87x2.08	136.531x132.208x1.98
Viewing angle(L/R/U/D)	85/85/85/85	85/85/85/85	85/85/85/85	85/85/85/85	85/85/85/85	80/80/80/80
Power Supply Voltage(LCD)	2.8V	2.8V	2.8V	3.3V	2.8V	1.8V
Power Consumption(B/L)	240mW	240mW	480mW	3240mW	124mW	744mW
Operating Temperature	-20~70	-20~70	-20~70	-30~85	-20~70	-20~60
Storage Temperature	-30~80	-30~80	-30~80	-40~85	-30~80	-30~75
Brightness	350/500	250/350	350/500	1200	250/350	350
Contrast Ratio	1000	1200	1200	1200	1200	1300
Interface	MIPI/TTL	TTL	MIPI	TTL/SPI	MIPI	MIPI

## Wide temperature Display

Size	5.00	7.00	7.00	7.00	7.00	8.00	10.10	10.40	11.80
Resolution	800x480	800x480	800x480	800x480	1024x600	1920x1200	1280x800	1024x768	1200x1600
Active Area	108.0x64.8	152.4x91.44	154.08x85.92	154.08x85.92	152.21x85.92	172.224x107.64	216.96x135.6	210.43x157.82	180.0x240.0
Aspect Ratio	15:9	15:9	16:9	16:9	16:9	8:5	16:10	4:3	3:4
Module size(mm)	120.7x77.8x5.85	165.0x104.6x7.8	164.9x100.2x8	164.9x100.0x5.75	164.9x100.0x5.6	119.8x181.7x5.5	229.46x149.1x4.75	238.6x175.8x6.8	194.0x258.55x10.6
Viewing angle(L/R/U/D)	80/80/80/80	85/85/85/85	70/70/60/70	70/70/60/70	80/80/80/80	85/85/85/85	80/80/80/80	80/80/80/80	85/85/85/85
Power Supply Voltage(LCD)	3.3V	3.3V	3.3V	3.3V	3.3V	3.3	3.3V	3.3V	3.3V
Power Consumption(B/L)	1628mW	3600mW	1620mW	1620mW	5022mW	6480mW	7560mW	7500mW	3500mW
Operating Temperature	-30~85	-30~85	-30~85	-30~85	-30~85	-30~85	-30~80	-30~80	-30~85
Storage Temperature	-30~85	-30~85	-30~85	-30~85	-40~90	-30~85	-30~80	-30~80	-40~95
Brightness	800	1000	500	450	1600	1000	1000	700	750
Contrast Ratio	1000	1500	800	800	1000	1200	1000	1000	1000
Interface	TTL	LVDS/TTL	TTL	TTL	LVDS	LVDS	LVDS	LVDS	LVDS

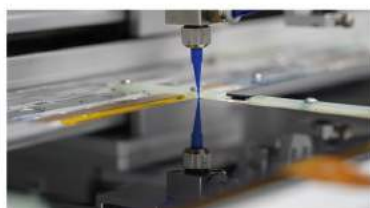
## High brightness Display

Size	3.5	4.3	5.0	7.0	7.0	8.4	10.1	10.1
Resolution	320x240	480x272	800x480	800x480	800x480	1024x768	1024x600	1280x800
Active Area	70.08x52.56	95.04x53.856	108.0x64.8	154.08x85.92	152.4x91.44	170.8x128.1	222.72x125.28	216.96x135.6
Aspect Ratio	4:3	16:9	15:9	16:9	15:9	4:3	16:9	16:10
Module size(mm)	76.5x63.7x2.95	105.4x67.1x3.0	120.7x75.8x2.8	165.0x100.0x5.65	165.0x104.6x7.8	203.0x145.9x5.7	235x143x4.6	229.46x149.1x4.75
Viewing angle(L/R/U/D)	80/80/80/80	80/80/80/80	80/80/80/80	70/70/50/70	85/85/85/85	80/80/80/80	85/85/85/85	80/80/80/80
Power Supply Voltage(LCD)	3.3V	3.3V	3.3V	3.3V	3.3V	3.3V	3.3V	3.3V
Power Consumption(B/L)	960mW	992mW	2400mW	1980mW	2940mW	5184mW	3465mW	5600mW
Operating Temperature	-20~70	-20~70	-20~70	-20~70	-30~85	-20~70	-20~70	-20~70
Storage Temperature	-30~80	-30~80	-30~80	-30~80	-30~85	-30~80	-30~80	-30~80
Brightness	1000	800	1000-2000	950	1000	1000	600	500/1000
Contrast Ratio	800	800	1000	500	1500	1000	800	1000
Interface	TTL+SPI	TTL	TTL	TTL/LVDS	LVDS/TTL	LVDS	LVDS	LVDS

## In-house Manufacturing



AOI



Automatic Dispensing



Backlight assembly line



Observation Aging Machine



# TOUCH SCREEN INTEGRATION & DISPLAY SERVICES

Integration involves bonding the touch panel and sensor to the selected display.



## Air Bonding

- Bonding line can support up to 32"
- 3M VHB
- Class 100 clean room
- Professional tools and operators



## Optical Bonding

- Adhesive materials are mainly divided into acrylic and silicon series  
Brand: Wacker, Polomo
- OCR (Optically Clear Resin) bonding line can support up to 32"  
One fully automated production line
- OCA (Optically Clear Adhesive) bonding line can support up to 15.6"  
Two fully automated production lines.

FANNAL also provide a full suite of original LCD such as AUO, Innolux, Tianma etc. sourcing, services to those customers looking for different solution.



- Curved Touch Monitor solution
- Shape: "C" & "J"
- Size: 23.6 inch to 55 inch  
C shape: 23.6" /32" /39" /43" /49" /55"  
J shape: 32" /39" /43" /49" /55"
- Back cover assembly service
- Design flexibility: Available in free sizes and a variety of colors to suit any application.

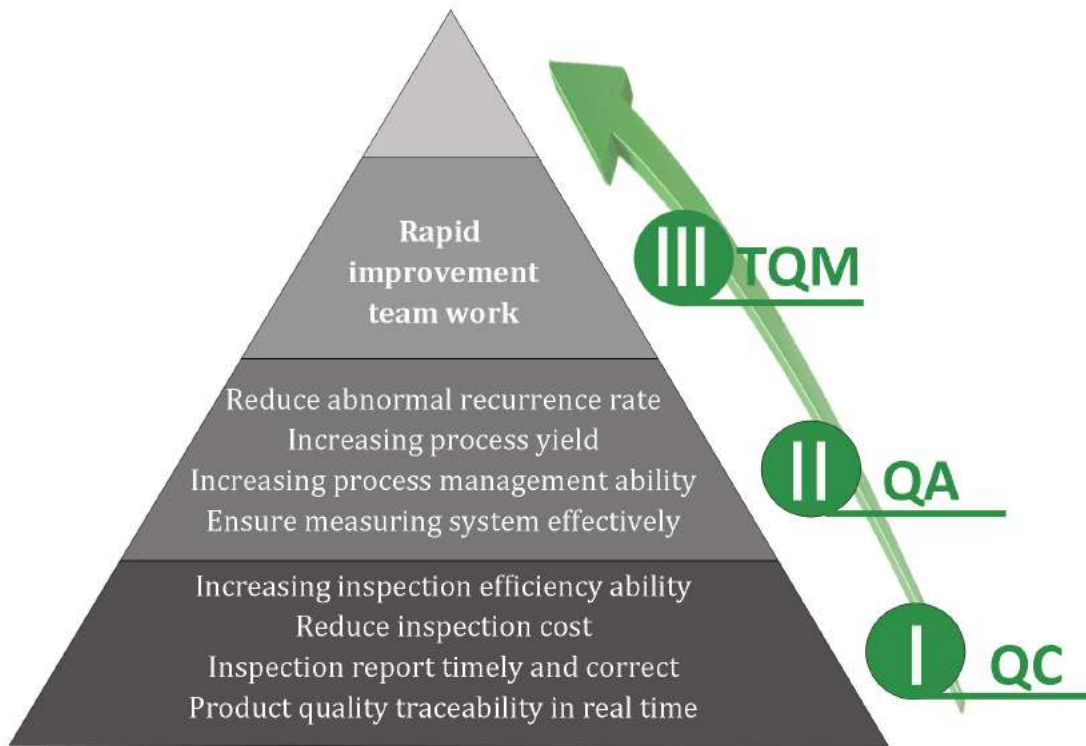
## In-house Manufacturing





# QUALITY CONTROL

Fannal is certified by ISO9001, ISO14001, IATF16949 and ISO45001, meet the RoHS, REACH and other environmental rules in global markets.



## Reliability Test





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