

ACF使用注意及常见不良分析

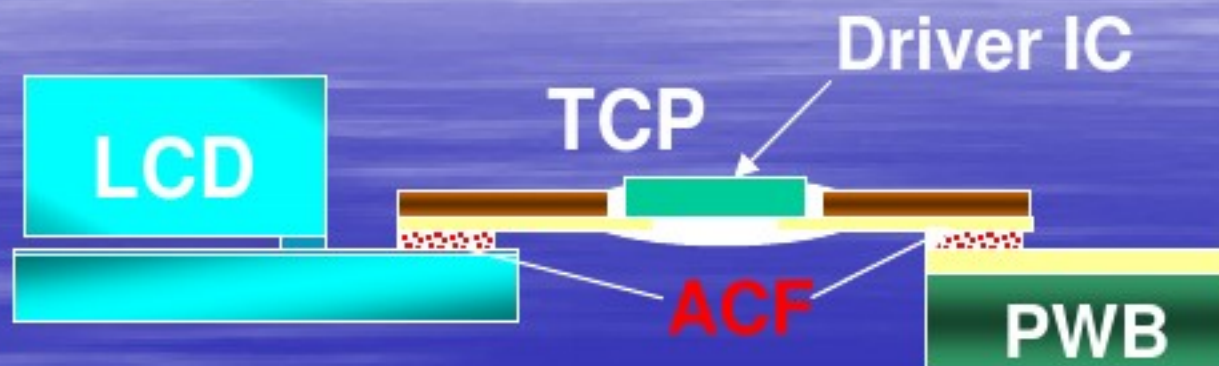
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1150 Goshomiya Shimodate
308-8524 Japan
Phone:+81-296-20-2471
Fax:+81-296-28-1305*

Application
example

Packaging structure

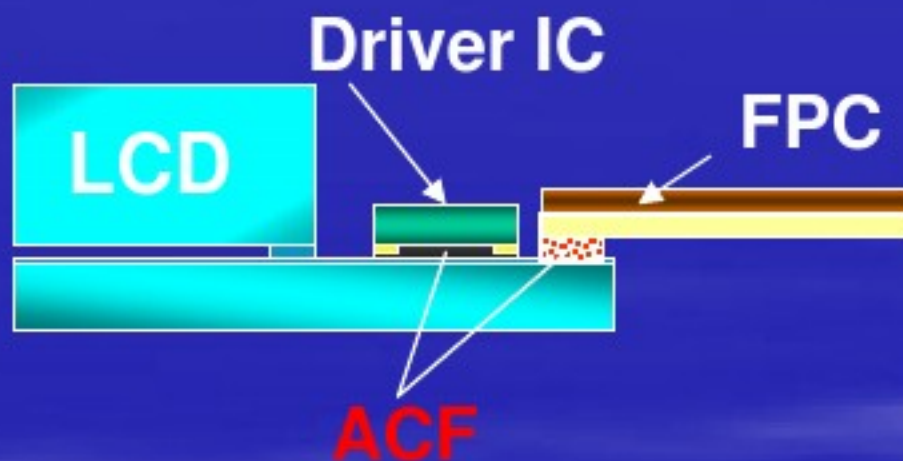
Features

>8 inches
(Monitor, TV,
Note PC)



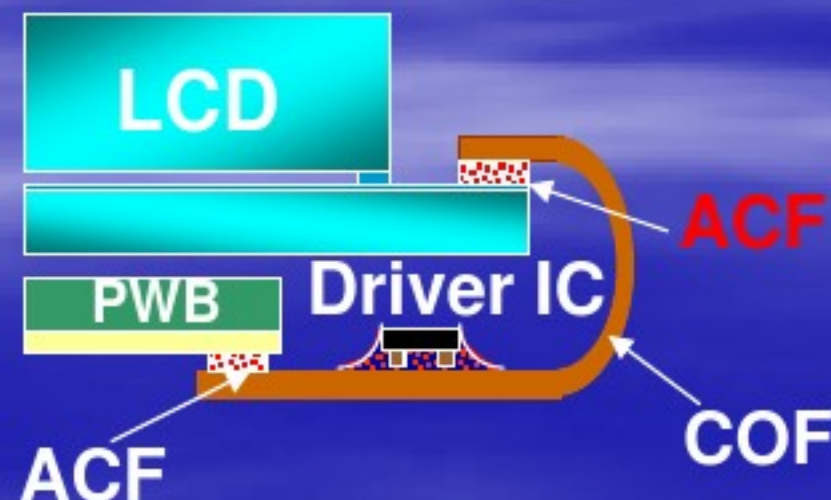
Established infrastructure
Easy inspection

<8 inch (Car
Navigation,
Camcorder,
Cellular
Phone)



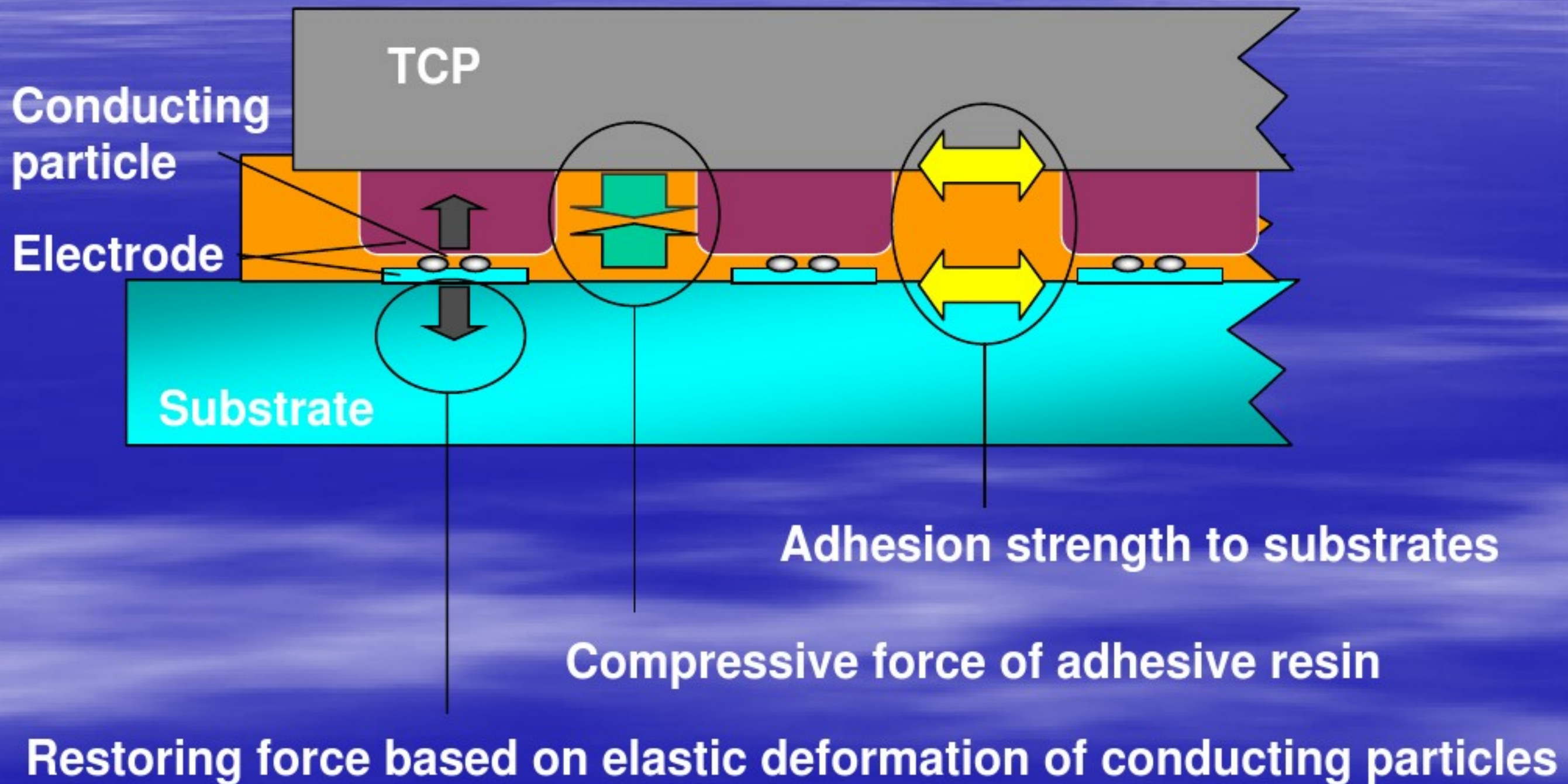
Low cost
Flexibility in module design

Note PC,
Cellular
Phone

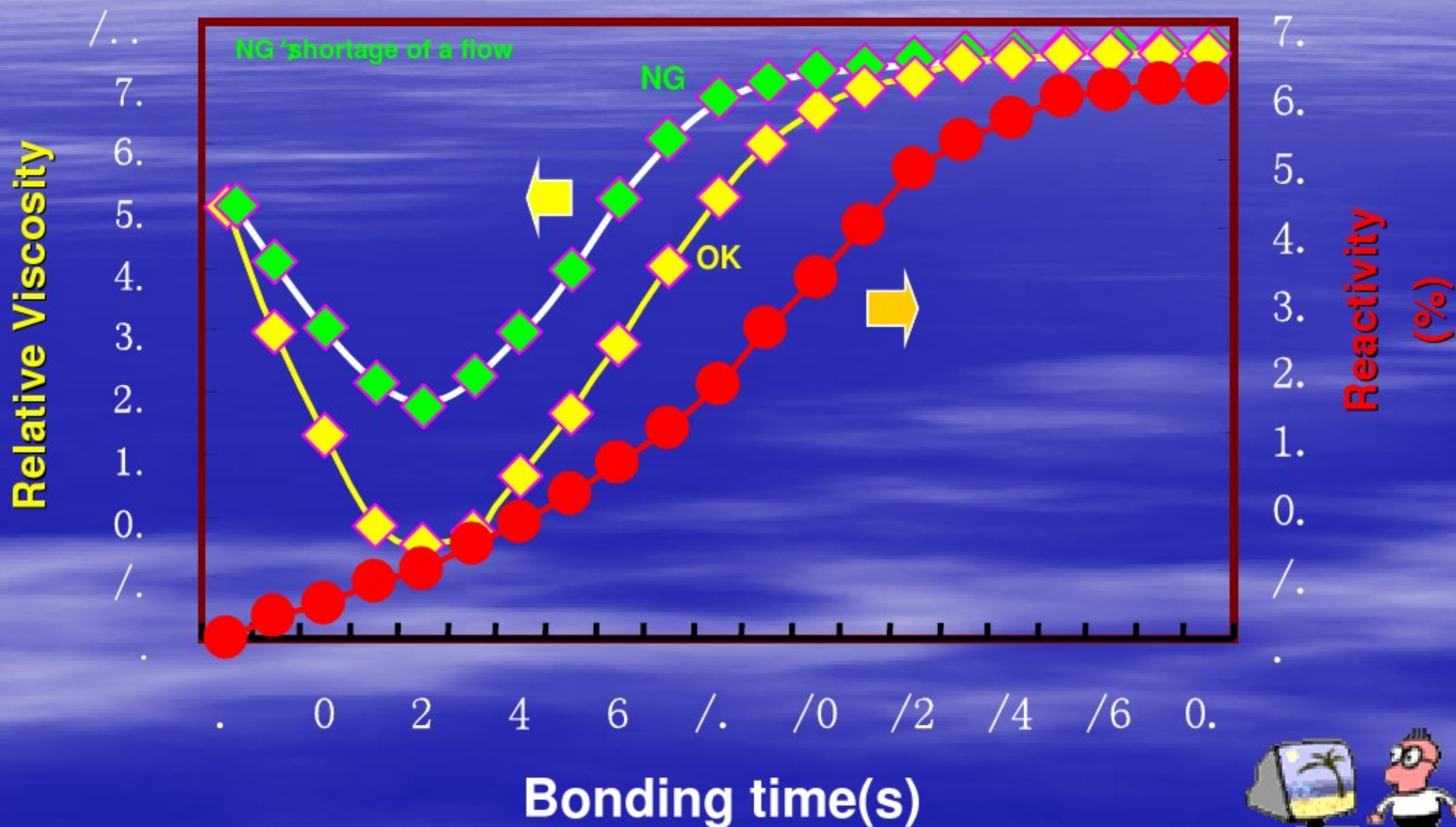


Excellent flexibility
Fine Pitch Capability

Connection mechanism by ACF



Melt viscosity and reactivity of Anisolm



Storage procedure of Anisolm(1)

- Anisolm is packed into an anti-moisture bag with a drying agent.
- Please store the bag of Anisolm at a refrigerator(-10-5 degrees C).
- Please confirm that Anisolm is not wet with dew after taking it out of a refrigerator followed by leaving it for about one hour at room temperature, when using it.



How can we determine an appropriate thickness of Anisolm?

- Thin thickness D Make voids and lower adhesion strength
- Thick thickness D Increase contact resistance

T0=Thickness of Anisolm

t1=Gap

H=Electrode height

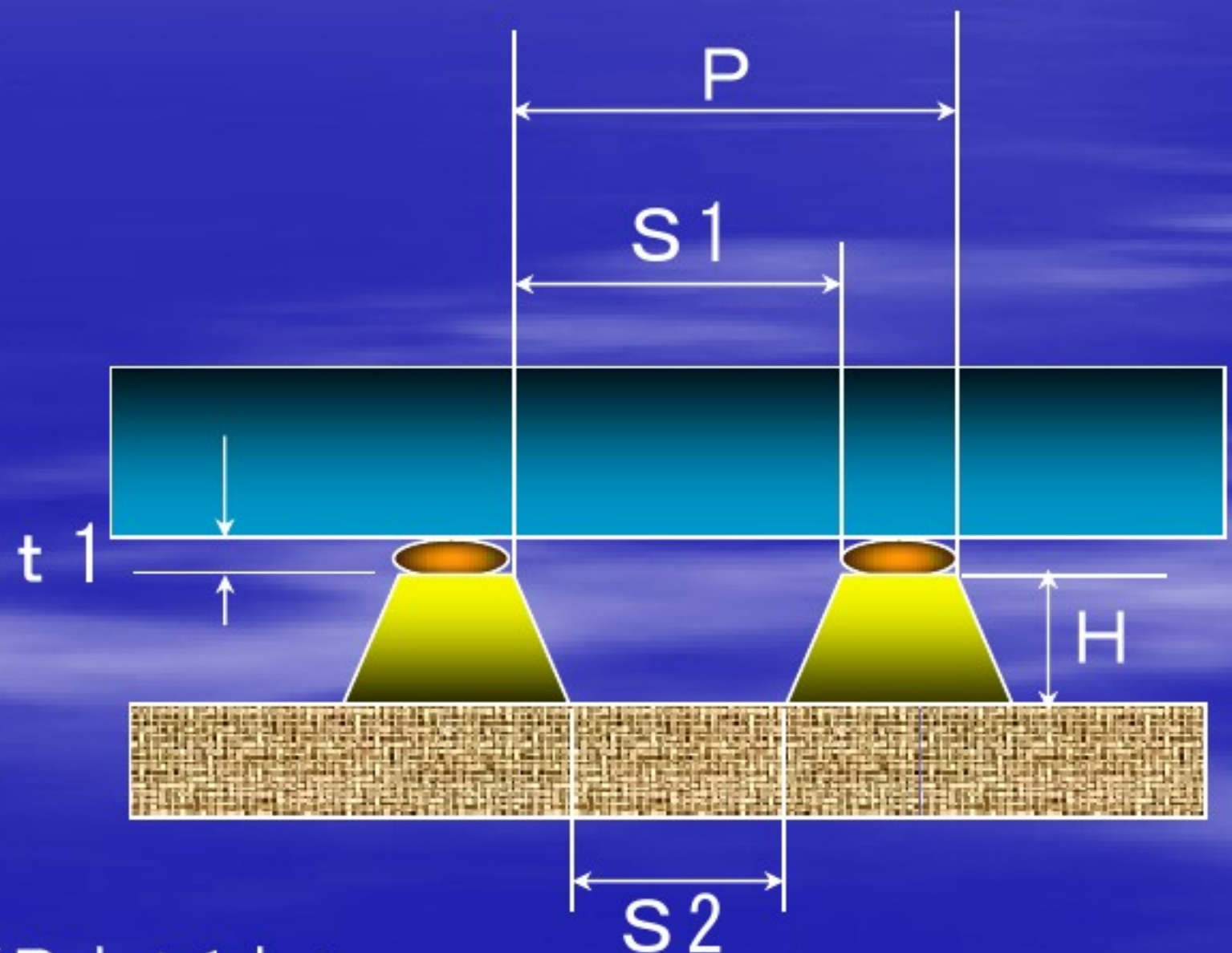
P=Pitch

S1=Space width(top)

S2=Space width(bottom)

α =Compensated value($0.25 \times H$)

$$T0 = (S1 + S2) / 2 \times H / P + t1 + \alpha$$



ACF厚度和被压接电路高度关系及外观

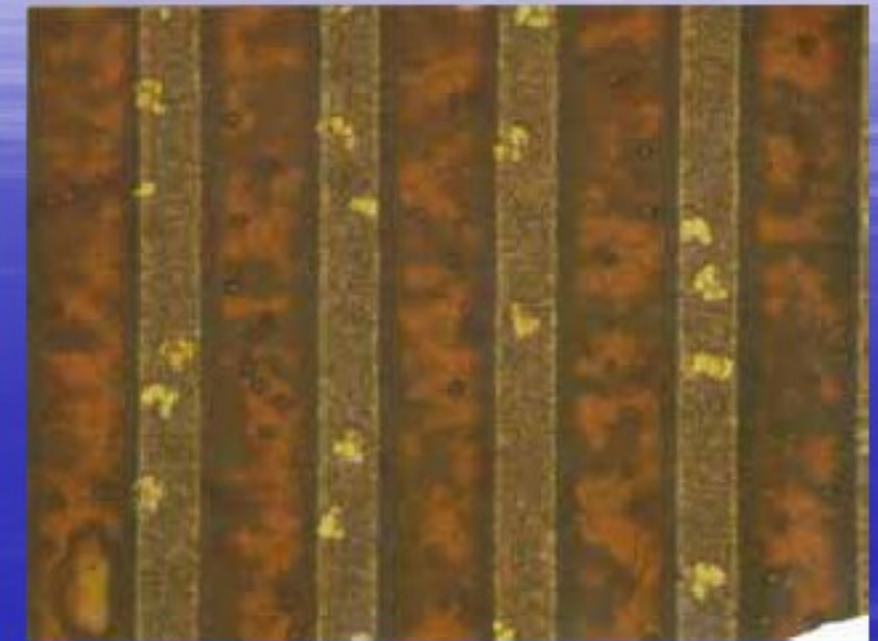
AC-7106U-25



P=0.1、Cu 18 μm



P=0.1、Cu 25 μm



P=0.1、Cu 35 μm

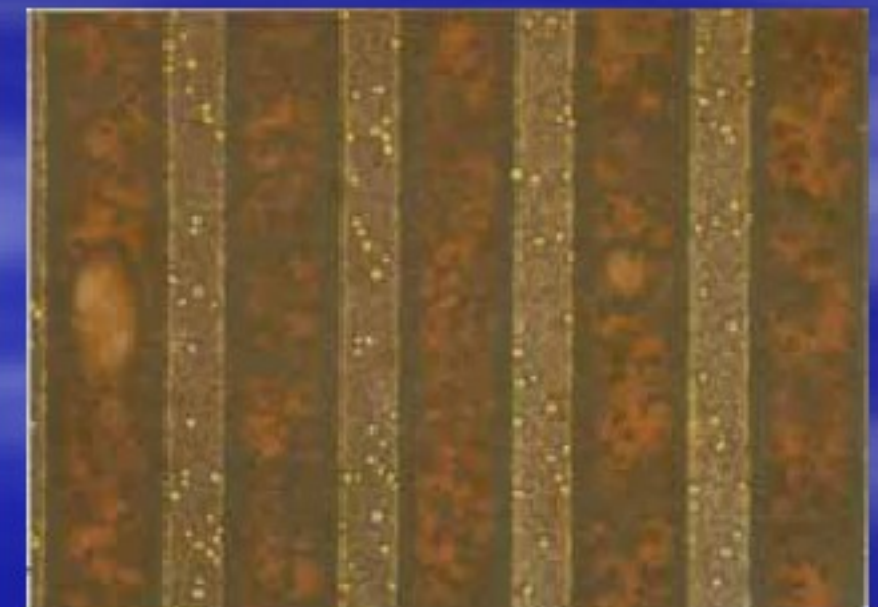
AC-7246LU-18



P=0.1、Cu 18 μm



P=0.1、Cu 25 μm

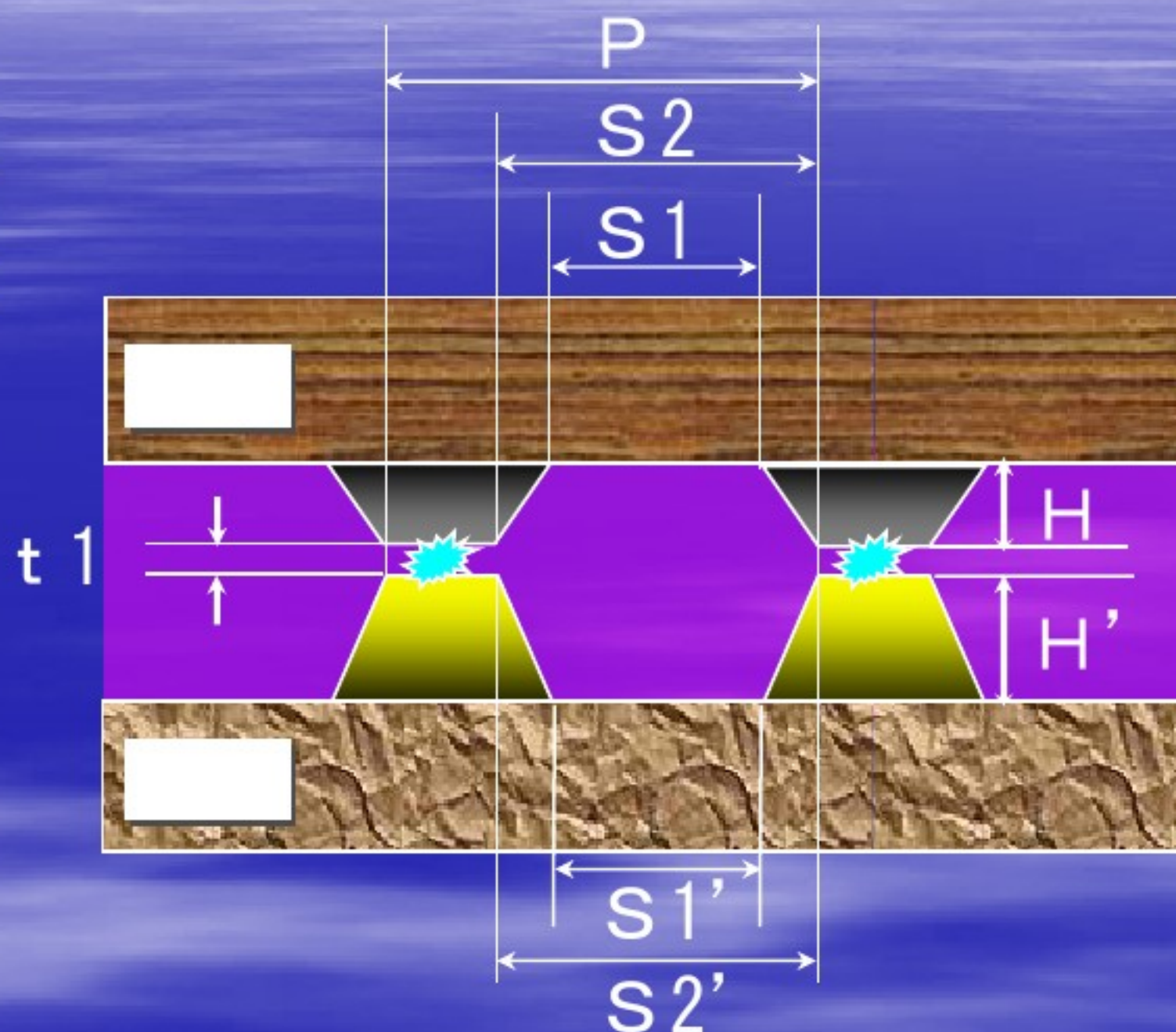


P=0.1、Cu 35 μm

Appropriate thickness of Anisolm for AC-9051AR

TCP/PWB joint

AC-9051AR-45

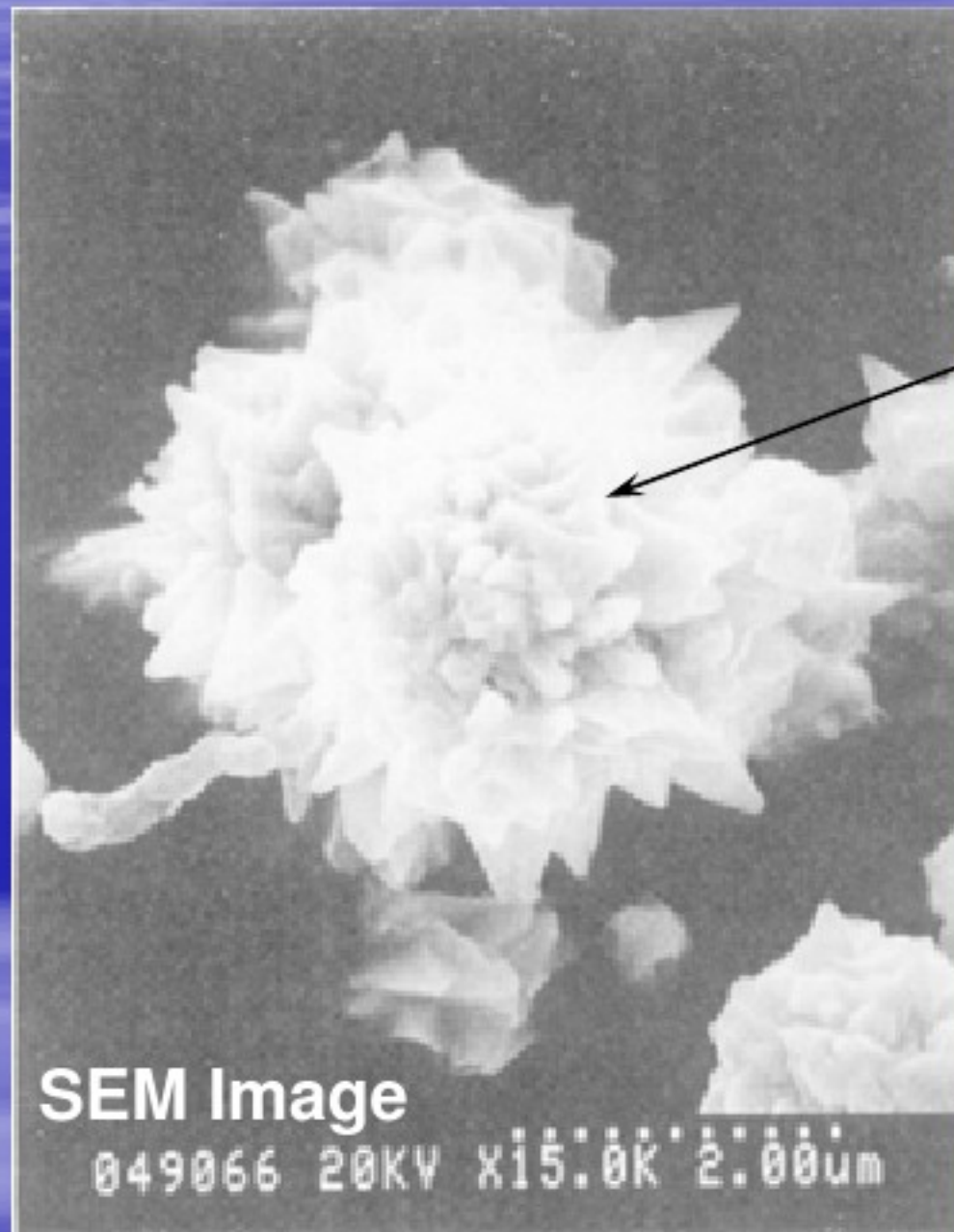


Calculation example

$$\text{Thickness of Anisolm}(T_o) = (S1+S2)/2 \times H/P + (S1'+S2')/2 \times H'/P + t_1 + \alpha$$

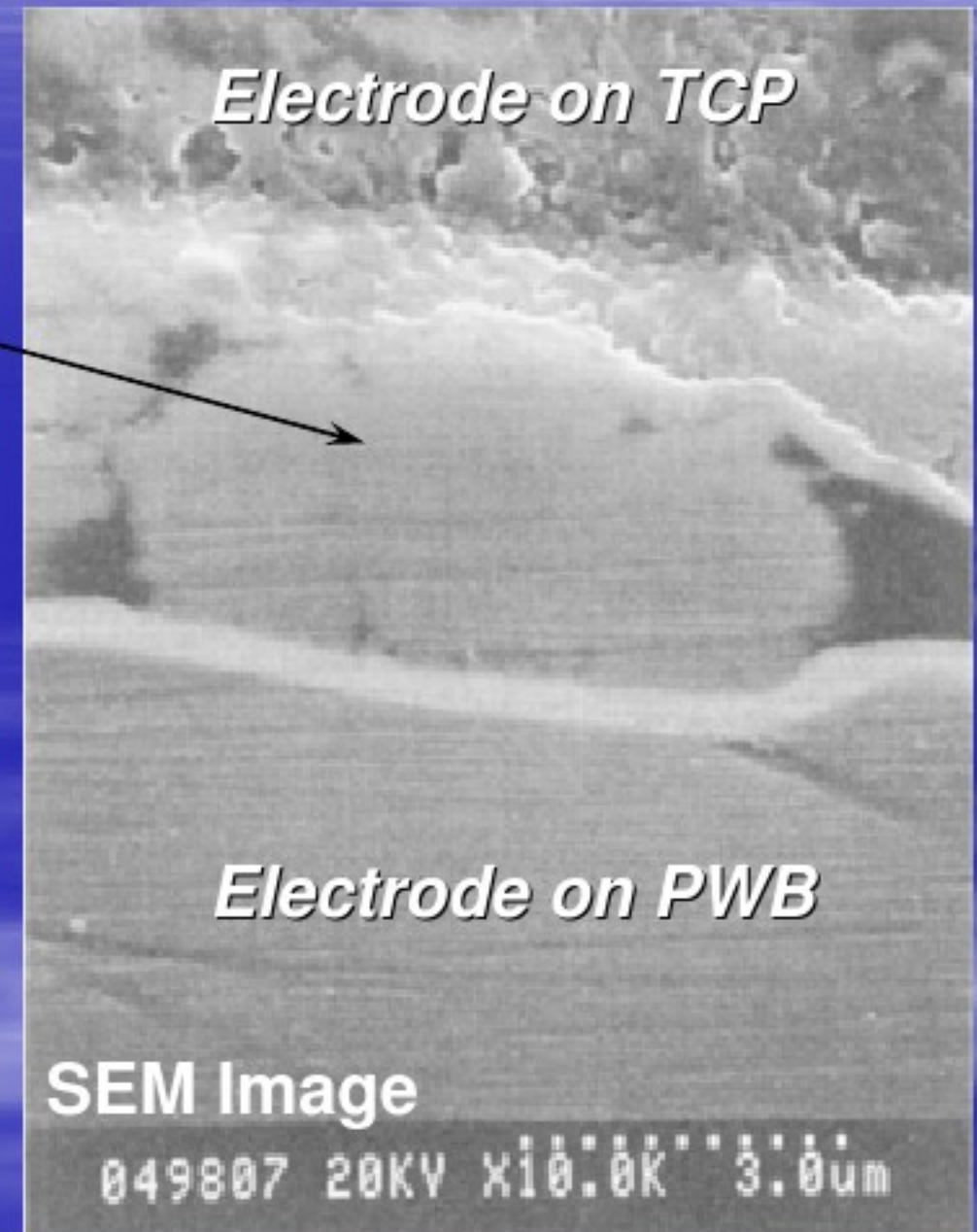
$$(200+250)/2 \times 18/400 + (200+250)/2 \times 40/400 + 2 + 0.255(18+40)/2 = \underline{42 \mu m}$$

*Conductive Particle in Interconnection between
PWB and TCP*



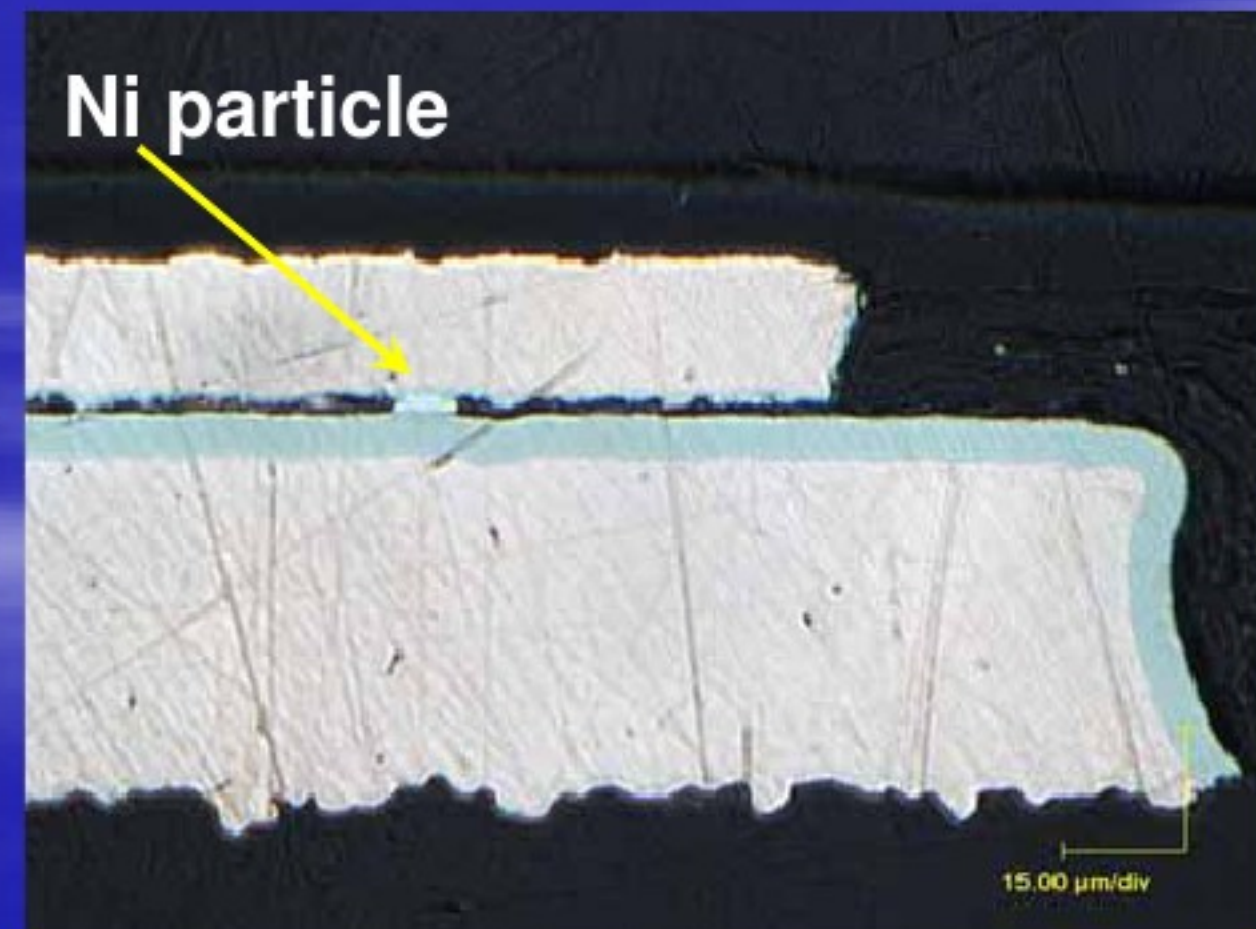
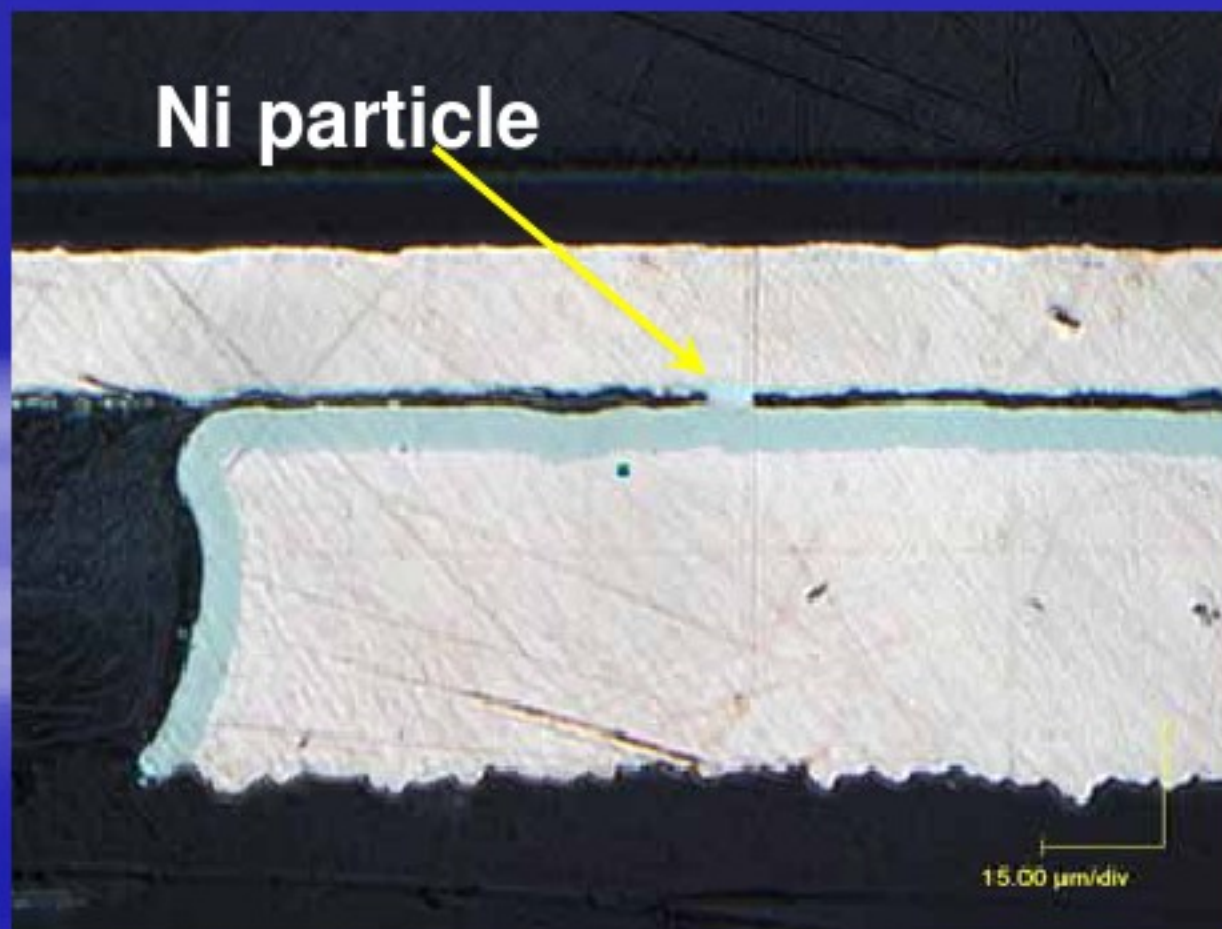
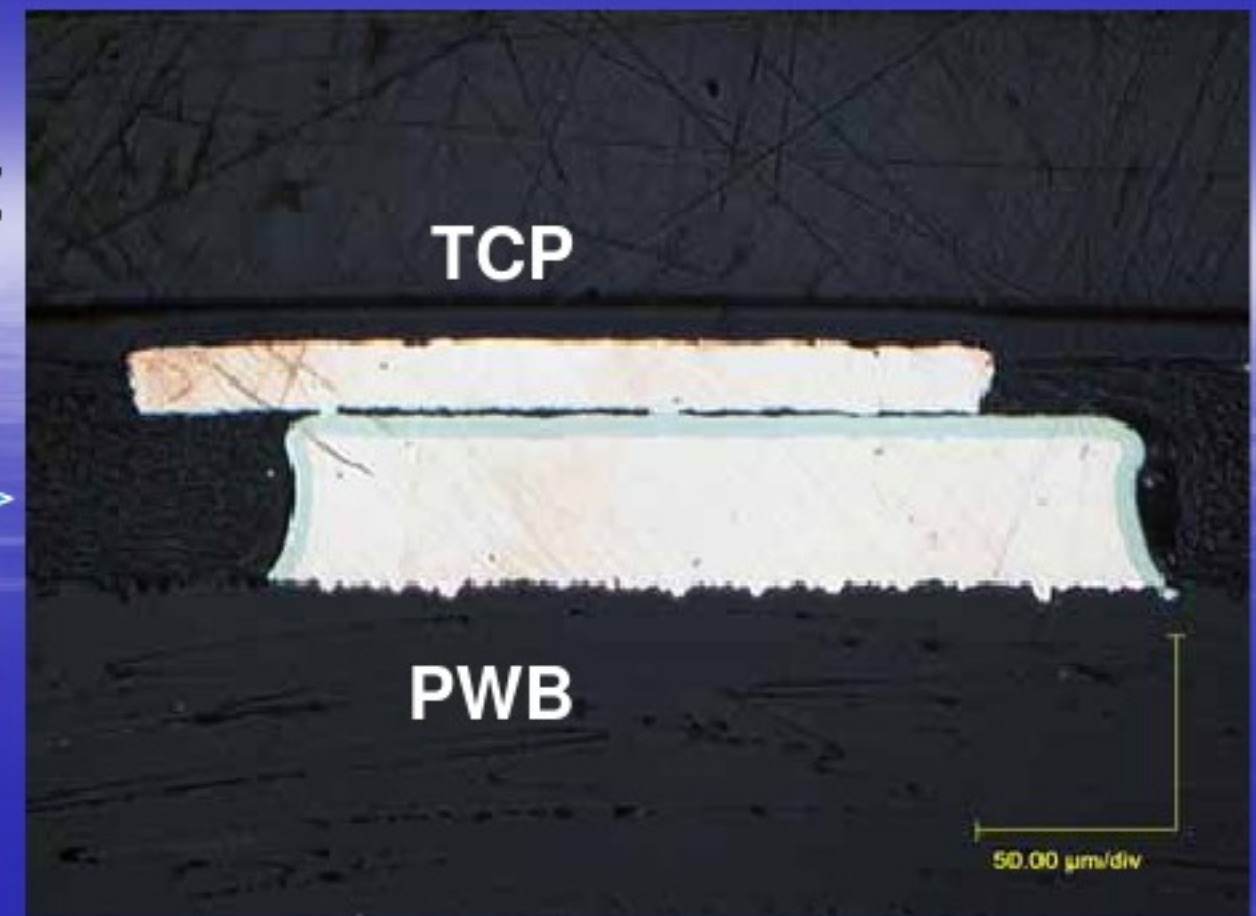
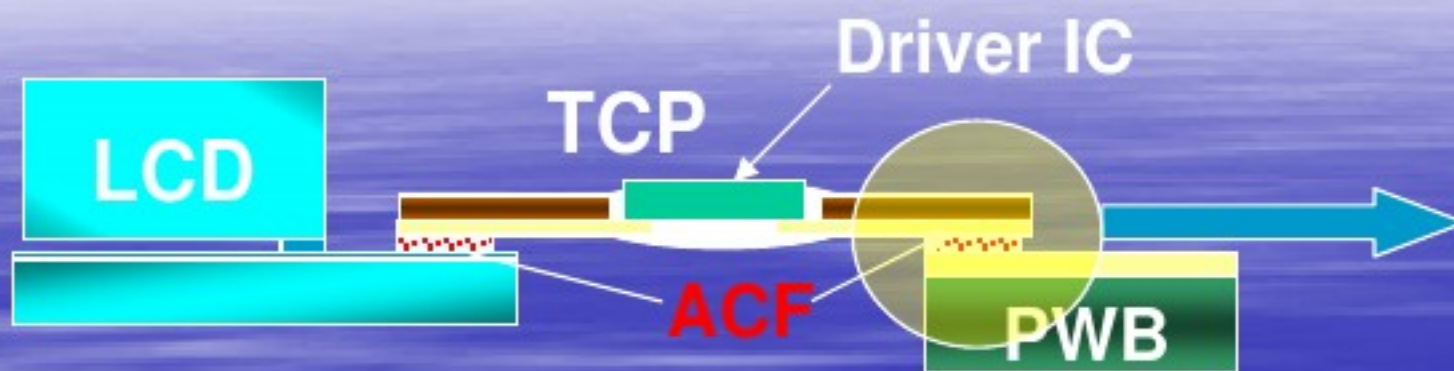
粒子単体

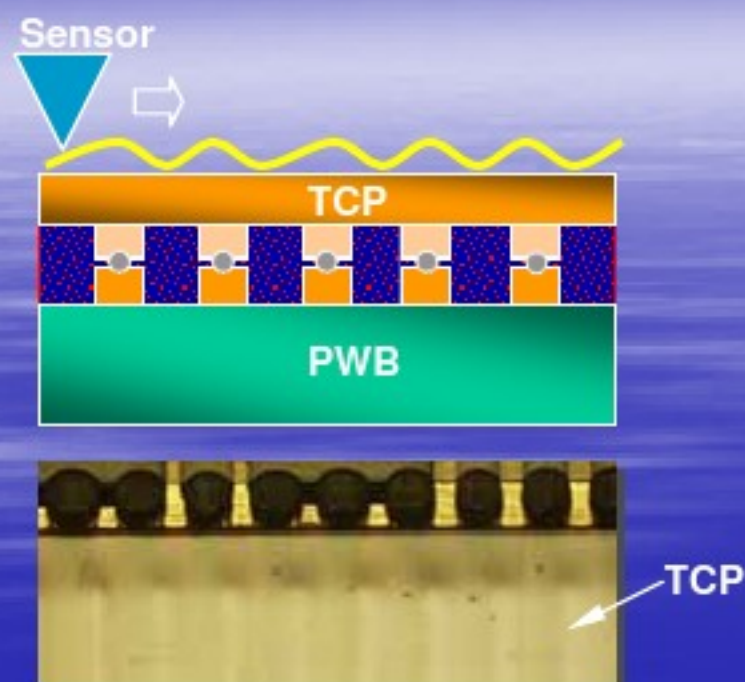
Ni Particle



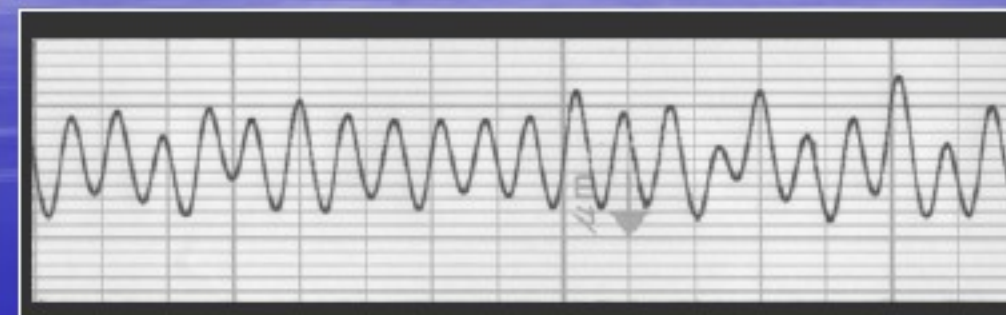
圧着後断面

Cross section of TCP/PWB joint

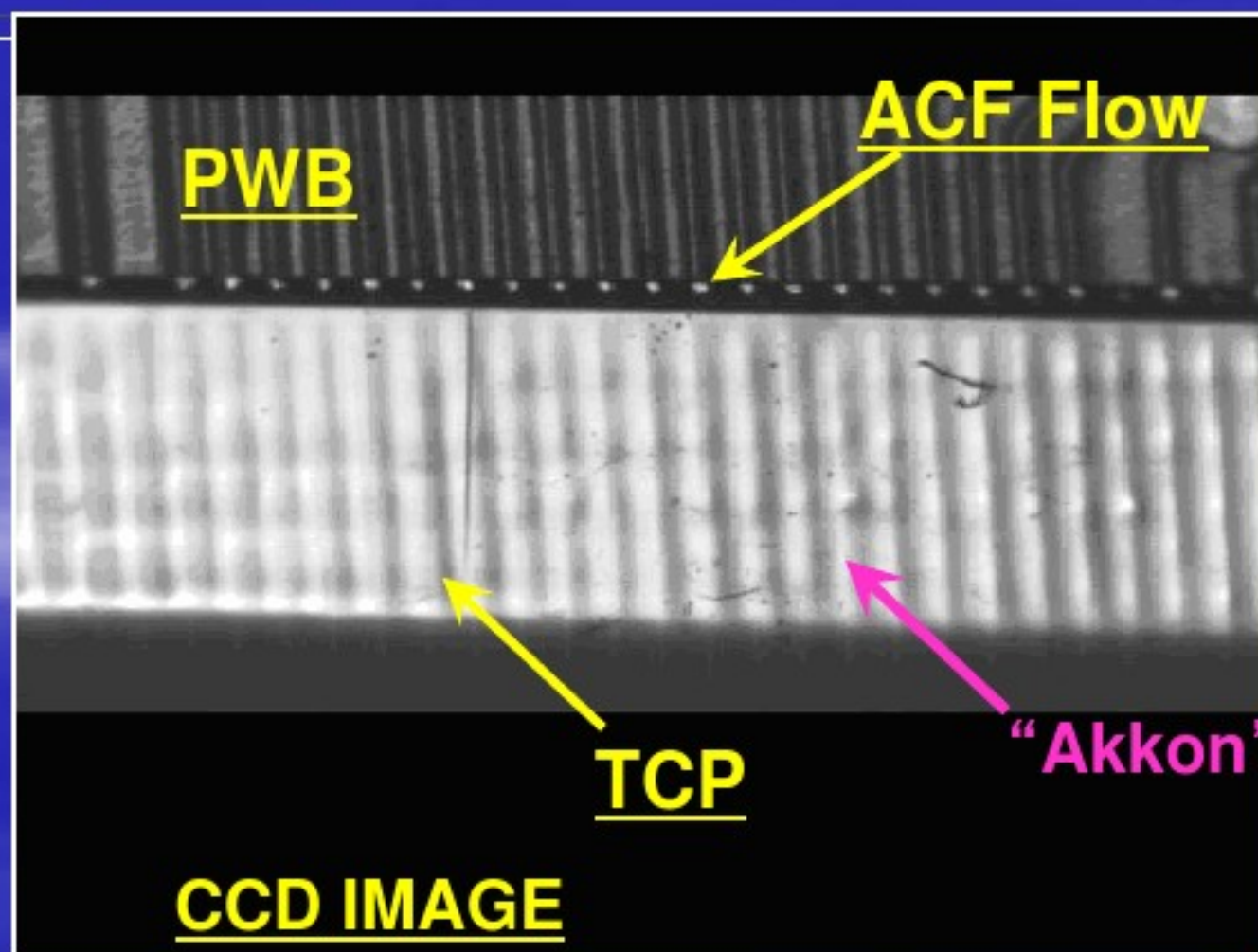




Measuring method of **AKKON**

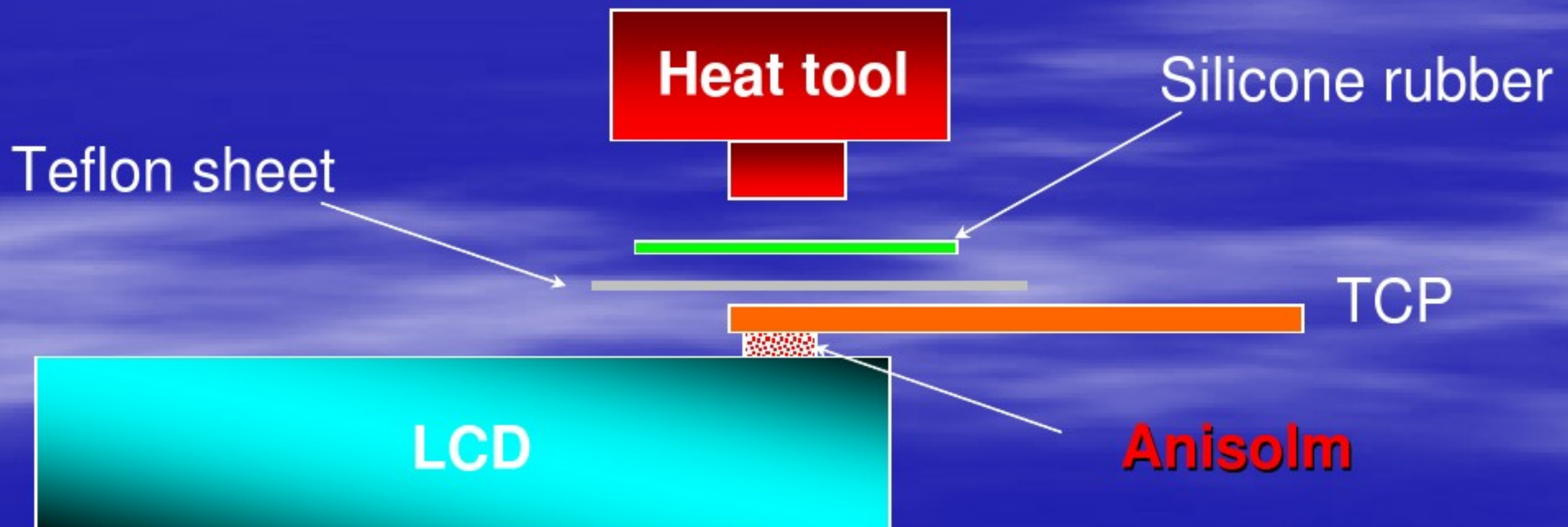


“Akkon” Chart



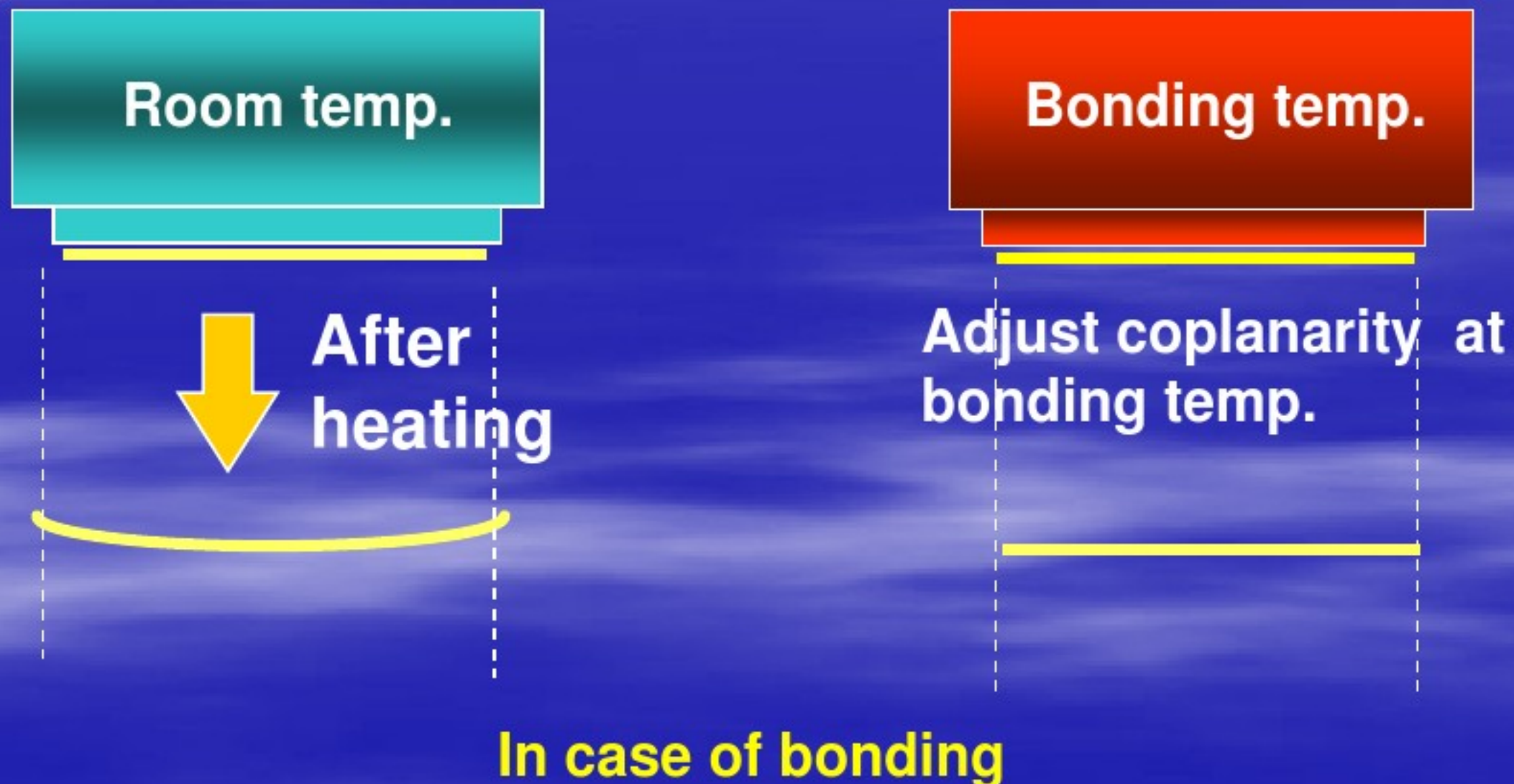
Heat tool

- Please adjust coplanarity of heat tool.
- Please use a cushion material(hardness:>70, thickness:about 0.2mm)



Adjustment of coplanarity of heat tool

- Please adjust coplanarity of heat tool at bonding temperature.

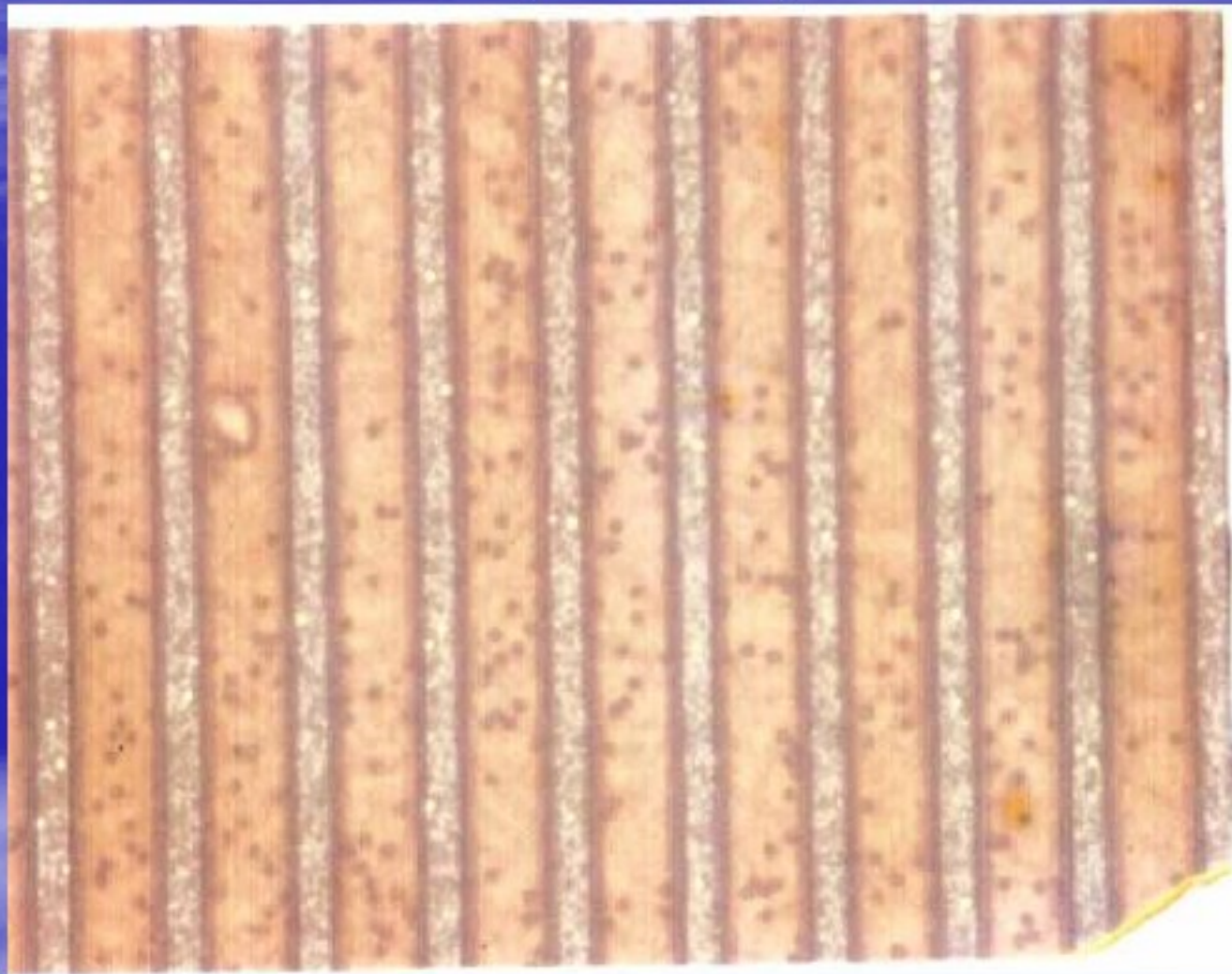


What are common failures of ACF joints?

- 1. Inappropriate bonding condition*
- 2. Contaminated bonding surface*
- 3. Pot life problem due to inappropriate storage condition*

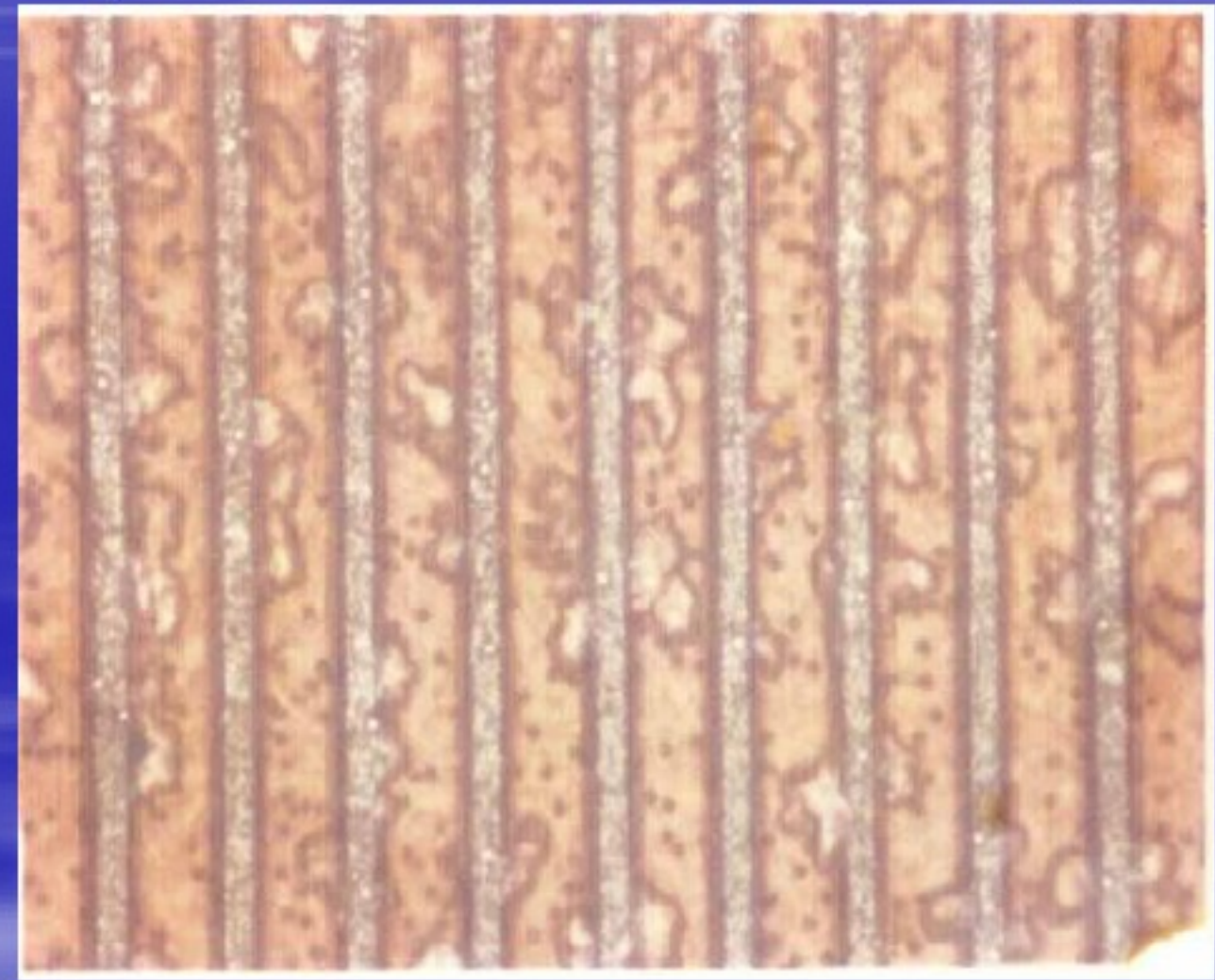
Bonding Appearance

OK



170 * -3MPa-20s(标准)

NG : 流动不足(Line上气泡多)

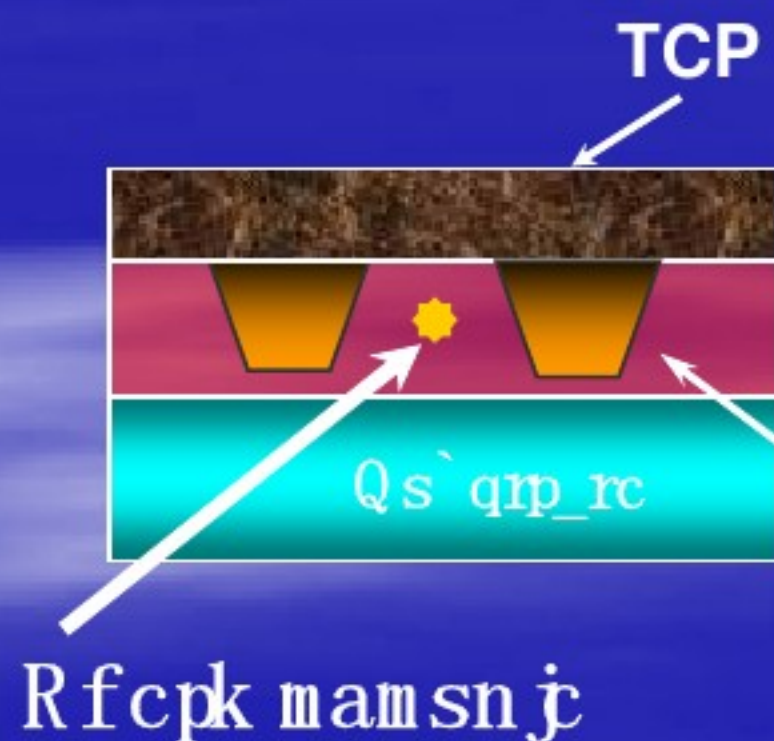


145 * -3MPa-20s(低温)

ACF : AC-7207LU-16

Measurement procedure of bonding temperature

- Please place thermocouple(<50micron in diameter) between circuits and measure bonding temperature.
- 90% of target bonding temperature should reach within 5s in case of 20s bonding.



/5. *

/31 *

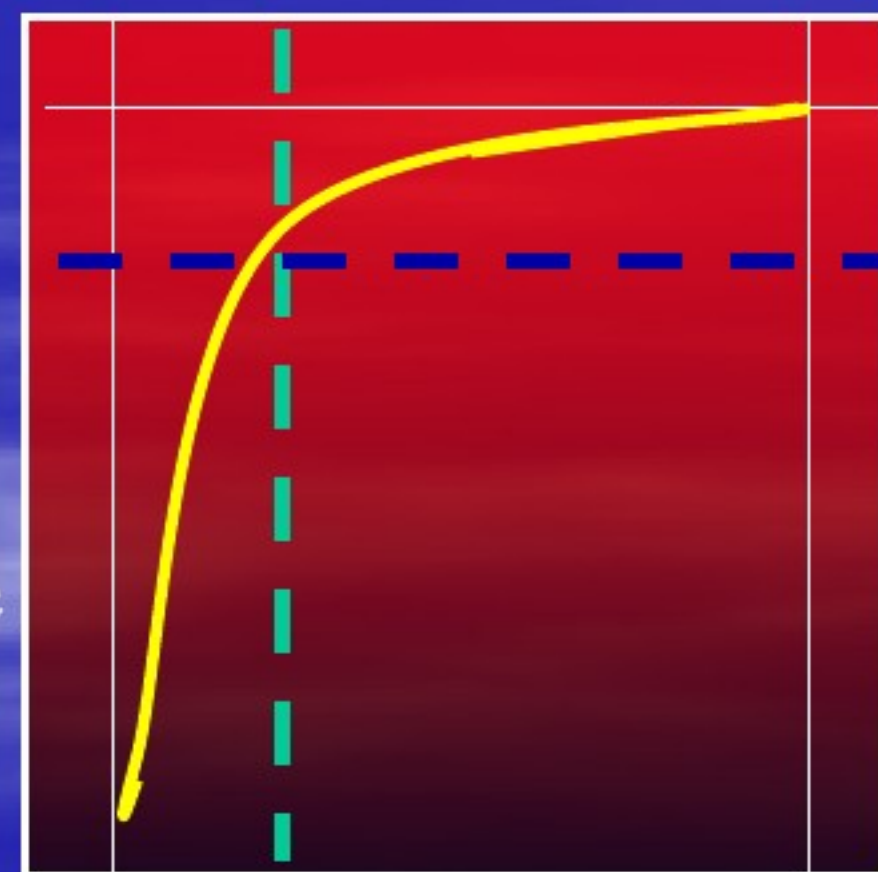
/5. □. ,7;/31

@mlbgle

rck ncp_rspc

&bcepcq A'

Anisolm



3 R g k c 0. X || ± 1

Low bonding pressure

树脂流动不足导致粒子形变不够。抵抗增大，信赖性变差。



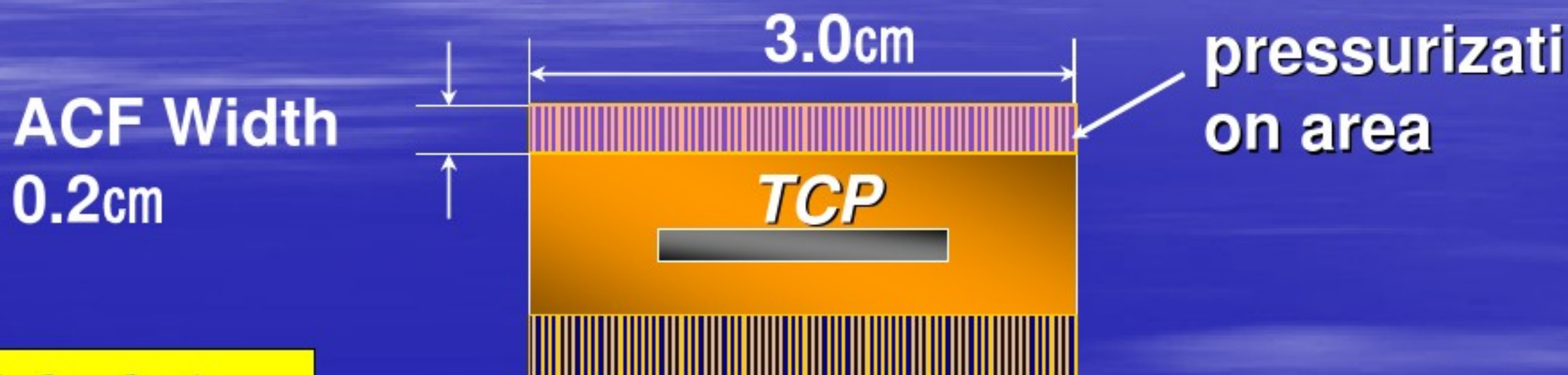
170 * -1MPa-20s(低压)



170 * -3MPa-20s(标准)

How is pressure set up?

Pressurization area is set up in the total area of the circuit pressurized by tool.



Calculation Example

In the case of target pressure 2MPa ($\sim 20\text{kgf/cm}^2$)

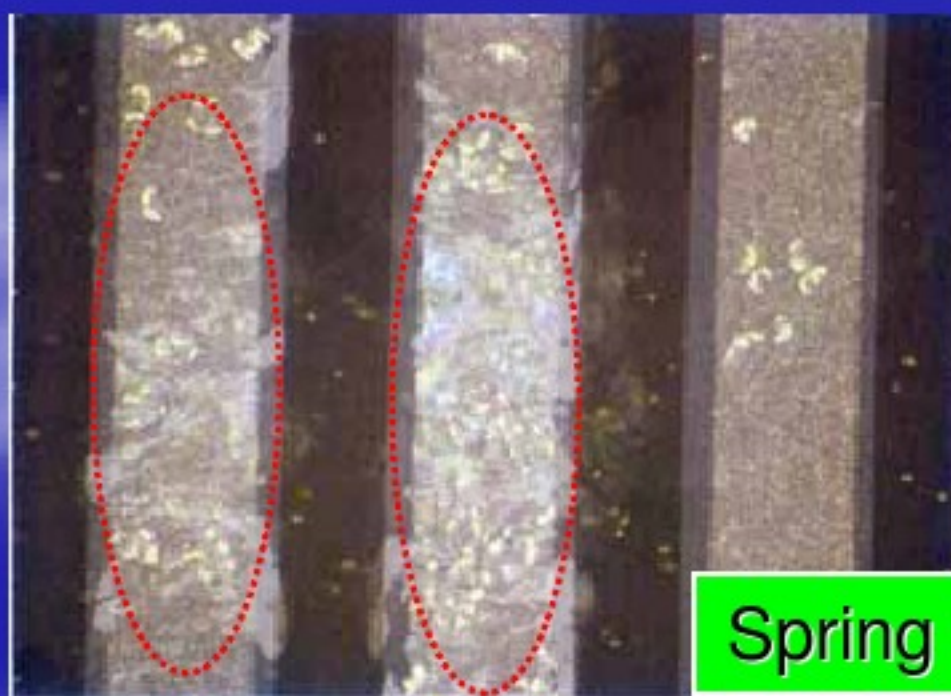
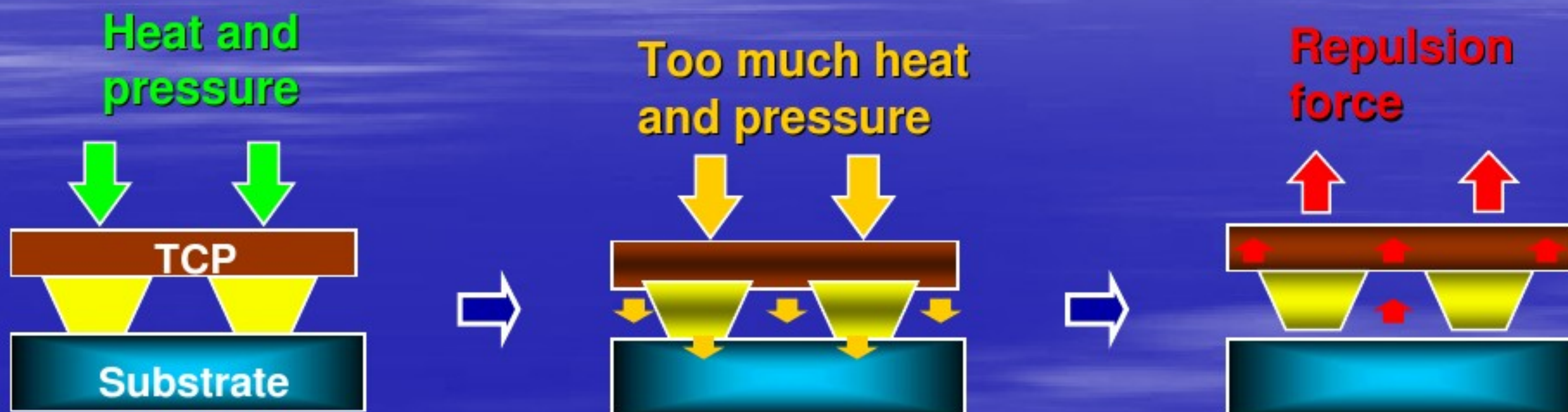
$0.2\text{cm} \times 3.0\text{cm} = 0.6\text{ cm}^2$ (pressurization area)

$0.6\text{cm} \times 20\text{Kgf/ cm}^2 = \mathbf{12\text{kgf}}$

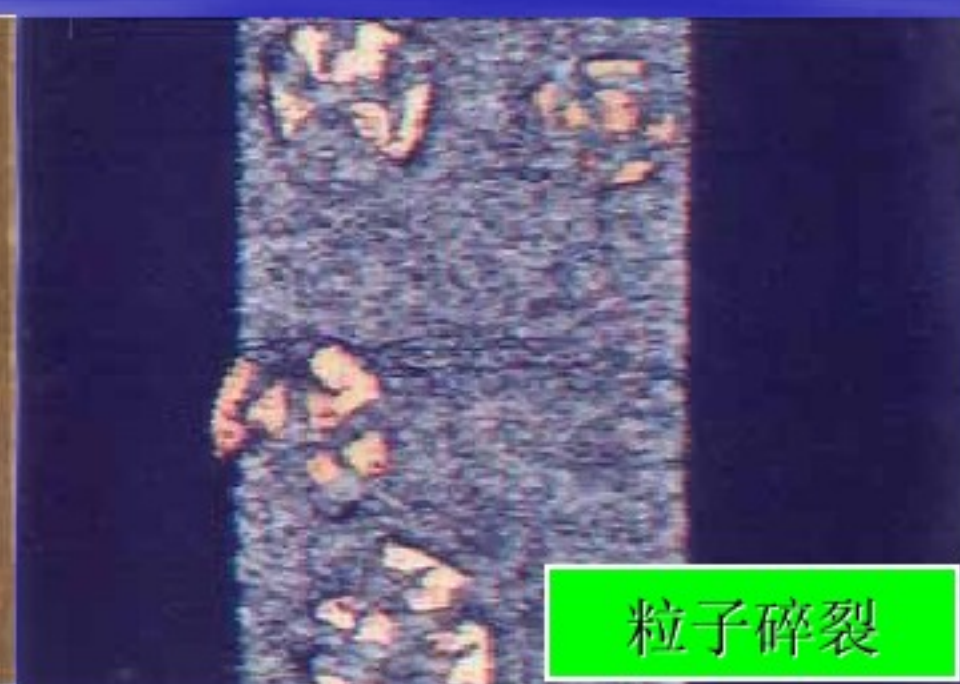
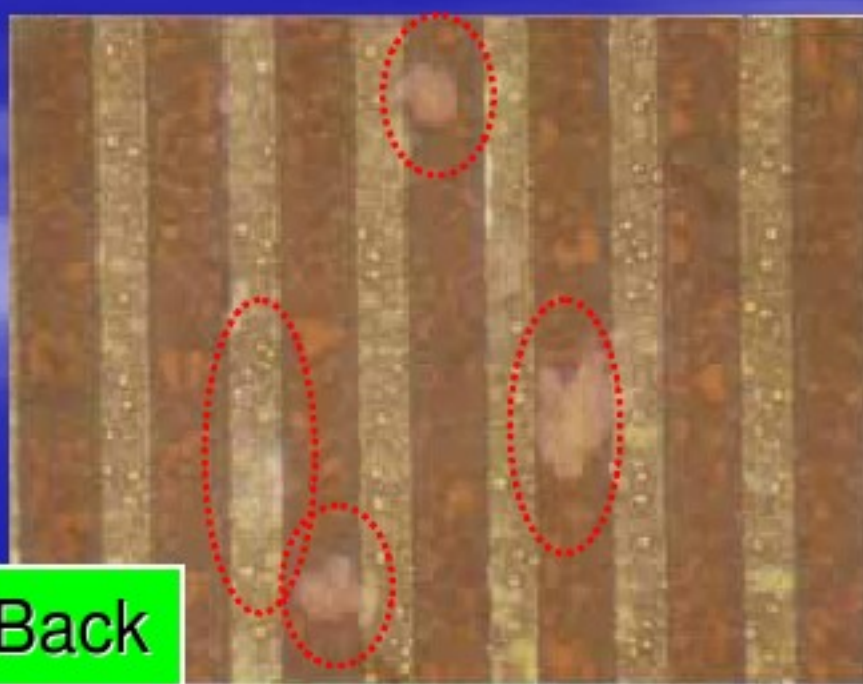
*A pressure device is set up so that the pressure of **12kgf** may be applied.*

High temp. and pressure

Spring Back现象发生导致De-lamination发生，并且导电粒子被完全压碎从而使压接信赖性变差。



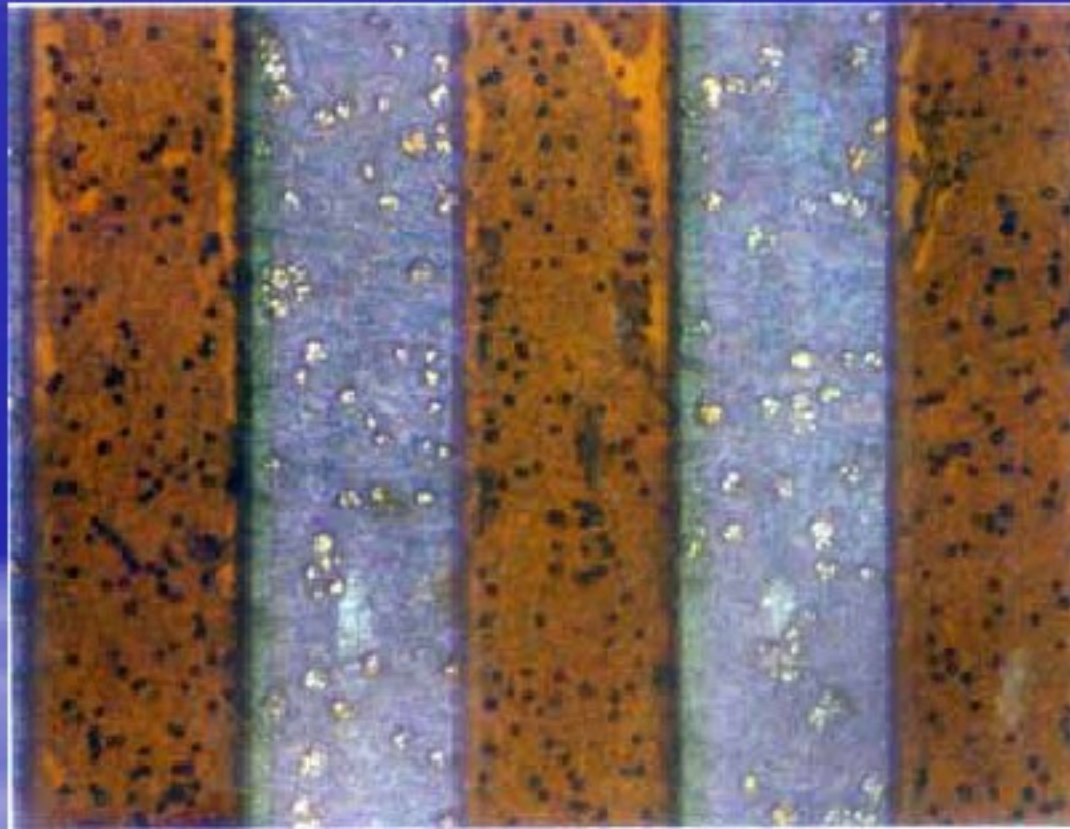
Spring Back



粒子碎裂

2. Contaminated bonding surface

被压着电路表面有污染物（油脂，有机硅等）存留，压着后**De-lamination**发生。



Storage procedure of Anisolm(2)

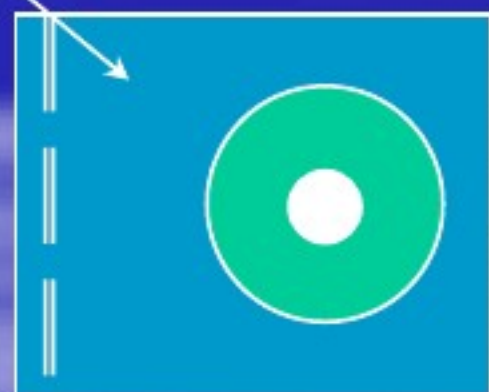
Storage term

Before opened : 7 (**6**)month after manufacturing(when stored at the temperature lower than 5 degrees C)

After opened : one month after manufacturing(when stored at <25 degrees C/<70%RH)

A product is term-of-validity six months in part (ex.AC-9051).

Sealed bag



Store at a refrigerator.

Can be stored for one month at room temperature.



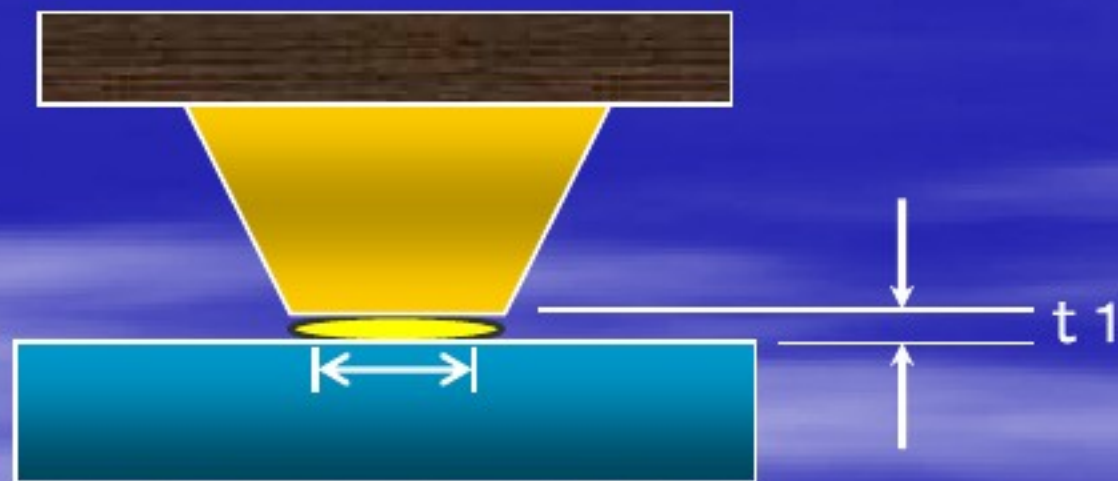
Anisolm



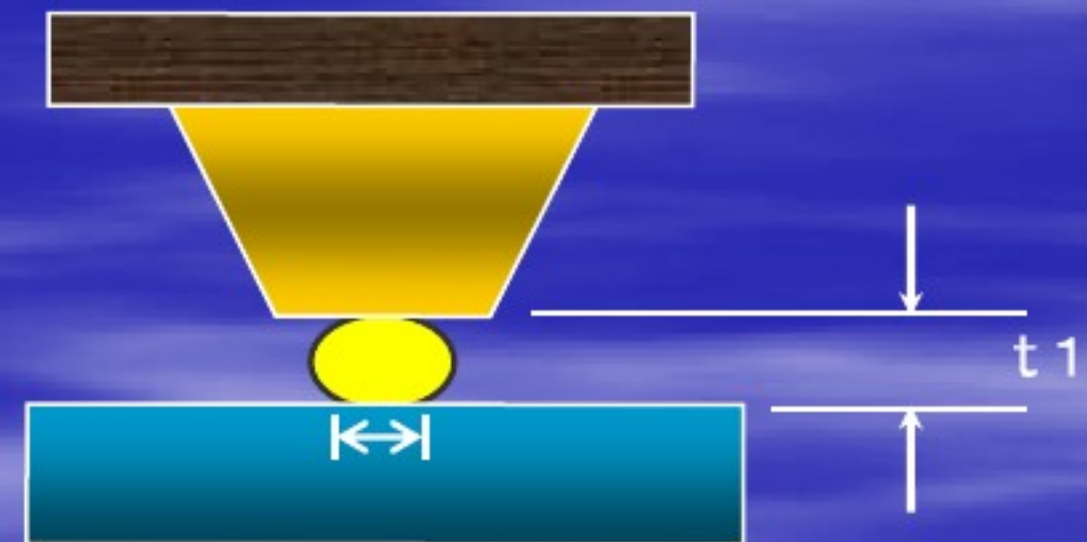
TCP

3. Pot life problem due to inappropriate storage condition

- *Deteriorates fluidity of Anisolm*
- *Can not squeeze out adhesive resin and deform conducting particles fully.*
- *Decreases adhesion strength.*



Normal state



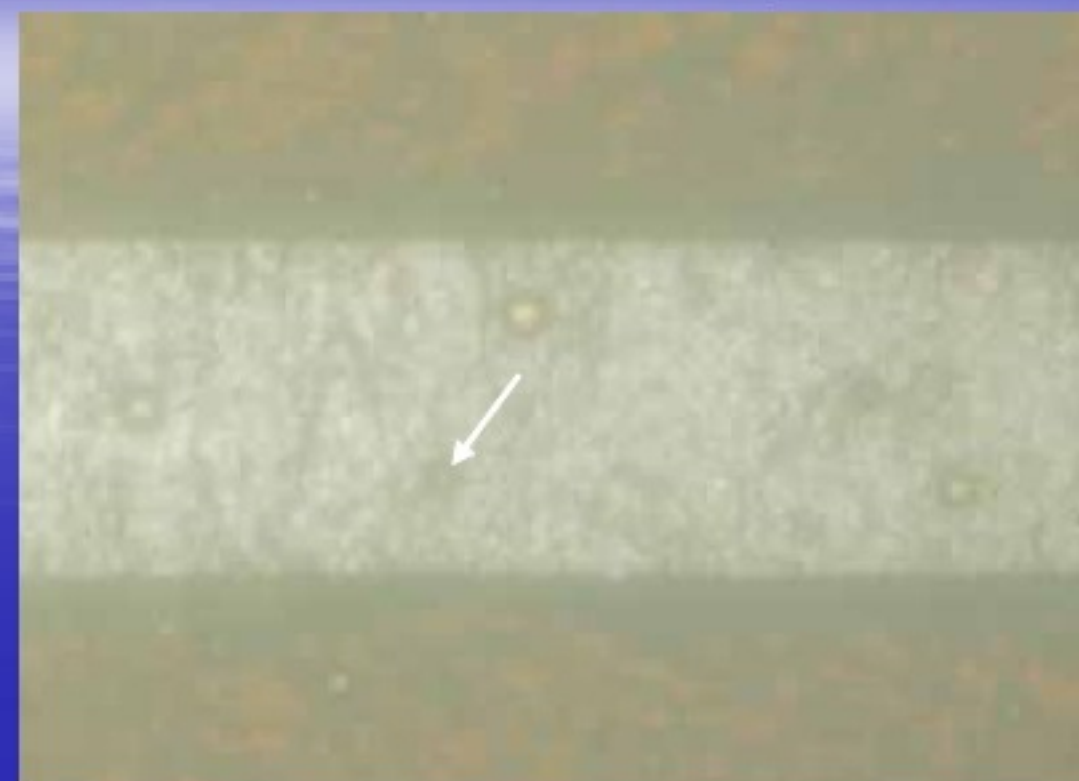
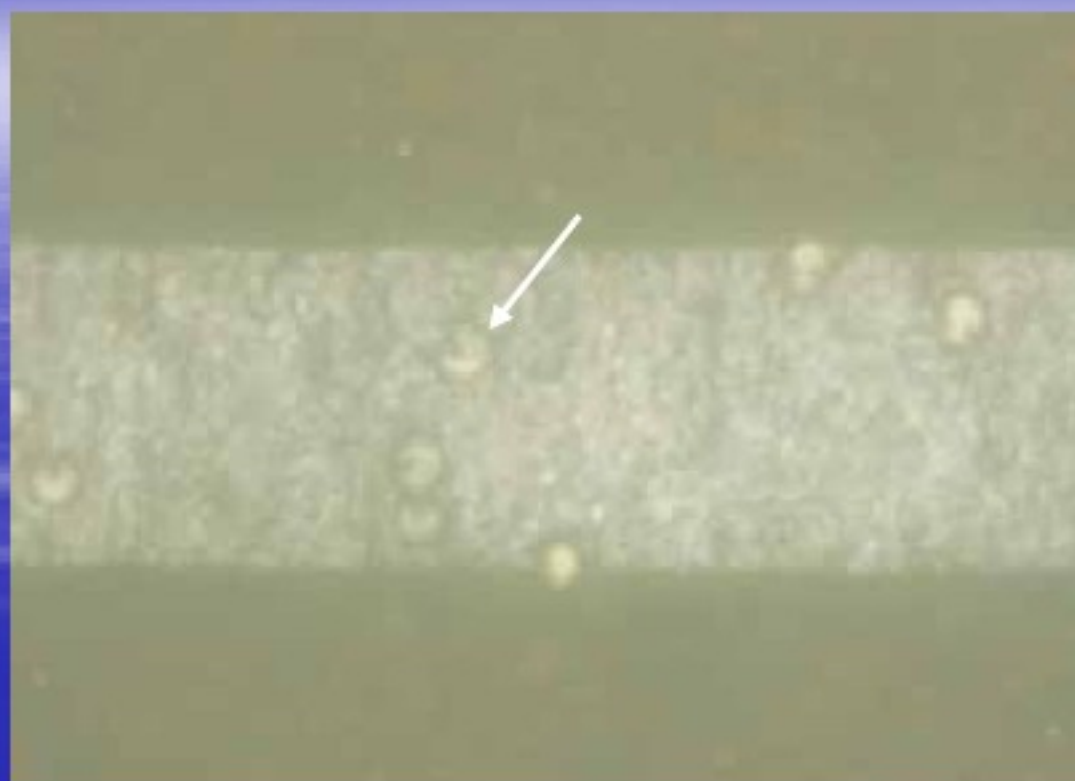
Gap(t_1) increases.

In the case of the shelf life failure

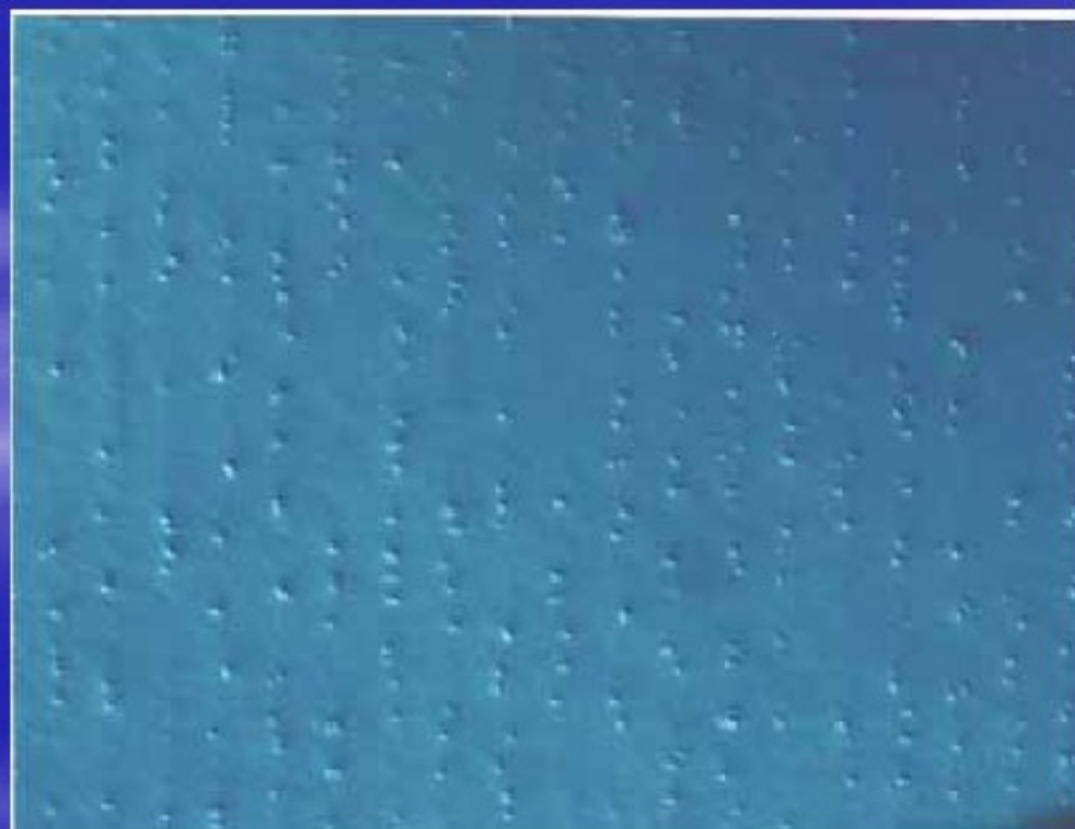
OK

Pot Life NG

*Particle
Deformation*



Akkon



ACF贴附不良原因分析（例）



*黄色部分表示影响度强。

ACF的接着力低下原因分析（例）



*黄色部分表示影响度强。

ACF压着后压痕低下主要原因分析（例）



*黄色部分表示影响度强。