



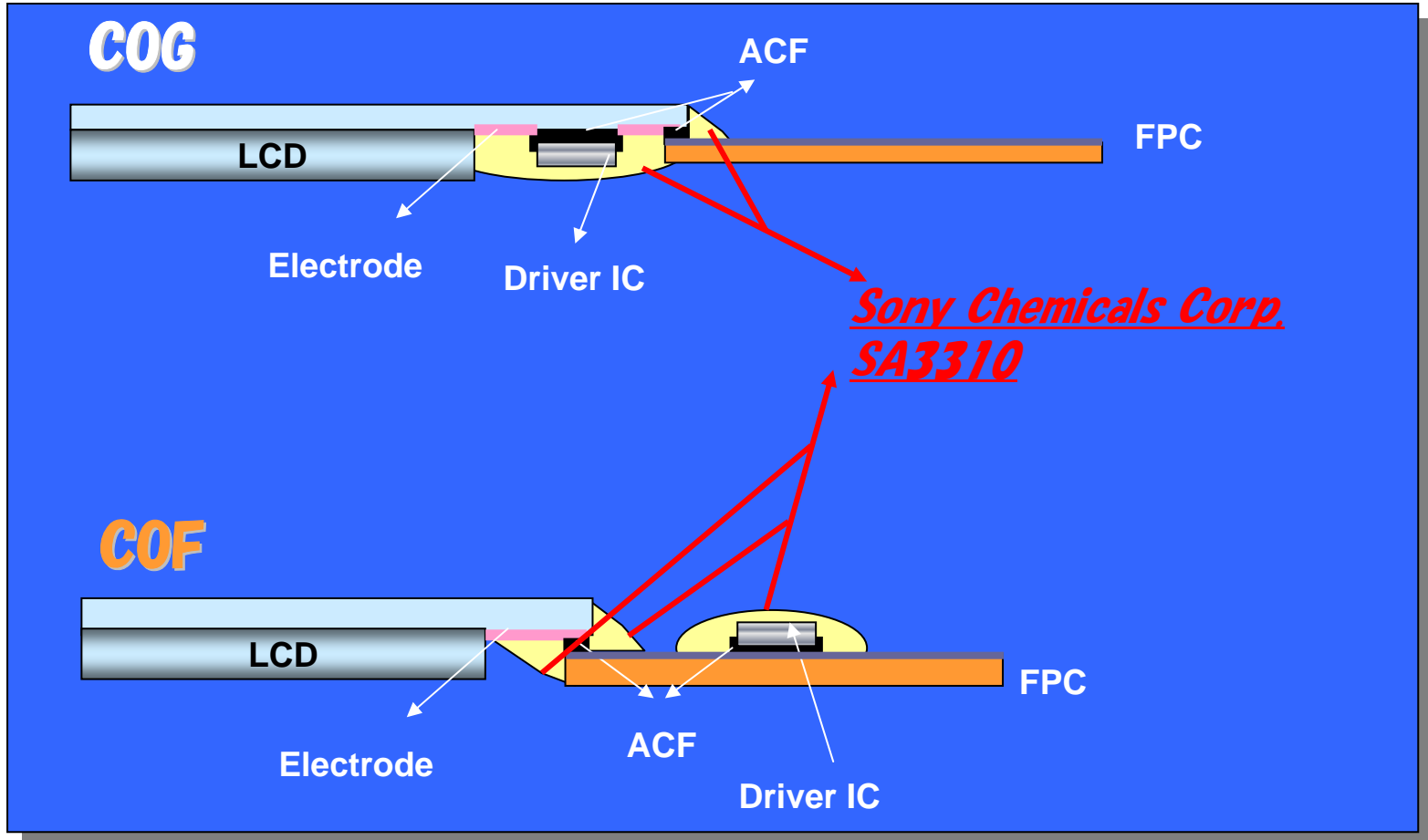
*We Always Add Value
with Chemical Enthusiastic
Sony Chemicals Corp.*

LCD用防濕coat
SA3310

Application of SA3310

UV-Curing Acrylic Resin: Conformal Coatings

SA3310 has high reliability as protection of Electrodes such as Al, Cr and ITO.



防濕coat材之用途

LCD Panel之pattern保護

- 1.物理性之保護：組裝過程中,防止異物進入.
→例)防止外界異物進入造成Pattern斷線.
- 2.防止pattern腐蝕或migration
→腐蝕與migration之發生,皆與水分,離子,及電壓有關.

開發理念1.

低吸水性・透濕性・高純度・低離子

	SA3310	Competitor UV	Silicon type	Solvent type	Remark
Water absorption (%)	0.7	1.1	0.2	6.6	Boil 2H After 70°C,12H
Water Vapor Transmission Ratio (g/m ² ·24h)	29	50	2419.11	336.41	Cup method 60°Cx90%RT
Anode ion (ppm)Na	0.1	0.77	0.9	2.0	extraction pure water 100°C × 10H Ion chromatography N.D.=Not Detected L.B.=Lower than Blank value.
Cathode ion (ppm) Cl	0.8	3.58	2.0	2.0	

開發理念2.

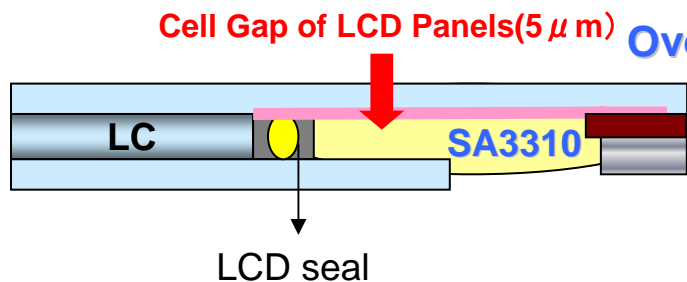
低黏度(對Cell Gap之滲透性)



SA3310
(viscosity:1400mPa·s)



Good Penetration into 5 μ m
Cell Gap of LCD Panels



viscosity:
Over 3000mPa·s

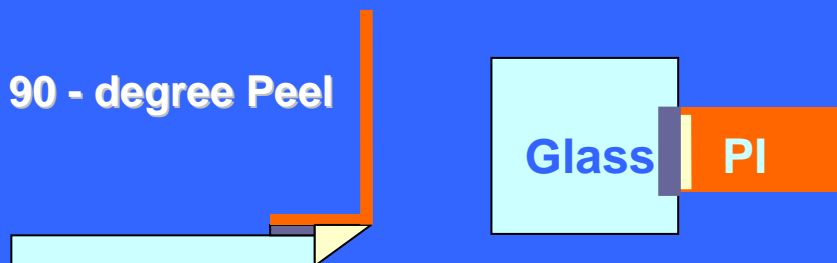


Insufficient penetration

開發理念3.

接著強度(LCD panel : glass與FPC)

Glass – FPC Peel strength



Test condition

- * 90 degree Peel strength
- * Test specimen width : 12mm
- * Peel speed : 20mm /min

	SA3310	Competitor UV	Silicon type	Solvent type
Peel strength Average (n=5)	28.1N FPC-AF	11.1N FPC-AF	0.6N FPC-AF	0.8N FPC-AF

Properties: No.SA3310

Item	SA3310 <i>(Faster-curable type)</i>	Remarks	
Cure type (resin)	Radical type (Acrylic)	UV cure	
Appearance	Light yellowish transparent liquid	Visual check	
Cure conditions	<u>a. 3000mJ/cm²</u> <u>b. 1500mJ/cm²</u>	a. UV spot type b. UV conveyer type	
Viscosity	<u>1400mPa·s</u>	Rheometer	
Hardness	<u>A70</u>	Type A	
Shrinkage by cure	4.1%	Density meter	
Liquid density	1.00		
Tg(α 1/α 2)	-18°C(6.6×10⁻⁵/1.3×10⁻⁴)	TMA method	
Water Vapor Transmission Ratio	<u>29 g/m²·24h</u>	Cup method 60°C×90%RT	
Water absorption	<u>0.7%</u>	Boil×2H	
Ion Impurities	Cl ⁻	<u>0.8ppm</u>	Ion chromatography
	Na ⁺	<u>0.1ppm</u>	

照射條件與反應率data 1.

a. UV conveyer type (SCC)

Cure Conditions :

UV conveyer : UVC-2533/1MNI C6-LR01
(Lamp: Metal Halide Lamp, Condensing type Conveyer, USHIO)

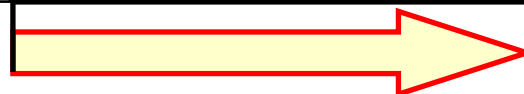
UV accumulated-light-amount meter: UNI METER UIT-102 (USHIO)

UV power: 120W/cm²

Work piece passing height: 10cm

UV accumulated-light-amount (1 pass; 300mJ/cm²):
600(2 pass), 900(3 pass), 1200(4 pass), 1500(5 pass), 1800(6 pass) and 2100(7 pass) mJ/cm²

pass(1pass:300mJ/cm ²)	2	3	4	5	6	7
UV accumulated-light-amount (mJ/cm ²)	600mJ	900mJ	1200mJ	<u>1500mJ</u>	<u>1800mJ</u>	<u>2100mJ</u>
Reaction Ratio(%)	34	58	87	<u>92</u>	<u>95</u>	<u>96</u>



Over 90% (SCC recommend)

照射條件與反應率 *data2*

b. UV spot type (SCC)

Cure Conditions:

UV spot : L8333 (Lamp: Mercury-Xenon Lamp, HAMAMATSU)

UV power meter: C6080 (HAMAMATSU)

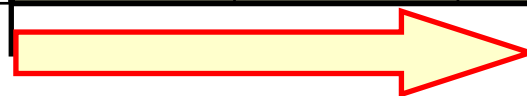
UV power: 500mW/cm²

Distance : 2cm

UV accumulated-light-amount (sec):

1500(3s), 2000(4s), 2500(5s), 3000(6s), 3500(7s), 4000(8s) mJ/cm²

second	3s	4s	5s	<u>6s</u>	<u>7s</u>	<u>8s</u>
UV accumulated-light-amount (mJ/cm ²)	1500mJ	2000mJ	2500mJ	<u>3000mJ</u>	<u>3500mJ</u>	<u>4000mJ</u>
Reaction Ratio(%)	56	78	89	<u>94</u>	<u>96</u>	<u>96</u>



Over 90% (SCC recommend)

Migration Test Data

Test Conditions

Al Electrode

• Test Samples

- 1) SA3310 (SCC) 2) Competitor UV
- 3) Competitor Silicon type 4) Competitor Solvent type

• Cure Conditions (UV-cure type)

UV Type: Condensing type Conveyer
(UVC-2533/1MNI C6-LR01; USHIO)

Lamp: Metal Halide Lamp UV Power: 120W/cm²

UV accumulated-light-amount: 500mJ/cm² x 3pass

(Work piece passing height: 10cm)

UV accumulated-light-amount meter

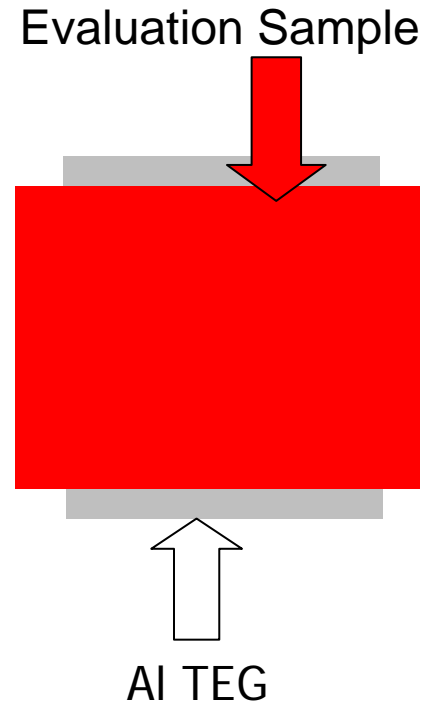
: UNI METER UIT-102 (USHIO)

• Thickness of Evaluation samples: 0.5 mm

• TEG: Al Comb tooth TEG of SCC evaluation test
(L/S=25/10)

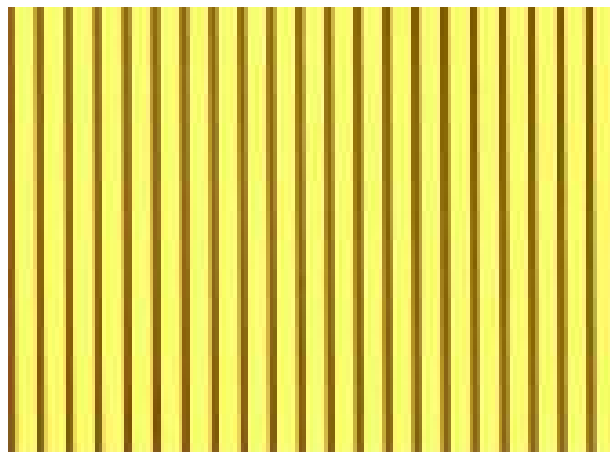
• Dew test conditions : 85°C/85%RH

• Voltage : 30V

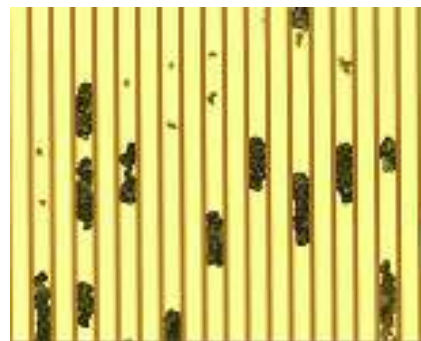


The Micrograph of Al TEG *after Migration Tests*

SA3310

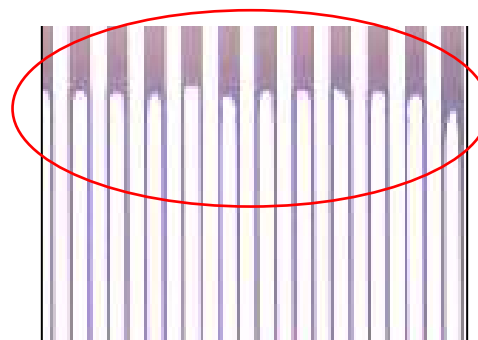


No Corrosion and Ion Migration
About 1000H



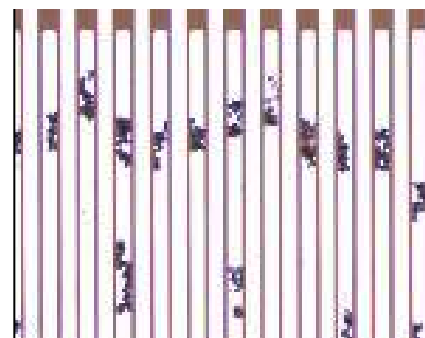
Competitor UV

Verified the Corrosion
at 200H



Competitor
Silicon type

Verified the Corrosion
at 150H



Competitor
Solvent type

Verified the Corrosion
at 150H

硬化條件與migration之關係

實施反應率約50% 與反應率約100% 之腐蝕實驗。

Cure Conditions:

UV conveyer :

UVC-2533/1MNI C6-LR01

(Lamp: Metal Halide Lamp, Condensing type Conveyer, USHIO)

UV accumulated-light-amount meter:

UNI METER UIT-102 (USHIO)

UV power:

120W/cm²

Work piece passing height:

10cm

UV accumulated-light-amount (1 pass; 300mJ/cm²):

900(3 pass)→反應率約50%type

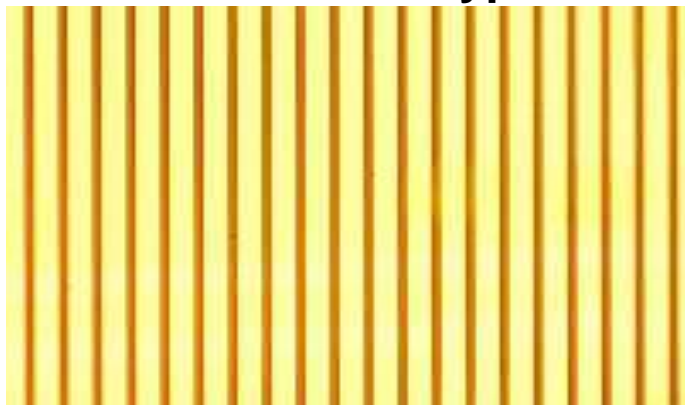
1500(5 pass)→反應率約100%type

Dew test conditions : 85°C/85%RH

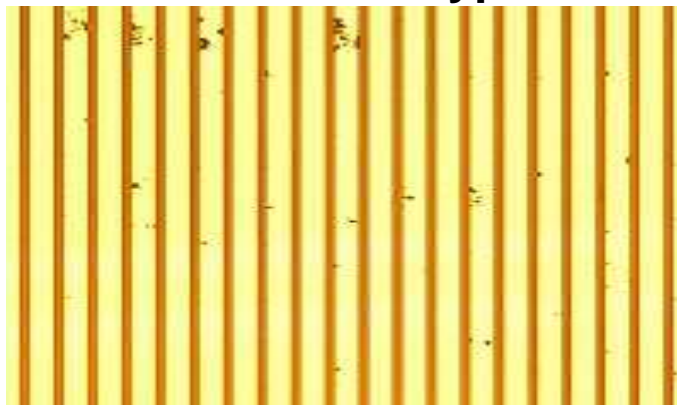
Voltage : 30V

The Micrograph of Al aspect after Migration Tests

About 100% cure type



About 50% cure type



About 50% cure type: No Corrosion at 750H
: Generated Corrosion at 850H

SA3310W使用注意事項

< 1. 關於sample之使用 >

○本產品係以UV光照射後,短時間硬化之防濕性材料。因此,使用上須注意下列各點

<開封前>

- 保存時,請置於日光燈照度130lx以下、30°C80%RH之陰暗環境下保存。
- 務必嚴守於保存期間內使用。→保存期間為製造後6個月

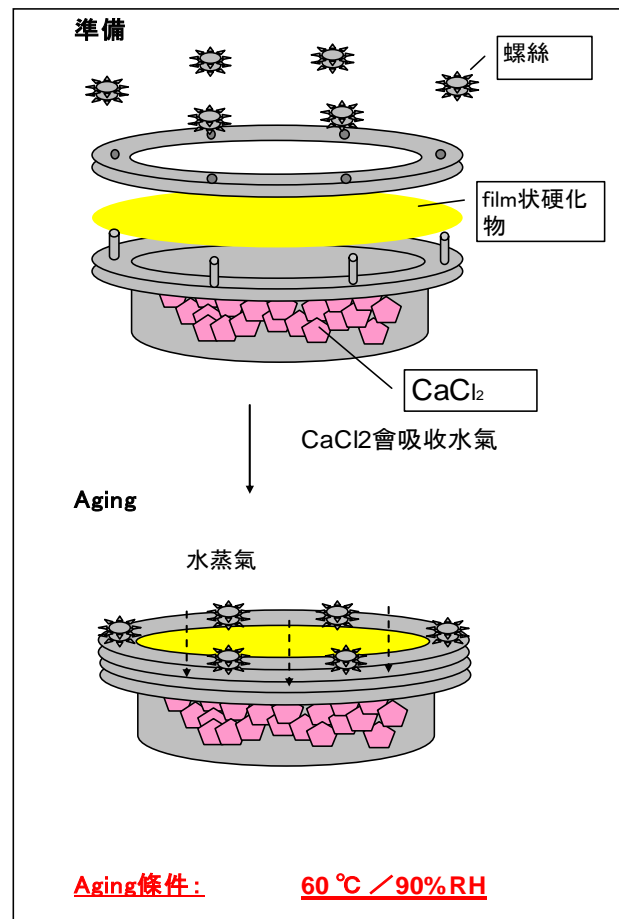
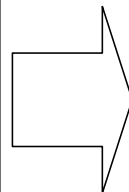
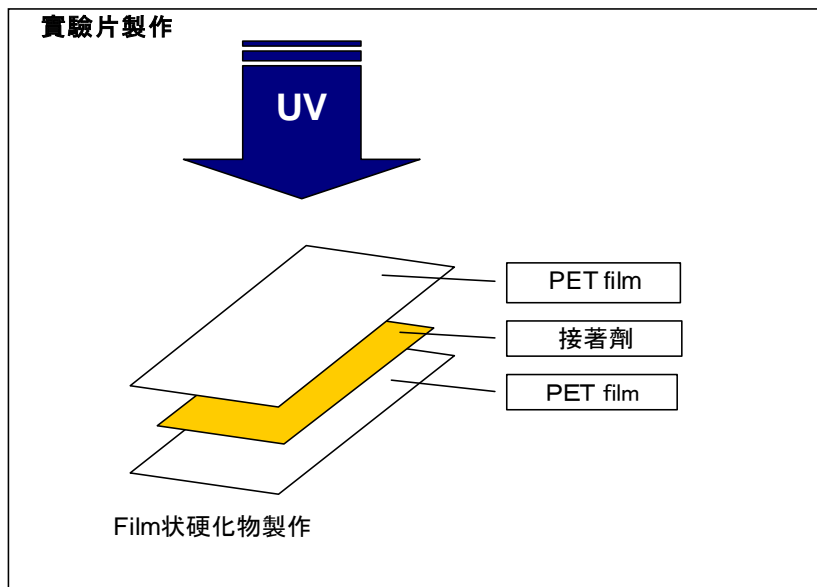
<作業中>

- 請使用遮光性良好之針筒。
- 如果產線停機30分鐘以上,請務必將針頭以鋁製holder將針頭蓋住(其他可遮光之材質之蓋子亦可)。
→如果針頭有膠材溢出,如意造成阻塞之不良情形。
- 將針筒內液體押出時,使用之air,請勿使用氮氣,而是要使用乾燥空氣才對,因為使用氮氣,會造成針筒內之UV硬化劑發生硬化之情形。
- 使用該劑時,務必穿戴保護之用具
→穿戴護具可同時避免液體進入眼睛或沾到皮膚外,亦可防止離子不純物混入膠材中。
- 其他注意項目請參照MSDS。

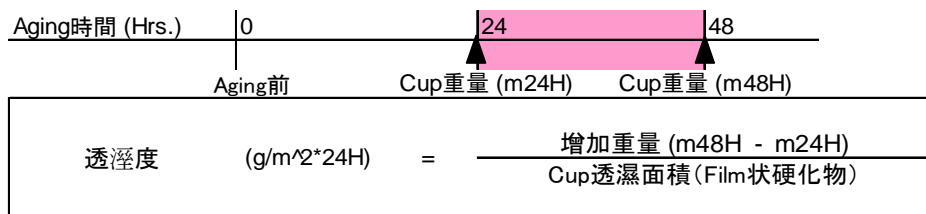
<作業完成後>

- 將針頭蓋住,並置於上述之保存之環境內。
→置入日光燈照度130lx以下、30°C80%RH以下之陰暗場所。
- 如產品過期,請勿使用。

透溼度實驗方式



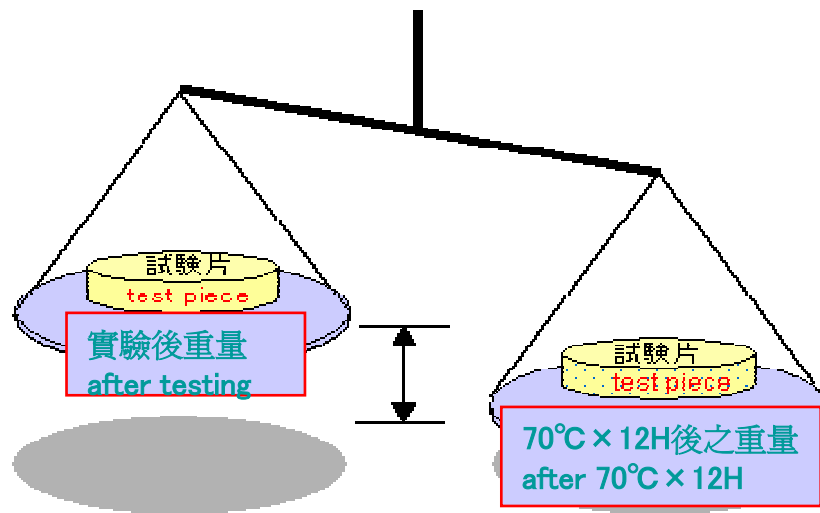
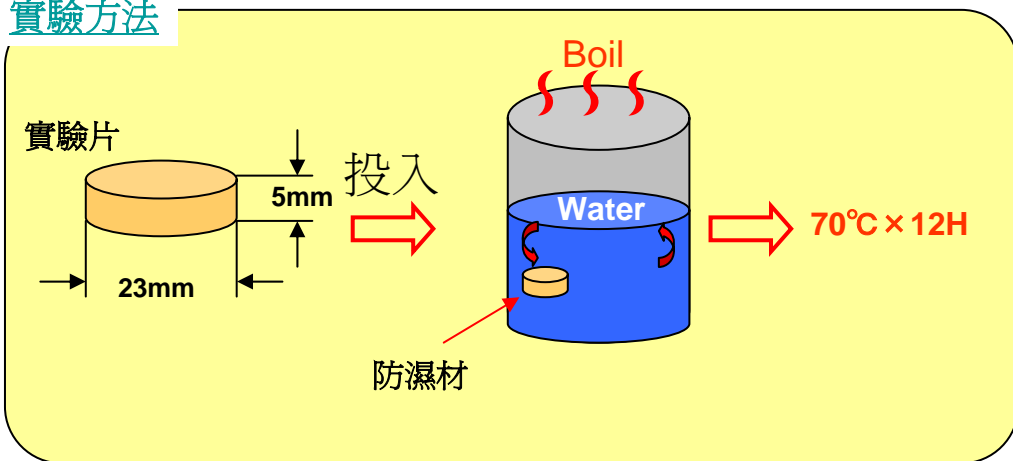
透溼度計算方式



吸水率測定: *Water Absorption*

- 將實驗片(硬化物)丟入如下之沸水中兩小時後取出。
→ 將實驗前與實驗後之樣品置入 $70^{\circ}\text{C} \times 12\text{H}$ 使其乾燥後,實施重量變化量測,以算出吸水率。

實驗方法



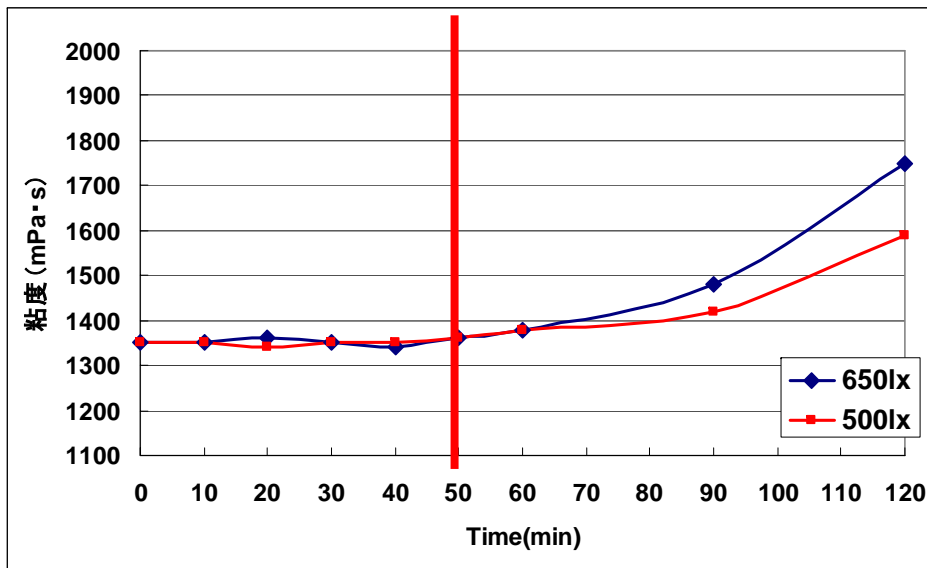
日光燈下之安定性

將SA3310倒入透明杯內約30cc、於日光燈下(照度500lx及600lx)以測定其安定性(是否膠化)。

側面

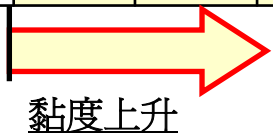


上面



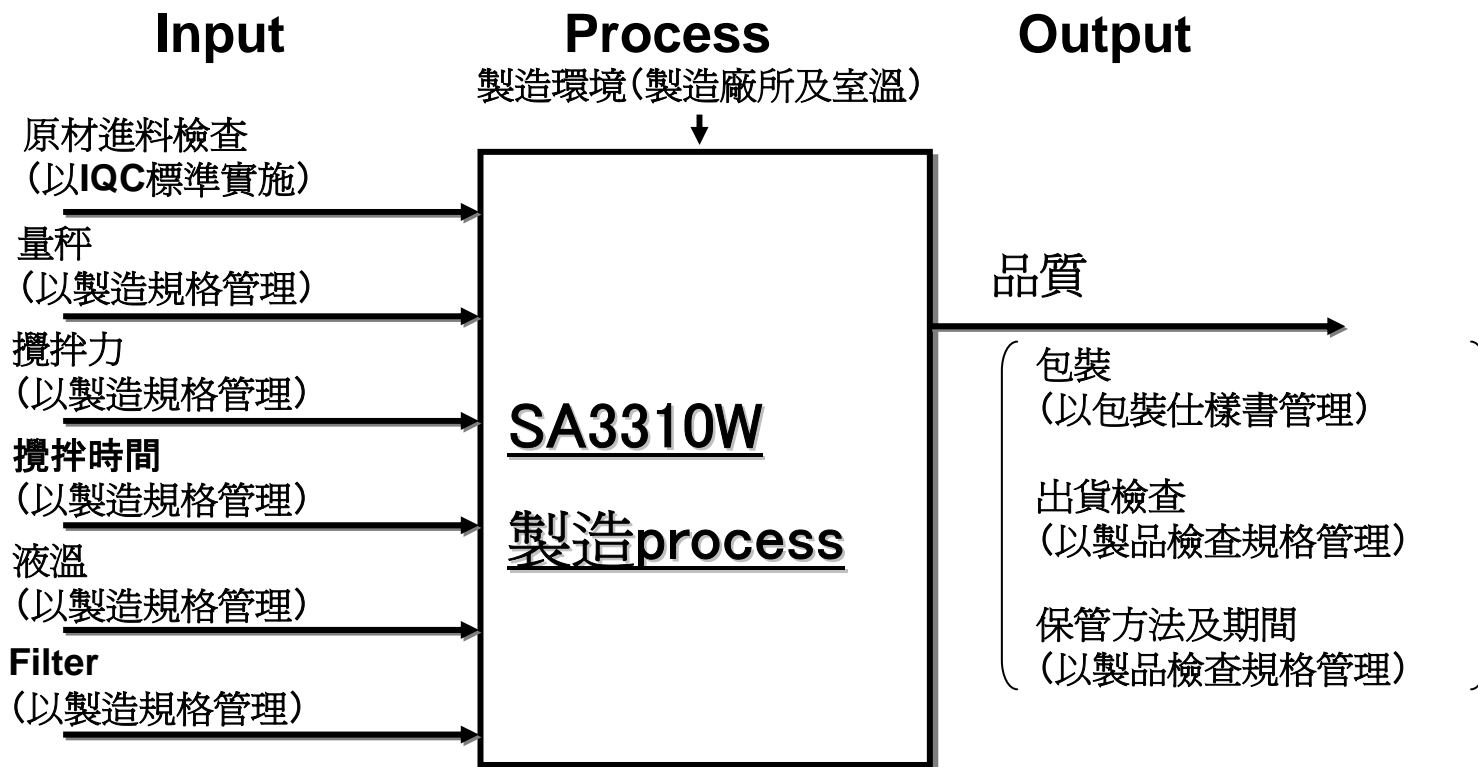
時間(min)		0	10	20	30	40	50	60	90	120
照度	650lx	1350	1350	1360	1350	1340	1360	1380	1480	1750
	500lx	1350	1350	1340	1350	1350	1360	1380	1420	1590

單位:mPa·s

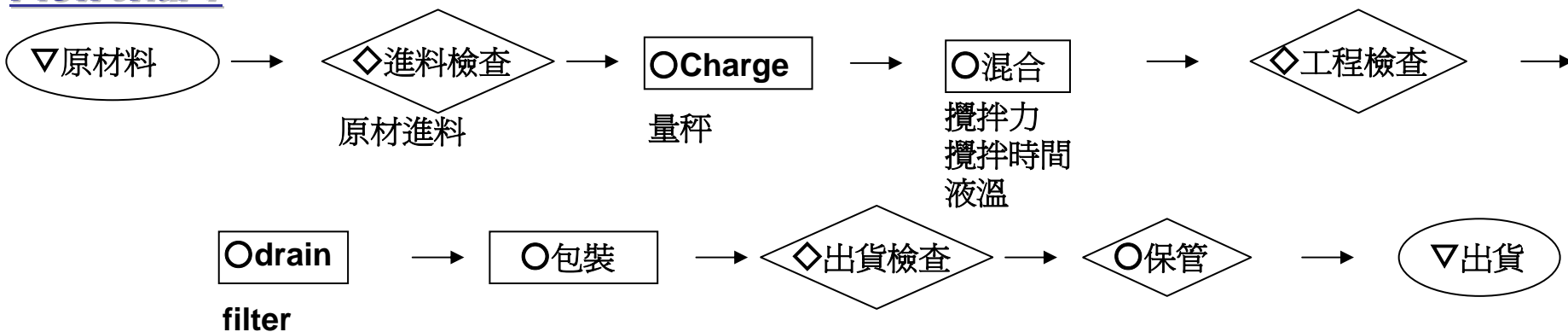


如產線停機**30**分鐘以上,請務必將針頭套住,以確保針頭不被光線照射。
→如果針頭有液體流出,會造成針頭阻塞。

製造process



Flowchart



出貨檢查之項目及目的

項目		單位	規格	檢查目的
			SA3310W	
液特性	外觀	—	藍色液體	液態製品之顏色(變色等)、異物檢查
	黏度	mPa · s	1400±300	原材料物投入之check
	曲折率	—	1.512±0.002	
硬化物特性	硬度	タイプ A	A74±10	硬化物之膜性確認
純度確認	離子純度	Na ⁺	≦10ppm	原材料及製程內離子異物之check
		Cl ⁻	≦10ppm	
硬化性確認	UV 硬化性	光反應發熱量	J/g	UV硬化性(硬化劑物投入)之確認
		光反應性最高發熱到達時間	秒	
			120±50	
			35~50	