

化工業 複合式洩漏偵測產品

洩漏偵測膠帶、防護套

產品開發動機

由於有害化學物質會對人體和工廠導致災難性的影響，**所以即時發現洩漏預防事故是首要之事。**

本產品提供最佳解決方案並精確找到洩漏點，提前阻止洩漏擴大及擴散。

- 由於法規與環安的要求，因此有毒化學品的管理、存儲和運輸非常重要。
- 化學工廠之危害風險主要為洩漏所引發的燃燒、爆炸、人員傷亡、環境污染波及鄰近工廠民眾等事件，因此如何預防洩漏、早期發現洩漏，以達到預防化學災害之目的。



New kinds of chemicals made constantly

- ✓ 44,000 kinds of distributed chemicals in Korea
- ※ 100,000 kinds of chemicals in EU
- ✓ 400 kinds of new chemicals every year



Types of chemical accidents



專利證書



(1) Certificate of Patent
“Leakage kit that detects acid and base at the same time”



(2) Certificate of Patent
“Acid base leak detection sensor capable of detecting the type of leakage of hazardous chemicals through the passivation layer”

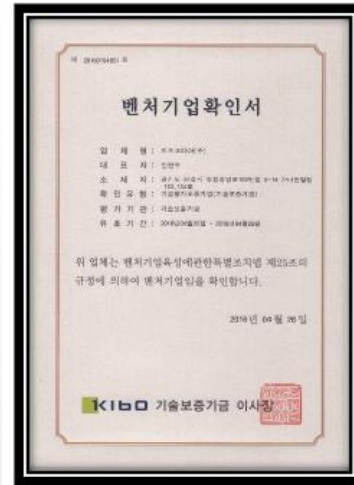


(3) Certificate of Patent
“Method for preparing a coating composition for a hazardous chemical sensor and Coating composition prepared”



(4) Certificate of Patent
“Fitting case for gas leak detection”

認證



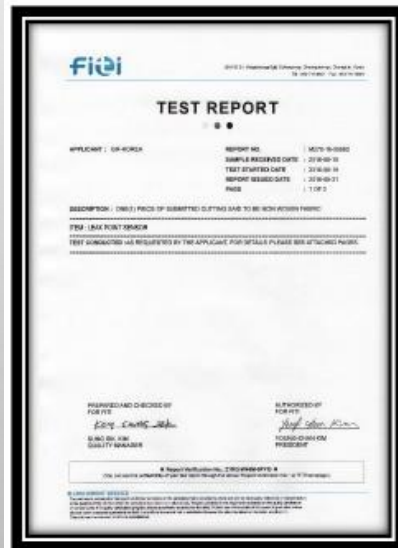
<Venture Company>



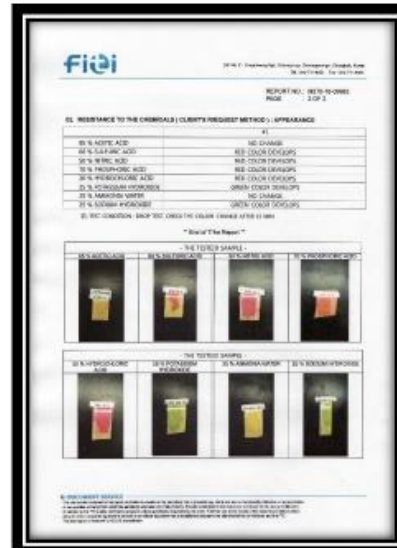
<R&D Institute>



<Patent>



<LEAK POINT SENSOR FILM Chemical Resistant Report>



<VOCs Report>



<Light Resistance Report>

產業實績



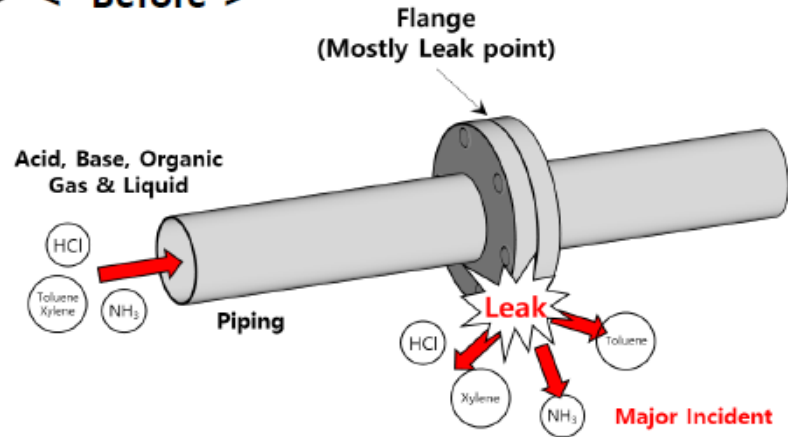
WINIFRED
Our Talents, Your Solutions
專業服務，為您打造

No.	Industry name	Company name	Corporate classification
1	Petrochemistry	BASF Korea	Midsized company
2	Petrochemistry	GS Caltex	GS affiliates
3	Petrochemistry	Lotte Chemical	Lotte affiliates
4	Petrochemistry	Isu Chemical Co., Ltd.	Midsized company
5	Petrochemistry	Aekyung Petrochemical Co., Ltd.	Midsized company
6	Petrochemistry	Hanwha Chemical	Hanwha affiliates
7	Petroleum, environment and chemistry	Inco Chemical	Small business
8	chemistry	LG Chemical	LG affiliates
9	Chemistry, energy	Toray Advanced Materials Co., Ltd.	Midsized company

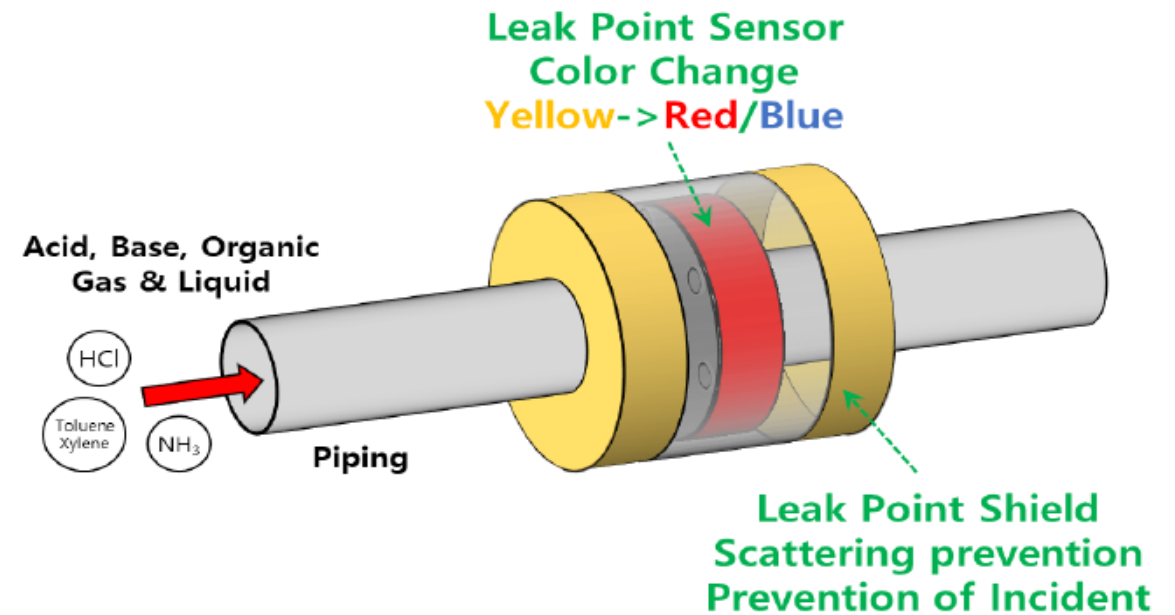
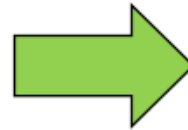
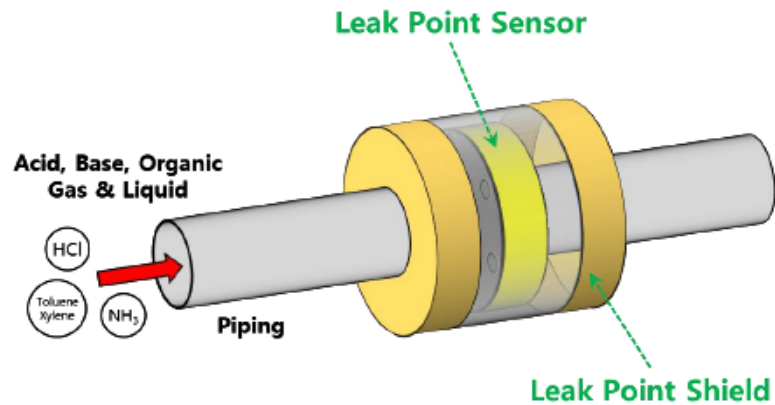
洩漏膠帶應用範圍及規格

化學液體、氣體容易洩漏的部位

< Before >



< After >



洩漏偵測膠帶應用範圍



Tank Link(Body&Lid)



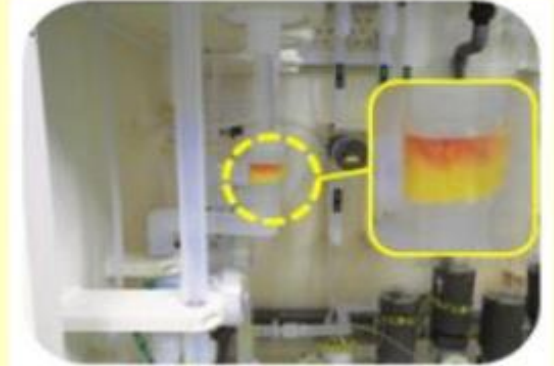
FLANGE (8mm interval)

Tank Level Control



FLANGE(8mm interval)

Unit inside Filter Inlet



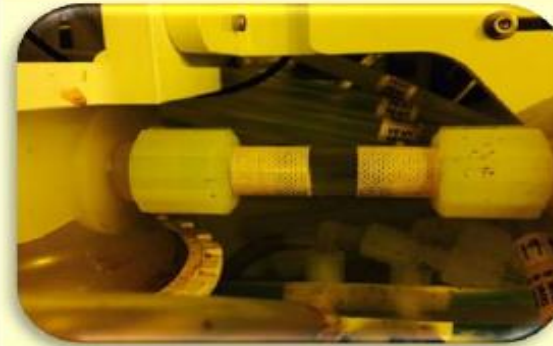
FITTING

Tank (in Dike)



Flange, Dike

Photomask in Semi.



Flange

Photomask in Semi.



Flange

LPSF-NORMAL (酸性化學品)



Acid


 LPSF-NORMAL
 (Acidic substances)

산 누출 시 변색

Standard (mm)	35/25
Adhesive (mm)	5(L)5(R)
Sensor part (mm)	25

- 用於酸性洩漏檢測的產品（黃色變紅色）。
- 對應物質(舉例)：氫氟酸，鹽酸、硫酸、硝酸。
- 可檢測化學氣體及液體。



HCl, H₂SO₄, HNO₃, CH₃COOHCH₂O₂, CH₂Cl
 HCN, C₂H₂Cl, C₃H₄O₂, HF, H₂PO₄, H₂Se, C₇H₇Cl,
 C₃H₅Cl, C₃H₃ClO, HSO₃Cl, POCl₃, TiCl₄, CuSO₄,
 ZnCl₂, PCl₃, BrF₅, CuI, CuCl₂, NiCl₂, Ni(NO₃)₂,
 NiF₂, C₂HCl₃O₂

規格 Specification

尺寸 Size 寬度 Width (mm)	黏著部分 Adhesive part 寬度 Width (mm)	感測部分 Sensor part 寬度 Width (mm)	總長度 Total length (公尺 m)
25	10	15	20
35	5 (L) / 5 (R)	25	

材質 Material (film)	PET	反應物 Reactant	HCl, H ₂ SO ₄ , HNO ₃ , CH ₃ COOHCH ₂ O ₂ , CH ₂ Cl, HCN, C ₂ H ₂ Cl, C ₃ H ₄ O ₂ , HF, H ₂ PO ₄ , H ₂ Se, C ₇ H ₇ Cl, NiF ₂ , C ₃ H ₅ Cl, C ₃ H ₃ ClO, HSO ₃ Cl, POCl ₃ , TiCl ₄ , CuSO ₄ , ZnCl ₂ , PCl ₃ , BrF ₅ , CuI, CuCl ₂ , NiCl ₂ , Ni(NO ₃) ₂ , C ₂ HCl ₃ O ₂
膠水 Glue	PET REMOVER		
操作溫度 Operating temperature(°C)	~ 100		
感測範圍 Detection range (pH)	1~3.5 (酸 Acid)		

LPSF-GBS (鹼性化學品)

- 基本物質泄漏檢測產品（黃色變藍色）。
- 對應物質(舉例)：氨、苛性鈉、過氧化氫等
- 可檢測化學氣體及液體。

規格 Specification

尺寸 Size 寬度 Width (mm)	黏著部分 Adhesive part 寬度 Width (mm)	感測部分 Sensor part 寬度 Width (mm)	總長度 Total length (公尺 m)
25	5 (L) / 5 (R)	15	20
35	5 (L) / 5 (R)	25	

材質 Material (film)	PET	反應物 Reactant	NaOH, KOH, NH ₄ OH, CH ₃ (NH)NH ₂ , C ₂ H ₄ (NH ₂) ₂ , (NH ₄)(NO ₃), C ₆ H ₁₂ N ₄ , H ₂ O ₂ , N ₂ H ₄ , C ₄ H ₁₁ N, C ₆ H ₁₅ N, (CH ₃) ₃ N, CH ₅ N
膠水 Glue	PET REMOVER		
操作溫度 Operating temperature(°C)	~ 100		
感測範圍 Detection range (pH)	9~14 (鹼 Base)		


 LPSF-GBS
 (Base, hydrogen peroxide)_In-door

Solution detection list

NaOH, KOH, NH₄OH, CH₃ (NH)NH₂,
 C₂H₄ (NH₂)₂,
 (NH₄)(NO₃), C₆H₁₂N₄, H₂O₂, N₂H₄, C₄H₁₁N,
 C₆H₁₅N, (CH₃)₃N, CH₅N

LPSF-ODS (有機物)

- 有機物泄漏檢測產品（黃色變紅色）。
- 對應物質(舉例)：苯、甲苯、MEK等。
- 可檢測有機化學品及油類。





規格 Specification

尺寸 Size 寬度 Width (mm)	黏著部分 Adhesive part 寬度 Width (mm)	感測部分 Sensor part 寬度 Width (mm)	總長度 Total length (公尺 m)
30	5 (L) / 5 (R)	20	20

材質 Material (film)	PET	反應物 Reactant	Toluene, Benzene, MEK (Methyl Ethyl Ketone), Acetone, Hexane, IPA, Dichloromethane, Ethanol, Methanol, 2-ethoxyethanol, Aniline, Nitromethane, Nitrobenzene, Toluene Diisocyanate (TDI), Trimethylolpropane diallyl, Penetrating oil (WD40), N-Methyl-2 pyrrolidone (NMP), Triethylene glycol, Dimethylformamide(DMF), Tetrahydrofuran(THF).
膠水 Glue	PET REMOVER		
操作溫度 Operating temperature(°C)	~ 80		
感測範圍 Detection range (pH)	-		

- DI Water 洩漏檢測產品(白色變紫色)。
- 對應物質：DI Water 等。



State	DDS TEST	
	반응 전	DI WATER
Liquid		

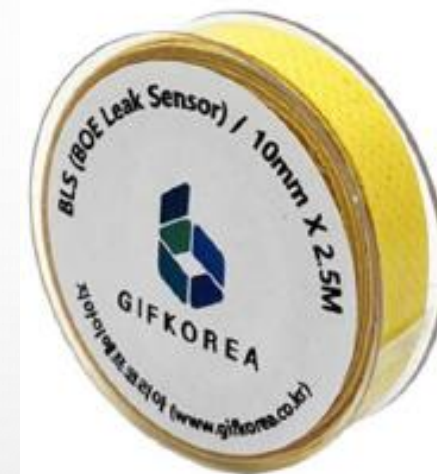
規格 Specification

尺寸 Size 寬度 Width (mm)	黏著部分 Adhesive part 寬度 Width (mm)	感測部分 Sensor part 寬度 Width (mm)	總長度 Total length (公尺 m)
30	5 (L) / 5 (R)	20	20

材質 Material (film)	PET	反應物 Reactant	Di water, NaOH, KOH, NH4OH, C3H9N
膠水 Glue	PET REMOVER		
操作溫度 Operating temperature(°C)	~ 100		
感測範圍 Detection range (pH)	-		

LPSF-BLS (BOE) 客製化

- 可立即使用的高靈敏度材料
- 即使少量BOE泄漏也檢測出來
- 對應物質：可選擇的檢測緩衝氧化物蝕刻
- BOE泄漏時的變色（黃色變藍色）



規格 Specification

尺寸 Size 寬度 Width (mm)	黏著部分 Adhesive part 寬度 Width (mm)	感測部分 Sensor part 寬度 Width (mm)	總長度 Total length (公尺 m)
10	客製	10	5

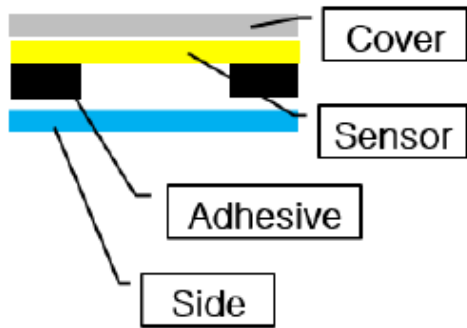
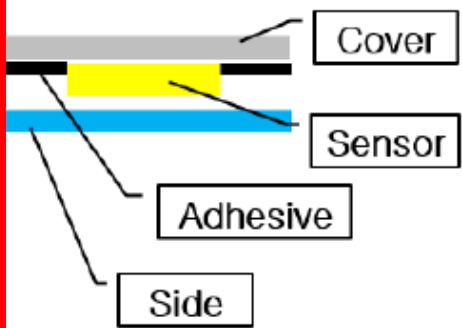
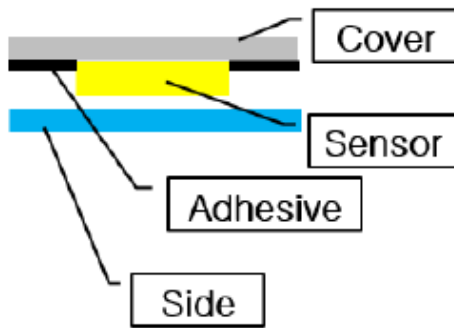
材質 Material (film)	PET / Non-woven	反應物 Reactant	<p>Buffered oxide etch (BOE) - NH_4F + HF</p> <p>** Reference Description – It is mainly used for silicon dioxide etching as a chemical mixture of NH_4F (Amonium Fluoriede) and HF (Hydrofluoric Acid) in semiconductor processes.</p> <p>When etching, HF is directly involved in oxide etch, and NH_4F serves as a buffer solution that improves uniformity by adjusting the etch rate.</p> <p>It is used as a cleaning chemical, such as removal of organic substances on the wafer surface, and is also part of the metal etching solution.</p>
膠水 Glue	-		
操作溫度 Operating temperature(°C)	~ 80		
感測範圍 Detection range (pH)	BOE, 9 ~ 14 (鹼 Base)		

與其他公司產品比較差異

Item	S Company	Winifred	備註
Detection material	Acid / Base / Organic compounds	Acid / Base / Organic compounds /DI water etc	Request material can be made
Scattering prevention	-	680N \approx 22.6bar	High pressure car wash sprayer=20bar
The tensile strength	About 35N	379.3N	
Applicable form	Flange	Flange / Reducing	
Adhesion	1,800 gf/in	4,000 gf/in	Box tape = 650gf/in
Type	S Company	Winifred	備註
Tape	 Acid / Base / Organic compounds	 Acid / Base / Organic compounds /DI water etc	Durability features
Shield Type	 Max 80°C	 Max 260°C	Advantages of use temperature

與其他公司產品比較差異

- 立即乾燥而無顆粒，靈敏度更高。
- 去除後無粘合劑殘留(無殘膠)。
- 可檢測酸性和鹼性化學物質（降低成本 / 零錯誤）。
- 更寬的感測範圍。
- 可阻擋內部洩漏化學品，以防止化學品外洩。

	WINIFRED	N Co.	M Co.	Note
Printing	Gravure _ Immediate drying	Gravure _ no immediate drying	Dipping	Free particle by gravure
Adhesive	PE	Acrylic	-	No adhesive deposit
Sensing	Both Acid and Alkaline	Either Acid or Alkaline	Either Acid or Alkaline	No error / Cost down
Location Marker	Light Type	X	X	easily found in dark site
Structure				<ul style="list-style-type: none"> • Able to change color if leak happens • Able to collect chemicals in the center in order to prevent chemicals escaping

已驗證的化學品



WINIFRED
Our Talents, Your Solutions
專業服務，為您打造

	Chemical Name	Chemical Formula	CAS Number	State
1	Phosgene, CG	COCl ₂	75-44-5	Gas
2	Ammonia	NH ₃	7664-41-7	Gas
3	Chlorine	Cl ₂	7782-50-5	Gas
4	Sulfur dioxide	SO ₂	7446-09-05	Gas
5	Sulfur trioxide	SO ₃	7446-11-09	Gas
6	Hydrogen cyanide	HCN	74-90-8	Gas
7	Hydrogen fluoride	HF	7664-39-3	Gas
8	Hydrogen chloride	HCl	7647-01-0	Gas
9	Nitric acid	HNO ₃	7697-37-2	Chemicals
10	Disulfuric acid	H ₂ S ₂ O ₇	7783-05-3	Chemicals
11	Hydrogen peroxide	H ₂ O ₂	7722-84-1	Chemicals
12	Chlorosulfonic acid	HSO ₃ Cl	7790-94-5	Chemicals
13	Hydrogen bromide	HBr	10035-10-6	Gas
14	Chlorine peroxide	ClO ₂	10049-04-4	Gas
15	Thionyl chloride	SOCl ₂	7719-09-07	Chemicals
16	Bromine	Br	7726-95-6	Chemicals
17	Nitrogen dioxide	NO	10102-43-9	Gas
18	Hydrogen fluoride (>1%)	HF	7664-39-3	Liquid
19	Hydrogen chloride (>10%)	HCl	7647-01-0	Liquid
20	Sulfuric acid (>10%)	H ₂ SO ₄	7664-93-9	Liquid
21	Ammonium Hydroxide (>10%)	NH ₄ OH	1336-12-6	Liquid

洩漏膠帶測試

洩漏偵測膠帶於不同環境變色效能比較



WINIFRED
Our Talents, Your Solutions
專業服務，為您打造

A1. ▶ Internal heat resistance temperature TEST (-66°C ~ 120°C oven, 1 hour drying)

• Result : -66°C ~ 120°C No abnormality in use

※ Recommended operating temperature 80°C

• Reference, Room temperature

State	상온			
	LPSF	GBS	ODS	DDS
Before reaction				
After reaction				

• -66°C, 1Hour TEST

State	-66°C, 1h			
	LPSF	GBS	ODS	DDS
Before reaction				
After reaction				

• 80°C, 1Hour TEST

State	80°C, 1h			
	LPSF	GBS	ODS	DDS
Before reaction				
After reaction				

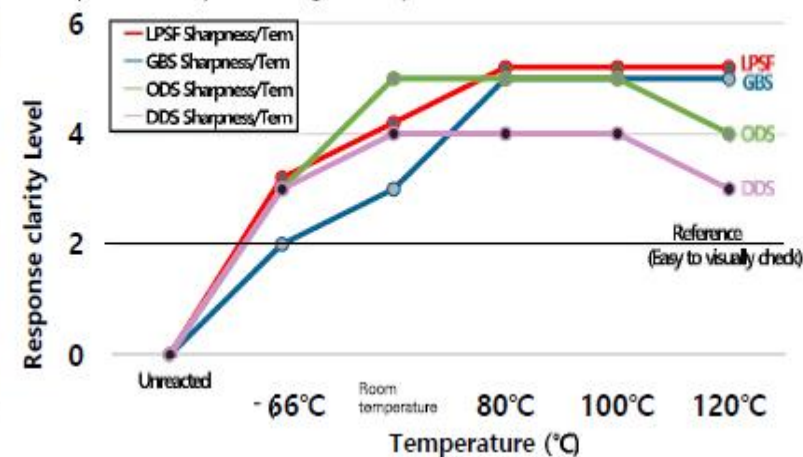
• 100°C, 1Hour TEST

State	100°C, 1h			
	LPSF	GBS	ODS	DDS
Before reaction				
After reaction				

• 120°C, 1Hour TEST

State	120°C, 1h			
	LPSF	GBS	ODS	DDS
Before reaction				
After reaction				


• Response clarity according to temperature



洩漏偵測膠帶黏附力測試

- A3. ▶ Existing : **PE Foam material**, excellent adhesion, but difficult to remove
Improving : Excellent adhesion with **rubber foam material** and easy to remove without residual foam

· REMOVER TAPE Test Report

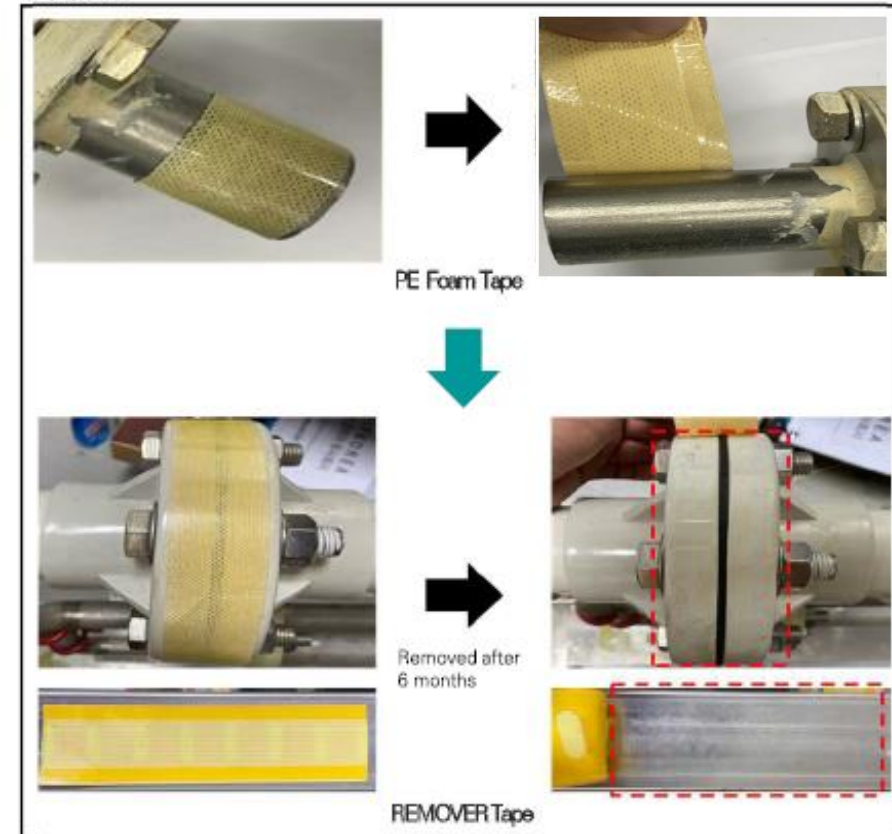
PRODUCT DATA SHEET		CoreTech	
PRODUCT INFORMATION		ITEM NO. : CT-5319K	
1. STRUCTURE(PET Film Base Double side tape)			
			
2. TECHNICAL DATA			
Color	Adhesive	Adhesion	Liner
Transparent	Rubber Adhesive	4000 gf/in	Kraft
			H.C.R
			-40°C ~ 80°C
3. FEATURE and APPLICATION			
<p>· 고온저온특성, 우수한 유착력, 초기점착력높음, 각종 난접착에 부착율이 높기때문에 우수, 다공질 표면 및 각종 직물원단의 부착용으로 적합, 핸드폰, 카메라 렌즈와 인조가죽의 부착, 천연 인조가죽류의 고정, 중량물의 판별 및 시프지의 벽면고정용, 화장실 케이스의 고정, 버프용, 엘크로원단, 실크인쇄면과 플라스틱 사출물의 부착, 자동차용 스피커용 케이스의 음무착용 등</p>			

Adhesive	Adhesion
Rubber Adhesive	4000 gf/in

- Result : - . **Rubber adhesive** material,
- . Adhesiveness **4000 gf/in** very good

- A3. 6. ▶ Adhesive test result
(**Rubber Foam**, removed after 6 months of application)

· 자체 TEST



GAS 濃度測試

如有特定氣體要測試需請先提出

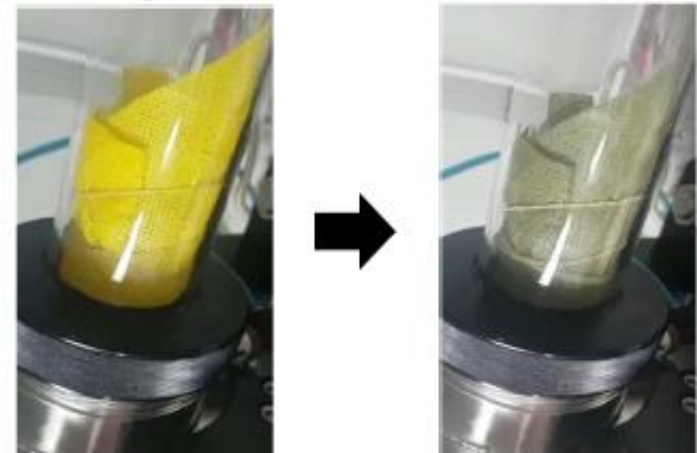
- A4. ▶ **HCl GAS TEST** (Semiconductor Company called "F" in progress)
HCl Gas 3~4ppm (Less than 5ppm legal standard) Injection (vacuum piping)
- Result : **Yellow** → **Red**, Easy to visually check

· "F" company, HCl GAS reaction TEST



- ▶ **NH₃ GAS TEST**
NH₃ Gas 100ppm Injection (vacuum piping)
- Result : **Yellow** → **Red**, Easy to visually check

· Inside NH₃ GAS reaction TEST



有機溶劑測試

有機氣體測試結果

A4.

- For leak detection of organic compounds, LPSF-ODS (Organic Compound Leak Detection Sensor) must be applied.
- In the case of LPSF-ODS, it reacts to IPA (99%) substances, and the reactivity to 20 organic compounds is as follows.



LPSF-ODS (Organic compound)_Indoor



유기물 누출 시 변색


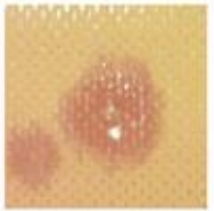
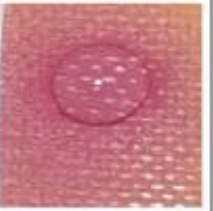
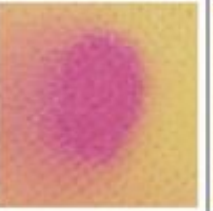
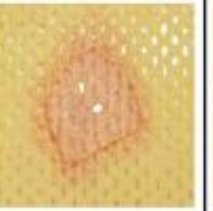

LPSF-ODS reaction	
Division	Name
Organic (14type)	Benzene(99%)
	Toluene(99%)
	Xylene(99%)
	MEK(2-butanol,99%)
	1-butanol(99%)
	Propylene Carbonate(99%)
	butyl acetate(99%)
	1-methoxy Propylene Acetate(95%)
	Tetrachloroethylene(99%)
	Tetra ethyl orthosilicate(99%)
	Trimethylolpropane duallyl ether(99%)
	Triethylene glycol duacrylate(99%)
	DMF(99%)
	IPA(99%)
Organic & Base (6type)	Methanol(95%)
	Ethanol(95%)
	Aniline(99%)
	Dimethyl form amide(99%)
	Dimethyl acetamide(99%)
	Trimethylamine(99%)

구분	Organic IPA(99%)
Before reaction	
After reaction	



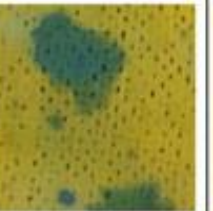
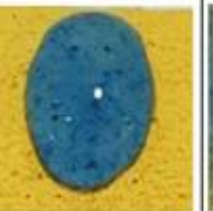

特定物質變色狀況

A5. ▶ Discoloration product reactivity TEST



• When an acid substance leaks, it turns 'Red' LPSF TEST

State	LPSF TEST					
	Before reaction	sulfuric acid(98%)	hydrochloric acid(35%)	nitric acid(60%)	phosphoric acid(80%)	acetic acid(99%)
Liquid						

• When leaking base material it turns 'Blue' GBS TEST

	GBS TEST				
	Before reaction	sodium hydroxide(1%)	sodium hydroxide(32%)	Potassium Hydroxide(1%)	ammonia(25%)
Liquid					

• When DI water leaks, it turns 'Pink' DDS TEST

State	DDS TEST	
	반응 전	DI WATER
Liquid		

特定物質變色狀況

A5. ▶ Discoloration product reactivity TEST

· When organic compounds and oil leak, it turns 'Red'

ODS TEST

State	After Organic										
	Before	톨루엔(99%)	자일렌(99%)	MEK(2-butanol(99%)	1-butanol(99%)	Propylene Carbonate(99%)	butyl acetate(99%)	1-methoxy Propylene Acetate(99%)	Tetrachloroethylene(99%)	Tetra ethyl orthosilicate(99%)	Methylalum glycol diacetate(99%)
Liquid											
	Ethanol(95%)	Aniline(99%)	Dimethyl sulfoxide(99%)(DMSO)	Dimethyl acetamide(99%)(DMA)	Trimethylamine(99%)	DMF(99%)	Methanol(95%)	Tetrahydrofuran diethyl ether(99%)	Methylalum glycol diacetate(99%)	Tetrahydrofuran diethyl ether(99%)	벤젠(99%)

環境干擾測試

經測試不會受到環境氣體或液體干擾

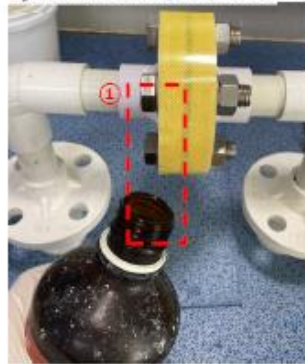
氣體無任何變色反應，僅有液體因虹吸現象會部分滲入邊緣，但洩漏偵測為中央區域不會影響判讀

A7. ▶ External Reactivity Internal Test

• LPSF Before Reaction



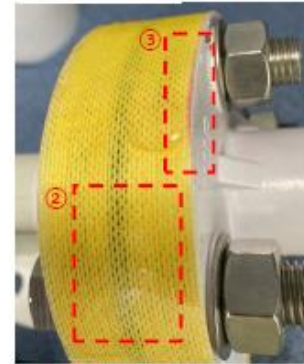
• hydrochloric acid(35%) Gas Unreacted



• hydrochloric acid(35%) Liquid Reaction



• Liquid Side Reaction



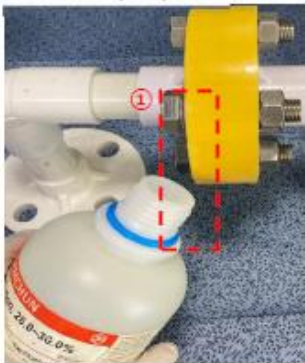
• Result

- ① Gas form unreacted
- ② Inability to penetrate inside due to high adhesive strength of the side tape
→ Flange inside and leak distinguishable
- ③ Only side contact surface reacts when high concentration liquid leak

• GBS Before Reaction



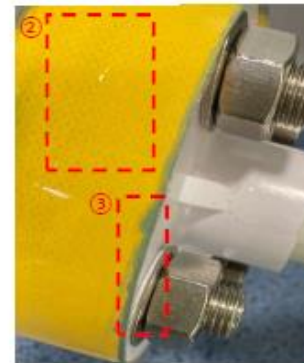
• ammonia(25%) Gas Unreacted



• ammonia(25%) Liquid Reaction



• Liquid Side Reaction



高温高湿環境測試

A7. ► Constant temperature and humidity test (temperature 85°C, humidity 85% / 1 hour)

- **Result** : -. No abnormality in reaction in normal environment (temperature 25°C, humidity 40%)
- Constant temperature and humidity test (extreme environment) → No abnormality except reaction due to DDS condensate generation
(No abnormality in the normal environment)

시험 성적서


 연락처 번호 : 169-20-0408
 홈페이지 : 11 / 총 18


 (주)아프로 R&D
 www.apro.co.kr

1. 개요

- 의뢰명 : 2020년 08월 07일
- 주소 : 경기도 수원시 영통구 신원로 88 C3지점(제101호) 307호
- 계약일자 : 2020. 08. 07.

2. 시험 성적서의 용도 : 품질 관리용

3. 시험대상품목/시험대상 : LPSP, QDS, DDS, DGS

4. 시험일자 : 2020. 08. 07.

5. 시험목적/항목 : 품질 관리용 시험 (온도 습도 시험)

6. 시험결과 : 결과 보고서 참조

주요 : 1. 의뢰명 : 2020년 08월 07일
2. 의뢰명 : 2020년 08월 07일
3. 의뢰명 : 2020년 08월 07일
4. 의뢰명 : 2020년 08월 07일

의뢰인 : (주)아프로 R&D 대표이사 (인)
 시험자 : (주)아프로 R&D 대표이사 (인)

2020년 08월 07일

(주)아프로 R&D 대표이사 (인)

서울특별시 강남구 테헤란로 35길 26, 2022년 08월 07일 (수) 11:00, 우편번호 06151
 Tel : 02-2108-1111 Fax : 02-2108-1888

APRO-GP-04-02

결과 보고서


 연락처 번호 : 169-20-0408
 홈페이지 : 11 / 총 18


 (주)아프로 R&D
 www.apro.co.kr

1. 시험 조건 및 결과

1.1. 온도 습도 시험

시험 항목	온도 습도 시험	
고 령 명	온도 습도 시험	시험 목적
종 류	LPSP, QDS, DDS, DGS	시험 일자
도 록 양	-	시험 날짜
시험 고객	Request of client	종류
시험 결과	시험 결과 참조	

1) 의뢰 사항에 고 령이 포함된 Sample를 시험 시키는 것임에 따라, 고 령에 대한 고 령을 고 령에 대한 시험 및 시험을 진행함.

2) 시험 사진



APRO-GP-04-02

결과 보고서


 연락처 번호 : 169-20-0408
 홈페이지 : 11 / 총 18


 (주)아프로 R&D
 www.apro.co.kr

1. 시험 결과

종류 명	종류 명	시험 일자	시험 날짜
온도 습도 시험	ESPEC	2020. 08. 07.	2020. 08. 07.

2. 결과 요약

시험 일자	종류 명	비 고
LPSP, QDS, DDS, DGS	온도 습도	온도 및 습도 시험 결과

3. 시험 결과

The Table of results

Test Sample	결과
LPSP	온도 및 습도 시험 결과
QDS	온도 및 습도 시험 결과
DDS	온도 및 습도 시험 결과
DGS	온도 및 습도 시험 결과

The Picture of results.

시험 일자	시험 일자
LPSP	QDS
DDS	DGS






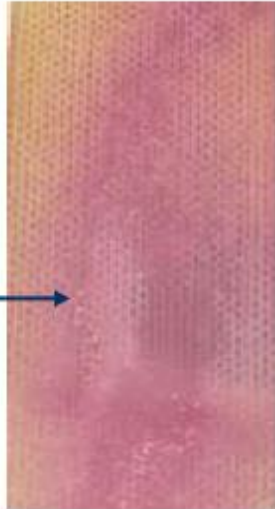
- 1 -

APRO-GP-04-02

戶外測試結果

戶外測試3個月後仍保持洩漏偵測效果，僅外觀微有變色情況

► LPSF-NORMAL self experiment

1 day(outdoor)	3 days(outdoor)	7 days(outdoor)	1 month(outdoor)	3 months(outdoor)	Drop test(after 3 months)
					
Yellow	Yellow	Yellow	Light Yellow	Light Yellow	Light Yellow → Red

Hydrochloric acid
- HCl (20%) Drop

※ Sunshine (UV) → Rain/Snow(Wet) → Wind(Dry) → Sunshine(UV) Cycles

※ Replacement cycle when using the product outdoors : (Recommend) 3month / (Maximum) 6month *Differences may occur depending on the usage environment

※ If it is installed in a place with good sunlight (UV) protection, the expiration date may be extended.

現場實測

電子廠廠務



化工廠管路



防護套應用範圍及規格

CHEMICAL SHIELD 化學品保護套

- 使用變色材料和樹脂防止洩漏噴濺並檢測有害物質的解決方案。
- 可檢測高溫氣體 (200°C) 和有毒氣體洩漏檢測化學洩漏。
- 檢測有毒氣體的微量洩漏並透過其優異的耐化學性防止噴濺。
- 可以防止配管洩漏噴濺的保護套，根據用途特性可用於高溫或通用型。
- 可根據配管標準進行訂製。

Specification		Heat resistant Type		General Type	
		Film part	Fabric part	Film part	Fabric part
Materials		PTFE Film	Heat resistant/chemical resistant fabric (PTFE Coating)	PTFE Film	Chemical resistant fabric
Melt temperature		260 °C	260 °C	100 °C	100 °C
Acid&base reactive substance	Reactivity	Color change Acid : Yellow → Red / Base : Yellow → Blue			
	Heat resistant temperature	200 °C		100 °C	
Chemical resistance		Hardly penetrates into strong acid/alkaline chemicals (Ex : Hydrochloric acid (37%) sulfuric acid (97%) sodium hydroxide (32%) for more than 72 hours)			Hydrochloric acid (37%) sulfuric acid (97%) sodium hydroxide (32%) for more than 48 hours



CHEMICAL SHIELD 化學品保護套

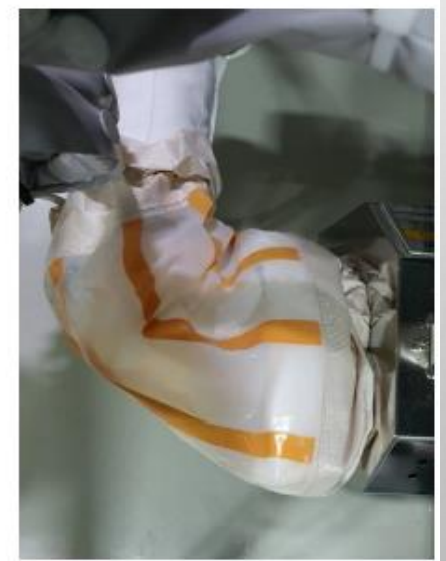
- 耐熱型產品實例：室內在200°C環境下唯一可用的解決方案。



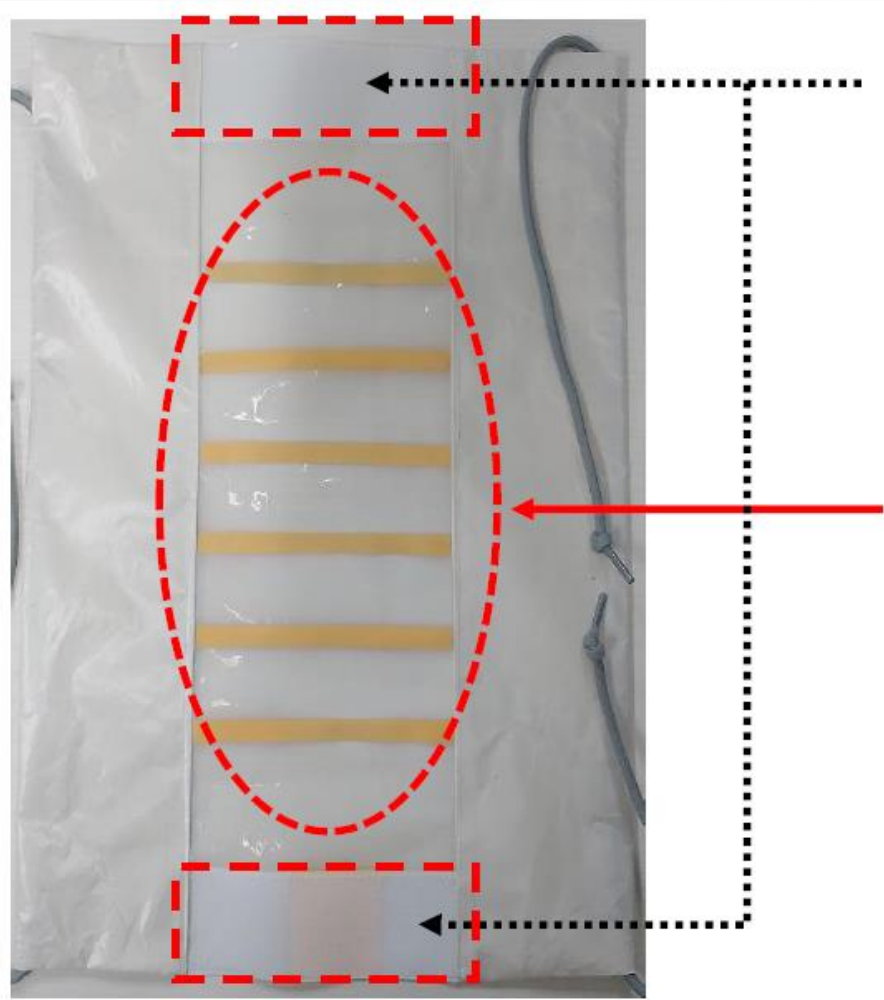
Heating jacket
measurement temperature



Installation examples



CHEMICAL SHIELD 化學品保護套



固定魔術貼(魔鬼氈)

- 防止因法蘭壓力過大而導致的化學品噴濺事故
- 非常易於安裝/拆卸/傳輸
- 化學物質洩漏後的保護觀察應對 (確認洩漏化學性質)

有害物質檢測感測器

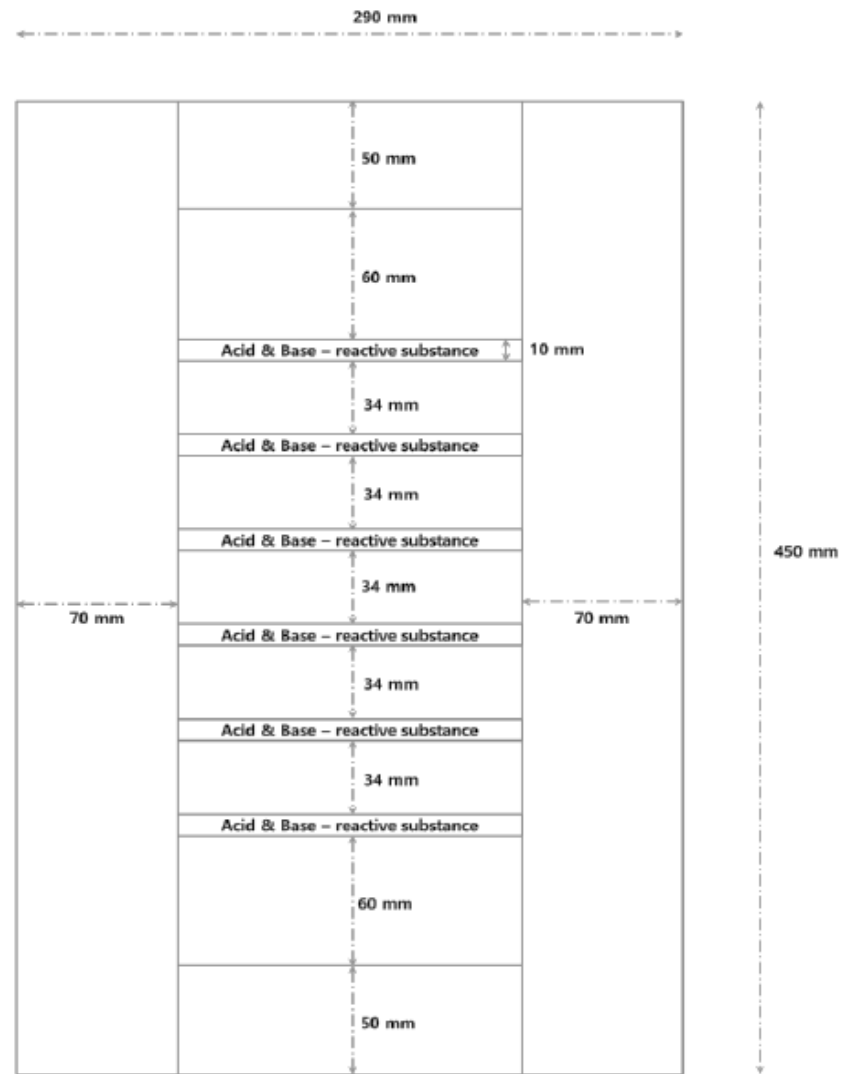
- 微細有害氣體濃度檢測 - 防止漏氣事故 (單位:PPM)
- 無外部環境引起的誤動作
- 高溫、高溼度的耐熱、耐候性環境

product standard size	大	• 700mm x 800mm
	中	• 700mm x 600mm
	小	• 700mm x 400mm
	※ SIZE can be changed upon request	

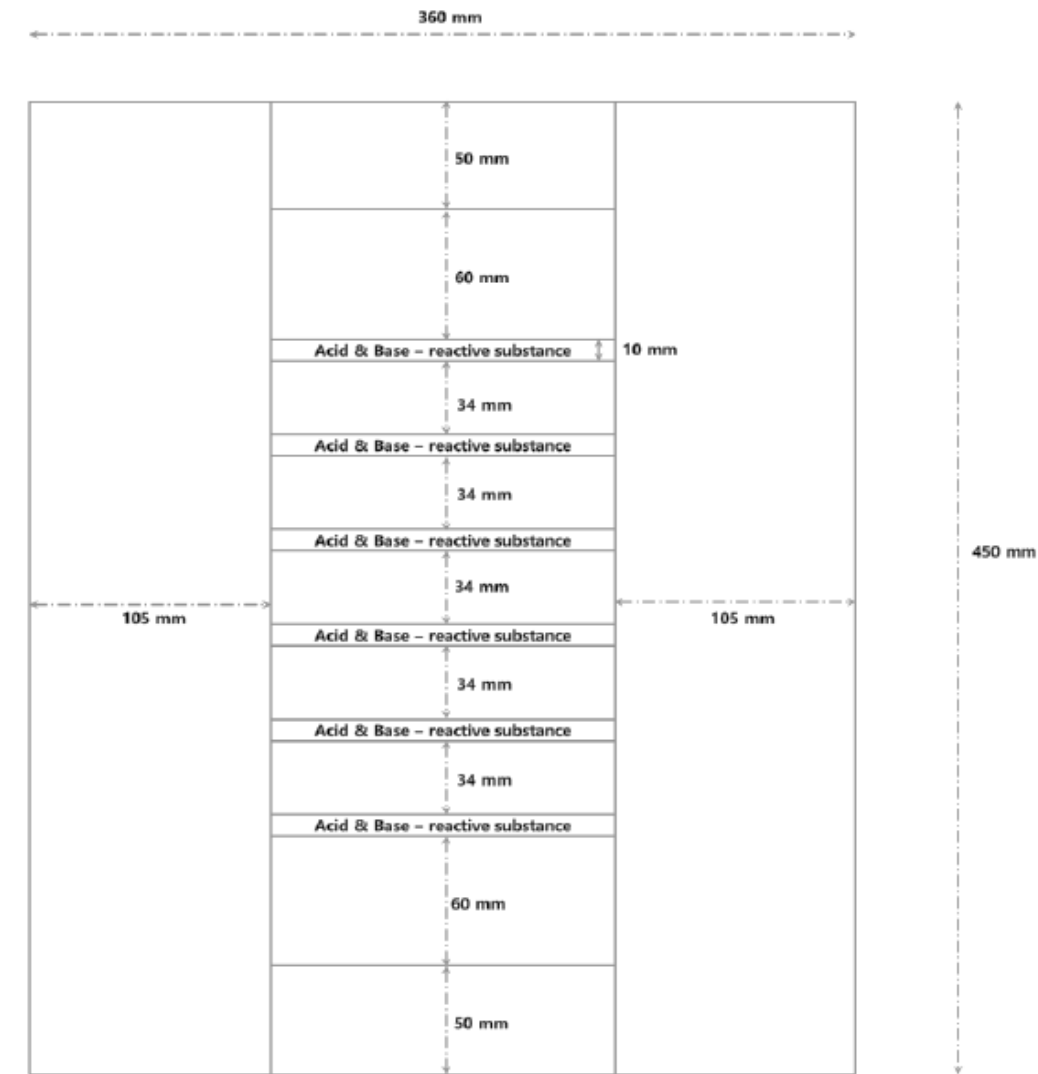
CHEMICAL SHIELD 化學品保護套

尺寸可依客戶需求訂製

SHIELD SIZE (The size can be made by user's request)



Example. 1



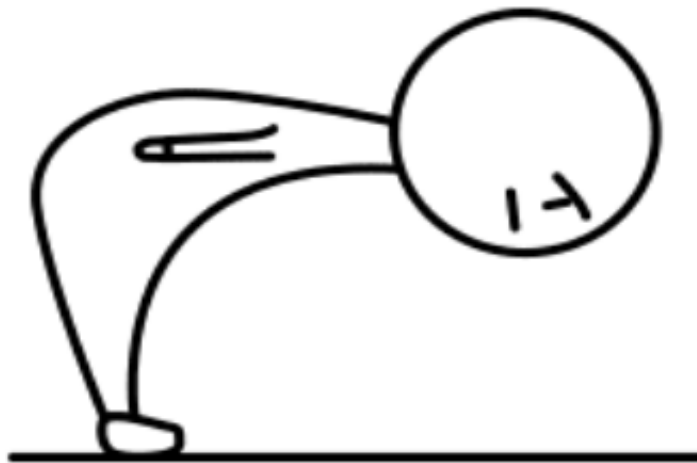
Example. 2

可檢測物質(化學液體、氣體)

Acid	Base
<p>HCl, H₂SO₄, HNO₃, CH₃COOHCH₂O₂, CH₂Cl</p> <p>HCN, C₂H₂Cl, C₃H₄O₂, HF, H₂PO₄, H₂Se, C₇H₇Cl, C₃H₅Cl,</p> <p>C₃H₃ClO, HSO₃Cl, POCl₃, TiCl₄, CuSO₄, ZnCl₂, PCl₃, BrF₅, CuI,</p> <p>CuCl₂, NiCl₂, Ni(NO₃)₂,</p> <p>NiF₂, C₂HCl₃O₂</p>	<p>NaOH, KOH, NH₄OH, CH₃(NH)NH₂, C₂H₄(NH₂)₂</p> <p>(NH₄)(NO₃), C₆H₁₂N₄, H₂O₂, N₂H₄, C₄H₁₁N, C₆H₁₅N,</p> <p>(CH₃)₃N, CH₅N</p>

Acid	Base
<p>※ Reaction when leaking over 5 PPM</p> <p>Halogen series</p> <p>BCl₃ Cl₂ HCl HF BF₃</p> <p>SF₆ WF₆ ClF₃ F₂ DCS</p> <p>N₂O SiF₄ TiCl₄</p> <p>Fluorocarbon gas</p> <p>C₂HF₅ C₃F₆ C₄F₈ CF₄ CH₂F CHF₃</p> <p>Hydrogen phosphide</p> <p>PH₃</p>	<p>※ Reaction when leaking over 50 PPM</p> <p>Ammonia</p> <p>NH₃</p>

THANK YOU



Thanks for your PO