

**'TORAY'**

Toray Advanced Film Co., Ltd.

**Innovation by Chemistry**

Toray Advanced Film Co., Ltd

**“TUFTOP”**

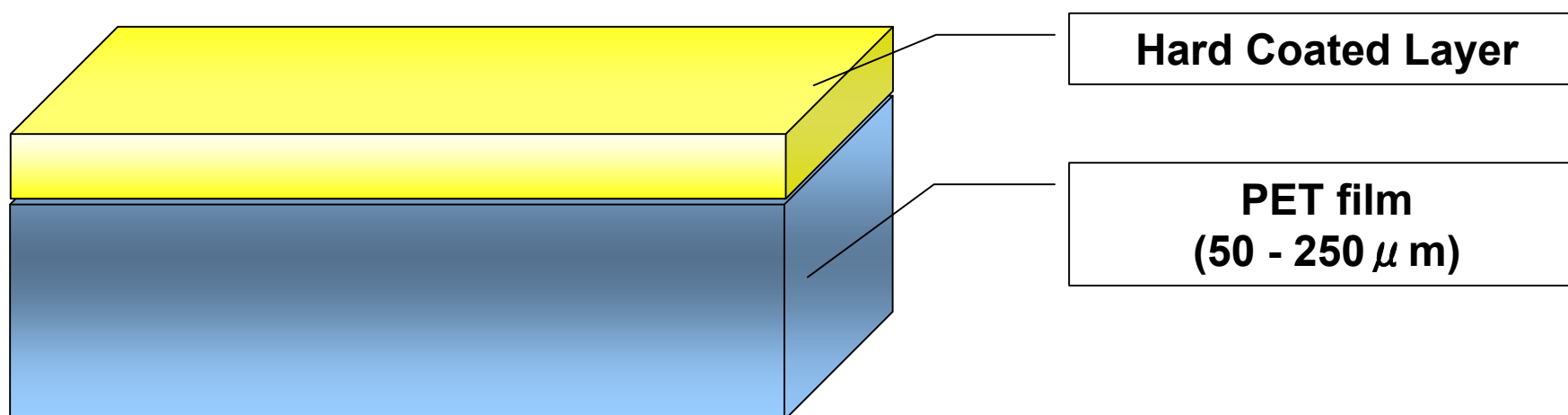
**Hard Coated PET FILM**

[www.toray-taf.co.jp](http://www.toray-taf.co.jp)

## “What is “Tuftop”?”

“Tuftop” is **Hard-Coated PET film** used for IML or I-CON sheet or ITO Electrode.

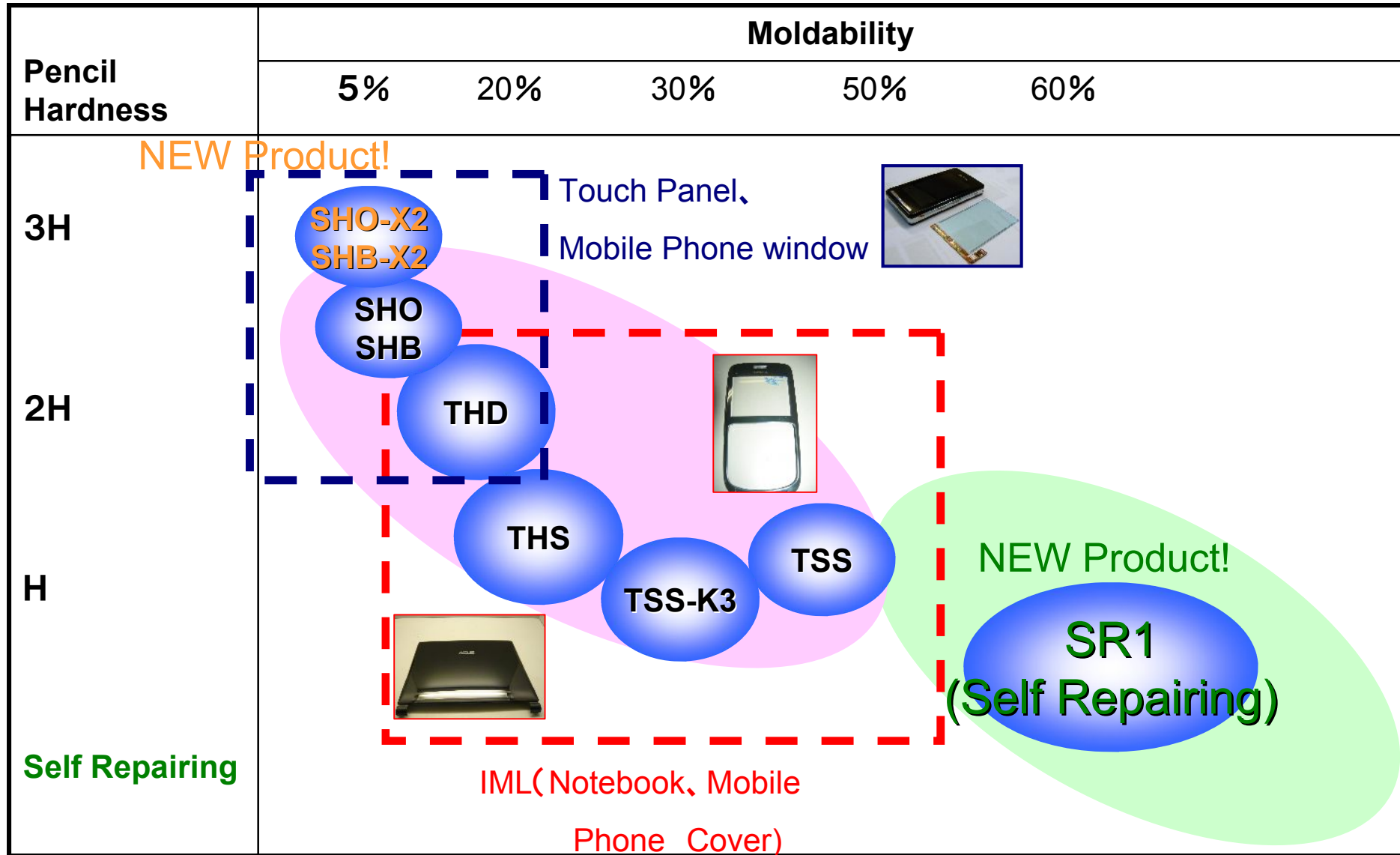
### Basic Structure of “Tuftop”



### Strength of “Tuftop”

- ① Wide Lineup (Hard type ~ Moldable type + **Self Repairing type!**)
- ② Low interference
- ③ Low foreign substances by clean coater
- ④ Good adhesion between HC layer and PET layer

# Tuftop Product line up

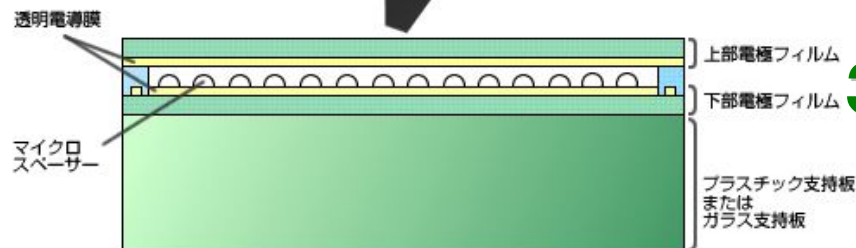


# Three Major Application



## 1. IML Application (A-cover for Notebook, or Mobile Phone)

## 2. ICON Sheet Application (Mobile Phone Window)

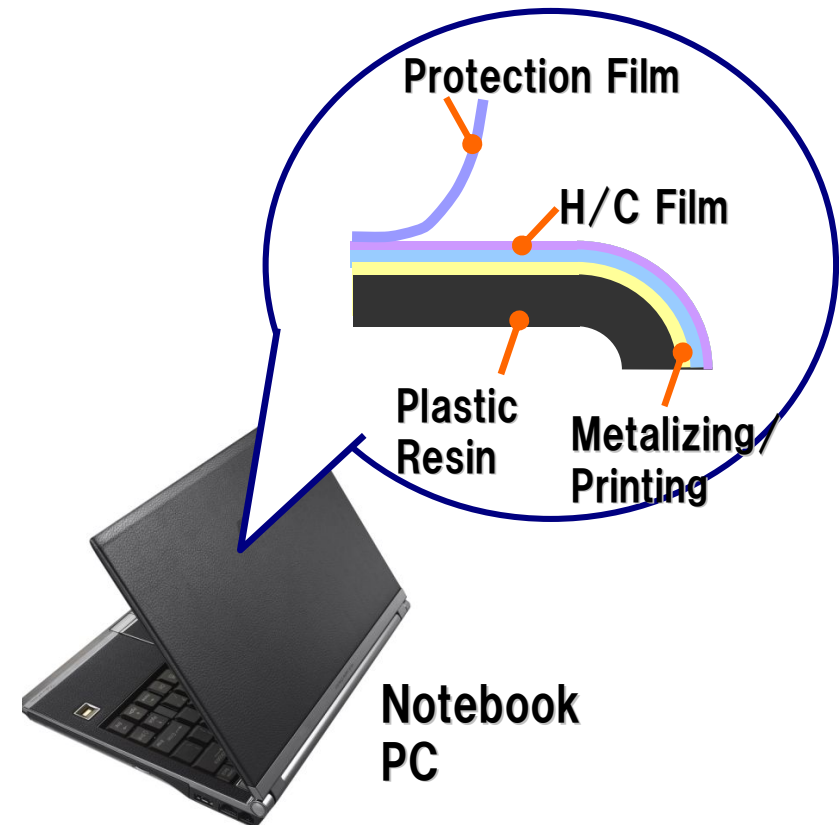
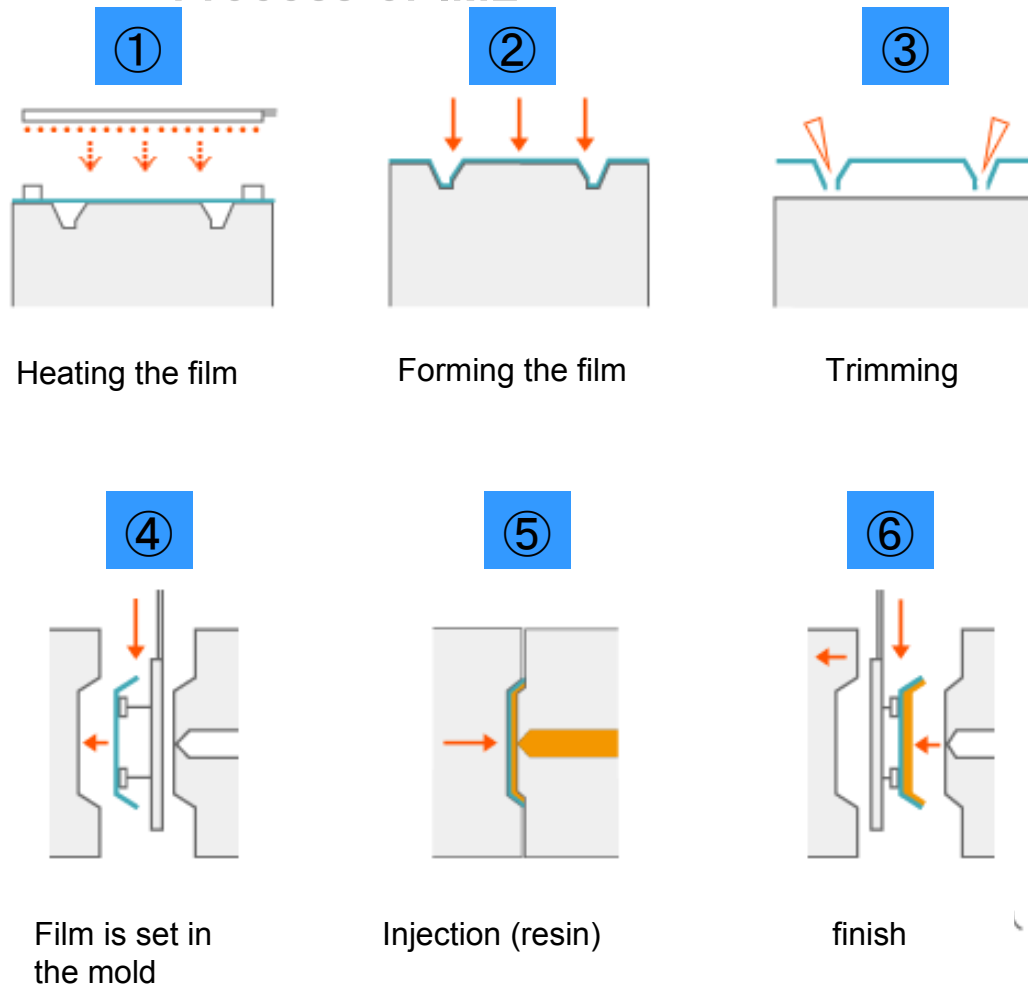


## 3. ITO Electrode Application (Touch Panel)

# 1. IML Application

- ◆ It strengthens the surface hardness of A-cover for mobile phone or laptop, etc.

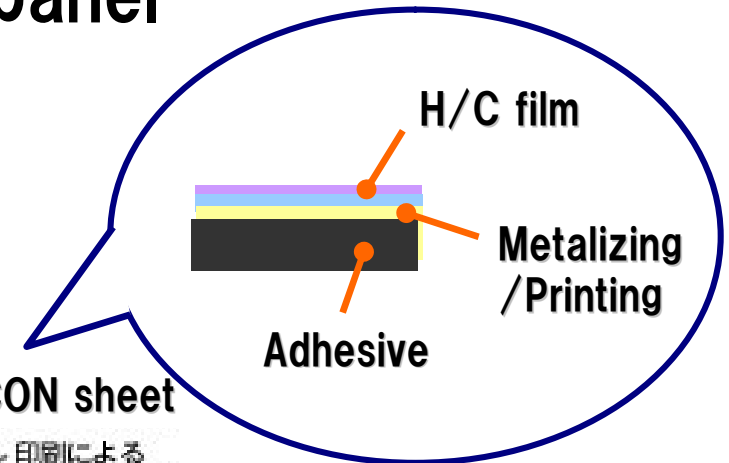
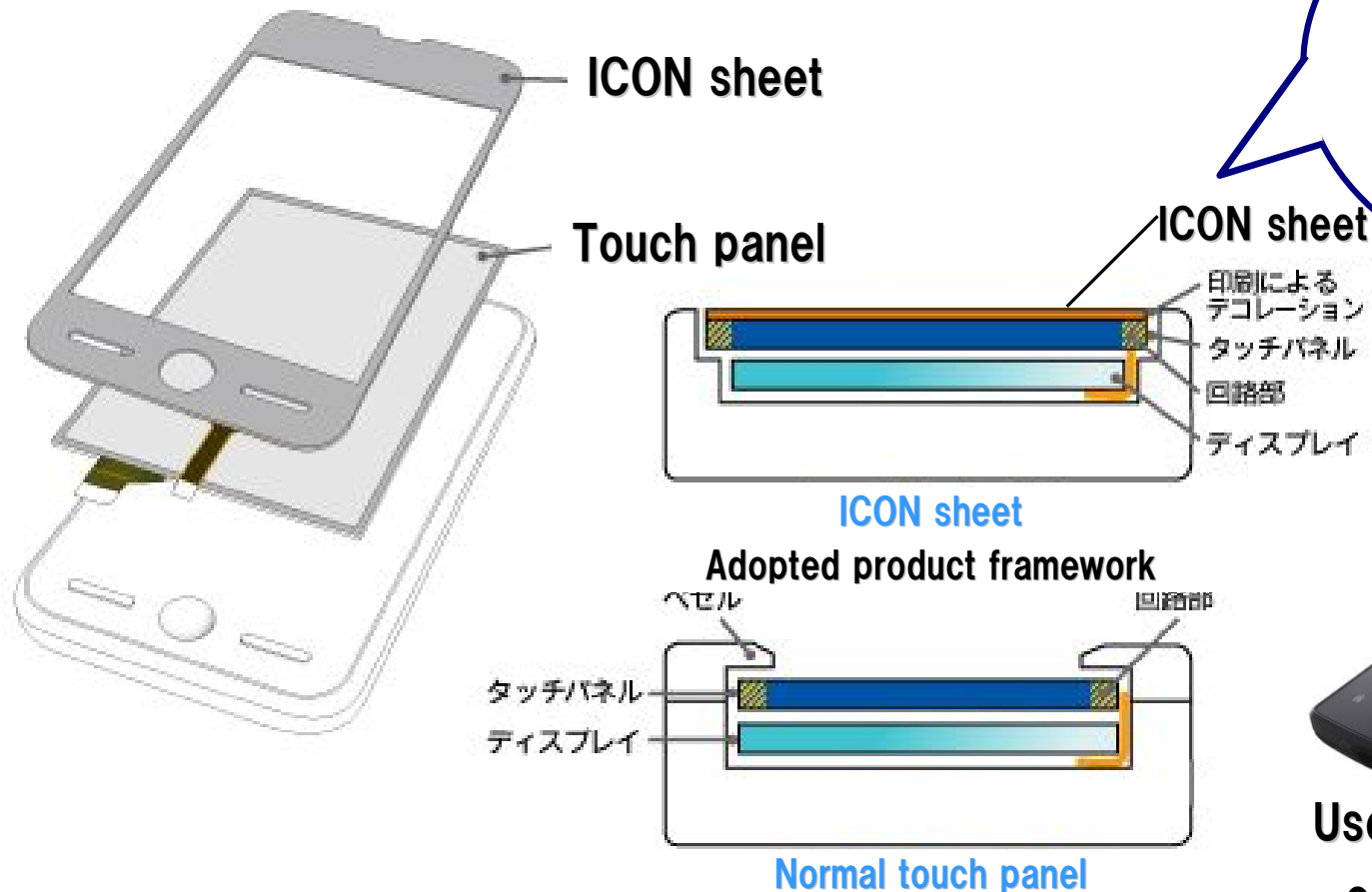
## Process of IML



# 2. ICON Sheet Application

## ◆ Window decorative film for touch panel

### ICON sheet framework

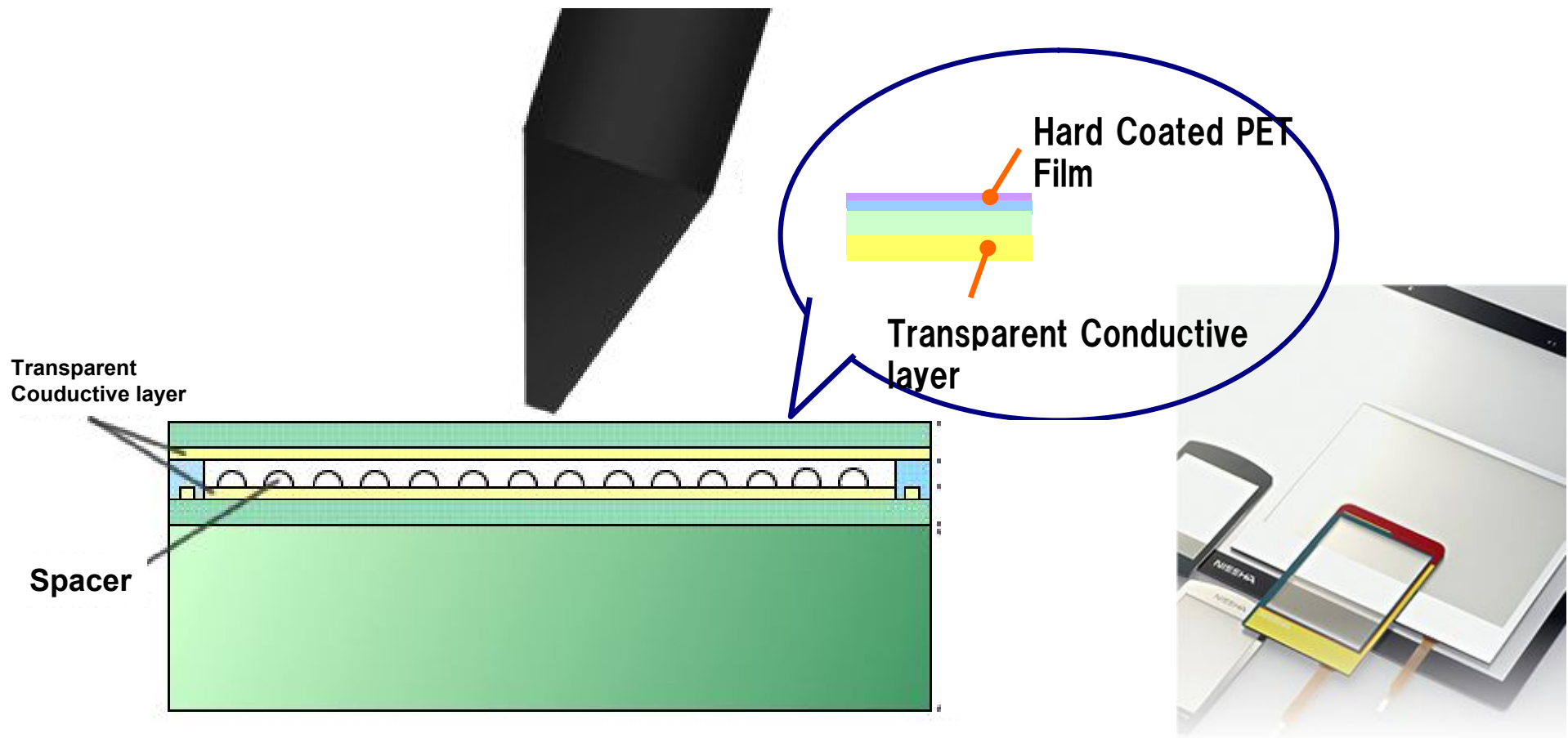


Used for SMARTPHONE  
or something.

# 3. ITO Electrode

◆ Base film of ITO sputtering for Touch Sensor.

Basic Structure of touch sensor



# Anti Blocking type “SHB-X2” Data sheet

- Feature**
1. High Pencil hardness (~3H)
  2. Anti finger print (difficult to see + easy wiping)
  3. Anti Blocking

	SHB		SHB-X2	
	Top Face	Back Face	Top Face	Back Face
Pencil hardness ※1	3H	3H	3H	H
Steel Wool test ※2	A-B	C	A-B	C
Total Light transmittance	91.0%		91.0%	
Haze	0.5%		0.5%	
Adhesion test	○	○	○	○
Anti Finger Print (Difficult to see)	△	—	○	—
Anti Finger Print (Easy Wiping)	○	—	◎	—
Anti Blocking (Frictional Coefficient)	-	0.8	-	0.4

※1 Pencil Hardness : 750g Load. Counting the scratch after 5 times rubbing.

When scratch < 2 or less, the hardness is that pencil hardness.

※2 Steel wool test : 800g Load. Counting the scratch after 20 times rubbing.

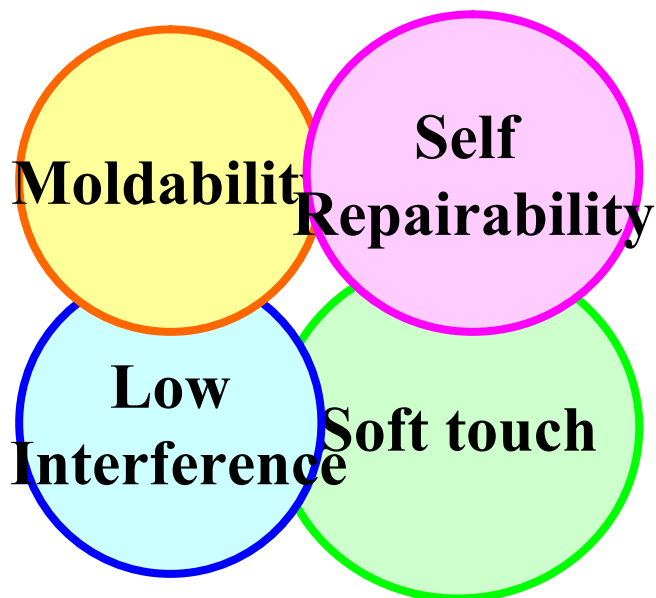
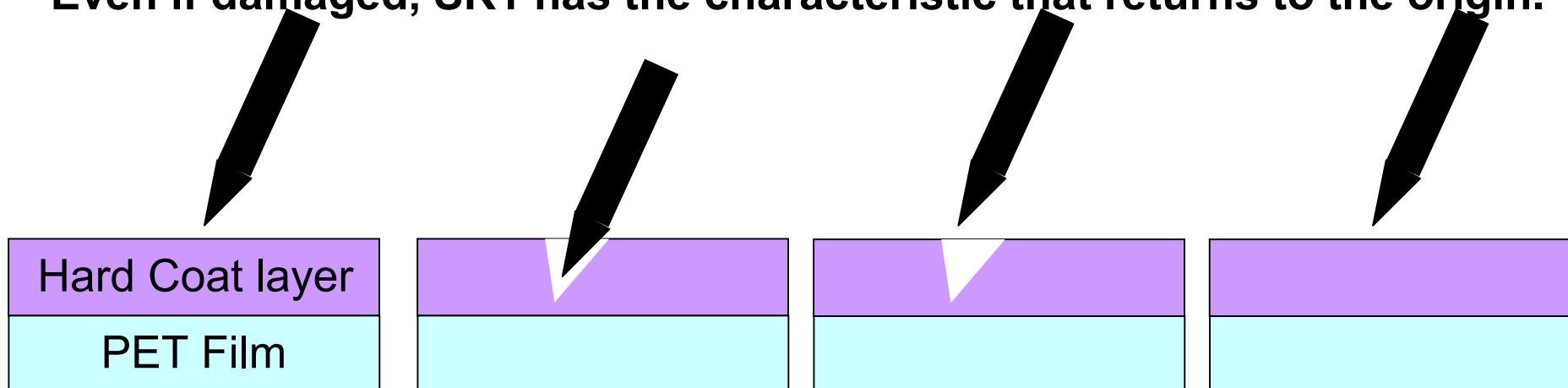
A:No scratch B:1-5scratches C:6-10 scratches D:11-20scratches E:21- scratches

※Above datas are representative, not guaranteed.



# Self Repairing coating "SR1"

Even if damaged, SR1 has the characteristic that returns to the origin.



## 【View of Self Repairing】

(High Speed Video image: 1/5 play speed)



# Self Repairing coating “SR1” Datasheet

property	THD	THS	TSS	SR1
	Hard type	Elongation type	Super Elongation Type	Self Repairing
Pencil hardness * 1	2H	H	F-H	HB-F
Total light transmittance * 2	90%<	90%<	90%<	90%<
Haze * 2	<1.0%	<1.0%	<1.0%	<1.0%
Elongation * 3	3%	15%	35%	35%<
Adhesion * 4	OK	OK	OK	OK
Self repair * 5	—	—	—	Self repair

※Above Dates are representative, not guaranteed.

## 【Evaluation Method】

\* 1 JIS K5600-5-4

\* 2 JIS K7136

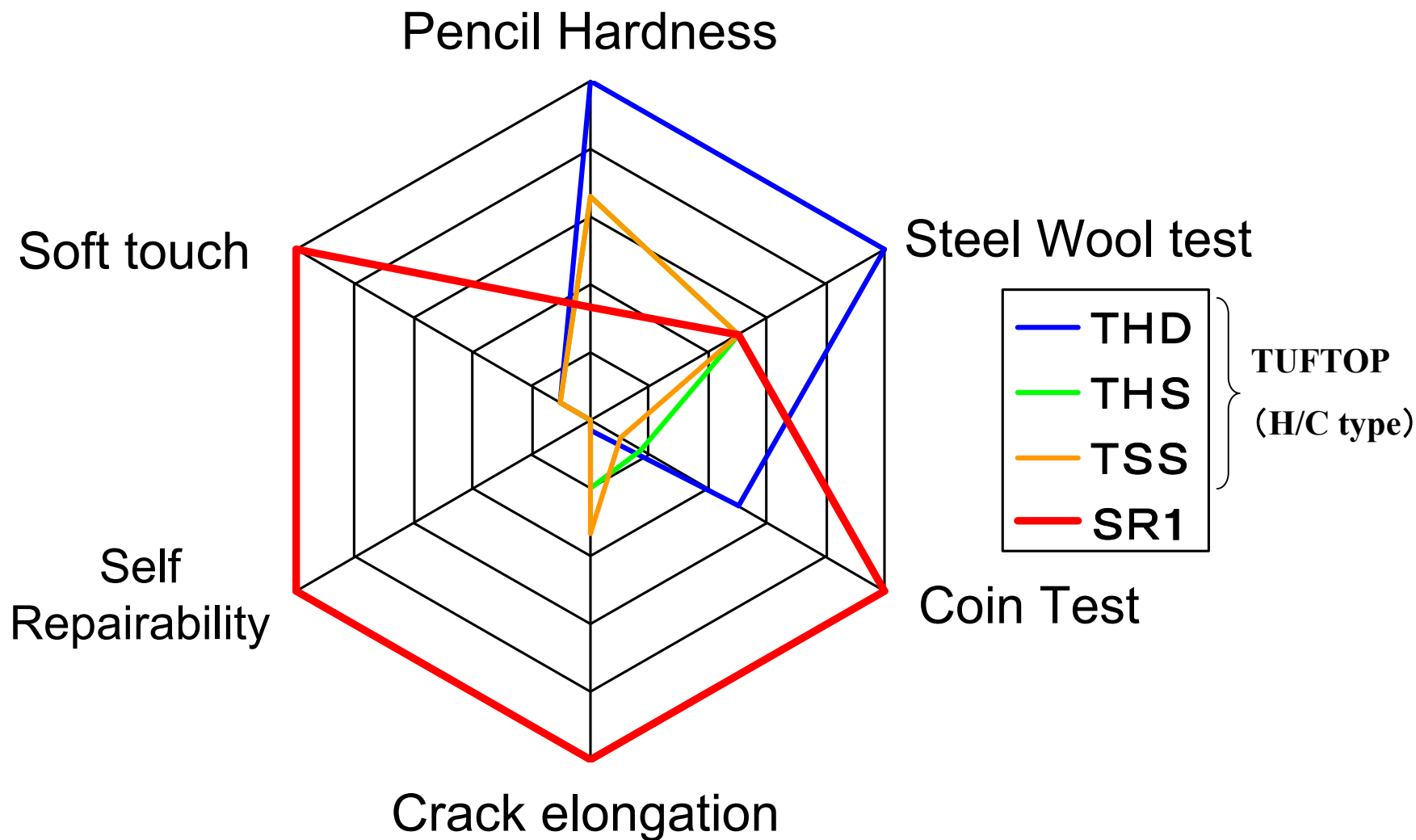
\* 3 TAFmethod using the sample 10mmX100mm.

Confirming the elongation rate when the crack happen on HC.

\* 4 JIS K5600-5-6

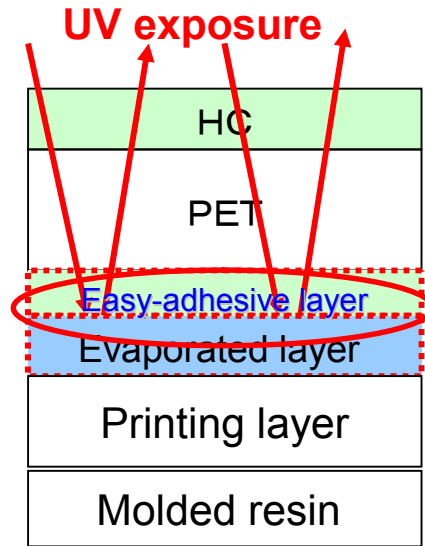
\* 5 JIS K5600 After rubbing(750g, HB pencil) confirm whether or not the scratch repair

# Self Repairing coating “SR1” Feature



# New Product: Anti-UV type

## Normal type



UV cutting  
Hard coat!

UV damage



## Anti-UV type

