

# **ELCRO CO.,LTD**

**– Hook & Loop Fastening Systems for Seat Assembly –**



# Introduction



## Company Address

39-1, Hwalcheonsaneop-ro, Duseo-myeon, Ulju-gun, Ulsan



## Company Overview

Date of Est.: February 2017

Main Products: Fastener (Hook & Loop)

Key Clients: Hyundai Transys, Hyundai Industrial, FORD, etc.

Phone No.: 052-264-9104~5

CEO: Sang Hee Lee





# History

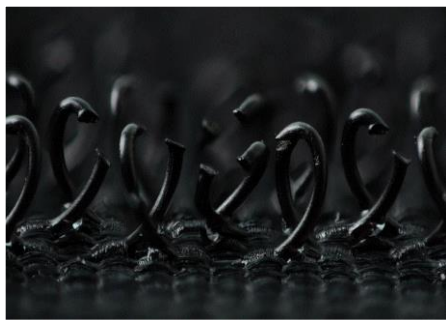
- Feb. 2017    Developed the widest domestic production method for Mushroom Hook (1440mm)
- Apr. 2017    Supply contract with Beijing DAS
- Aug. 2019    Supply contract with Ford & Changsung Motors
- Aug. 2022    Patent application for the Twin Lock manufacturing method
- June 2024    Obtained ISO 9001:2015 Quality Management Certification
- Oct. 2024    Installation of artificial turf applying Mushroom Hook &  
Development of composite waterproofing method
- Jan. 2025    Completed development of Twin Lock  
(Velcro that combines without distinguishing male and female)
- July 2025    Supply contract for Twin Lock in China & India



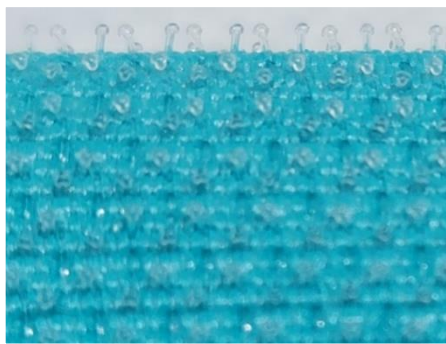


# Main Products

## Textile Hook



TYPE: J SHAPE

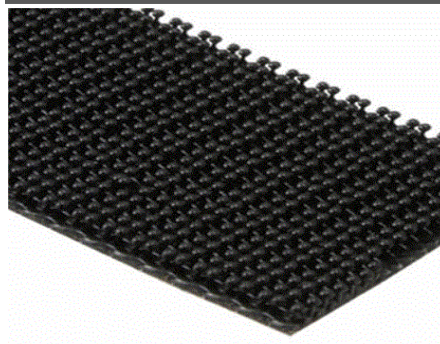


TYPE: MUSHROOM

## Plastic Hook



TYPE: T SHAPE

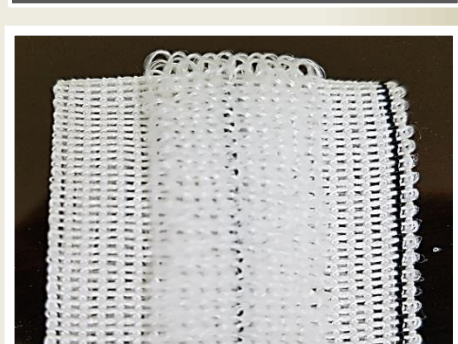


TYPE: TWIN-LOCK

## Textile Loop



TYPE: TEXTILE LOOP



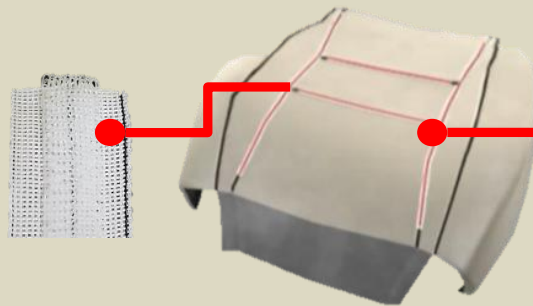
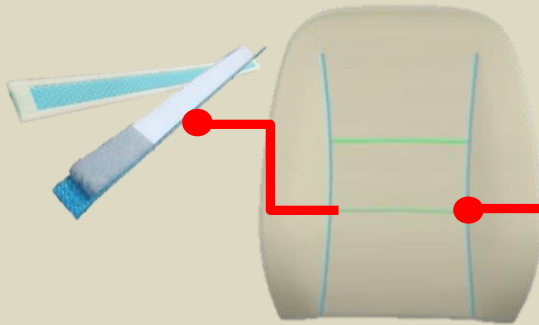
TYPE: AUTOMOTIVE LOOP



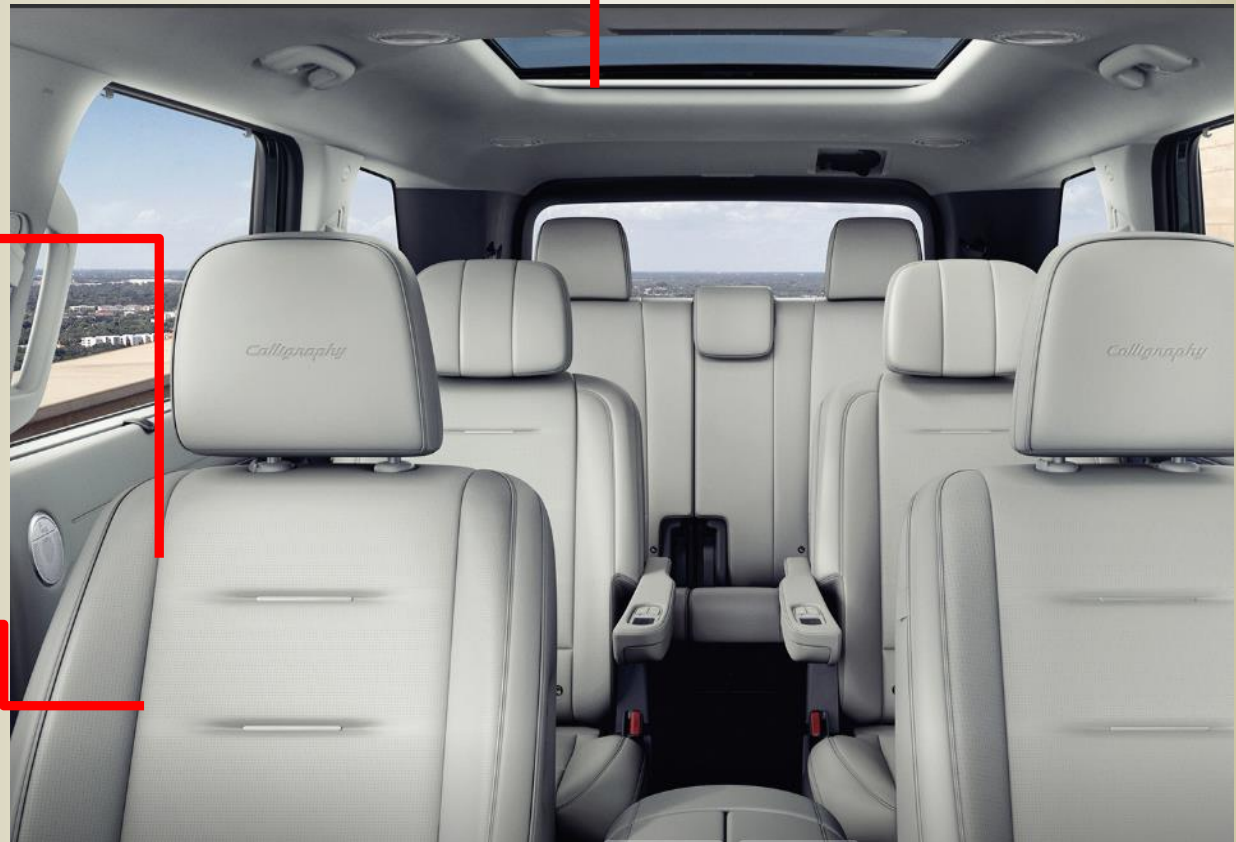
# Main Products

Automotive  
Interior Materials

HOOK & LOOP



TWIN-LOCK



# Application Status



Palisade



Grandbird



Santafe



Ranger



Staria



Tucson



FX series



Avante



Explorer

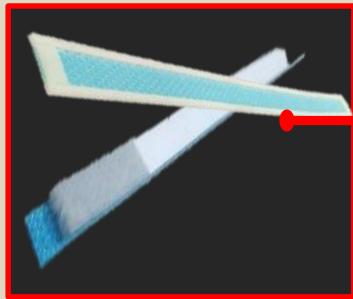


Creta



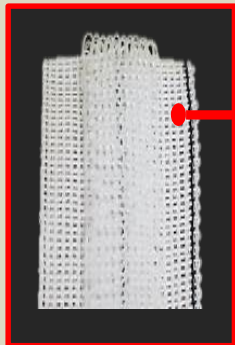
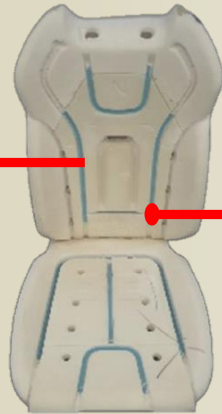


# HOOK & LOOP



HOOK

SEAT PAD



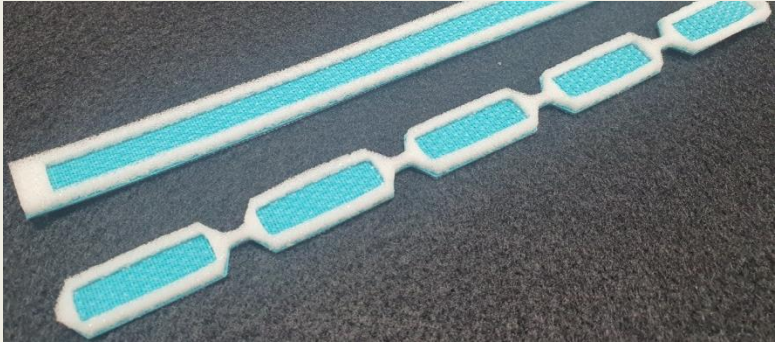
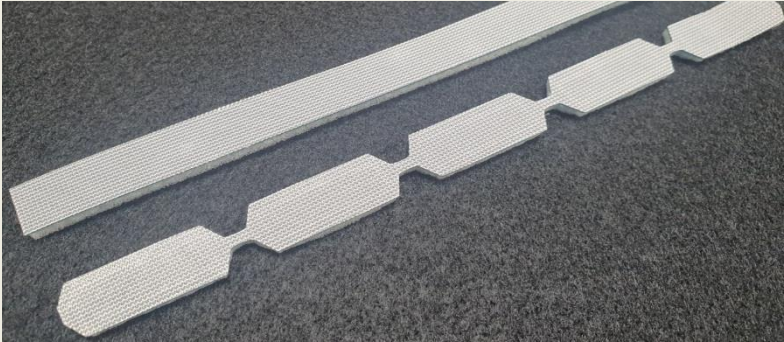
LOOP

SEAT COVER

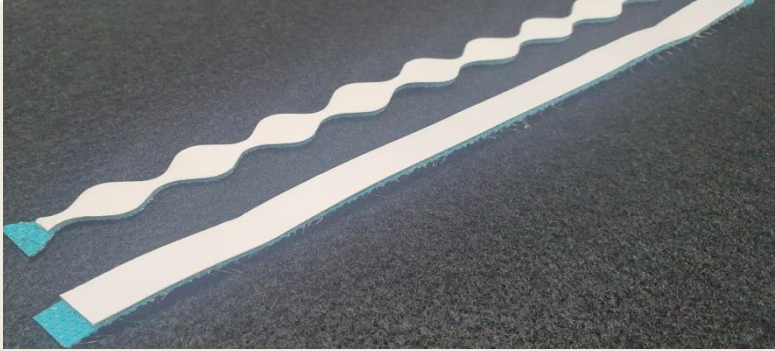
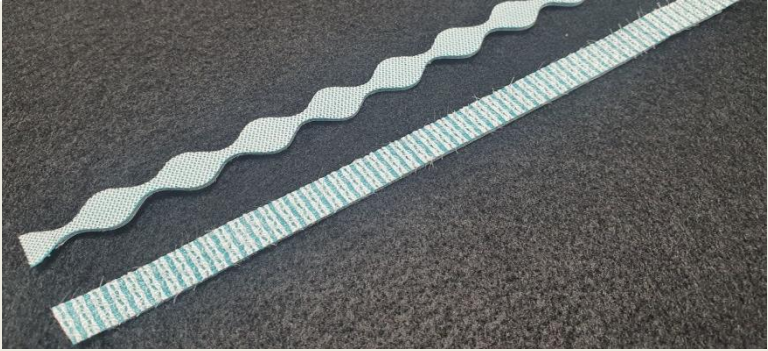


# 01. HOOK Product Composition (Non-Cover Hook)

| Classification      |                 | Content                |                          |
|---------------------|-----------------|------------------------|--------------------------|
| Composition         |                 | HOOK                   | POLYPROPYLENE (MUSHROOM) |
|                     |                 |                        | POLYESTER (BASE)         |
|                     |                 |                        | PET FILM                 |
|                     |                 |                        | FE POWDER                |
|                     |                 |                        | POLYESTER (MESH)         |
| Thickness           |                 | 4.5mm±0.1mm            |                          |
| Tolerance           |                 | ±0.1mm (LENGTH, WIDTH) |                          |
| Separation Strength | HOOK & LOOP     | 15±3 KGF               | (standard : 100mm)       |
|                     | HOOK & SEAT PAD | 22±3 KGF               | (standard : 100mm)       |

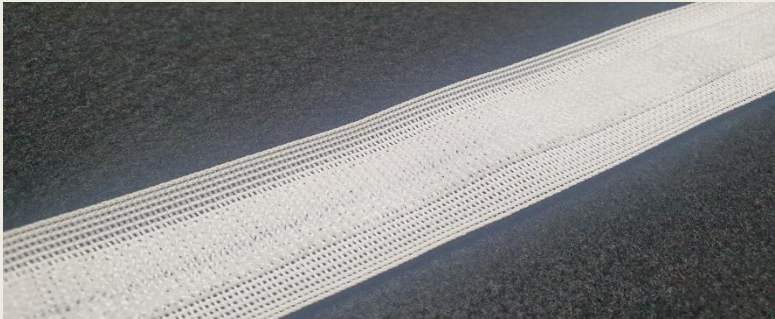
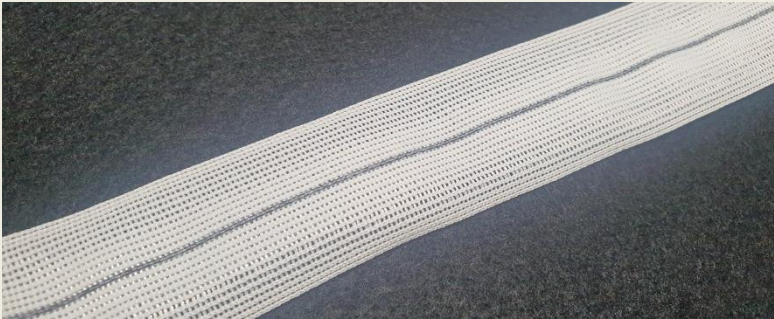
| Shape | Front                                                                               | Back Side                                                                            |
|-------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|       |  |  |

## 02. HOOK Product Composition (COVER HOOK)

| Classification      |                                                                                     | Content                     |                                                                                      |
|---------------------|-------------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------|
| Composition         |                                                                                     | HOOK                        | POLYPROPYLENE (MUSHROOM)                                                             |
|                     |                                                                                     |                             | POLYESTER (BASE)                                                                     |
|                     |                                                                                     |                             | NYLON LOOP                                                                           |
|                     |                                                                                     | COVER                       | PAPER (BASE)                                                                         |
|                     |                                                                                     |                             | FE POWDER                                                                            |
|                     |                                                                                     |                             | NYLON (LYLEX)                                                                        |
| Thickness           |                                                                                     | 4.5mm±0.1mm                 |                                                                                      |
| Tolerance           |                                                                                     | ±0.1mm (LENGTH, WIDTH)      |                                                                                      |
| Separation Strength | HOOK & LOOP                                                                         | 15±3 KGF (standard : 100mm) |                                                                                      |
|                     | HOOK & SEAT PAD                                                                     | 22±3 KGF (standard : 100mm) |                                                                                      |
| Shape               | Front                                                                               |                             | Back Side                                                                            |
|                     |  |                             |  |

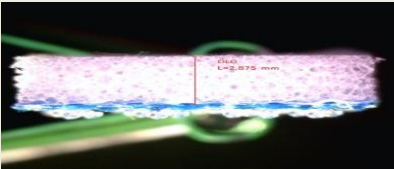
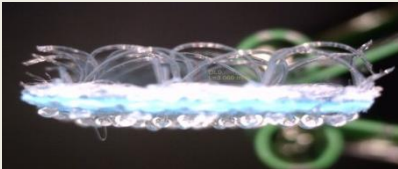
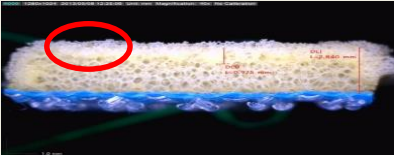
# 03. LOOP Product Composition

| P/NAME              | LOOP                                              |
|---------------------|---------------------------------------------------|
| Material            | Polyester (Phosphorus-Based Flame Retardant Yarn) |
| Product Thickness   | 3.2mm±0.1mm                                       |
| Product Width       | 40mm / 38mm / 36mm 外                              |
| Separation Strength | 15Kgf±2Kgf<br><div>(standard : 100mm)</div>       |

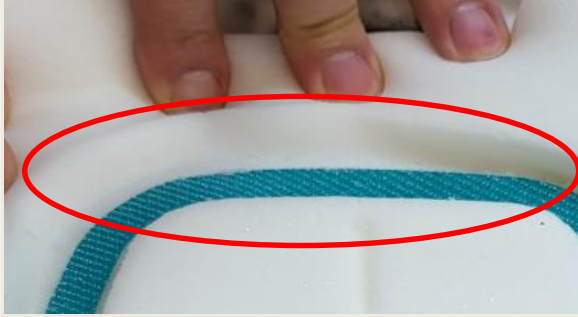
| Shape | Front Side                                                                           | Back Side                                                                             |
|-------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|       |  |  |

# 04. HOOK Product Quality Comparison

#.01

| Advantages                                                                                         | Before / After Foaming | Competitor Products                                                                | ELCRO                                                                               |
|----------------------------------------------------------------------------------------------------|------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| HOOK & SEAT PAD Integration                                                                        | Before Foaming         |  |  |
|                                                                                                    | After Foaming          |  |  |
| HOOK & SEAT PAD approximately 35 mm integration (Existing products: approximately 1 mm integrated) |                        |                                                                                    |                                                                                     |

#.02

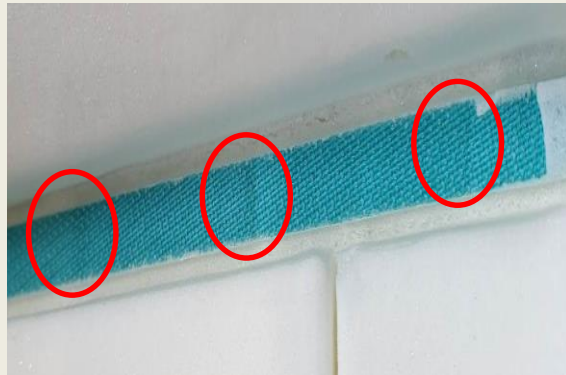
| Advantages                                                                   | Competitor Products                                                                 | ELCRO                                                                                |
|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Unformed (Void) Prevention Effect                                            |  |  |
| The effect of the HOOK rear NYLON LOOP significantly reduces foaming defects |                                                                                     |                                                                                      |

# 04-1. HOOK Product Quality Comparison

#.03

| Advantages                                                                                                                | Competitor Products                                                                | ELCRO                                                                               |
|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| HOOK and the Rear of HOOK Integration                                                                                     |  |  |
| Integrated with strong adhesion of HOOK & the rear of HOOK (Existing products: Separation occurs when removing the cover) |                                                                                    |                                                                                     |

#.04

| Advantages                                                                       | Competitor Products                                                                 | ELCRO                                                                                |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Occurrence of HOOK Wrinkles                                                      |  |  |
| No wrinkles in HOOK (Wrinkles in HOOK cause wrinkles during seat cover assembly) |                                                                                     |                                                                                      |

## 05. HOOK Separation Strength

Unit : Kgf

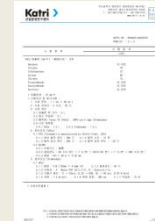
### 1. HOOK & LOOP

| Standard                                                                   | Test Method                                                                       | Result | Note |
|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------|------|
| Width10mm X Length100mm<br>Vertical separation as measured by<br>P/P Gauge |  | 17     |      |

### 2. HOOK & PAD

| Standard                                                                   | Test Method                                                                        | Result | Note |
|----------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------|------|
| Width10mm X Length100mm<br>Vertical separation as measured by<br>P/P Gauge |  | 23     |      |

## 06. HOOK Reliability Test

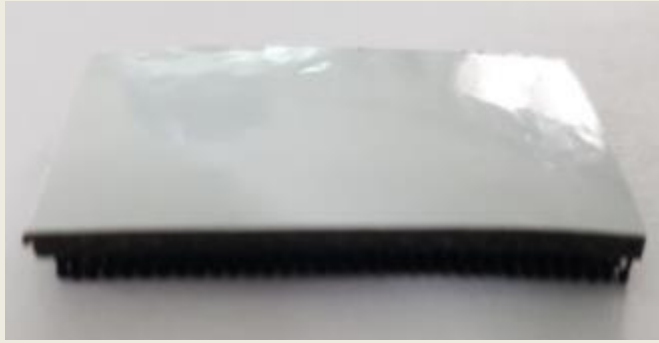
| NO | Test Title                  | Test Standard | Testing Requirements                 | Test Certificate                                                                      | Test Results |
|----|-----------------------------|---------------|--------------------------------------|---------------------------------------------------------------------------------------|--------------|
| 1  | Inflammability of Interiors | MS 300-08     | Burn Velocity<br>80mm/min below      |    | Approved     |
| 2  | Smell of Interiors          | MS 300-34     | 3 grade over                         |    | Approved     |
| 3  | Volatile Organic Compounds  | MS 300-55     | TVOC – 2ppm less<br>HCHO – 2ppm less |   | Approved     |
| 4  | Regulate Heavy Meta         | MS 201-02     | Pb, Hg, Cd, Cr6+<br>No Detected      |  | Approved     |

MS: HYUNDAI-KIA Motors Engineering Standard  
(Consistent with the motor safety standards in North America and Europe)

# **Twin Lock**



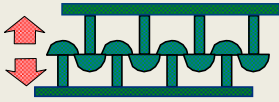
# 01. TWIN LOCK Product Specification Sheet

| Product Name       |                                                                                     | TWIN LOCK                  |                                                                                       |      |
|--------------------|-------------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------|------|
| Composition Layer  | A                                                                                   | PORYLOLEFINE               |                                                                                       |      |
|                    | B                                                                                   | ACRYLIC FOAM               |                                                                                       |      |
|                    | C                                                                                   | ACRYLIC RESIN (Adhesive)   |                                                                                       |      |
|                    | D                                                                                   | Tape Cover (Release Paper) |                                                                                       |      |
| Color              | BLACK                                                                               |                            |                                                                                       |      |
| Thickness          | 3.6mm±0.2mm                                                                         |                            |                                                                                       |      |
| Combined Thickness | 5.6mm±0.3mm                                                                         |                            |                                                                                       |      |
| No. of Protrusions | 400 (Horizontal: 20 stems, Vertical: 20 stems)                                      |                            |                                                                                       |      |
| Reliability Test   | Flame Retardancy                                                                    |                            | 54mm/min                                                                              | Pass |
|                    | Combustibility                                                                      |                            | Grade 1.5                                                                             | Pass |
|                    | Prohibition and Reporting of Hazardous Substances                                   |                            | Not Detected                                                                          | Pass |
| Tensile Strength   | 20KGF ~ 28KGF<br>Standard: (25 mm × 25 mm)                                          |                            |                                                                                       |      |
| Classification     | Front                                                                               |                            | Back                                                                                  |      |
| Shape              |  |                            |  |      |

## 02. Twin Lock Separation Strength Test

### 1. #400 & #400

Unit : Kgf

| Standard                                                                                                                              | Test Method                                                                       | Result | #.1  | #.2  | #.3  | #.4  |
|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------|------|------|------|------|
| <p>Width 25mm X Length 25mm</p> <p>Instron 5582</p>  |  | 23°C   | 25.1 | 26.8 | 27.5 | 25.8 |
|                                                                                                                                       |                                                                                   | -30°C  | 33.2 | 32.4 | 35.5 | 33.7 |
|                                                                                                                                       |                                                                                   | 120°C  | 8.3  | 9.5  | 8.3  | 8.7  |

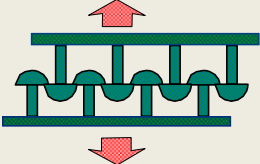
### 2. #400 & #250

Unit : Kgf

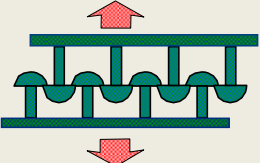
| Standard                                                                                                                                | Test Method                                                                        | Result | #.1  | #.2  | #.3  | #.4  |
|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------|------|------|------|------|
| <p>Width 25mm X Length 25mm</p> <p>Instron 5582</p>  |  | 23°C   | 20.8 | 18.4 | 19.5 | 20.2 |
|                                                                                                                                         |                                                                                    | -30°C  | 28.7 | 25.6 | 23.4 | 28.2 |
|                                                                                                                                         |                                                                                    | 120°C  | 7.4  | 7.6  | 7.1  | 7.7  |

# 03. Twin Lock & Primer Heat Resistance Test

## 1. #400 & #400

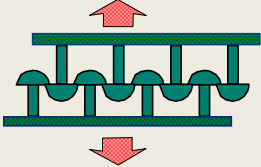
| Standard                                                                                                                                        | Test Method                                                                                                                                                                                                                                                                                                                | Test Method                                                                        | Result   |
|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------|
| <p>Width 25mm X Length 25mm</p> <p>HMC Test specification</p>  | <p>Test Method</p> <ol style="list-style-type: none"> <li>1. Chamber Temperature: 100°C (Oven)</li> <li>2. Weight: 1 kg SPCC Steel Plate &amp; 2 kg SPCC Steel Plate</li> <li>3. Specimen: RAIL (AL)</li> <li>4. Apply PRIMER (9960 BTX) and attach</li> <li>Test Conducted 1 Day Later</li> <li>5. 8-Hour Test</li> </ol> |  | APPROVED |
|                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                            |                                                                                    | APPROVED |
|                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                            |                                                                                    | APPROVED |

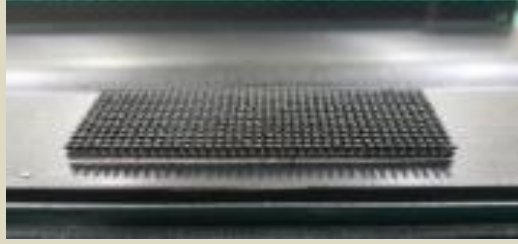
## 2. #400 & #250

| Standard                                                                                                                                          | Test Method                                                                                                                                                                                                                                                                                                                | Test Method                                                                         | Result   |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------|
| <p>Width 25mm X Length 25mm</p> <p>HMC Test specification</p>  | <p>Test Method</p> <ol style="list-style-type: none"> <li>1. Chamber Temperature: 100°C (Oven)</li> <li>2. Weight: 1 kg SPCC Steel Plate &amp; 2 kg SPCC Steel Plate</li> <li>3. Specimen: RAIL (AL)</li> <li>4. Apply PRIMER (9960 BTX) and attach</li> <li>Test Conducted 1 Day Later</li> <li>5. 8-Hour Test</li> </ol> |  | APPROVED |
|                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                            |                                                                                     | APPROVED |
|                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                            |                                                                                     | APPROVED |

## 04. TWIN LOCK & PRIMER 3-CYCLE Test

### 1. #400 & #250

| Standard                                                                                                                                | Test Method                                                                                                                                                                 | PRIMER  |          |
|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------|
| Width 25mm X Length 25mm<br>HMC Test specification<br> | Test Method<br>3-Cycle / 1-Cycle standard:<br>High temperature (120°C) for 8 hours<br>→ Low temperature (-40°C) for 8 hours<br>→ Room temperature (23°C/50% RH) for 8 hours | 520K    | APPROVED |
|                                                                                                                                         |                                                                                                                                                                             | 4298UV  | APPROVED |
|                                                                                                                                         |                                                                                                                                                                             | 9960BTX | APPROVED |

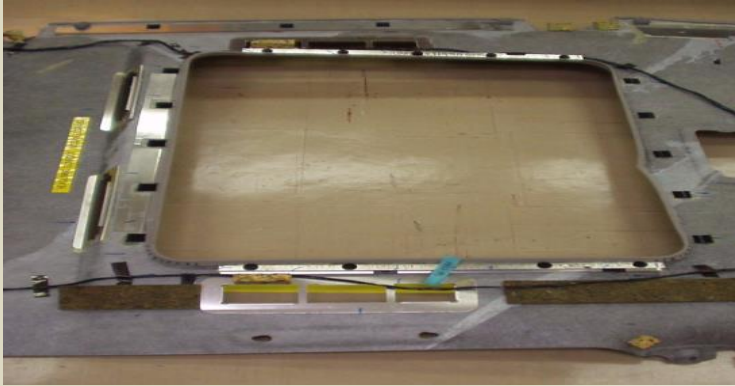
| Product | SIDE MOLDING                                                                       | SIDE MOLDING                                                                        | RAIL                                                                                 |
|---------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| PRIMER  | 520K                                                                               | 4298UV                                                                              | 9960BTX                                                                              |
| Photo   |  |  |  |
| Result  | PASS                                                                               | PASS                                                                                | PASS                                                                                 |

# 05. TWIN LOCK Quality Certification

| NO | Test Title                                 | Test Standards | Test Requirements                     | Test Certificate                                                                     | Remarks |
|----|--------------------------------------------|----------------|---------------------------------------|--------------------------------------------------------------------------------------|---------|
| 1  | Combustibility of Interior Materials       | MS 300-08      | Combustion Speed<br>80 mm/min or Less |   | Pass    |
| 2  | Odor of Interior Materials                 | MS 300-34      | Grade 3 or Higher                     |   | Pass    |
| 3  | Harmful Substances Prohibition & Reporting | MS 201-02      |                                       |  | Pass    |

MS: Hyundai & Kia Motors Technical Standards  
(Compliant with North American and European  
Automotive Safety Standards)

## 06. TWIN LOCK Application Status



•SUNROOF & H/LINNER

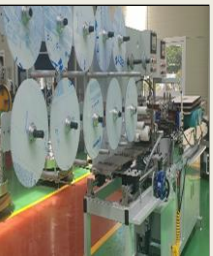
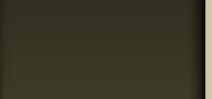
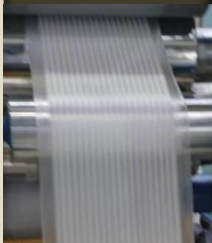
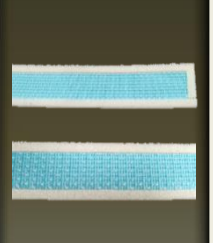
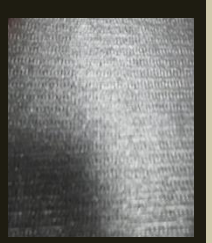


QTR GLASS



DOOR TRIM

# Equipment Status

| Thermoforming Machine                                                            | Slitting Machine                                                                  | Lamination / Die Cutting Machine                                                  | Extrusion Coating Machine                                                         | Non-Cover Machine #1                                                               | Non-Cover Machine #2                                                                | Double Forming Machine                                                              | Six-Fold Forming Machine                                                            |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| MUSHROOM Forming Equipment                                                       | Fabric Specifications Cutting Equipment                                           | Finished Product Specifications Cutting                                           | Film / Fabric Extrusion Coating Equipment                                         | Non-Cover Production Equipment                                                     | Non-Cover Production Equipment                                                      | Twin-Lock Molding Equipment                                                         | Twin-Lock Post-Processing Equipment                                                 |

**Thank You.**