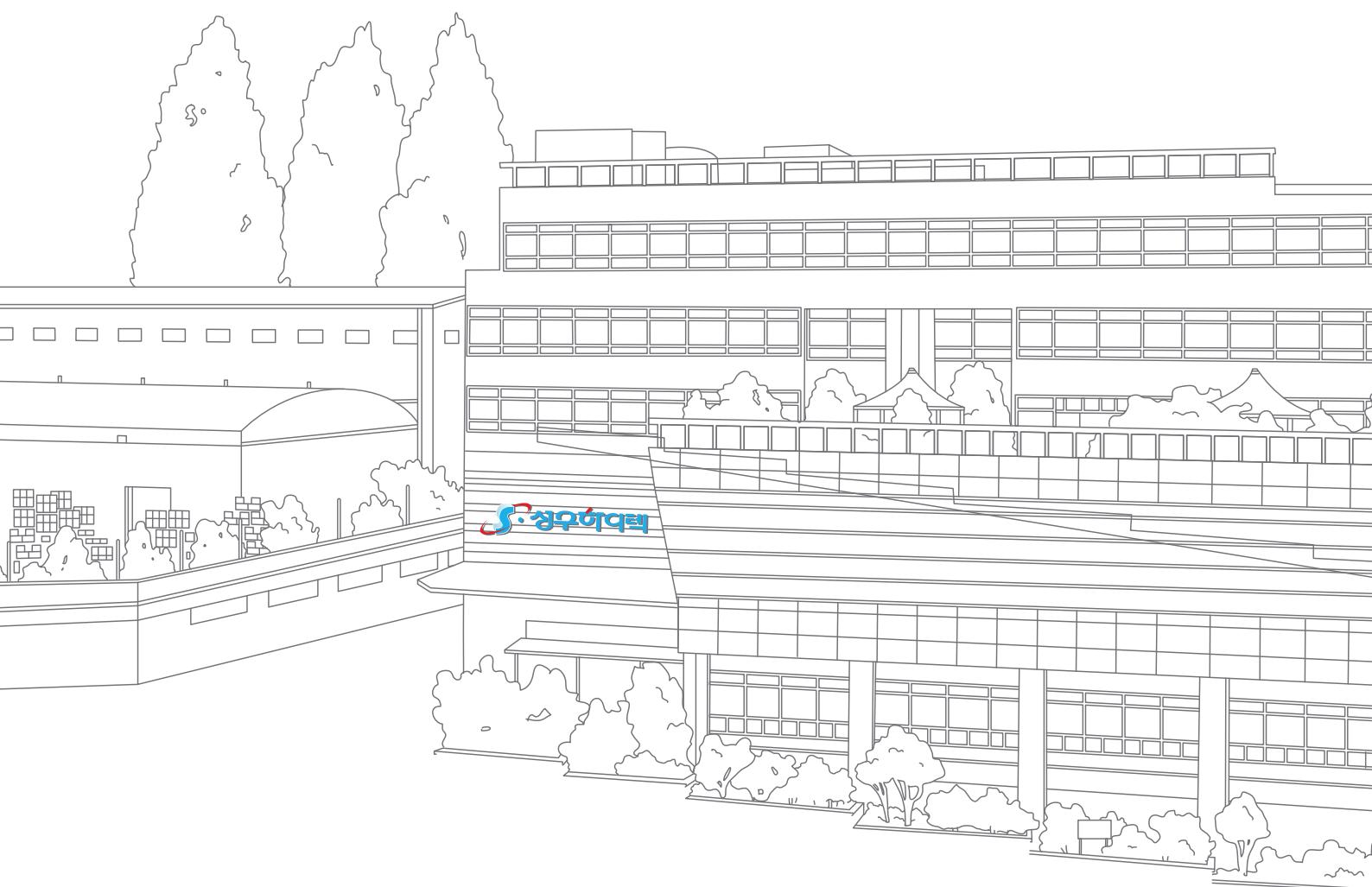


SUNGWOO HITECH

# GENERAL INFORMATION



## CEO Greetings

### 믿음과 신뢰가 바탕이 된 기업으로 글로벌 자동차 부품산업에 이바지할 것입니다

Sungwoo Hitech based on trust  
and confidence will continue to  
contribute to the global automobile  
components industry.

1977년도 창사 이래 저희 성우하이텍은 축적된 기술력과 품질에 대한 확신을 바탕으로 한국 자동차 부품업계의 선두업체로서의 입지를 구축해왔음을 자부하고 있으며, 무한경쟁의 시대에서 최고의 가치는 '진보된 기술력'과 '품질에 대한 확신'에 근거한다는 믿음으로 성우가 만드는 모든 제품에 자부심을 담고 있습니다.

불량률 제로에 도전하는 품질 경영시스템 운영, 혁신적인 신기술 개발을 위한 지속적인 연구개발·투자, 믿음과 신뢰가 바탕이 되어 무분규 사업장으로서의 새로운 노사문화를 열어가는 신노사문화의 구축, 이 모든 노력을 통한 경쟁력 있는 고부가가치의 제품 생산으로 세계 초일류 기업으로의 도약을 준비하고 있으며, 나아가 글로벌 자동차 부품산업의 발전에 이바지할 것을 약속드립니다.

회장 이명근



Sungwoo Hitech has proudly cultivated its position as a leader in the Korean automobile components industry on the basis of confidence in accumulated technology and high-quality since its foundation in 1977. In the era of infinite competition, we believe that ‘advanced technology’ and ‘confidence in quality’ are the best values hence Sungwoo Hitech presents all of our products with confidence.

We aim to become a global leader by manufacturing competitive, high value-added products through a diverse variety of efforts, such as the operation of a quality management system challenging for zero-defects, continuous R&D and investment on innovative new technology development, and the establishment of a new labor-management culture that supports zero-labor disputes based on trust and confidence. Furthermore, we promise you that we will continue to contribute to the development of the global automobile components industry.

CEO Lee Myung-geun

---

## Domestic Business

1989



정관공장(부산 기장군 정관읍)  
Jeonggwan Factory (Busan, Gijang-gun)

Site (m<sup>2</sup>) 11,164  
Building (m<sup>2</sup>) 16,429

1990



금형공장(경남 양산시 소주동)  
Stamping Mold Factory(Sojugongdan, Yangsan-si, Gyeongsangnam-do)

Site (m<sup>2</sup>) 22,832  
Building (m<sup>2</sup>) 17,864

1994



R&D센터(경남 양산시 소주동)  
R&D Center (Sojugongdan, Yangsan-si, Gyeongsangnam-do)

Site (m<sup>2</sup>) 13,990  
Building (m<sup>2</sup>) 13,034

1995



아산성우하이텍(충남 아산시 신창면)  
Asan Sungwoo Hitech (Sinchang-myeon, Asan-si, Chungcheongnam-do)

Site (m<sup>2</sup>) 130,934  
Building (m<sup>2</sup>) 52,548

1997



코일센터(부산 기장군 장안읍)  
Coil Center (Jangansan-ro, Gijang-gun, Busan)

Site (m<sup>2</sup>) 32,657  
Building (m<sup>2</sup>) 25,170

2001



서창공장(경남 양산시 소주동)  
Seochang Factory (Sojugongdan, Yangsan-si, Gyeongsangnam-do)

Site (m<sup>2</sup>) 66,669  
Building (m<sup>2</sup>) 96,663

2007



지사공장(부산 강서구 지사동)  
Jisa Factory (Gwahaksan-dan, Gangseo-gu, Busan)

Site (m<sup>2</sup>) 22,896  
Building (m<sup>2</sup>) 27,323

2008



핫스탬핑(경북 경주시 건천읍)  
Samyoung Hot Stamping (Geoncheon-eup, Gyeongju-si, Gyeongsangbuk-do)

Site (m<sup>2</sup>) 21,214  
Building (m<sup>2</sup>) 19,305

2010



수원 R&D센터(경기도 수원시 권선구)  
Suwon R&D Center (Gwonseon-gu, Suwon-si, Gyeonggi-do)

Site (m<sup>2</sup>)  
Building (m<sup>2</sup>)

2012



삼영공업(대구 달서구 성서로)  
Samyoung Industry (Seongseo-ro, Dalseo-gu, Daegu)

Site (m<sup>2</sup>) 6,594  
Building (m<sup>2</sup>) 4,869

2021



아산EV공장  
Asan EV Factory (Seonjangmyeon, Asan-si, Chungcheongnam-do)

Site (m<sup>2</sup>) 31,658  
Building (m<sup>2</sup>) 31,809

## Overseas Business Sites

2002



**북경성우차과기유한공사**  
Beijing Sungwoo Che Hitech Co.,Ltd.  
Site (㎡) 146,993  
Building (㎡) 107,980

2002



**성우과기(무석)유한공사**  
Sungwoo Hitech(WUXI) Co., Ltd.  
Site (㎡) 100,005  
Building (㎡) 35,518

2006



**성우과기차부건(염성)유한공사**  
Sungwoo Hitech Automobile Components Co.,Ltd(Yanbergl) Co.,Ltd  
Site (㎡) 178,659  
Building (㎡) 106,195

2008



**성우과기(심양)유한공사**  
Shenyang Sungwoo Automobile Components Co.,Ltd  
Site (㎡) 65,675  
Building (㎡) 29,742



2011



**연태성우기차부건유한공사**  
Yantai Sungwoo Automobile Components Co.,Ltd  
Site (㎡) 64,000  
Building (㎡) 24,037

2015



**창주성우기차부건유한공사**  
CangZhou Sungwoo Hitech Automobile Parts. Co.,Ltd  
Site (㎡) 173,706  
Building (㎡) 38,575

2015



**중경성우해특기차부건유한공사**  
ChongQing Sungwoo Hitech Automobile Parts. Co., Ltd  
Site (㎡) 153,247  
Building (㎡) 36,400

1997



**SHI(India)**  
Sungwoo Hitech India Limited  
Site (㎡) 60,106  
Building (㎡) 42,125

2010



**SSP(India)**  
Sungwoo Stamping Private Limited  
Site (㎡) 54,096  
Building (㎡) 27,808

2011



**UZ SUNGWO(Uzbekistan)**  
JV "UZSUNGWO" LLC  
Site (㎡) 66,116  
Building (㎡) 16,847

2005



**성우하이텍 s.r.o(Czech)**  
Sungwoo Hitech s.r.o  
Site (㎡) 163,168  
Building (㎡) 114,214

2006



**성우하이텍 슬로바키아 s.r.o**  
Sungwoo Hitech Slovakia s.r.o  
Site (㎡) 48,258  
Building (㎡) 31,213



2008



**성우하이텍 RUS (Russia)**  
Sungwoo Hitech RUS Limited Liability Company  
Site (㎡) 49,487  
Building (㎡) 11,269

2012



**WMU (Germany)**  
WMU GmbH&Co.KG  
Site (㎡) 121,364  
Building (㎡) 19,841

2014



**WMU Bavaria(Germany)**  
WMU Bavaria GmbH  
Site (㎡) 59,855  
Building (㎡) 14,512

2018



**성우하이텍 폴란드**  
Sungwoo Hitech Poland  
Site (㎡)  
Building (㎡) 16,334

2014



**성우하이텍 멕시코**  
Sungwoo Hitech Mexico S.A de C.V  
Site (㎡) 256,420  
Building (㎡) 134,175

2016



**성우하이텍 북미지점(Troy)**  
Sungwoo Hitech America

2021



**성우하이텍 미국법인**  
Sungwoo Hitech America Corp.  
Site (㎡) 161,874  
Building (㎡) 34,839



## Awards

2000. 06. 무재해 달성 대통령상 수상  
Awarded the Presidential Prize for Achieving the Target Record of Zero-Accidents
2007. 11. 제33회 국가품질경영대회 은탑산업훈장  
Silver Tower Order of Industrial Service Merit at the 33rd National Quality Management Convention
2010. 09. TRUE COMPANY 금상 수상  
Awarded Gold Prize at TRUE COMPANY
2012. 09. 노사문화대상 대통령상 수상  
Awarded the Presidential Prize at Best Labor-Management Culture Enterprise Award
2013. 11. 대한민국 일하기 좋은 100대 기업 본상 수상  
Awarded the prize at the Great Place to Work in Korea
2014. 01. 2013 현대자동차그룹 올해의 협력사 대상 수상(06년 올해의 협력사 수상)  
Awarded the Grand Prize of Hyundai-Kia Motor Group's Supplier of The Year, 2013 (Supplier of The Year, 2006)
2016. 03. 2015년도 고용창출 100대 우수기업 선정(고용노동부)  
Selected as the Top 100 Companies for Job Creation in 2015(Ministry of Employment and Labor)
2017. 04. 이달의 산업기술상(사업화 기술부문) 장관상 수상(산업통상자원부)  
Awarded Minister's Prize for Industrial Technology(Business Development Category) in this Month's Industry Prize(Ministry of Trade, Industry and Energy)
2017. 11. 2017 대한민국 기술대상 국무총리상 수상 (가변 롤 포밍 성형 공정)  
Awarded the Prime Minister's Prize at the 2017 Korean Technology (the Variable Roll Forming Process)
2017. 12. 5억불 수출의 탑 수상  
Awarded USD 500 Million Export Tower
2021. 01. 소부장(소재 부품 장비) 으뜸기업 선정 (부산 최초)  
Selected as a Leading Company in the Materials, Parts and Equipment (the first in Busan)
2022. 03. GM GLOBAL 올해의 협력사상 수상(11년간 수상)  
Awarded GM GLOBAL Supplier of the Year(for 11 Years)



대한민국 일하기 좋은  
100대 기업 본상  
Great Place to Work  
in Korea



노사문화대상 대통령상  
Best Labor-Management  
Culture Enterprise Award



국가품질경영대회 우수분임조상  
National Quality Management  
Convention Award

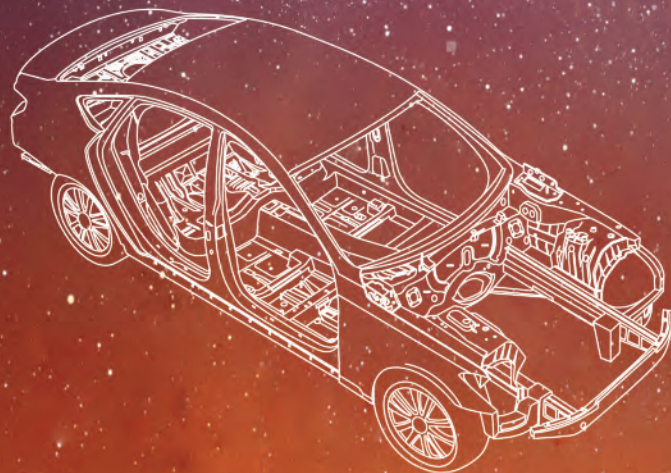


GM GLOBAL 올해의 협력사상  
GM GLOBAL  
Supplier of the year



고용창출 우수기업  
Selected as the company for  
Job Creation

**Thinking  
makes  
innovation**





<b>Seochang Factory</b>	50, Sojugongdan 3-gil, Yangsan-si, Gyeongsangnam-do, Korea
<b>R&amp;D Center</b>	18-2, Sojugongdan 6-gil, Yangsan-si, Gyeongsangnam-do, Korea
<b>Tooling Center</b>	30, Sojugongdan 7-gil, Yangsan-si, Gyeongsangnam-do, Korea
<b>Jeonggwan Factory</b>	2-9, Nonggong-gil, Jeonggwan-eup, Gijang-gun, Busan, Korea
<b>Coil Center</b>	151, Jangansandan-ro, Jangan-eup, Gijang-gun, Busan, Korea
<b>Jisa Factory</b>	31, Gwahaksandan 1-ro, 60beon-gil, Gangseo-gu, Busan, Korea
<b>Hot Stamping</b>	173-80, Yongmyeonggongdan-gil, Geoncheon-eup, Gyeongju-si, Gyeongsangbuk-do, Korea
<b>Asan Factory</b>	591, Seobunam-ro, Sinchang-myeon, Asan-si, Chungcheongnam-do, Korea



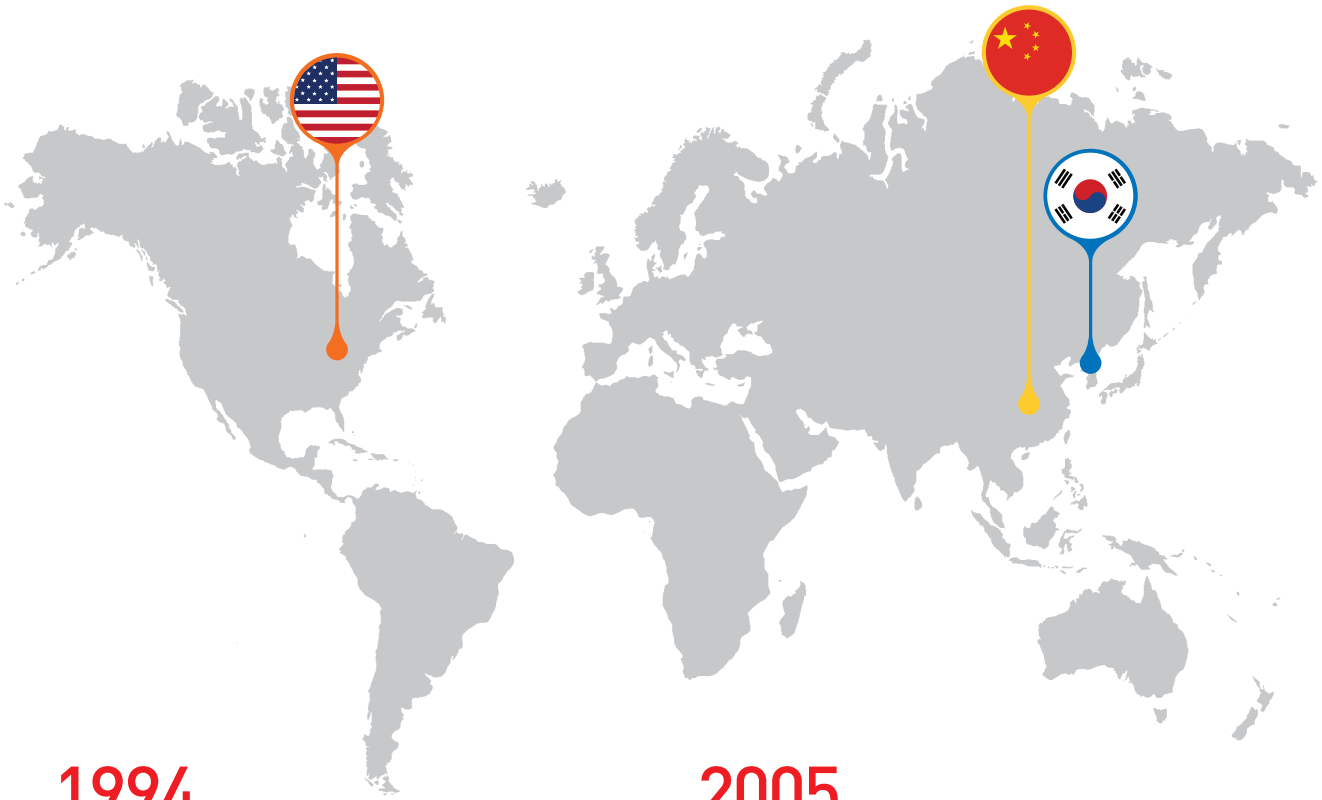


**SUNGWOO HITECH**

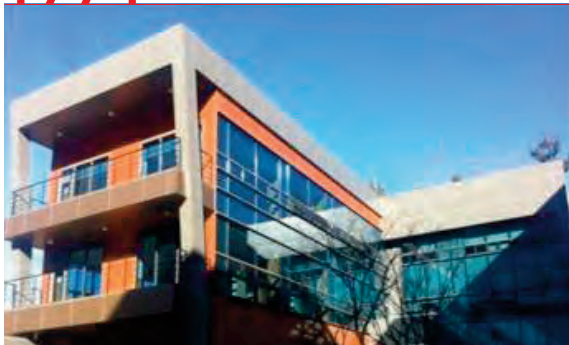
**R&D**

**BUSINESS SITES**

## Sungwoo Hitech R&D Center Status



1994



서창\_한국 (Head)  
Seochang\_Korea

2005



수원\_한국  
Suwon\_Korea

2012



무석\_중국  
Wuxi\_China

2016



트로이(디트로이트)\_미국  
Troy(Detroit)\_USA

## History

- 1994 기술연구소 설립 Established Technology Institute
- 1998 Roll-Forming Bumper 개발 Developed Roll-Forming Bumper
- 2000 TWB Laser Welding System 국산화 Localized the TWB Laser Welding System
- 2004 Laser Hybrid Welding 기술 개발 / RWS 기술 개발 Developed Laser Hybrid Welding Technology / Developed RWS Technology
- 2005 고강도 알루미늄 범퍼 개발 Developed the High Strength Aluminum Bumper
- 2006 알루미늄 프레임 바디 개발 Developed the Aluminum Frame Body
- 2008 다종소재 차체 개발 Developed the Hybrid Material Body Structure
- 2010 Hot Stamping 양산화 Commenced with Mass Production of Hot Stamping
- 2013 알루미늄 고진공 주조 속업소버 하우징 부품 양산(DH, F/APRON & FR S/MBR)  
Commenced with Mass Production of Aluminum High Level Vacuum Casting Shock Absorber Housing Components(DH, F/APRON & FR S/MBR)
- 2014 기술연구소 이전(부산시 정관면 → 양산시 소주동)  
Relocated the Technology Institution (Jeonggwan-myeon, Busan-si → Soju-dong, Yangsan-si)
- 2016 미국 트로이(디트로이트) 연구분소 설립 Established the Troy(Detroit) Branch Office Technical Institute, U.S.A.
- 2018 배터리 팩 개발 및 Body in white 조립 Battery pack development and body in white assembly
- 2019 Full Aluminum Door 개발 Developed of Full Aluminum Door

## Awards

- 1999 현대기아 자동차 기술 개발 우수상 수상(Roll Forming Bumper )  
Awarded Excellence Award in HKMC Automobile Technology Development (Roll Forming Bumper)
- 2000 국산 신기술 KT 마크 획득 Acquired KT(Korea Good Technology) Mark  
현대자동차 기술 개발 우수상 수상(TWB Laser Welding 기술)  
Awarded Excellence Award in HKMC Automobile Technology Development (TWB Laser Welding Technology)
- 2002 IR52 장영실상 수상(TWB Laser Welding 기술) Awarded IR52 Jang Young-shil Award (TWB Laser Welding Technology)
- 2003 부품 소재 기술상 수상(Roll Forming 기술) Awarded Parts and Materials Technology Prize (Roll Forming Technology)
- 2007 현대기아 자동차 '기술5스타' 획득 Achieved HKMC 'Technology 5-Star'
- 2012 현대기아 자동차 'R&D 우수 협력사' 수상 Awarded HKMC 'Excellent R&D Supplier'
- 2013 산업통상자원부 신기술 인증(AI S/ABS HSG)  
Acquired New Excellent Technology Certification by MOTIE (Ministry of Trade, Industry and Energy, AI S/ABS HSG)  
차세대 세계일류상품 인증(고인성 알루미늄 적용 차체)  
Certified as the Next World-Class Korean Products(Toughened Aluminum Body Structure)
- 2014 현대기아 자동차 협력사 R&D TECH FESTIVAL 우수협력사 수상  
Awarded Excellent Supplier at HKMC Suppliers R&D TECH FESTIVAL
- 2015 제50회 발명의 날 '산업포장' 수훈 Awarded 'Industrial Prize' at the 50<sup>th</sup> Invention Day
- 2017 산업통상자원부 '이달의 산업기술상' 수상 Awarded 'Industrial Technology of the Month' by MOTIE
- 2022 HKMC R&D Partners Tech Day, R&D 우수 협력사 수상 Awarded the "Excellent R&D Partner" in R&D Partners from HKMC

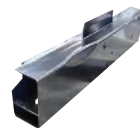
# Technology

## 다종소재 차체 부품 성형 Forming of multi-material body parts

다종 소재 및 신성형 공법을 적용하여 BW 차체 프레임과 클로저 파트를 개발  
Developed BIW body frame and closure parts by applying multi-materials and new forming process



< Die Casting >



< Extrusion >



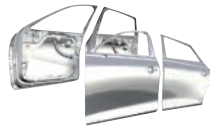
< Hot Stamping >



< CFRP Pultrusion, PCM, Hybrid Forming >



< Roll Forming >

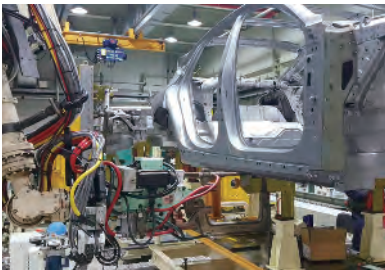


< Al, Mg Stamping >



## 경량 차체 BIW 조립 Lightweight BIW assembly

센터플로어와 BSA를 일체화한 다목적 기반 EV 언더바디 플랫폼 개발  
Development of a Purpose Built Vehicle based EV underbody platform that integrates the center floor and BSA(Battery System Assembly)



< Aluminum Laser >



< Laser >



< Self Piercing Rivet >



< Flow Drill Screw >



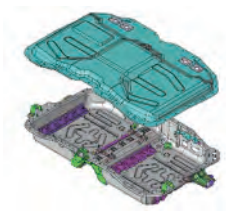
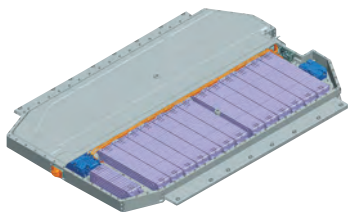
< Friction Stir Welding >



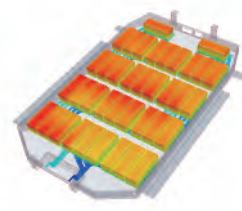
< Rivet Stud Bolt / Rivet Joining Nut >

**BPC, BSA 시스템 개발**  
Development of Battery Pack Case & Battery System Assembly

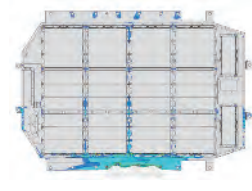
스틸, 알루미늄 소재를 적용한 배터리 케이스 개발 및 배터리 모듈, 전장 부품, 전력관리 시스템 개발  
Development of battery pack case technology applied to steel and aluminum materials, and battery modules, electrical components, and power management systems



〈 BPC 〉



〈 배터리 열관리 시스템 〉



〈 배터리 압축 시험 〉



〈 저항 용접 〉



〈 아크 용접 〉



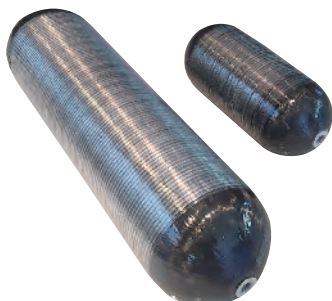
〈 레이저 용접 〉



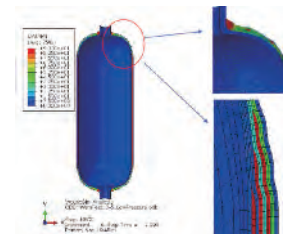
〈 기계적 접합 〉

**고압수소저장용기, 프레임 & 모듈**  
High Pressure Hydrogen Tank, Frame & Module

700bar 고압으로 수소를 저장하는 저장용기, 용기를 고정하기 위한 프레임 및 수소를 연료전지로 공급하기 위한 모듈 개발  
Development of hydrogen tank for storage 700bar high pressure hydrogen, Frame for fixing hydrogen tank and Module supplying hydrogen to fuel cell



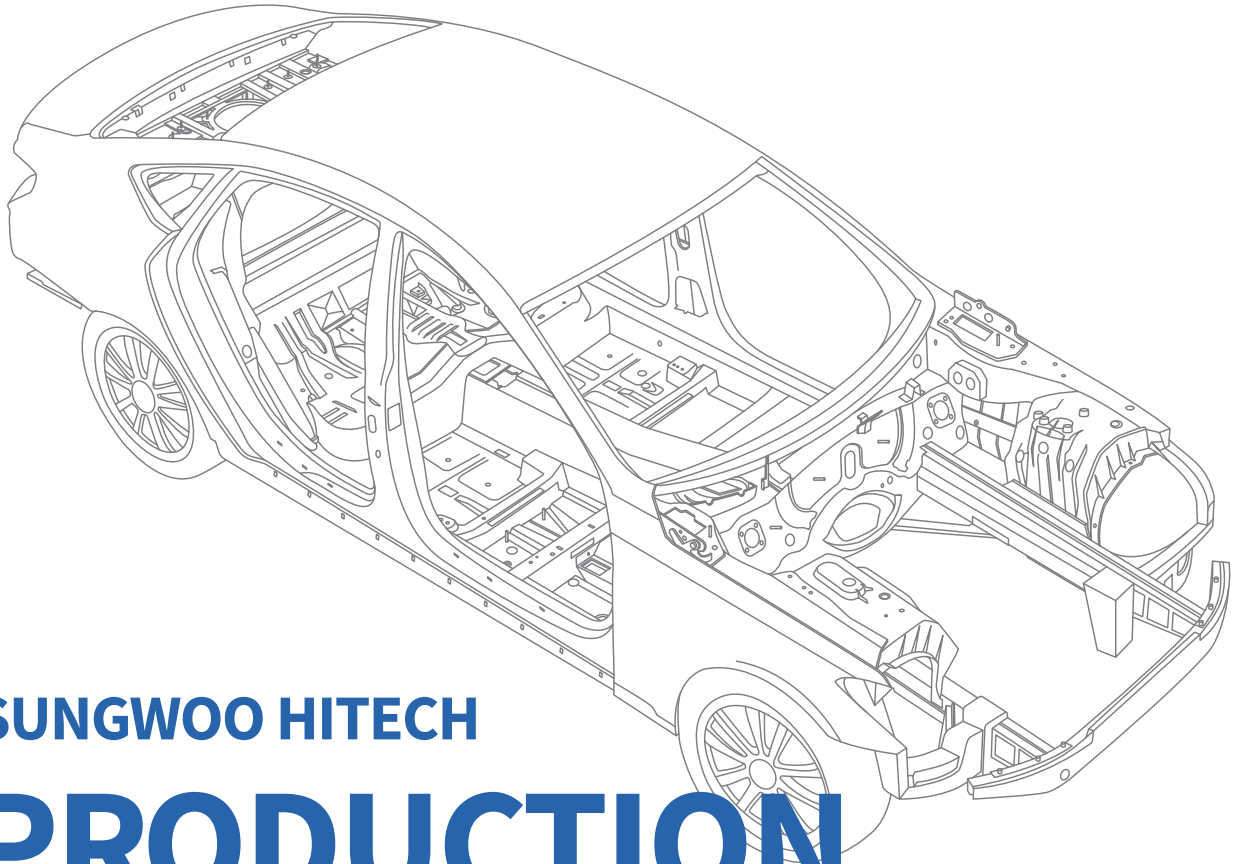
〈 용기 제작 〉



〈 프레임 & 모듈 제작 〉



Seochang Factory	50, Sojugongdan 3-gil, Yangsan-si, Gyeongsangnam-do, Korea
R&D Center	18-2, Sojugongdan 6-gil, Yangsan-si, Gyeongsangnam-do, Korea
Tooling Center	30, Sojugongdan 7-gil, Yangsan-si, Gyeongsangnam-do, Korea
Jeonggwan Factory	2-9, Nonggong-gil, Jeonggwan-eup, Gijang-gun, Busan, Korea
Coil Center	151, Jangansandan-ro, Jangan-eup, Gijang-gun, Busan, Korea
Jisa Factory	31, Gwahaksandan 1-ro, 60beon-gil, Gangseo-gu, Busan, Korea
Hot Stamping	173-80, Yongmyeonggongdan-gil, Geoncheon-eup, Gyeongju-si, Gyeongsangbuk-do, Korea
Asan Factory	591, Seobunam-ro, Sinchang-myeon, Asan-si, Chungcheongnam-do, Korea



**SUNGWOO HITECH**

# **PRODUCTION STATUS**

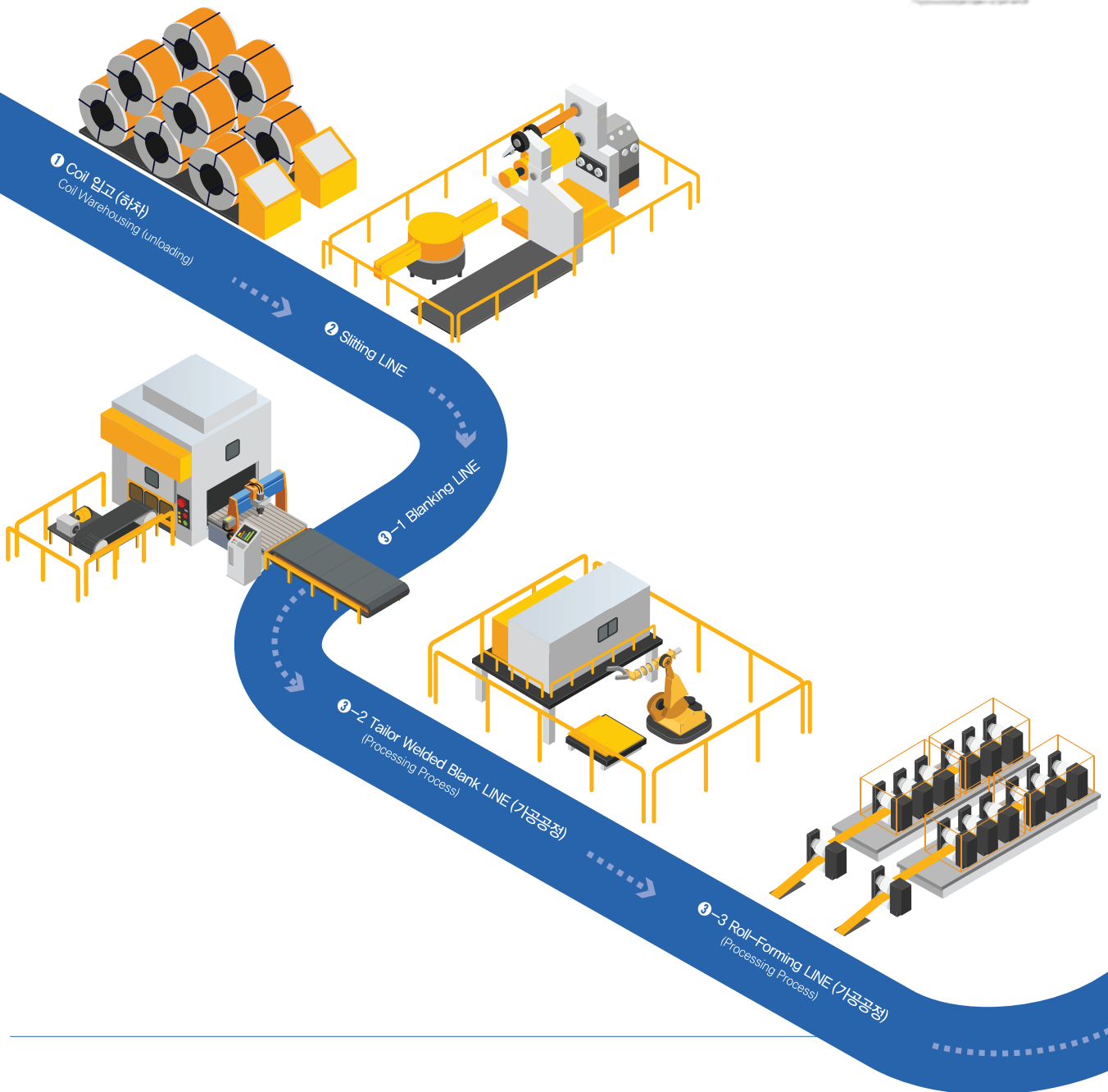
## Production Process

성우하이텍은 코일의 공급에서 금형의 제작, 프레스 스탬핑, 제품의 조립, 완제품 도장, 출고에 이르기까지 원자재에서부터 완제품의 제작에 이르는 모든 공정이 시스템화된 최상의 경쟁력을 갖춘 국내 유일의 자동차 차체전문기업입니다.

Through a competitive approach, Sungwoo Hitech is the only automobile component company specialized in body structure in Korea by systematizing the entire processes from raw materials to complete product manufacturing, including coil supply, mold manufacturing, press stamping, assembly, painting finished products and release.



QR코드를 스캔하면  
제품생산과정을 보실 수 있습니다.  
Scan the QR code to view the production process.







1 Unloading Supplies(coil)



2 Slitting Line



3-1 Blanking Line



3-2 Tailor Welded Blank LINE



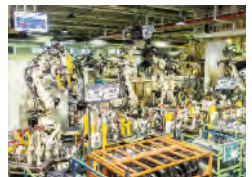
3-3 Roll-Forming LINE



4 Press LINE



5-1 Hot Stamping



5-2 Assembly LINE



6 Door Hemming LINE



7 Electro Painting LINE

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## Main Product

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Aluminium Bumper Beam



Hood Assembly(Aluminium)



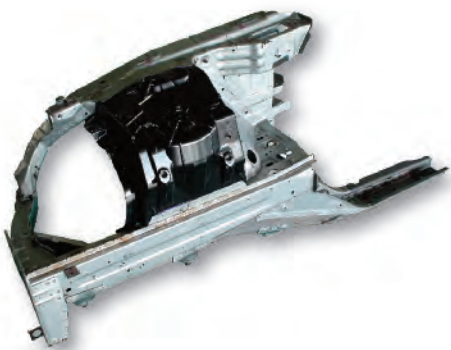
Door Assembly



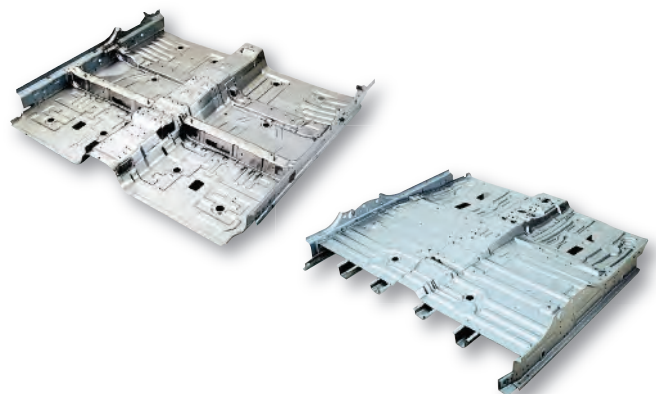
Side Outer  
Side Inner



Fender Apron Front Side Member

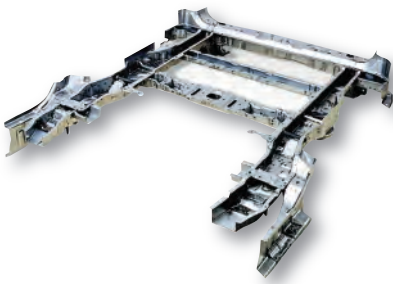


Center Floor Complete

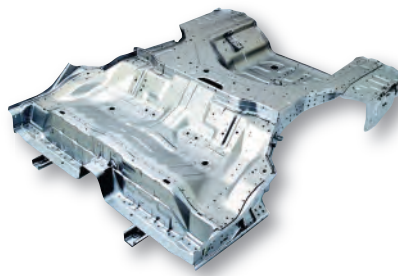


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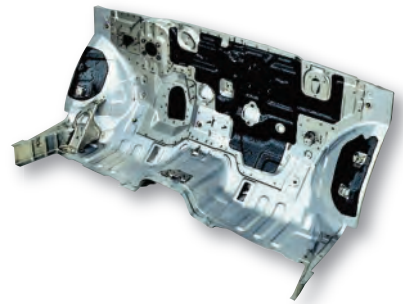
Rear Side Member Complete



Rear Floor Complete



Dash Complete



---

Trunk Lid

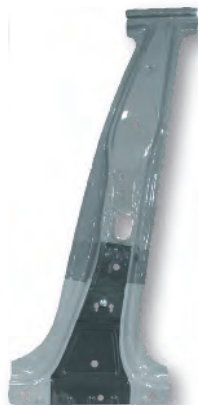


Tail Gate



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Hot Stamping



Center Pillar



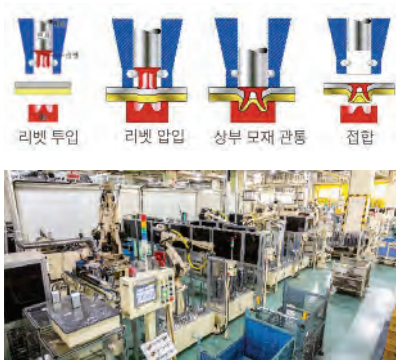
Dash Cross Member



Roof Rail

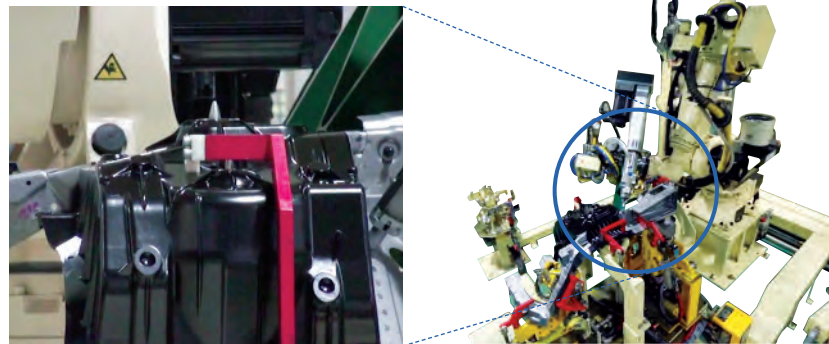
## State of Production

### 초고장력강 SPR 접합 Advanced High Strength Steel (AHSS) SPR Joining

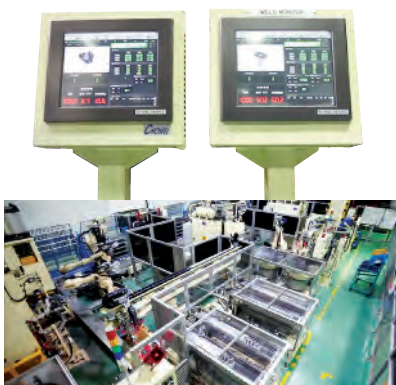


### 초고장력강(780급) 전용 SPR 개발을 통한 접합 강도 개선 Improvement in Bonding Strength by Developing an Exclusive SPR for AHSS (780 grades)

- 이종 재료(AL+STEEL) 접합 전위차 부식 개선
  - S/ABS HS'G 전착 도장
  - 이종 재료 접합부 구조용 접착제 도포
- Improvement of the Galvanic Corrosion of a Hybrid Material (AL+STEEL) Joint
  - S/ABS HS'G electro painting
  - Application of a structural adhesive to the hybrid material joint

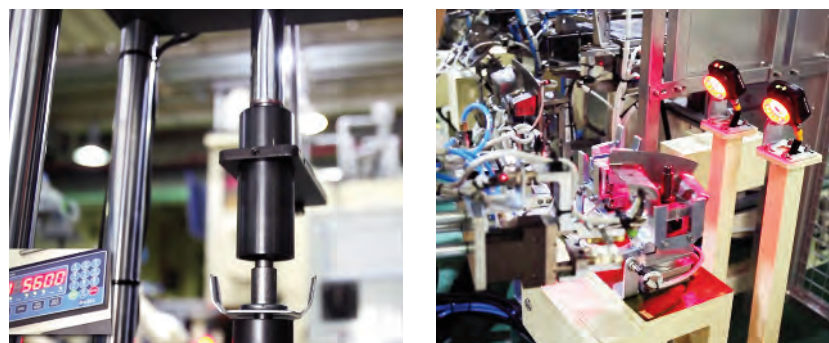


### 고강도 프로젝션 용접 High Strength Projection Welding



### 고강도 프로젝션 용접 기술 적용으로 용접 품질 확보 Welding quality assurance via the application of technology suitable for high strength projection welding

- CO<sub>2</sub> 토치 간섭으로 용접 불가 구간 해소
- 용접 중 열변형에 의한 평탄도 불량 해소
- 스파터에 의한 노이즈/발청 불량 해소
- Elimination of non-weldable areas caused by CO<sub>2</sub> torch interference
- Elimination of flatness defects caused by heat strain during welding
- Elimination of noise/rusting caused by spatters



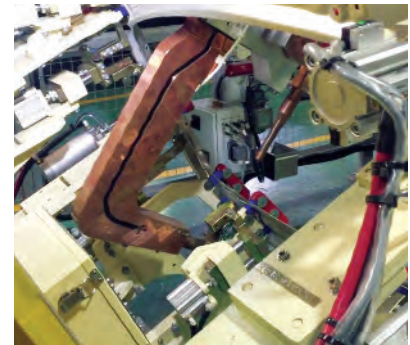
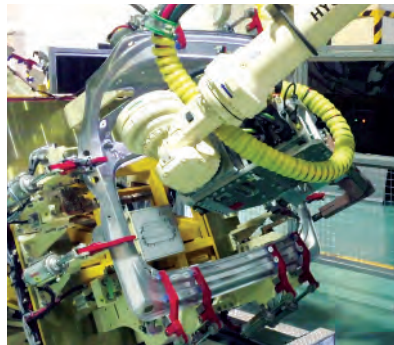
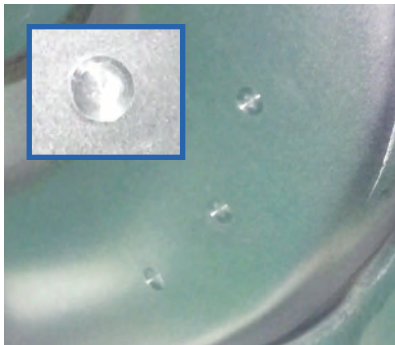


QR코드를 스캔하면 홍보영상을 보실 수 있습니다.  
Scan the QR code to watch the PR video.

## 알루미늄 용접 Aluminum Welding

### 알루미늄 저항용접 적용 Application of the Aluminum Resistance Welding

- 차체 부품 경량화 관련 알루미늄 소재 용접 新기술 적용
- 경량 소재 용접 기술 확보
- 원가 경쟁력 강화
- Application of a new aluminum material welding technology designed for body component weigh lightening
- Securement of lightweight material welding technology
- Enhancement of cost competitiveness



## 로딩 공정 자동화 Automated Loading Process

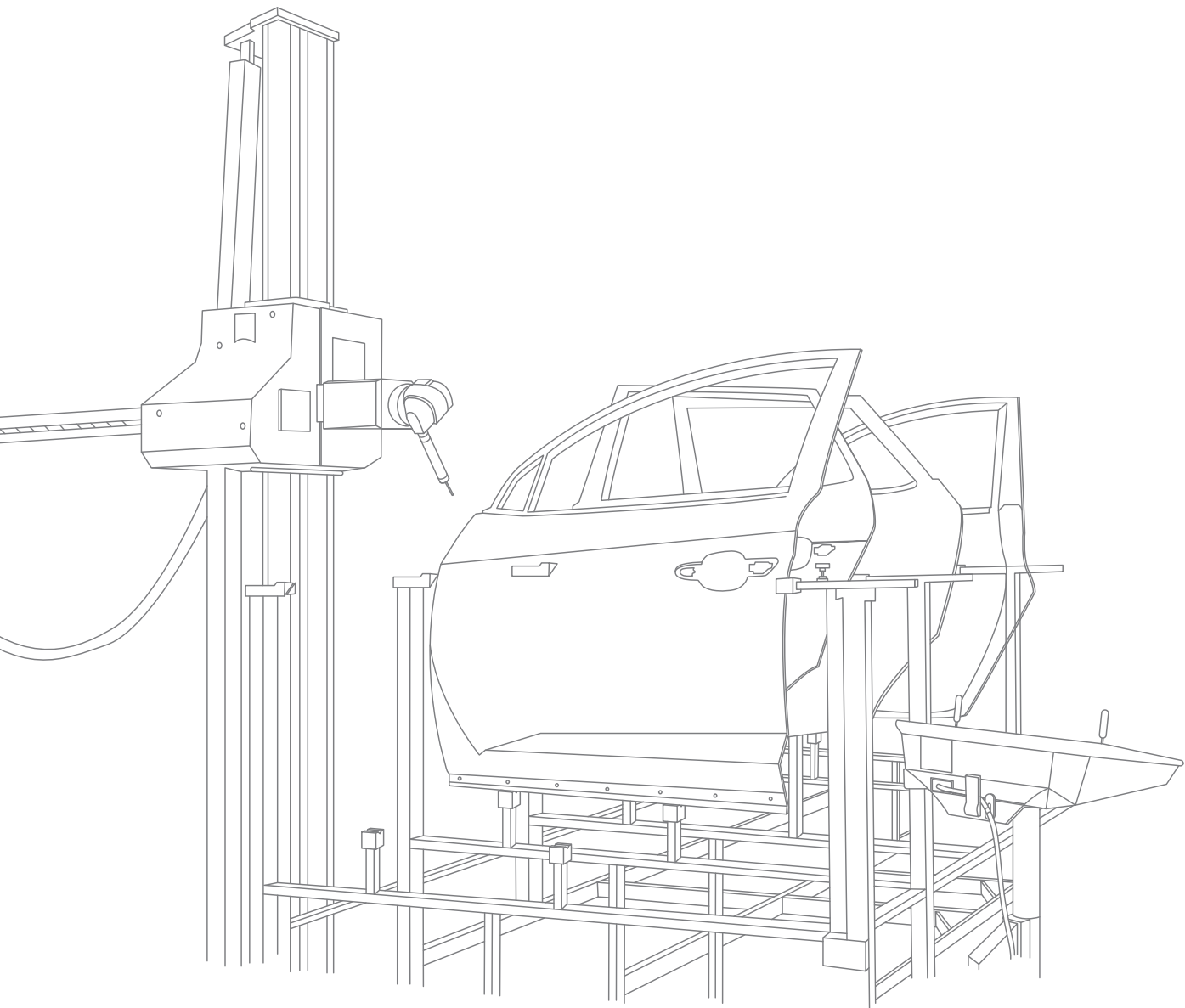
### 로딩 공정 자동화 적용 Application of the Automated Loading Process

- 로딩공정 PART 6-ITEM 카트리지 설치 및 이송 로봇 적용을 통한 공정 자동화 적용
- 로딩공정 무인화 운영으로 라인 소인화 개선 적용
- Installation of the loading process PART 6-ITEM cartridge and application of the process automation via transfer robots
- Application of the flexible manpower line through the operation of an unmanned loading process





<b>Seochang Factory</b>	50, Sojugongdan 3-gil, Yangsan-si, Gyeongsangnam-do, Korea
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**SUNGWOO HITECH**

# **QUALITY STATUS**

## Awards

- 2006. 11. 제32회 국가품질경영대회 품질경영상 [제조 대기업부문] 수상  
Awarded a prize in [Large Manufacturing Company Category] of Quality Management Award at the 32nd National Quality Management Convention
- 2007. 02. 품질 및 기술 5스타 달성(현대기아자동차)  
Achieved Quality and Technology 5-Star(HKMC)
- 2008. 02. 품질, 기술, 납입 5스타 달성(현대기아자동차)  
Achieved Quality, Technology and Payment 5-Star(HKMC)
- 2011. 01. 그랜드 품질 5스타 달성  
Achieved Grand Quality 5-Star
- 2011. 11. 품질경쟁력 우수기업 3년 연속 수상(지식경제부)  
Awarded Excellent Quality Competitiveness Enterprise for three consecutive years(Ministry of Knowledge Economy)
- 2011. 12. 국가 품질경영대회 국가 품질대상 수상  
Awarded the Grand Prize in National Quality Award at the National Quality Management Convention
- 2012. 03. 제37회 국가품질경영대회 국가품질대상(대통령 단체표창) 수상  
Awarded the Grand Prize(Presidential Group Citation) in National Quality Award at the 37th National Quality Management Convention
- 2014. 01. 2013년 올해의 협력사 대상 수상(HKMC)  
Awarded Supplier of The Year, 2013(HKMC)
- 2021. 01. GM 협력사 품질 우수상 수상(2018~2021, 4년 연속)  
Supplier Quality Excellence Award



품질경영상  
Quality Management Award



국가품질대상  
National Quality Award



그랜드 품질 5스타상  
Grand Quality 5-Star



품질 5스타상  
Quality 5-Star



현대자동차 올해의 협력사 대상  
HKMC Supplier of The Year



GM 협력사 품질 우수상  
Supplier Quality Excellence Award



## Global Quality System

### 통합 품질시스템 구축

Total Quality System Building

### 통합 관리 Total Management

- 글로벌 성우의 실시간 품질 정보를 관리할 수 있도록 글로벌 품질확보실(Global Quality Center)을 운영, 현지와 본사의 주요 이슈와 의견 결정의 창구 역할을 수행한다.
- Global Quality Center is operated to manage the real-time quality information of global Sungwoo Hitech and serve as an opportunity for the main issues and opinions of the field and HQ to be shared and discussed.



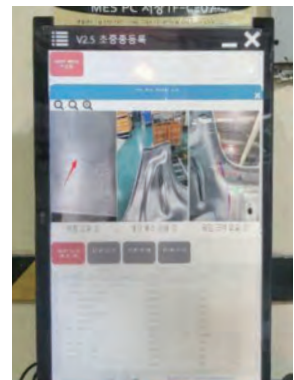
### 자주검사 전산화를 통한 실시간 검사모니터링 (2차사 포함)

Real-time Inspection Monitoring through  
Computerization of Independent Inspection  
(including tier suppliers)

### 검사 시스템 Inspection System

2차사 포함하여 사내외 전 공정 검사 및 시험 관리 전산화 시스템 구축을 통한 전수 보증으로 제품 책임을 예방(PLP)하고 공정간 지정 특성에 대한 전수 Data 연계 관리로 고객 만족을 실현한다.

Practice PLP (Product Liability Prevention) by constructing a computerized system for both the internal and external process inspection and test management including tier 2 suppliers that fulfills the clients needs through comprehensive data interface control for specific properties between processes.



## Ensure dimensional quality

### CMM 측정 CMM Measurement

#### 제품 치수, 정도 검사 Inspection of Product Dimension and Accuracy Inspection

- 물체의 표면 위치를 검출할 수 있는 프로브(Probe, 탐침)가 3차원 공간을 이동하면서 각 측정 점의 공간 좌표를 접촉하여 검출하고 그 데이터를 컴퓨터가 처리함으로써 3차원 위치를 자동 측정하는 시스템.
- 차체 골격 정도를 자동으로 측정하여 이전 Data와 변화량을 분석하여 정도가 유지될 수 있도록 한다.
- It is an automatic 3D coordinate measurement system in which a probe, that can detect the surface location of the object, moves a 3D space to contact and detect the spatial coordinates of each measure point and the data is processed by the computer.
- It allows us to maintain the desired accuracy through the automatic measurement of the BIW (body-in-white) accuracy and the analysis of previous data and variations.



### 3D 스캐너 인라인 적용 RG4(G90) FR/RR DR A case of Introduction of 3D Scanner in Assembly Line

#### 제품 치수, 정도 검사 Part Dimension and Accuracy

- RS4(G90)알루미늄 클로저파트(DOOR) 인라인 검사설비(3D 스캐너) 적용
- 주요 검사포인트 자동 측정으로 Data와 변화량을 실시간 모니터링하여 제품 정도가 유지될 수 있도록 한다.
- Introduction of 3D scanner to the assembly line of RS4 aluminum closure parts (G90 Doors)
- It assures the consistent dimension of parts, providing data of important check points and its variance through the real-time monitoring system, which are inspected automatically.



**신차개발단계**  
**디지털 품질확보**  
 Digital Quality Loop in New Car Development Stage

**제품 치수, 정도 검사 Part Dimension and Accuracy**

3D 스캐너를 활용하여 단품 부터 ASSY까지 3D 스캐너 성적서를 데이터 베이스화 하여 공정별 변화량 추적 및 부품간 매칭성을 분석하여 신속, 정확한 수정 방향을 수립 할 수 있습니다.

The reports of 3D scanning from stamping to assembly parts are created as database to trace the variance in all of the processes and to analyze the mating conditions between parts, which enables to quickly and accurately determine the direction of quality loops.

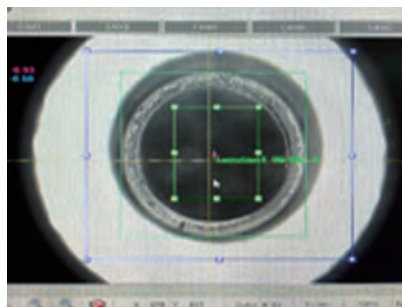
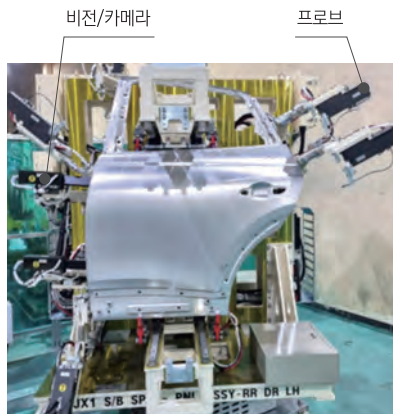


**SPC를 통한 공정능력 확보**  
 Assurance of process capability using SPC

**제품 치수, 정도 검사 Part Dimension and Accuracy**

SPC(Statistical Process Control, 통계적 공정관리) 시스템은 비전, 레이저, 프로브 등을 활용하여, 실시간 품질 모니터링(통계기법을 활용, X bar-R 관리도 등)을 통한 공정 상태를 파악하고, 최상의 품질을 관리하기 위한 설비입니다.

The SPC(Statistical Process Control) system is to manage the best quality utilizing vision, laser, probe, and etc. to check the process condition through real-time quality monitoring system such as statistical technique, X-R chart.



< 비전 시스템 >



< 품질 모니터 >

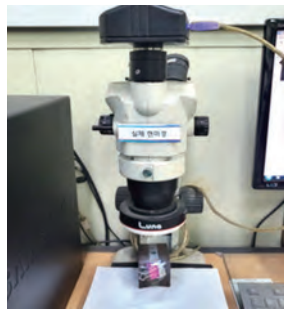
## Reliability of part durability

### 실체 현미경을 통한 용접부 절단 검사 Welding Zone Cutting Inspection using a Stereoscopic Microscope

### CO<sub>2</sub>/레이저 용접 품질 확인 CO<sub>2</sub>/Laser Welding Quality Conformance

일상 자주검사 반파괴 검사, 목시검사에서 확인할 수 없는 CO<sub>2</sub> 용접 요구 기준 (용입량, 각장, 목두께 등)만족여부를 전자 광학 현미경을 통해 CO<sub>2</sub> 용접단면을 확대 검사함으로써, CO<sub>2</sub> 용접에 대한 LOT성 품질문제 방지 및 효율적인 예방품질을 실현한다.

Prevents LOT quality issues and achieves the efficient proactive quality for CO<sub>2</sub> welding through the inspection of the enlarged CO<sub>2</sub> weld intersection using an electron optical microscope in accordance with the CO<sub>2</sub> welding required standards (weld penetration, leg length, throat length and etc.) that cannot be verified via regular independent inspection, semi-destructive inspection and visual inspection.



### 범퍼 제품의 전착 도장 품질 검증 Quality of Electro-Painted Parts for Bumpers

### 도장 표면 처리 검사 Painted-Surface Treatment Test

자동차 부품 수명증대를 위한 전착도장 신뢰성 검사를 자체 시험실에서 염수분무, 내유성, 내수성, 내충격성, 경도, 도막두께 측정기 등을 구비하여 실시함으로써, 차체 부식 발생 방지 및 효율적인 예방품질을 실현한다.

In order to extend the life-time of electro-painted parts, Sungwoo Hitech conducts various validation tests such as salt-spray test, oil resistance test, water-proofing test, impact resistance test, hardness test, thickness test in laboratory with proper instruments, which enables to prevent corrosion and improves the efficiency of preventative quality.



〈 내염수분무성 시험 〉



〈 경도 시험 〉



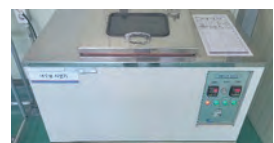
〈 부착성 시험 〉



〈 내충격성 시험 〉



〈 내유성 시험 〉



〈 내수성 시험 〉

## Securing welding quality

### 초음파를 통한 비파괴 검사 (RSWA)

Non-destructive Inspection using Ultrasonic Wave (RSWA, Resistance Spot Weld Analyzer)

### SPOT 용접 품질 확인 SPOT Welding Quality Conformance

SPOT 용접 너겟의 SPEC 만족여부를 확인하기 위해 요구되는 전파괴 시험의 인원, 부품과 실질 비용 손실과 소음, 진동 등의 환경적인 손실을 해결하기 위한 간접적인 용접검사 방법으로 용접상태와 너겟 크기를 수치화 판정가능하여 최소 비용으로 용접 강도를 검증한다.

It is an indirect welding inspection method to solve environmental costs, such as the number of people involved in the total destruction inspection, loss of components and real cost, noise and vibration, those are required to check the SPEC satisfaction of SPOT welding nuggets. It investigates the welding strength at the lowest cost by digitalizing the welding condition and nugget size.



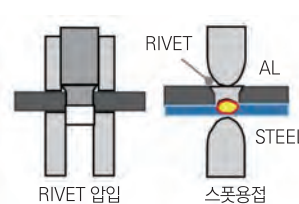
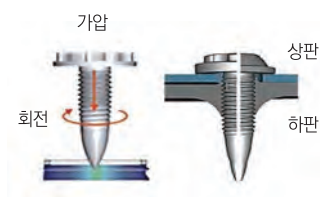
### 신소재 적용을 통한 이종재질 접합 검사

Tests for Multi Material Joints with New Materials

### 이종 접합 품질 확인 Quality of Multi Material Joints

일상 자주검사 반파괴 검사, 목시검사에서 확인할 수 없는 용접 및 접합의 요구 기준(용입량, 인터락, PNL GAP 등) 만족여부를 전자 광학 현미경을 통해 검사함으로써, 용접 및 이종 접합에 대한 LOT성 품질문제 방지 및 효율적인 예방 품질 실현한다.

Cross-section test is conducted with an electro-optical microscope to fulfill the quality of multi material Joints that cannot be inspected by daily chisel test or visual test such as penetration, interlock, gaps between materials, and so on, which enables to prevent the mass quality issues and improves the efficiency of preventative quality.



< FDS(Flow Drill Screw) >

폐단면(편측) 이종재질 접합 가능한 신기술

A new joint technology for multi materials with impassable surfaces

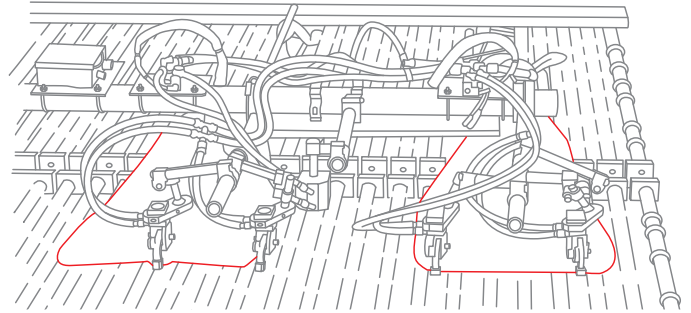
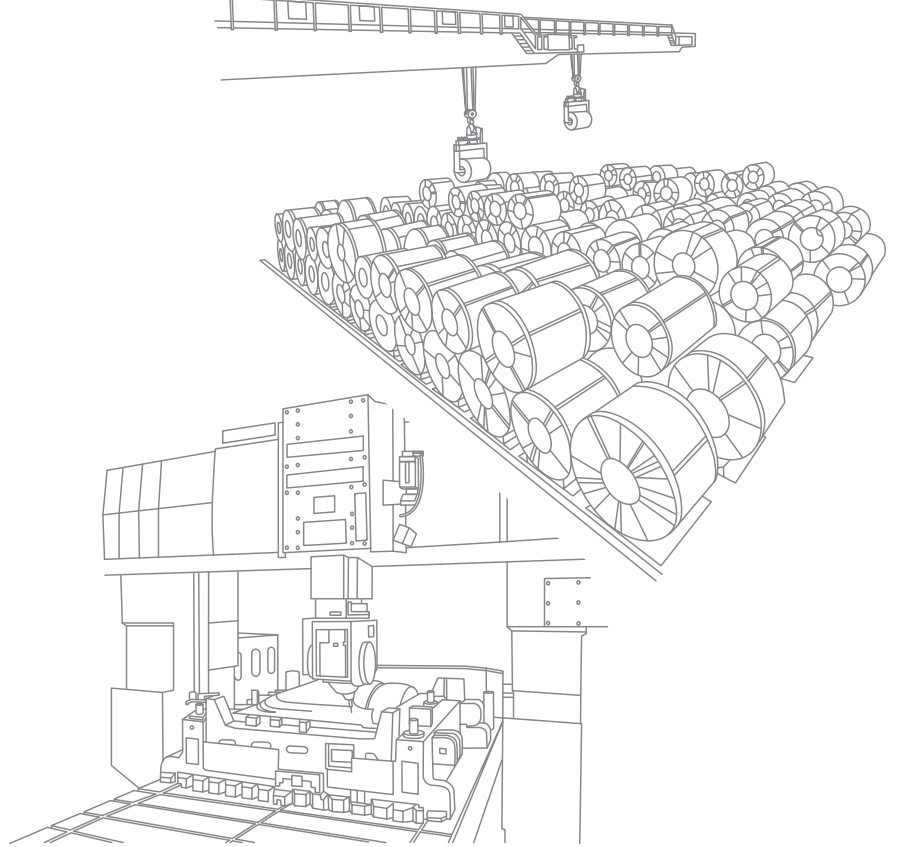
< REW(Resistance Element Welding) >

이종재질의 스폿용접 접합을 위한 신기술공법

A new joint technology for multi materials to execute spot welding



<b>Seochang Factory</b>	50, Sojugongdan 3-gil, Yangsan-si, Gyeongsangnam-do, Korea
<b>R&amp;D Center</b>	18-2, Sojugongdan 6-gil, Yangsan-si, Gyeongsangnam-do, Korea
<b>Tooling Center</b>	30, Sojugongdan 7-gil, Yangsan-si, Gyeongsangnam-do, Korea
<b>Jeonggwan Factory</b>	2-9, Nonggong-gil, Jeonggwan-eup, Gijang-gun, Busan, Korea
<b>Coil Center</b>	151, Jangansandan-ro, Jangan-eup, Gijang-gun, Busan, Korea
<b>Jisa Factory</b>	31, Gwahaksandan 1-ro, 60beon-gil, Gangseo-gu, Busan, Korea
<b>Hot Stamping</b>	173-80, Yongmyeonggongdan-gil, Geoncheon-eup, Gyeongju-si, Gyeongsangbuk-do, Korea
<b>Asan Factory</b>	591, Seobunam-ro, Sinchang-myeon, Asan-si, Chungcheongnam-do, Korea



**SUNGWOO HITECH**  
**COIL CENTER**  
**TOOLING CENTER**  
**HOT STAMPING TECHNOLOGY**

# System & Facilities

## 시스템 현황 Status of System

< CAE >



< CAD/CAM >



- ▶ AUTOFORM
- ▶ AUTOCAD
- ▶ CATIA
- ▶ UG
- ▶ NX
- ▶ POWER MILL
- ▶ 3D PRO
- ▶ MODEVIEW

### 시스템 System

선행 공법 및 설계 검증을 위한 소프트웨어  
Software to verify preceding method and design

## 가공설비 현황 Status of Processing Equipment

### MACHINING LINE



- ▶ MCR-B III (2EA)
- ▶ MCR B II
- ▶ MCR-A5C II (2EA)
- ▶ MCR A5C(2EA)
- ▶ MCR A5C
- ▶ RB-4NM
- ▶ RB-4VM

### TRY OUT PRESSLINE



- |   |   |
|---|---|
| <p>&lt;D/S PRESS&gt;</p> <ul style="list-style-type: none"> <li>▶ 200T</li> <li>▶ 100T</li> <li>▶ 50T</li> <li>▶ 30T</li> </ul> | <p>&lt;T/O PRESS&gt;</p> <ul style="list-style-type: none"> <li>▶ 2000T</li> <li>▶ 1500T</li> <li>▶ 1200T</li> <li>▶ 1000T</li> <li>▶ 800T</li> <li>▶ 600T</li> <li>▶ 400T</li> </ul> |
|---|---|

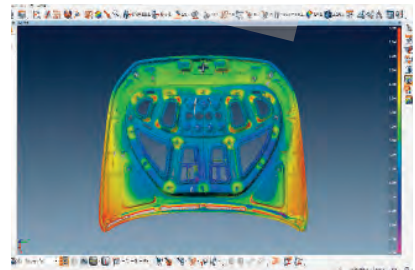
### 설비 Equipment

대형 금형 가공 및 생산성 검증을 위한 설비  
Equipment to verify large tool machining and productivity



**3D 레이저 스캔검사**  
3D Laser Scanning

- 빠른 측정속도로 실시간 품질 확인
- 대형 금형 측정
- Real-time quality check by fast measurement speed
- Measuring large tools

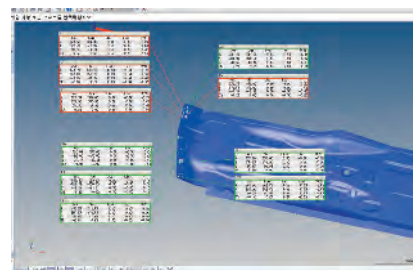


〈 3D 레이저 스캔검사 〉  
3D Laser Scanning

〈 3D 레이저 스캔검사 결과 〉  
3D Laser Scan Result

**CMM 측정검사**  
CMM Measurement

- 고정밀 장비를 사용한 제품 품질 확보
- 측정 오차범위 최소화로 제품 신뢰도 증대
- Assuring product quality with high-precision equipment
- Increasing product reliability by minimizing margin of measurement error



〈 제품 산포도 CMM 측정검사 〉  
CMM Measurement of Product Dispersion

〈 CMM 측정결과 〉  
CMM Measuring Results

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## History of Mold Making

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### Moving Parts

RR DOOR INR/OTR



HOOD INR/OTR



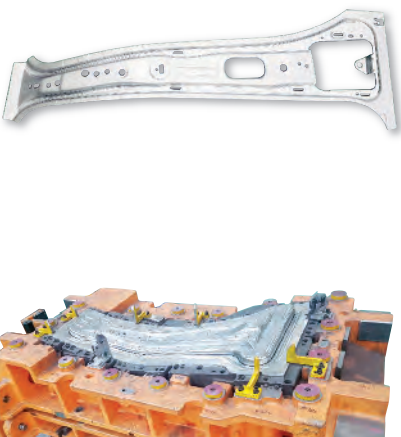
TRUNK LID INR/OTR



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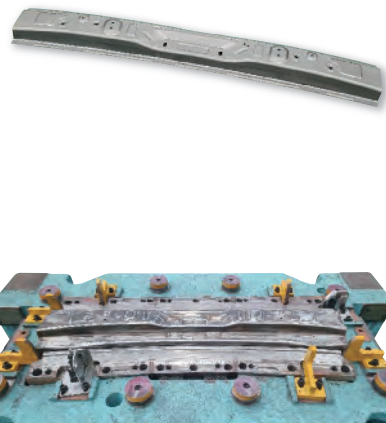
### UHSS Parts (Ultra High Strength Steels)

CTR PLR INR



< 980MPa, 1.3T >

RAIL ROOF FRT



< 1180MPa, 0.9T >

REINF SIDE SILL OTR



< 1500 MPa, 1.3T >

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### Hot Forming Parts

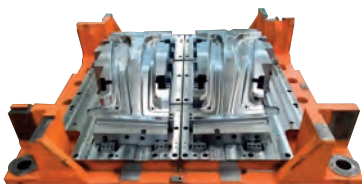
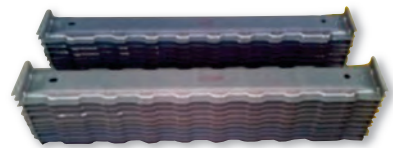
CTR PLR OTR



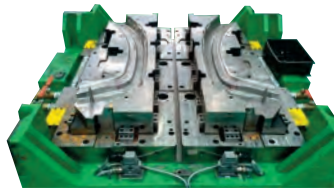
FRT PLR OTR UPR



BAR ASM FLR PNL



< 1470MPa, 1.2T >



< 1470MPa, 1.0T >

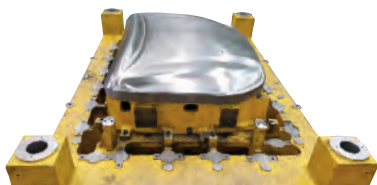
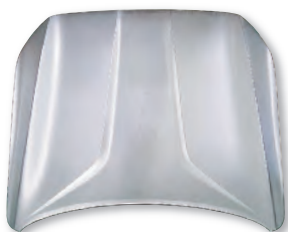


< AL 6000 series, 1.6T >

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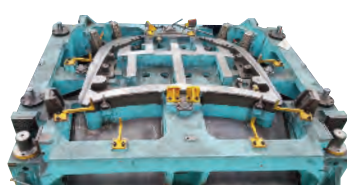
### Aluminum Parts

HOOD OTR



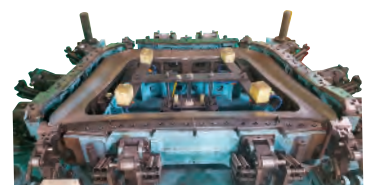
< AL 6000 series, 1.0T >

HOOD INR



< AL 6000 series, 0.85T >


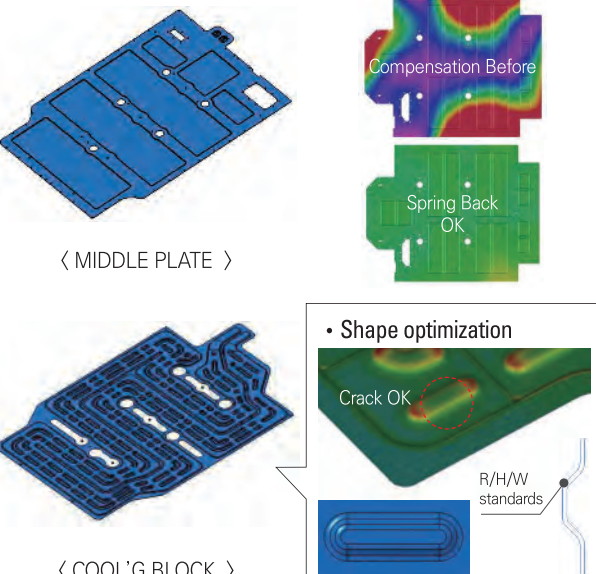
HOOD HEM'G



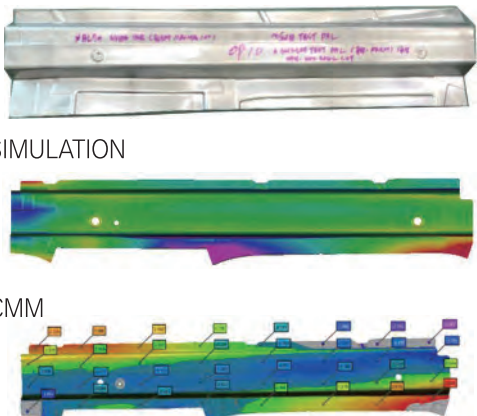
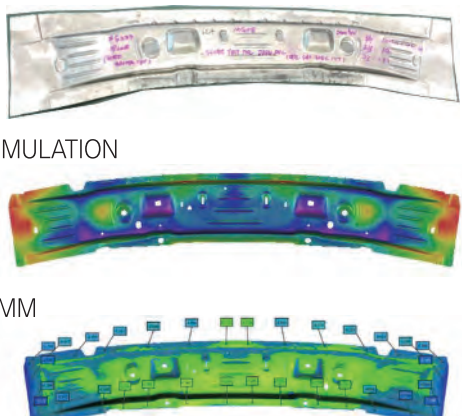
< AL 6000 series, 1.0T >  
< AL 6000 series, 0.85T >

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### Battery pack case

BAT UPR COVER Method optimization	AL BAT COOL'G BLOCK CASE Method
 <p data-bbox="231 1086 359 1120">&lt; 1<sup>ST</sup> DRAW &gt;</p> <p data-bbox="518 1086 678 1120">&lt; 2<sup>ND</sup> REDRAW &gt;</p> <p data-bbox="622 1131 662 1153">258</p> <p data-bbox="670 1176 758 1220">1<sup>ST</sup> D/FACE 2<sup>ND</sup> DRAW</p>	 <p data-bbox="845 884 1021 918">&lt; MIDDLE PLATE &gt;</p> <p data-bbox="845 1198 1021 1232">&lt; COOL'G BLOCK &gt;</p> <p data-bbox="1157 694 1332 728">Compensation Before</p> <p data-bbox="1197 840 1292 884">Spring Back OK</p> <p data-bbox="1109 963 1300 996">• Shape optimization</p> <p data-bbox="1125 1030 1220 1064">Crack OK</p> <p data-bbox="1268 1108 1348 1176">R/H/W standards</p>

### Stainless steel Technology

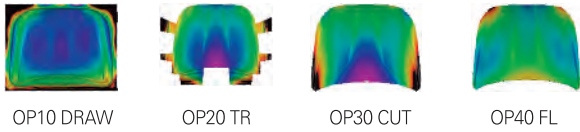
Comparison with the simulation of stainless steel	
<p data-bbox="151 1467 414 1489">• FORM'G stainless steel test</p>  <p data-bbox="167 1646 335 1680">✓ SIMULATION</p> <p data-bbox="167 1803 255 1836">✓ CMM</p>	<p data-bbox="790 1467 1061 1489">• DRAW'G stainless steel test</p>  <p data-bbox="805 1646 973 1680">✓ SIMULATION</p> <p data-bbox="805 1803 893 1836">✓ CMM</p>
<ul data-bbox="151 1960 558 2027" style="list-style-type: none"> <li>• 성형성/생산성 분석</li> <li>• 냉각장치/오일분사/비닐부착 표준 정립</li> </ul>	<ul data-bbox="790 1960 1340 2027" style="list-style-type: none"> <li>• Formability / Productivity analysis</li> <li>• Cooling System/ Oil spray / Friction Standard correct</li> </ul>

# Mold modification and analysis techniques

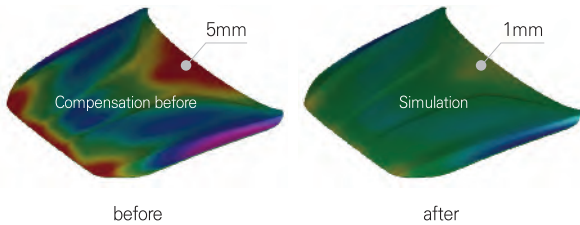
## Compensation Technology

### Compensation Simulation

- All Operation Springback Simulation



- Compensation Simulation



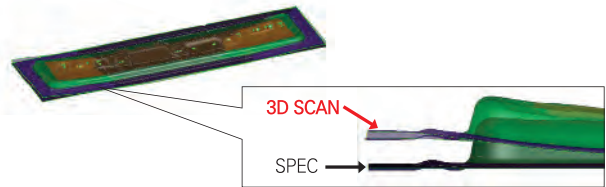
- Simulation Tool 활용 보정 적용
- S/Back 발생에 대한 PNL 안착성 향상
- Apply modification using simulation tool
- Improve PNL settlement for S/Back

### Modification Technique using 3D Scan

- Draw 3D Scan



- 3D Model'g Copy

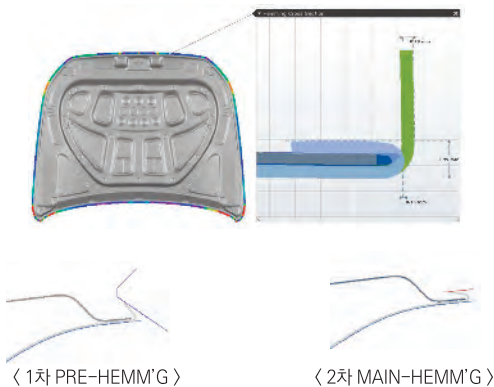


- 3D SCAN – 정확한 Spring Back량 산출
- 금형 보정 개선
- 역설계 Model'g COPY 가공
- 3D SCAN – Calculate accurate spring back amount
- Tool modification improvement
- Reverse engineering Model'g COPY processing

## Simulation Technology

### Hemming Analysis

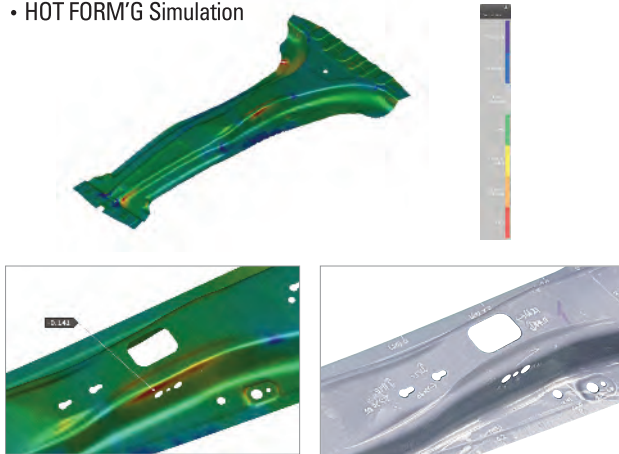
- HEMM'G Simulation



- 성형성 분석
- HEMM'G 시 문제점 발취
- T/O 시 문제해결
- Analyze formability
- Extract issues during HEMM'G
- Address issues during T/O

### Hot Forming Analysis

- HOT FORM'G Simulation

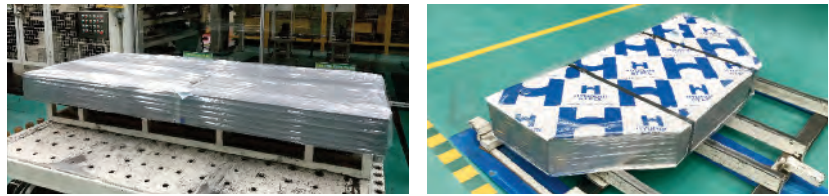


- 냉각채널 고려한 핫포밍 해석
- 연속 생산에 의한 온도변화 고려
- Hot forming analysis considering cooling channel
- Consideration of temperature change due to the continuous production

## Processing Line

### BLK Line(500톤/400톤 2개 라인) BLK Line(500 tons/400 tons Two Lines)

원자재(COIL)를 투입, 금형을 사용하여 일정한 형태의 철판제품을 전단가공하며 외판 및 TWB 용접재를 주 생산 가공하는 라인(500톤:스틸, 400톤: 스틸/알루미늄)  
It is a production and processing line mainly for outside plates and TWB welding materials through shearing of some form of steel plate products using the mold with raw material(coil) input.(500ton:Steel, 400ton: Steel/Aluminium)



〈 이물질 유입 최소화(랩포장)로 품질향상 〉  
Quality Improvement by minimizing inflow of foreign substances(wrap packaging)

- 연간 생산능력 : 60,000톤(5,000톤/月), 16,800,000 PNL(1,400,000 PNL/月)
- 장비 SPEC : 두께(0.5T~3.2T), 폭(300mm~1,860mm) 가공 가능
- 주요 생산 품목 : 알루미늄/스틸 DR INR/FRAME, TWB 용접재
- Annual production capacity : 60,000 tons(5,000 tons/month), 16,800,000 PNL (1,400,000 PNL/month)
- Equipment Spec : Processible thickness(0.5T~3.2T) and width (300mm~1,860mm)
- Main product list : (TWB welding material), NX4 DR OTR and etc.

### Sliter Line(2개 라인) Sliter Line(Two Lines)

원자재(COIL)를 라인에 투입하여 일정한 폭으로 절단 가공하는 라인  
It is a processing line to cut raw material(coil) to a certain width.



〈 고장력 롤포밍(범퍼) 소재 〉  
High Strength Roll Forming(Bumper) Material

〈 도어 프레임(외판) 소재 〉  
Door Frame(Outside Plate) Material

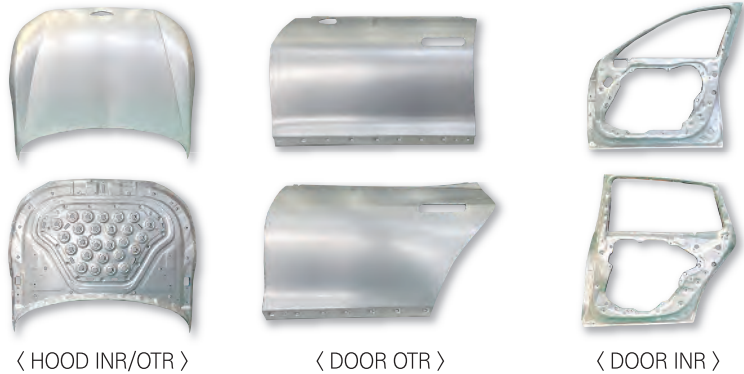
- 연간 생산능력 : 240,000톤(20,000톤/月)
- 장비 SPEC : 최대 가공중량(25톤), 두께(0.5T~3.2T), 폭(180mm~1,860mm), 고장력(150KG)까지 가공 가능
- 주요 생산 품목 : 고장력 범퍼(롤포밍) 소재, 도어 프레임(외판) 소재 외
- Annual production capacity : 240,000 tons(20,000 tons/month)
- Equipment Spec : Processible maximum weight(25 tons), thickness(0.5T~3.2T), width(180mm~1,860mm) and high strength(150kg)
- Main product list : high strength bumper(roll forming) materials, door frame(outside plate) materials and etc.

## Transfer Line

### 3,700 ton Transfer Line

3,700톤(2,500톤 + 1,200톤) 2개의 Head-Press로 차체 중요 부품인 DR OTR/INR, HOOD OTR/INR, T/LID 등의 제품을 생산하는 라인

It is a production line with two Head-Presses of 3,700 tons(2,500 tons + 1,200 tons) that produces critical parts of a car body such as DR OTR/INR, HOOD OTR/INR and T/LID.



- 연간 생산능력 : 1,920,000PNL(160,000PNL/月)
- 주요 생산 품목 : 알루미늄 대물 외판 아이템(HOOD, DOOR)
- Annual production capacity : 1,920,000PNL(160,000PNL/month)
- Main product list : Aluminium exterior items(HOOD, DOOR)

### 2,600 ton Transfer Line

2,600톤의 Head-Press로 차체의 DR FRAME, HINGE FACE, DR BELT 등의 제품을 생산하는 라인

It is a production line with a Head-Press of 2,600 tons that produces DR FRAME, HINGE FACE, DR BELT and others of a car body.



- 연간 생산능력 : 3,600,000PNL(300,000PNL/月)
- 주요 생산 품목 : 알루미늄 A,B급아이템(DR FRAME, HINGE FACE, DR BELT)
- Annual production capacity : 3,600,000 PNL(300,000 PNL/month)
- Main product list : Aluminium A, B Grade items(DR FRAME, HINGE FACE, DR BELT)

## Hot Stamping

900°C 이상으로 가열된 보론강을 프레스 성형과 동시에 냉각시켜 1500MPa 이상의 초고강도 제품으로 제조하는 성형 기술  
Press forming technology to manufacture UHSS(1500Mpa) products with Boron Steel by Simultaneous forming and quenching after blank heating over 900°C.

### 장점 Advantage

- 초고강도(1500MPa)
- 경량화, 부품 일체화
- 고연신율(60%)에 의한 성형성 증대
- 스프링백 최소화
- Ultra-high strength(1500 MPa)
- Weight Reduction & Part Integration
- High Formability with High Elongation(60% ↑)
- Less Springback



① 블랭킹  
Blanking

② 가열  
Heating

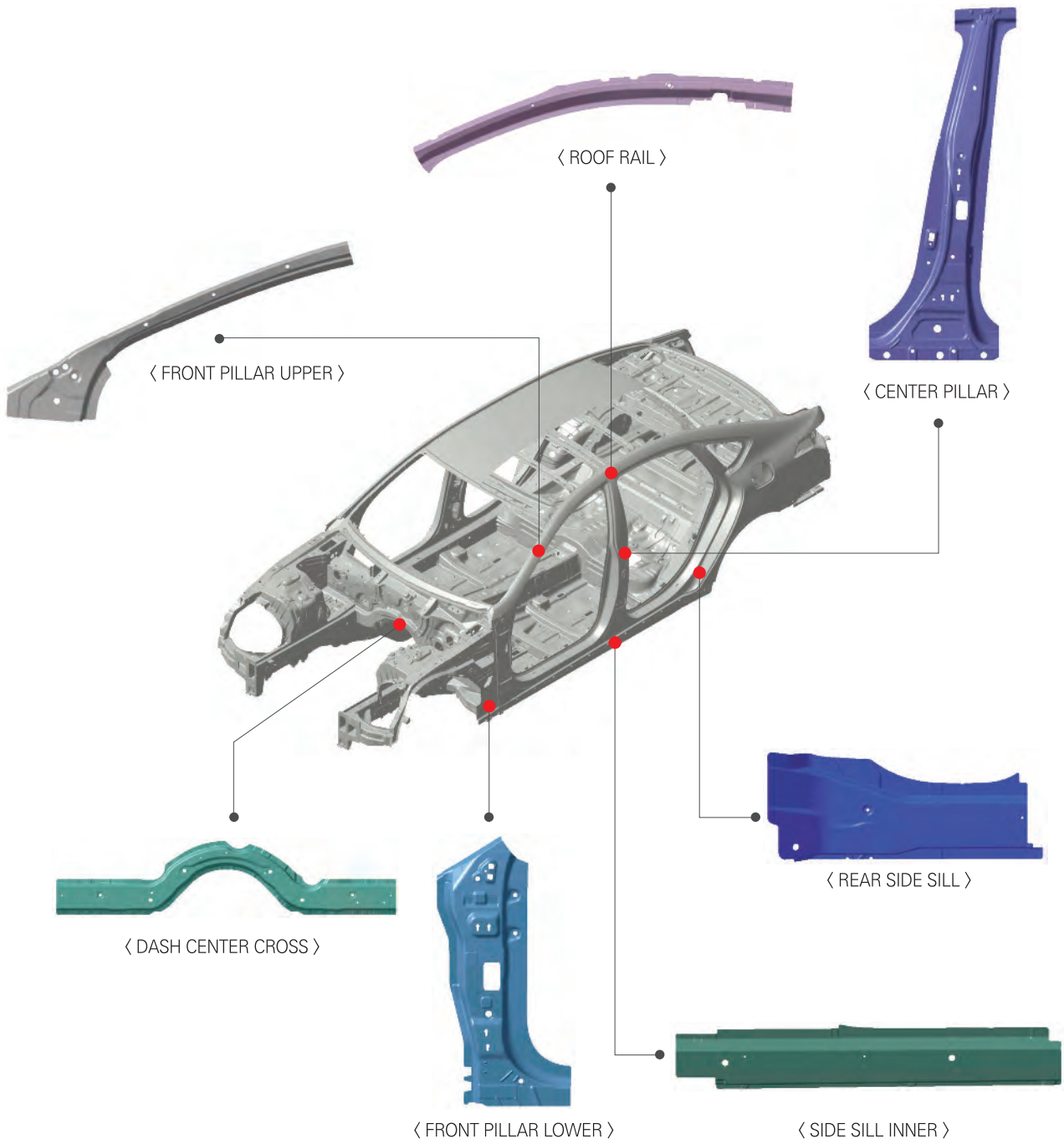
④ 후가공(레이저 커팅)  
Post-processing(laser cutting)

③ 프레스 성형&Quenching  
Press forming&Quenching





## Hot Stamping Technology Applied to Body Parts

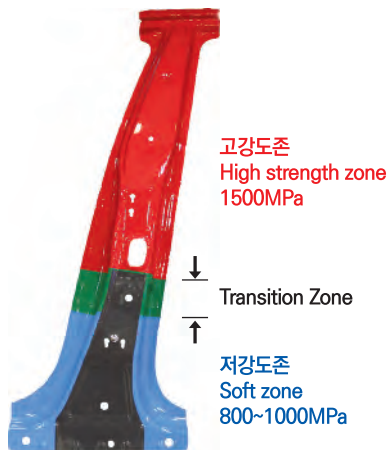


## Soft Zone

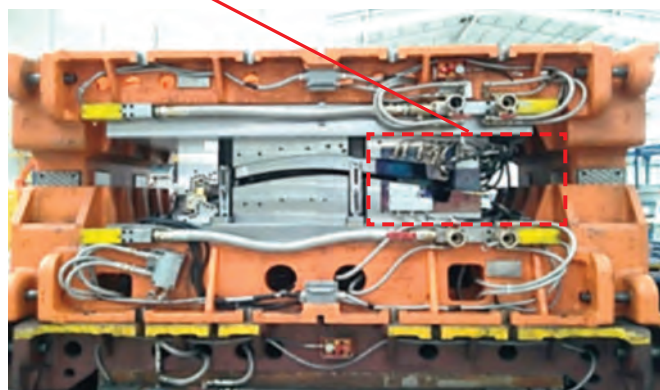
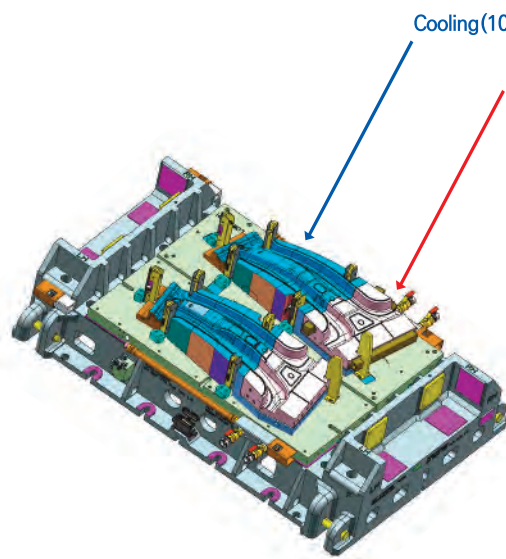
- 기술 : 블랭크를 부분 냉각 및 가열하여, 단일 제품에서 다중 강도 구현
- 효과 : 효율적인 충돌 에너지 흡수로 인해 측면 충돌 시 승객의 안정성 향상
- Technology : Single part with multi-strength by multi-cooling rate
- Effect : Enhanced passenger's safety against side crash by efficient energy absorbance

### ◎ 금형을 이용한 다중 냉각

Partial Quenching with Multi-Cooling Rate



< CENTER PILLAR >

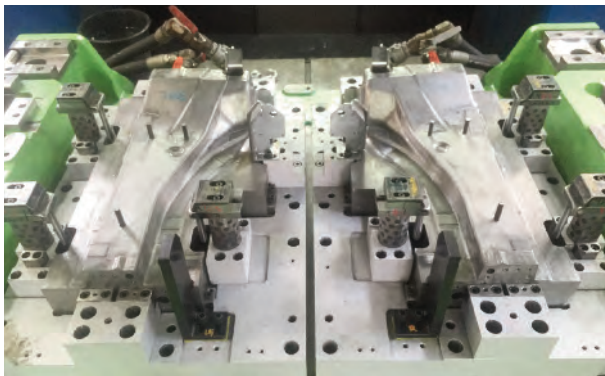
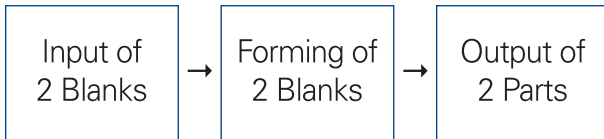


## Various Cavity

- 기술 : 싱글 스트로크로 다중 제품 프레스 성형(4 Cavity)
- 효과 : 생산성 향상, 제조원가 절감
- Technology : Press forming of various parts in single stroke(4 Cavity)
- Effect : Higher Productivity, Cost reduction

### Existing

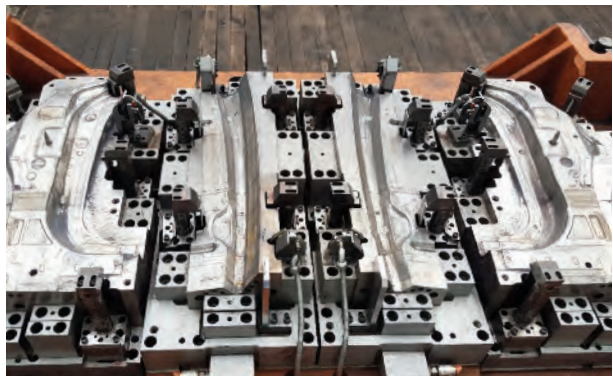
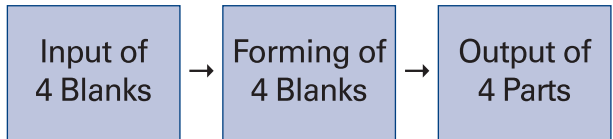
- 2 CVT 성형
  - 낮은 생산성(2 parts/1 stroke)
  - 필요 성형력 : 600 ton/Rocker
- 2 CVT forming
  - Low productivity(2 parts/1 stroke)
  - Required forming force : 600 ton/Rocker



< REAR SIDE SILL >

### New

- 4 CVT 성형
  - 높은 생산성(4 or 8 parts/1 stroke)
  - 생산능력 향상
- 4 CVT forming
  - High productivity(4 or 8 parts/1 stroke)
  - Improved production capacity



< FRONT PILLAR LOWER >

< ROOF RAIL >

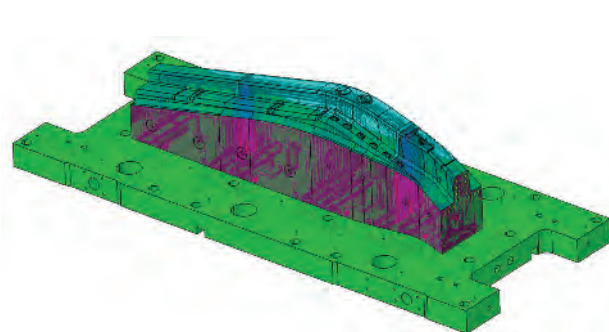
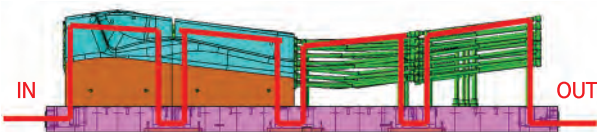
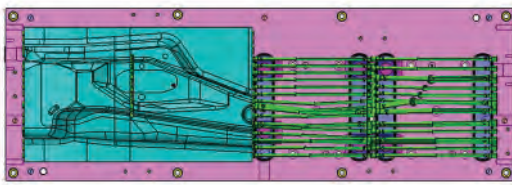
< FRONT PILLAR LOWER >

## Direct Cooling Channel

- 기술 : 냉각 채널과 금형 표면 사이의 거리를 일정하게 가공 하여 일관된 냉각 성능 구현
- 효과 : 냉각 시간 단축&내부 응력 감소
- Technology : Consistent cooling performance by constant distance between cooling channel and mold surface
- Effect : Reduced cooling time&internal stress reduction

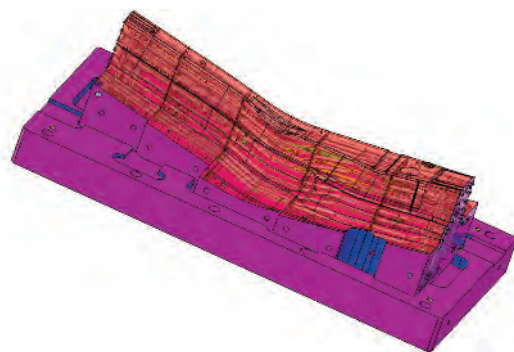
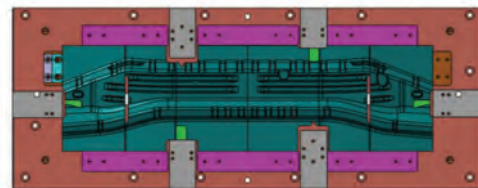
### Existing

- 각 스틸별로 분리된 냉각 채널
  - 금형 표면과 냉각 채널 거리 불균형으로 인해 냉각 시간이 길어짐
- Separated cooling channels for each steel
  - Increased cooling time due to unequal distance between mold surface and cooling channel



### New

- 일정한 간격으로 효율적인 냉각 가능
  - 전체 제품의 균일한 냉각
- Efficient cooling with equal distance between mold surface and cooling channel
  - Equivalent cooling rate of whole part

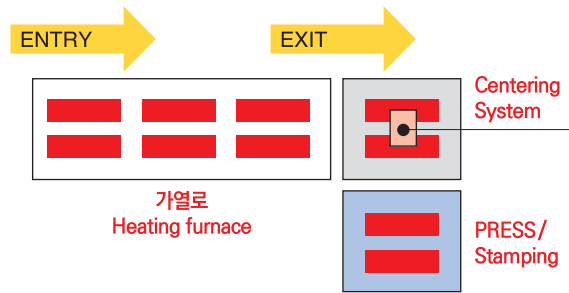
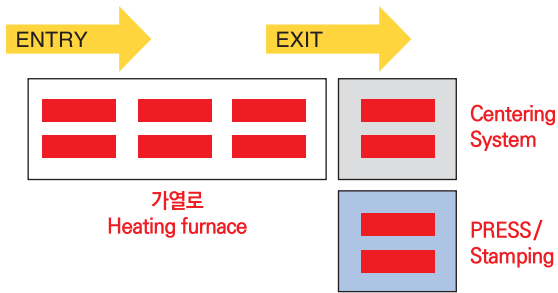


## Blank Position Detection

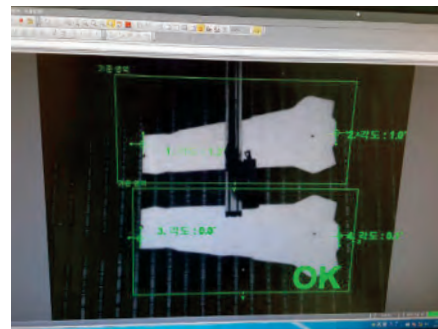
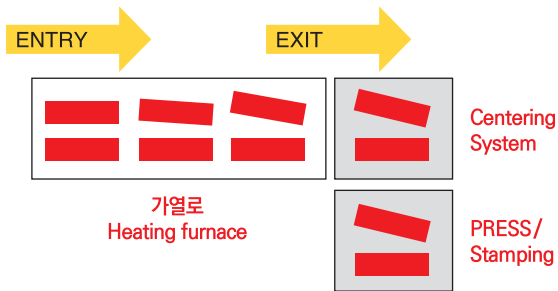
- 기술 : 비전 시스템을 통한 블랭크 위치 감지
- 효과 : 금형 손상 방지 및 제품 품질 안정화
- Technology : Blank position detection via vision system
- Effect : Preventing mold damage and stabilizing product quality

Existing	New
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▷ 정상조건  
Normal Condition



▷ 가열로 내 소재배치 이상  
Blank dislocation in the furnace



< 비전 센서 설치 >  
Installing the vision sensor

※ 블랭크 가열 시 급격한 온도 변화에 의해 가열로 내 블랭크 배열 흐트러짐  
Sudden blank heating causes dislocation of the flowing blanks in the furnace

- 금형 손상
- 후공정 불량
- 제품 품질 불균일
- Mold damage
- Post-process failure
- Unstable product quality

- 소재 각도 체크  
3° 이상 위치 이상 시 불량 처리  
- 금형 손상 및 후공정 불량 예방  
- 소재 쓸림으로 인한 품질 산포 예방
- Monitoring Blank Angle  
Defective processing at over 3° position error  
- Preventing mold damage and post-process failure  
- Higher & stable quality with accurate blank location



Seochang Factory	50, Sojugongdan 3-gil, Yangsan-si, Gyeongsangnam-do, Korea
R&D Center	18-2, Sojugongdan 6-gil, Yangsan-si, Gyeongsangnam-do, Korea
Tooling Center	30, Sojugongdan 7-gil, Yangsan-si, Gyeongsangnam-do, Korea
Jeonggwan Factory	2-9, Nonggong-gil, Jeonggwan-eup, Gijang-gun, Busan, Korea
Coil Center	151, Jangansandan-ro, Jangan-eup, Gijang-gun, Busan, Korea
Jisa Factory	31, Gwahaksandan 1-ro, 60beon-gil, Gangseo-gu, Busan, Korea
Hot Stamping	173-80, Yongmyeonggongdan-gil, Geoncheon-eup, Gyeongju-si, Gyeongsangbuk-do, Korea
Asan Factory	591, Seobunam-ro, Sinchang-myeon, Asan-si, Chungcheongnam-do, Korea