

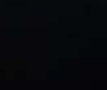
# Sunil dyfas

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# Sunil dyfas

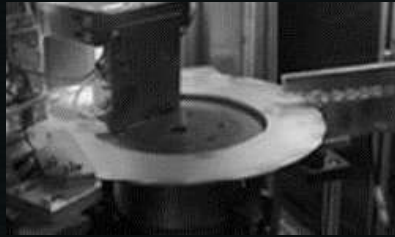
Total Solution for Fastener • from Good Design to Great Fastening



# Contents



## 1. History & Status




## CORPORATE HISTORY

45 years of expertise  
in fastening industry  
**Established in  
1976**

New products and new  
technology for new-  
mobility, and 50+ future-  
era

Quality Excellence Supplier  
for 8 years consecutive awards  
by global OEM  
**1<sup>st</sup> case in hardware area**



<ul style="list-style-type: none"> <li>• 1976 SK Machinery established</li> <li>• 1983 Sunil Machinery established, hived-off from SK group</li> <li>• 1989 R&amp;D Center established</li> <li>• 1995 100PPM certified by HMC</li> <li>• 1993 Quality management contract with Mizuno steel Japan</li> <li>• 1996 Technical Cooperation with KAMAX Germany (terminated in 2004)</li> </ul>	<ul style="list-style-type: none"> <li>• 2000 Jincheon plant established (Korea)</li> <li>• 2003 Company name changed to Sunil Dyfas Corp.</li> <li>• 2005 Tianjin plant established (China)</li> <li>• 2005 National productivity grand-prix by Korean government</li> <li>• 2008 JVC with SFS Swiss in Tianjin, China</li> <li>• 2009 Sunil M-Tech in Gimhae (Korea), M&amp;A DY Hynix</li> </ul>	<ul style="list-style-type: none"> <li>• 2012 HRD excellence certified by Korean government</li> <li>• 2015 Mexico plant founded</li> <li>• 2015 Nantong plant founded (China)</li> <li>• 2015 Tower of export award - USD 70 Million</li> <li>• 2016 Grand-prix of management innovation by GSM institute</li> <li>• 2017 Tech. innovation grand-prix awarded by Korean gov.</li> <li>• 2018 Silver tower medal awarded by Korean government</li> </ul>	<ul style="list-style-type: none"> <li>• 2019 Quality Excellence Company by GM - 8 years consecutive</li> <li>• 2020 Hub bolt supply to big 3 - 1<sup>st</sup> case in Asia</li> </ul>
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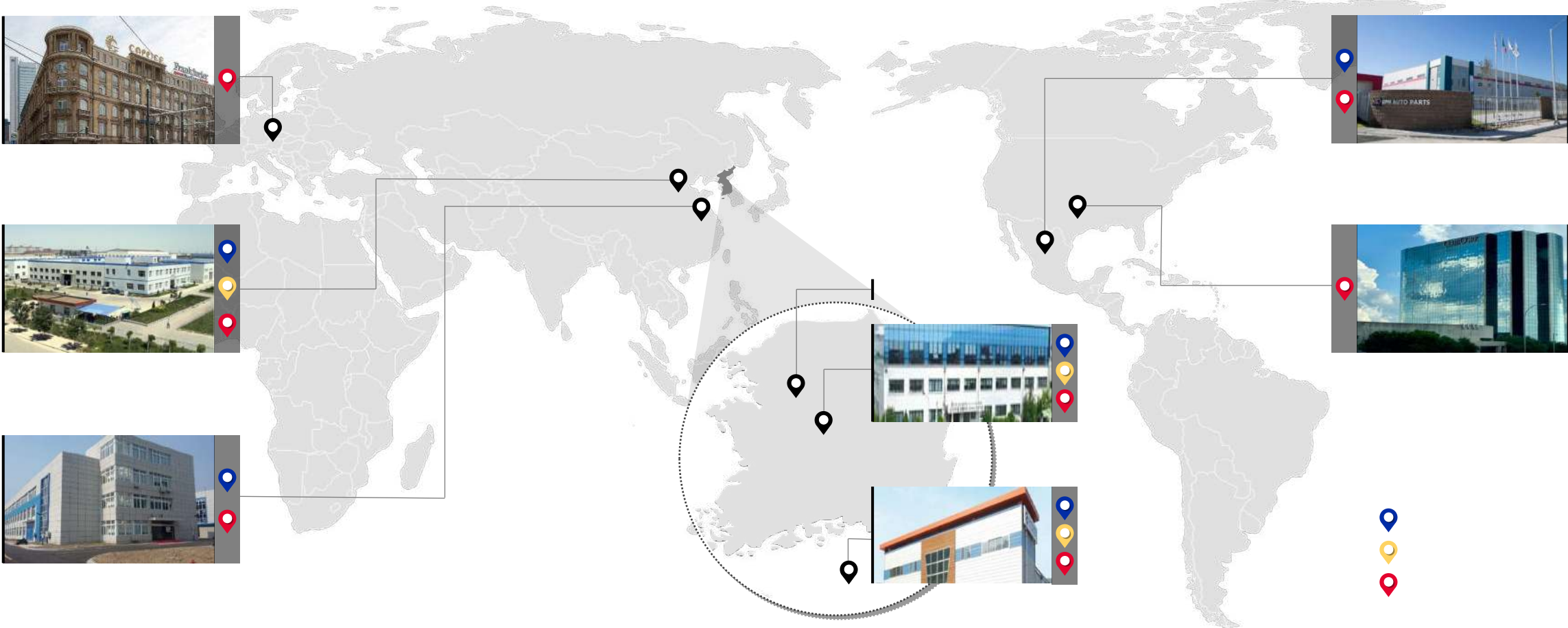
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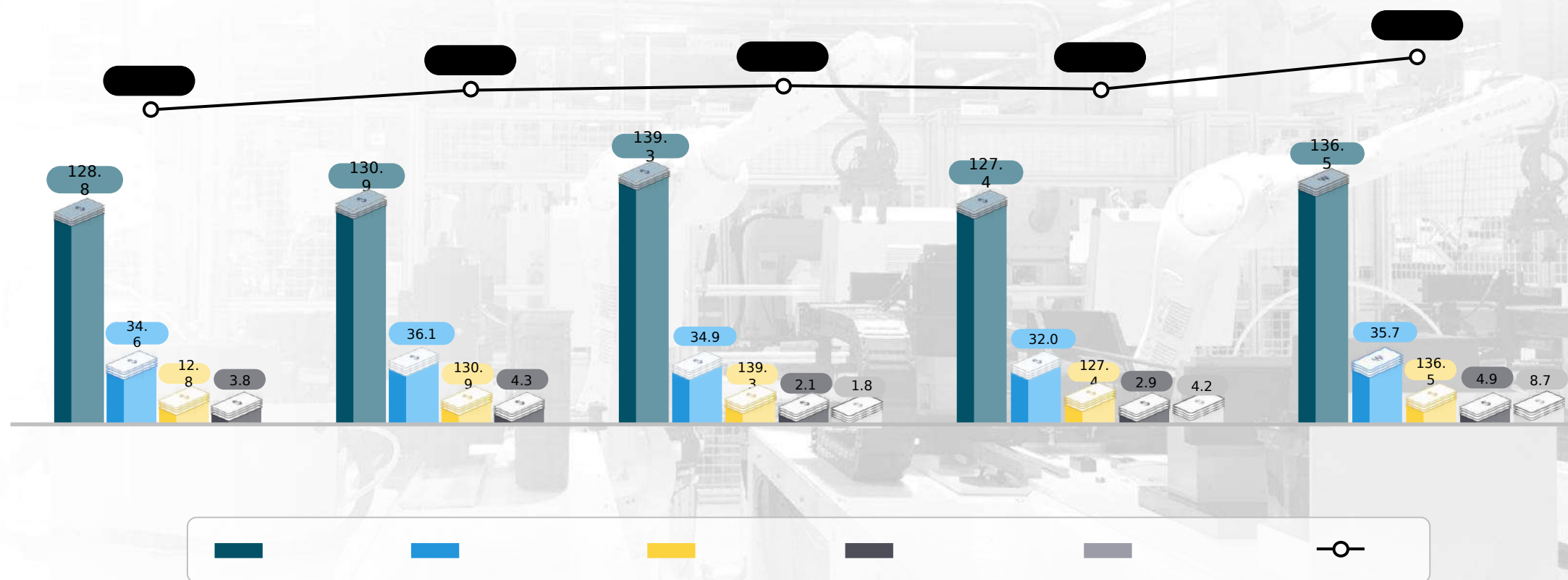


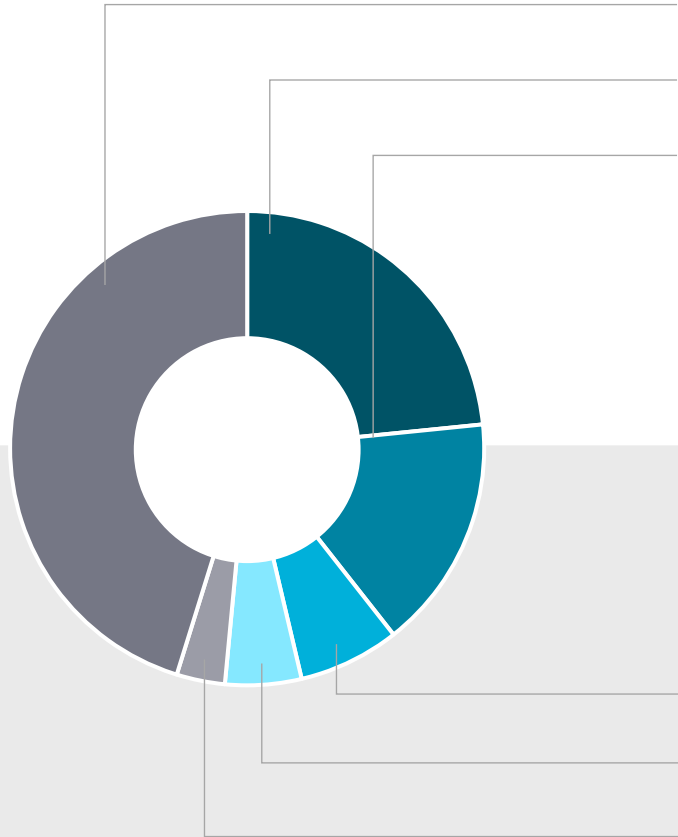
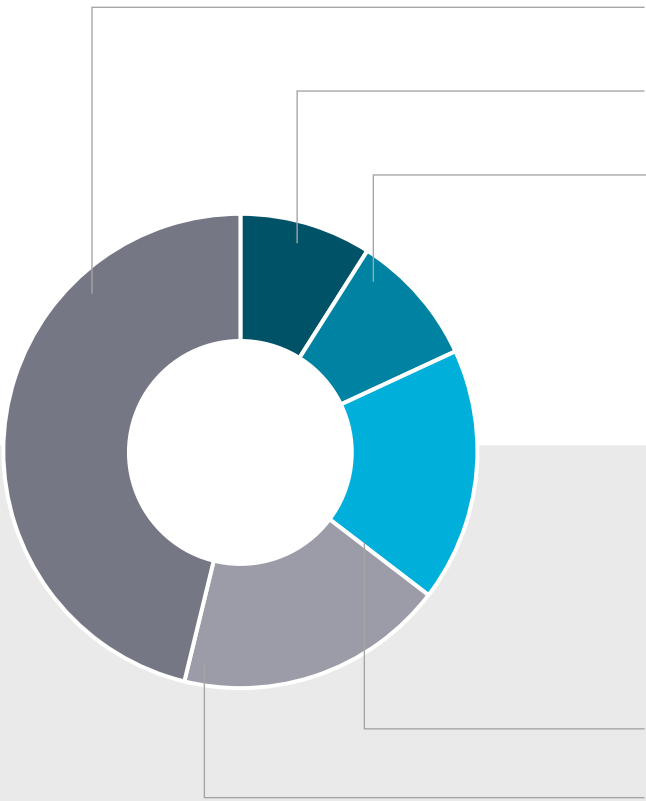
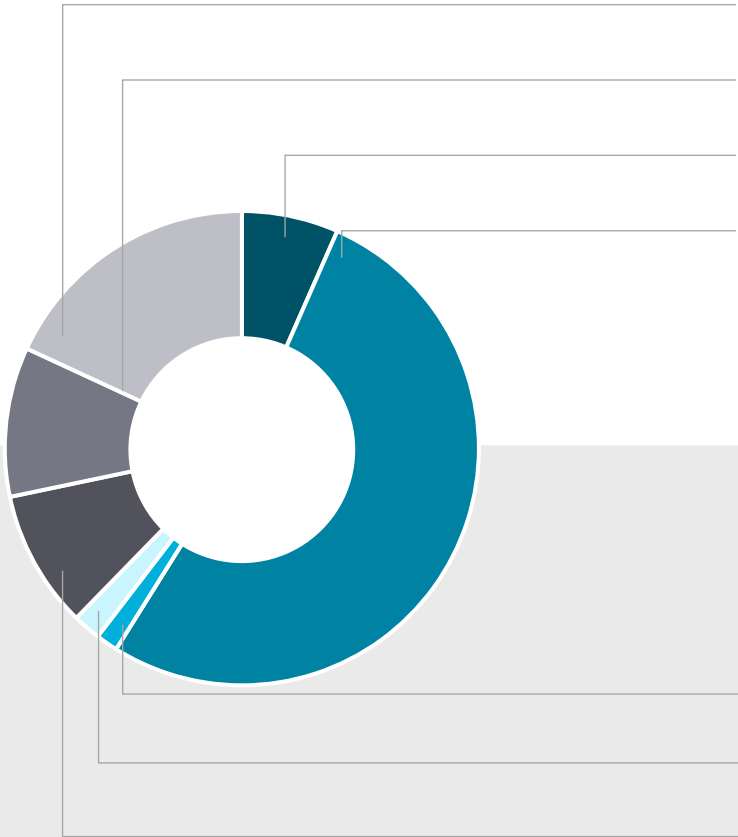


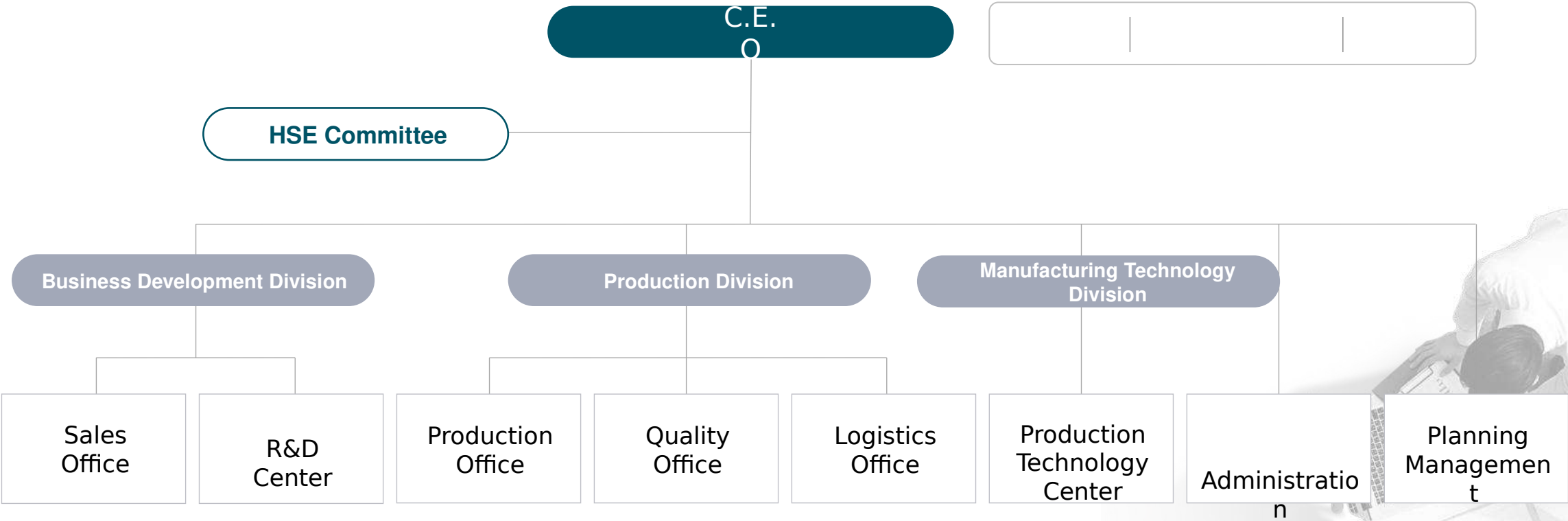
 <p>Korea</p>	 <p>HYUNDAI</p>	 <p>KIA</p>	 <p>gm</p>	 <p>SSANGYONG MOTOR</p>	 <p>HYUNDAI MOBIS</p>	 <p>HYUNDAI WIA</p>	 <p>HYUNDAI TRANSYS</p>	 <p>ILJIN</p>	 <p>DOOSAN 대한인프라</p>	 <p>Mando Mando Corporation</p>	 <p>myunghwa</p>
 <p>China</p>	 <p>ZF</p>	 <p>HYUNDAI</p>	 <p>KIA</p>	 <p>长安汽车</p>	 <p>GEELY</p>	 <p>TOYOTA</p>	 <p>广汽长丰</p>	 <p>长城汽车</p>	 <p>上汽集团</p>	 <p>东风汽车公司</p>	 <p>CHERY</p>
 <p>Mexico</p>	 <p>SKF</p>	<p>DAIMLER</p>	 <p>KIA</p>	 <p>HYUNDAI WIA</p>	 <p>HYUNDAI TRANSYS</p>	 <p>HYUNDAI MOBIS</p>	 <p>myunghwa</p>	 <p>LG전자</p>			
 <p>NA</p>	 <p>gm</p>	 <p>CHRYSLER</p>	 <p>Ford</p>	 <p>HYUNDAI</p>	 <p>KIA</p>	 <p>Autoliv</p>	 <p>Gates A Tenneco Company</p>	 <p>metaldyne</p>			
 <p>EU</p>	 <p>VW</p>	 <p>ZF</p>	 <p>HYUNDAI</p>	 <p>KIA</p>	 <p>Continental</p>						
 <p>Japan</p>	 <p>KATO</p>	 <p>HONDA</p>	 <p>NISSAN</p>	 <p>Caterpillar</p>	 <p>TOHATSU MARINE</p>						



## Annual sales (Million USD)







## 2. Total Solution



We guarantee the product reliability and fastening performance by design validation and optimal process



Structure analysis,  
simulation tool



Design validation  
Enhanced quality performance  
Manufacturing technology



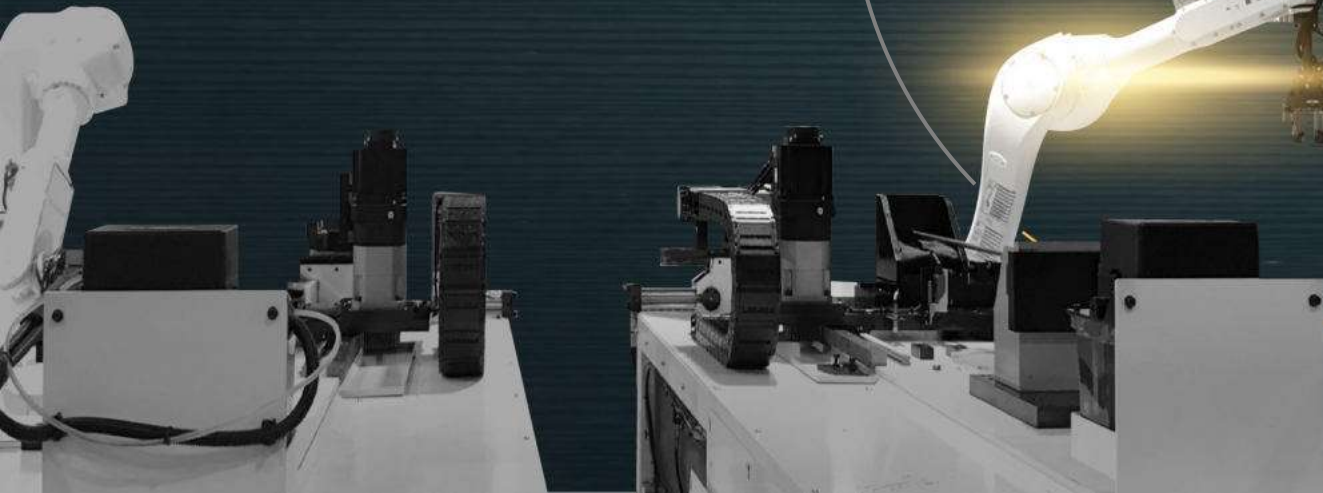
Assembly line verification,  
Axial force guarantee



Loosening prevention,  
Quality assurance



Real-time response  
Customer satisfaction



### Robust design



- **Structure analysis**
- **Simulation analysis**
- **Process and mold design automation**

### Smart factory

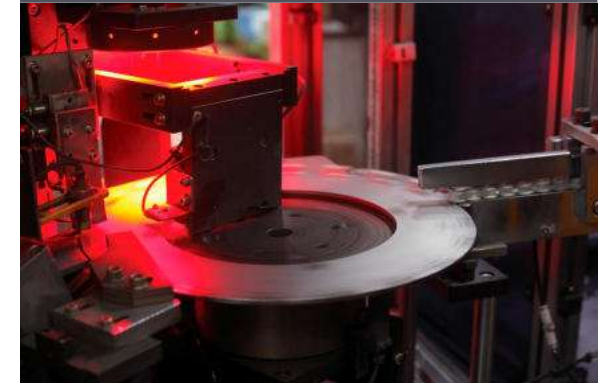


Automated robot line system

Automated forging machinery

- **APS based process management**
- **Process control and quality assurance based on SPC**
- **MES implementation, and factory automation**

### Quality control



- **Machine Vision**
- **Zero Defect**
- **Clamping force verification**



### R&D

- **Creation of customer value**  
- new tech. and products
- **Design verification**
- **Pre-verification system**  
- Simulation tool, CAE



### New technology

- **Eco-friendly parts**
- **Light-weighting parts**
- **Precision forming method**
- **Pipe forging technology**
- **SBW parts processing**



### Core technology

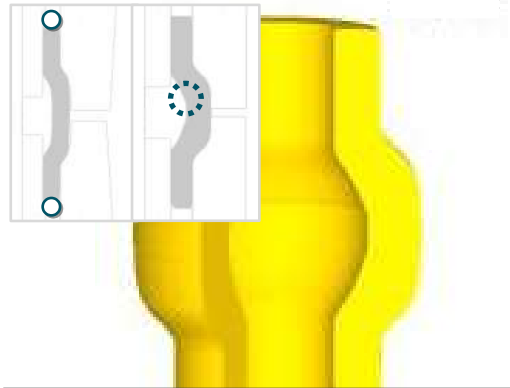
- **Near Net Shape forming**
- **Fastening technology**
- **Precision Processing**
- **Heat treatment**
- **Surface treatment**



### Patents

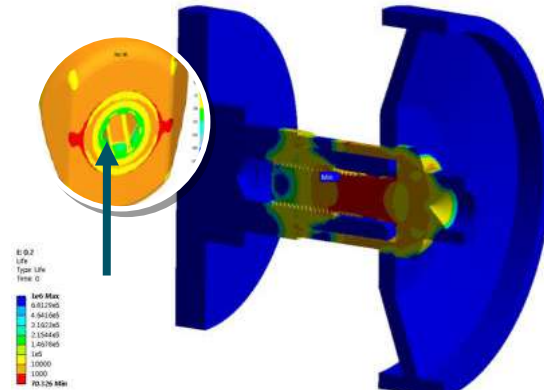
- **CAM-Washer integral bolt manufacturing technology**
- **Metal oxide-coating control technology**
- **AL E-cap hardening process**
- **AL pipe tension test**

### Forming analysis



- Advanced technology development
- Forging formability analysis
- Quality and cost effectiveness

### Structure analysis



- Optimal mold design
- Improvement of mold life
- Reliability improvement

### Fastening- fatigue test



- Durability improvement
- Stable fastening force
- Fatigue performance improvement

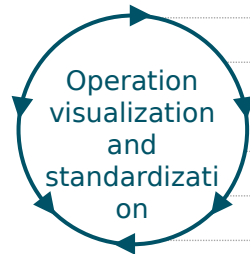
### Fastening reliability



- Clamping force verification in assembly line
- Fastening condition setup
- Fastening specification

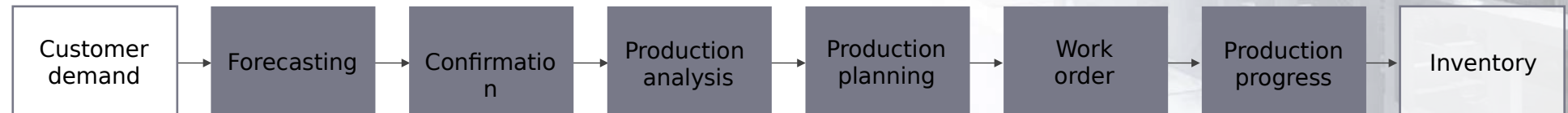
## Established optimal production and supply to quickly respond to changes in customer demand

Smart, connected, digitized, and in real-time (Real-Time Enterprise)



- Intellectualization
- Visualization
- Standardization
- Automation
- Digital
- Connectivity

**Demand driven production system (APS)**  
**Production planning digitalization (APS)**  
**Real-time process monitoring (MES/POP)**  
**Digitization of work orders (ERP)**





- $\Phi 5 \sim \Phi 22$



- 2D-2B~7D-7B
- $\Phi 6 \sim \Phi 37$



- FLAT/ROTARY/ROLLER
- M6 ~ M24



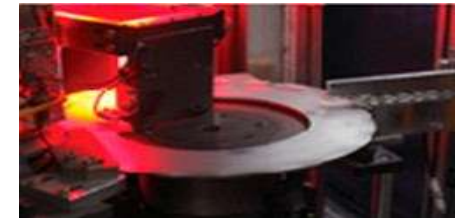
- Quenching and Tempering
- High Frequency
- Carburizing

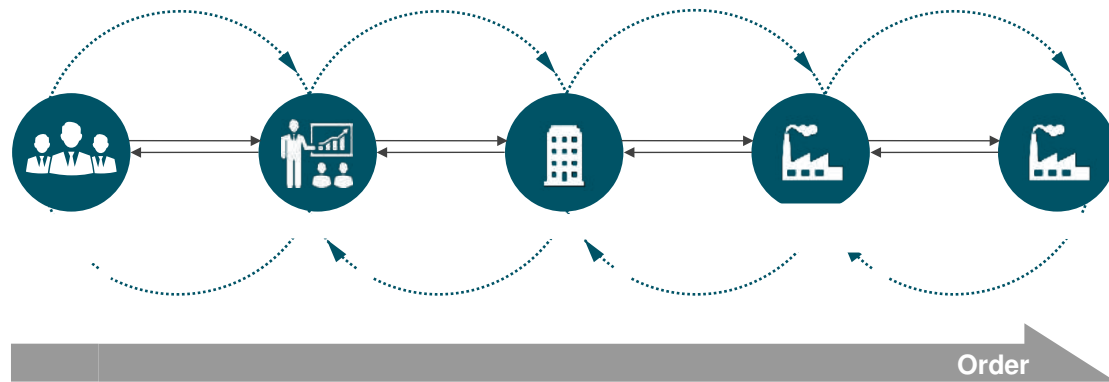


- Zinc & Zinc-Nickel plating
- Phosphating
- Geomet, DACRO



- Eddy current
- Machine Vision
- Laser scanning





Advanced product development through technical cooperation with customers



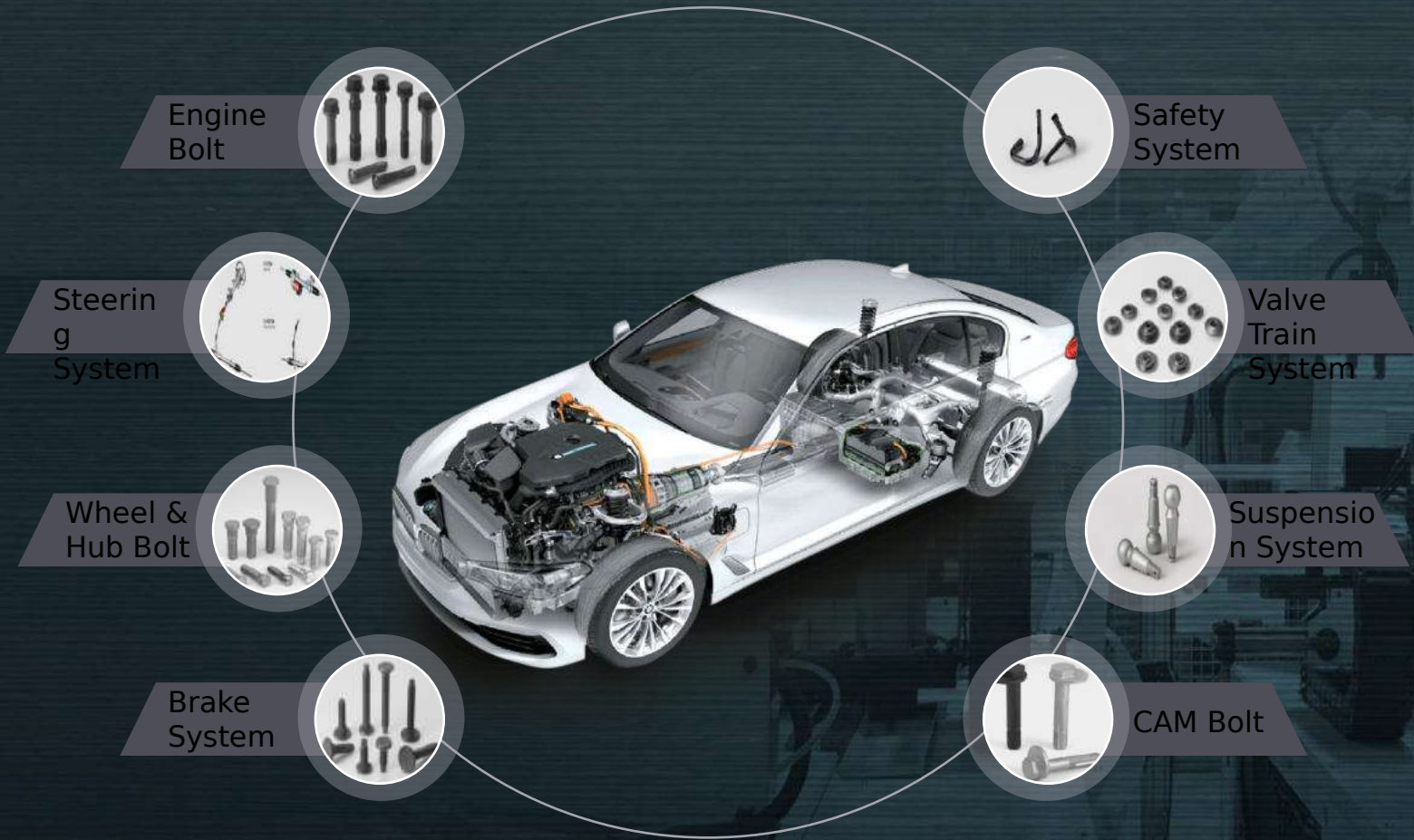
Technology exchange with customer



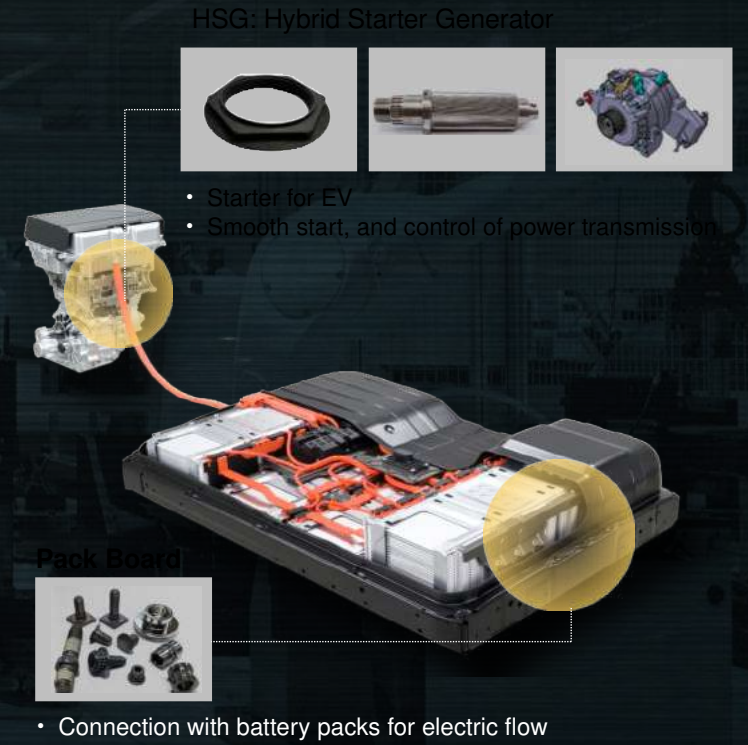
Clamping force verification in customer's assembly line






























### 3. Product Portfolio



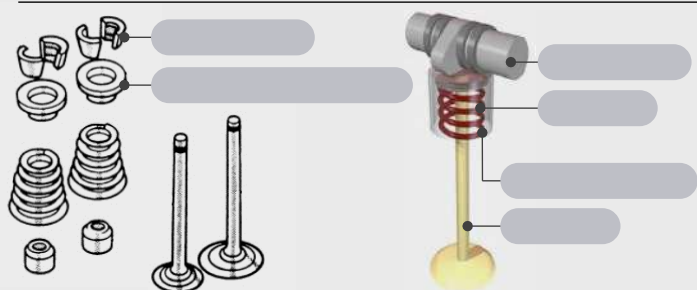
### New Mobility



Engine Bolt	Valve Train System	Wheel & Hub Bolt	Safety System	Brake System	Steering System	Suspension System	New Mobility	Cam Bolt
 <p>Cylinder Head Bolt</p>	 <p>Valve Spring Retainer</p>	 <p>Passenger Car</p>	 <p>P/T Pipe</p>	 <p>Booster Bolt</p>	 <p>MDPS</p>	 <p>Ball Stud</p>	 <p>SBW Component</p>	
 <p>Conrod Bolt</p>	 <p>Tappet</p>	 <p>Commercial Car</p>	 <p>Spacer</p>	 <p>Push Rod</p>	 <p>Input Shaft</p>	 <p>Ball Sleeve</p>	 <p>Insert Nut</p>	
 <p>Bearing Cap Bolt</p>	 <p>Valve Lock</p>	 <p>Commercial Car</p>	 <p>Retractor</p>	 <p>Guide Rod</p>	 <p>Output Shaft</p>	 <p>Ball Joint Socket</p>	 <p>Ball Screw Shaft</p>	 <p>CAM-Washer one body type</p>



Advantages	Features	Verification of axial force
<ul style="list-style-type: none"><li>• <b>Lightweight Bolt</b></li><li>• <b>Consistent fastening force</b></li><li>• <b>Verified fastening reliability</b></li></ul>	<ul style="list-style-type: none"><li>• <b>Stabilization of axial force distribution</b></li><li>• <b>Design for stable elongation region</b></li><li>• <b>Stable coefficient of surface friction</b></li></ul>	<ul style="list-style-type: none"><li>• <b>Elongation measurement</b></li><li>• <b>Ultrasonic measurement</b></li></ul>



Valve Spring Retainer	Tappet	Valve Lock
<ul style="list-style-type: none"> <li>• Optimal process by multi-stage forming technology</li> <li>• Cost efficiency, and quality assurance</li> </ul>	<ul style="list-style-type: none"> <li>• Process optimization by Transfer Deep Drawing</li> <li>• Cost efficiency by process simplification, consistent quality, and high-level productivity</li> </ul>	<ul style="list-style-type: none"> <li>• Process optimization by multi forming equipment</li> <li>• Cost efficiency by consistent quality, and high-speed manufacturing</li> </ul>



### Hub Bolt



### Wheel Stud & Hub Bolt



- **Validation of fastening-fatigue & mechanical property**
- **High-strength required property**
- **Zero Defect required for safety**





### Pretensioner Pipe



- Seat belt component to rewind belt instantaneously in emergency, e.g., collision.

**1<sup>st</sup> case in Korea**

### Retractor Components



- Shaft torsion of retractor
- **1<sup>st</sup> case in Korea**

### Wheel Gear

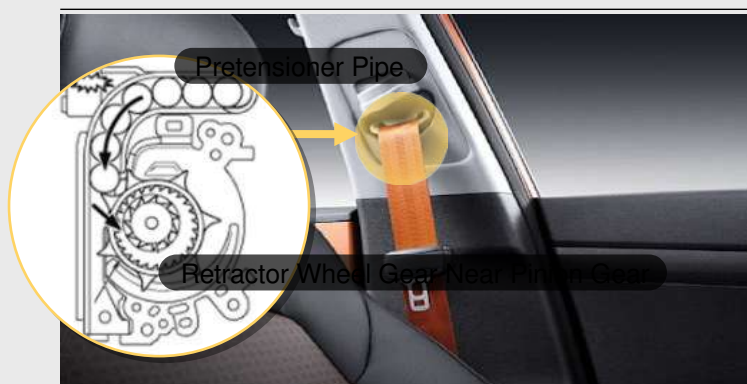


- Belt locking gear connecting with base lock gear
- **Near Net Shape Technology**

### Pinion Gear



- Rewinding seat belt to pull passenger to seat
- **Net Shape Technology**







### Seat Belt

#### Spacer



- Moving the belt left and right, assembled with seat belt bolts

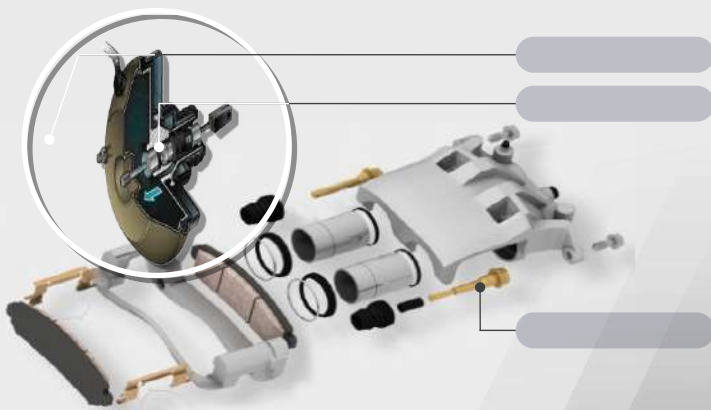
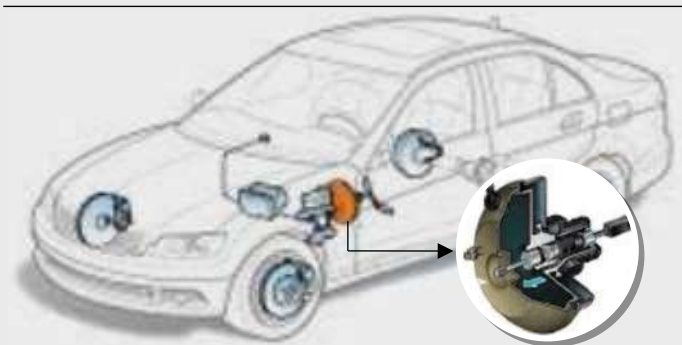
#### Bolt



- Fixing component seat belt system to vehicle frame
- As a security part, perfect quality of strength and load

### Airbag





**Booster Bolt**



- **Mounted in brake booster**
- **Leak-proof components by assembly strength and surface shape management**

**Push Rod**

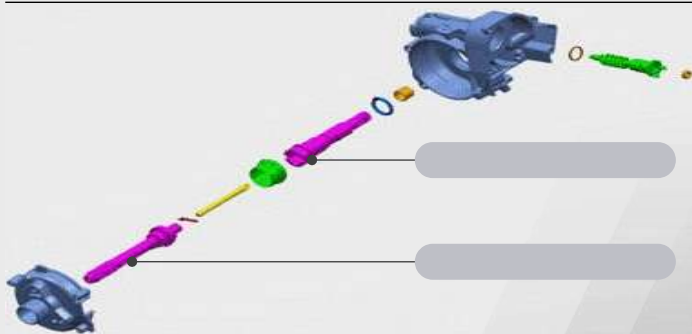
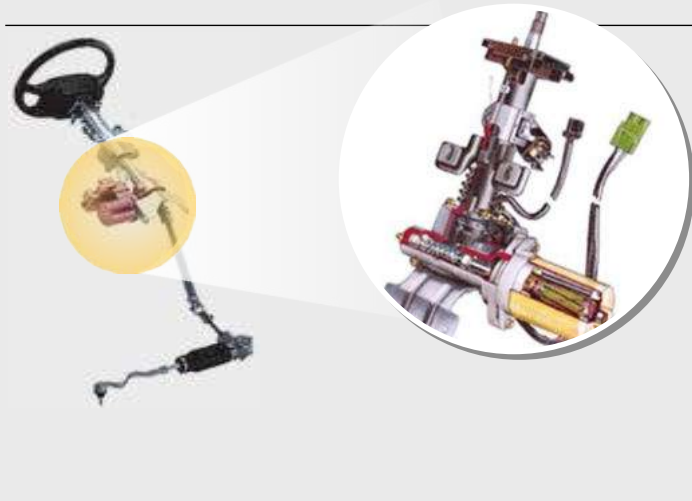


- **Transmit cam movement to valve**
- **Excellent quality by forging the inner diameter in high precision forming**

**Guide Rod**



- **Guide for brake caliper**
- **Essential components for braking system**



### MDPS (Motor Driven Power Steering)



- **Electronic control of steering wheel force**
- **Essential components for driving stability and autonomous driving**

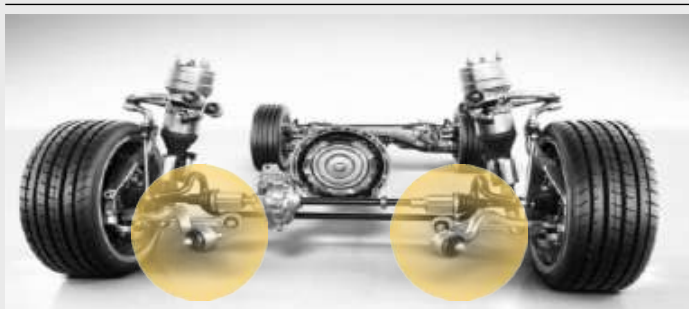
### Output Shaft



### Input Shaft



- **High precision components**
- **Near Net Shape technology**
- **Precise processing**



Ball Sleeve



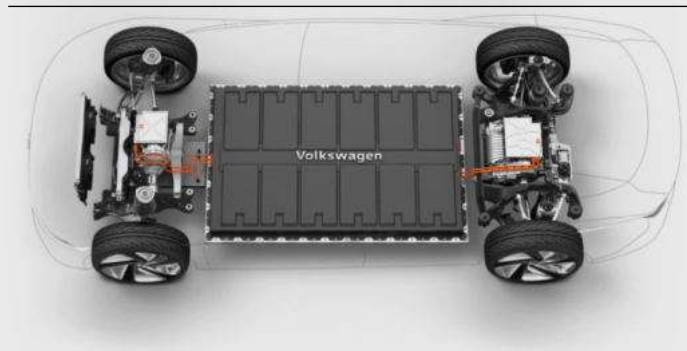
Ball Stud



Feature

- Improve driving comfort and safety with precise wheel and vibration control
- Near Net Shape + high precision process





### Battery Components

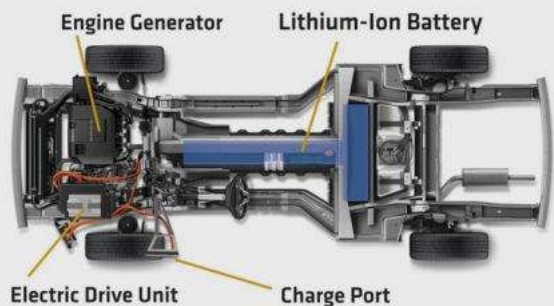


- Core components to connect battery pack
- Non-ferrous metal
- Compact-sized fastener

### Rotor Shaft



- Driving power transfer (EV mode & hybrid mode)
- Cold forging technology in large scale



### Ball Screw Shaft (EV)



- High-precision power transmission by converting rotational motion into linear motion in power actuator system
- Spline forging + Precision processing

### SBW Actuator



- Components for electronic shift system (Shift By Wire)
- 1<sup>st</sup> developed in Korea



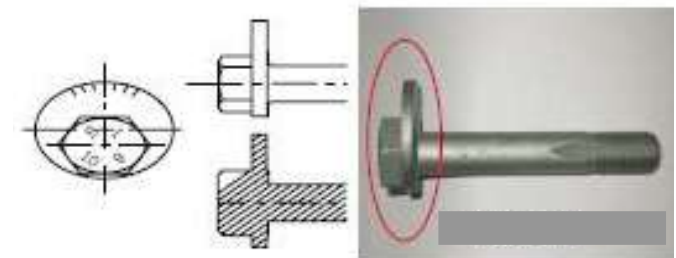
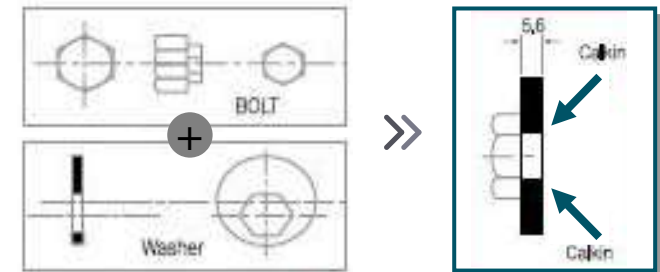
### Integrated Cam- Washer



- Integrated type to prevent a separation of Cam and Washer permanently
- Improved durability and economical efficiency

**Improved torsion-strength in two times**

### Features



### Aluminum



- Inner pipe and pretensioner pipe
- Weight improved in 35%

### Stainless Steel



- Core components of Hydrogen valve
- Functional components of EGR Cooler

### Copper & Brass



- Thermostat components for high thermal-conductivity
- Closing and opening valve device by change of coolant temperature from water jacket



## 4. Facility & Equipment



### Automated operation

- Full automated robot line system
- Automated forging machinery
- Automated warehouse
- Automated inspection & packing



### Smart factory

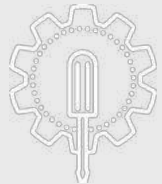
- APS, POP, SPC, MES
- Improved logistics and production
- Automatic process-control & monitoring
- Quality data generation & management



### Global network

- Plants in Korea, China, and Mexico
- Global capability build-up
- Quality control & management
- Customer collaboration in real-time

**Automated  
robot line**



**Automated  
forging  
machinery**

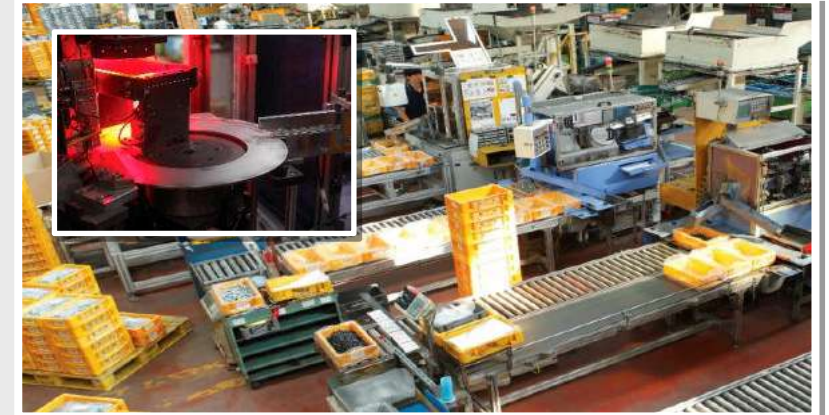


**Heat-  
treatment line  
monitoring**

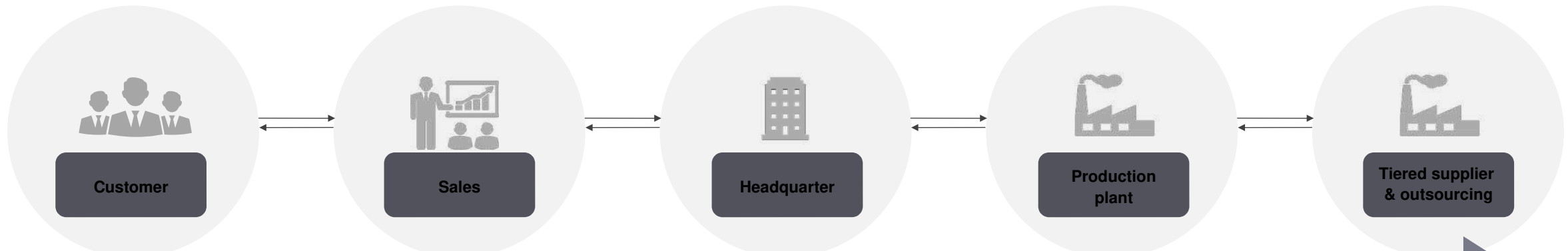


**High-speed  
rolling  
machinery**





### Delivery time management (SCM optimized APS system)



## 5. Quality Management System

### Global Standard Process

	KOSHA 18001	ISO 14001	ISO 22301
	Health & Safety	Environment	Business continuity plan
	Risks & Hazard	Risks & Opportunity	Business impact analysis
	Preventive Action	ENVR Policy	Event / Incident
	Continual Improvement	ENVR Performance	Recovery Plan
	Documentation	Continual Improvement	BCMS exercise
			Performance evaluation

P&C of Workers: Participation & Consultation of workers  
 OH&S: Occupational Health & Safety

5.1. Certification (1/2)

Quality Management

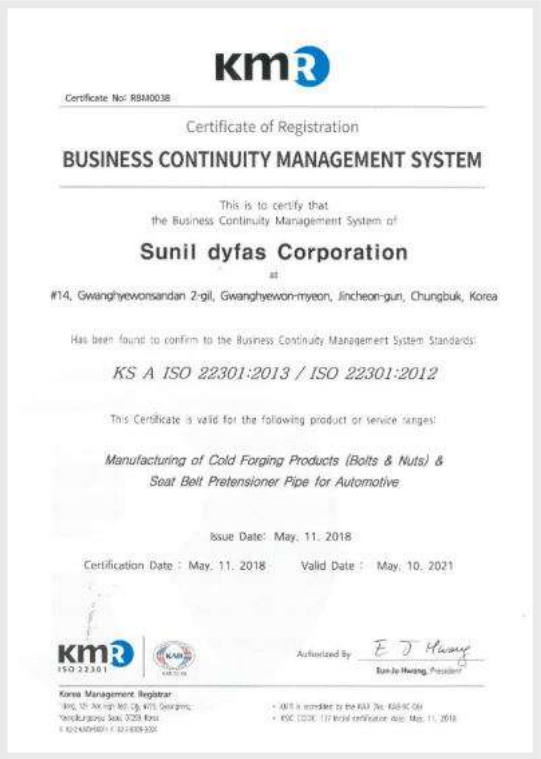
IATF16949



ISO 9001



ISO22301



## 5.1. Certification (2/2)

### ISO14001



Certificate No.: REM2031

**ENVIRONMENTAL MANAGEMENT SYSTEM**

This is to certify that the environmental management system of **Sunil dyfas Corporation** at #14, Gwanghyewonsandan 2-gil, Gwanghyewon-myeon, Jincheon-gun, Chungbuk, Korea

Has been found to conform to the Environmental Management System Standards: **KS I ISO 14001:2015 / ISO 14001:2015**

This Certificate is valid for the following product or service ranges: **Manufacturing of Cold Forging Products (Bolts & Nuts) & Seat Belt Pretensioner Pipe for Automotive**

Issue Date: May. 11, 2018  
 Certification Date: Jun. 27, 2018    Valid Date: Jun. 26, 2021

Authorized By: *E. J. Hwang* (Sunil Hwang, President)

KMR is accredited by the KAC (No. KMR-17-15)  
 KMR is accredited by the KQA (No. KQA-10-10)  
 KQSC CODE 177 Initial verification date: Dec. 10, 2013  
 KQAF CODE 177 Initial verification date: Jun. 27, 2002

### OHSAS 18001



Certificate No.: 3011179

**Management System Certificate**

This is to certify that the occupational health and safety management system of **Sunil dyfas Corporation** at #14, Gwanghyewonsandan 2-gil, Gwanghyewon-myeon, Jincheon-gun, Chungbuk, Korea

has been found to conform to the Occupational Health and Safety Management System Standards: **K-OHSMS 18001:2007 / OHSAS 18001:2007**

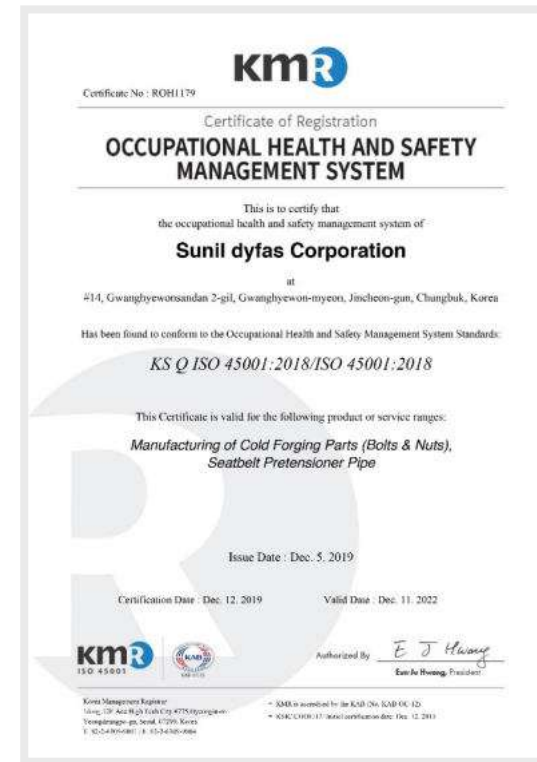
This Certificate is valid for the following product or service ranges: **Design and Manufacturing of Cold Forging Products (Bolts & Nuts)**

Issue Date: Oct. 7, 2016  
 Certification Date: Dec. 12, 2016    Valid Date: Dec. 11, 2019

Authorized By: *K. H. Park* (Ki Ho Park, President)

KMAR is accredited by the KAC (No. KMR-17-15)  
 KQSC CODE 177 Initial verification date: Dec. 10, 2013  
 KQAF CODE 177 Initial verification date: Jun. 27, 2002

### ISO45001



Certificate No.: ROH1179

**OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM**

This is to certify that the occupational health and safety management system of **Sunil dyfas Corporation** at #14, Gwanghyewonsandan 2-gil, Gwanghyewon-myeon, Jincheon-gun, Chungbuk, Korea

Has been found to conform to the Occupational Health and Safety Management System Standards: **KS Q ISO 45001:2018/ISO 45001:2018**

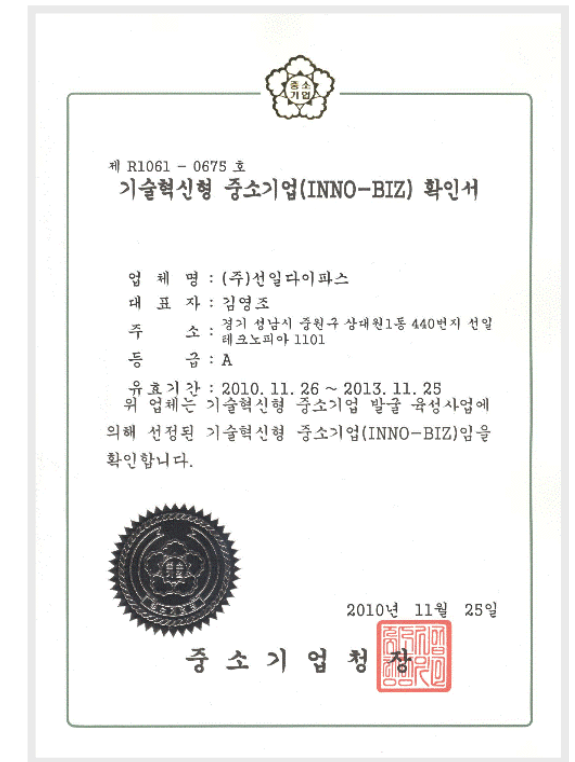
This Certificate is valid for the following product or service ranges: **Manufacturing of Cold Forging Parts (Bolts & Nuts), Seatbelt Pretensioner Pipe**

Issue Date: Dec. 5, 2019  
 Certification Date: Dec. 12, 2019    Valid Date: Dec. 11, 2022

Authorized By: *E. J. Hwang* (Sunil Hwang, President)

KMR is accredited by the KAC (No. KMR-17-15)  
 KQSC CODE 177 Initial verification date: Dec. 10, 2013  
 KQAF CODE 177 Initial verification date: Jun. 27, 2002

### Inno-biz award



제 R1061 - 0675 호  
**기술혁신형 중소기업(INNO-BIZ) 확인서**

업 체 명 : (주)선일디파스  
 대 표 자 : 김영조  
 주 소 : 경기 성남시 중원구 상대원1동 440번지 선일테크노피아 1101  
 등 급 : A

유효기간 : 2010. 11. 26 ~ 2013. 11. 25  
 위 업체는 기술혁신형 중소기업 발굴 육성사업에 의해 선정된 기술혁신형 중소기업(INNO-BIZ)임을 확인합니다.

2010년 11월 25일  
**중소기업청**

## 5.2. Awards

2020

2019

2018

2017

2016

2005

Quality Excellence Supplier by GM



Supplier Of Year awarded by Hyundai





### 5.3. Global Quality Management



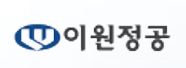
# QUALITY CONTROL

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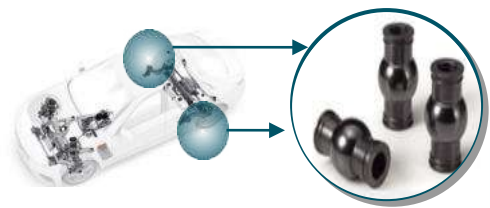
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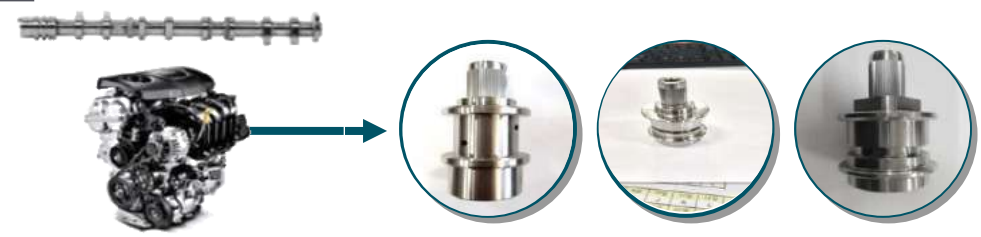
## Sunil M-Tec Co., Ltd.



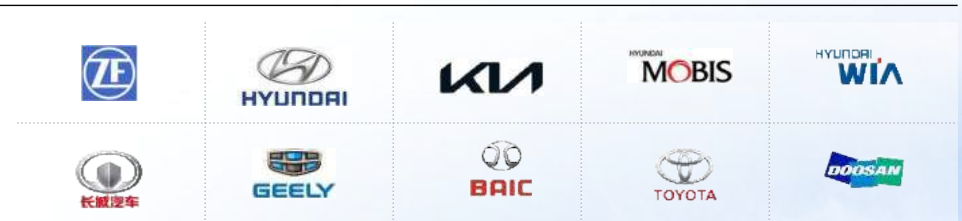
1 Column Drive-EPS Input & Output Shaft 2 Suspension-Ball Sleeve



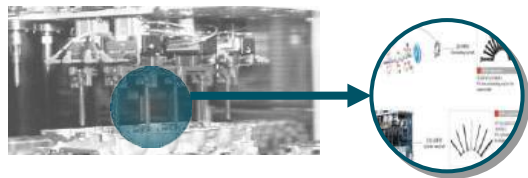
3 Cam Shaft-End Piece



## Sunil SFS-intec Co., Ltd.



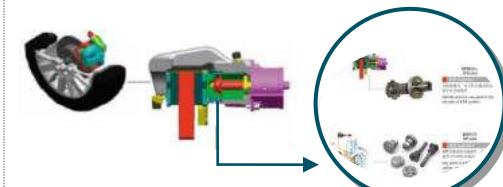
### 1 Engine bolts



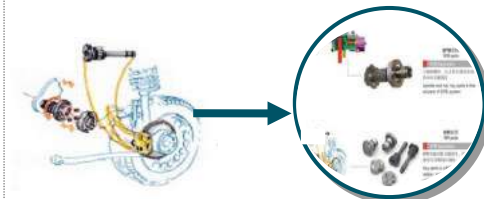
### 3 Safety components



### 2 EPB & BIR



[ Electric Parking Brake parts ]



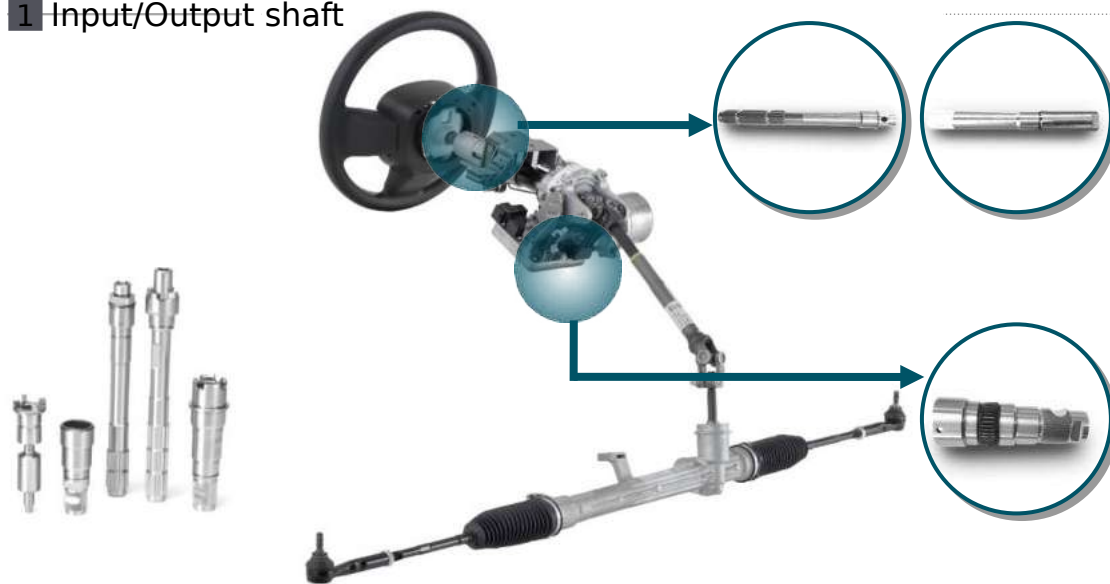
[ BIR type Brake Caliper parts ]



## SUNIL AUTO PARTS (Sunil Kibae Nantong Co., Ltd.)



### 1 Input/Output shaft



## SPM AUTO PARTS



1 Bolt



2 Nut



# Sunil dyfas

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Quality



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Future Cars



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Response



Smart  
Factories



Thank you

