

EVERY MOTION,
WE DRIVE & CONTROL



CHANGWON PLANT & R&D Center

21, Pyeongsan-ro 8beon-gil, Uichang-gu, Changwon-si, Gyeongsangnam-do, Korea
T. +82-55-294-0011 F. +82-55-296-9695



GUNPO PLANT & 2nd R&D Center

8, Heungan-daero 18beon-gil, Gunpo-si, Gyeonggi-do, Korea
T. +82-31-456-0015 F. +82-31-456-0016



HAMAN PLANT

49-17, Hamansandan 2-gil, Gunbuk-myeon, Haman-gun, Gyeongsangnam-do, Korea
T. +82-55-716-0014 F. +82-55-716-0019

MOTION TECHNOLOGY PROVIDER



www.samhyun.co.kr

GLOBAL TOP LEADER

SAMHYUN

We are doing our best to provide the best quality products through unrelenting efforts and continuous investments

Since we established in 1988, SAMHYUN has been Developing & Manufacturing electric Motors and Controllers for Automotive, Defense, Robot, Marine and Aerospace with our own design and the best price, the best quality based on the spirit of creativity, challenge and innovation.

We are committed to continuous innovation management for the customers satisfaction and we are doing our best to provide the best products under slogan "Global Top TQS & Zero Defects". We will pave the way for great company in the world with new technology and best quality from customer's standpoint.

HISTORY

- | | |
|--|---|
| <p>1988 • Establishment SAMHYUN Co.,Ltd.</p> <p>2003 • Set-up R&D Center</p> <p>2004 • Started developing BLDC (Brushless Direct Current) Motor & Controller</p> <p>2006 • Acquired SQ Certificate from HYUNDAI Motors
• Designed BLDC applications and fabricated prototypes for automotive industry</p> <p>2009 • Qualified as supplier of BLDC/BLAC Motor together with control system by Korean Army</p> <p>2013 • Pilot Production of BLDC Motors for Dual Clutch Transmission
• Passed Function & Performance Test of IRST for Korean Army</p> <p>2014 • Started Mass Commercial Production of BLDC Motors for 7 Speed DCT application
• Established GUNPO Plant & R&D center to facilitate cooperation with HYUNDAI & KIA Motors relating to high efficiency e-Motors, especially Traction Motors</p> | <p>2015 • Started Mass Commercial Production of BLDC Motors for 6 Speed DCT application of HEV</p> <p>2016 • Started developing 5 Speed AMT Motor</p> <p>2017 • Started developing CVVD Motor & Controller</p> <p>2018 • Started developing E-Clutch Motor & Controller
• Started Mass Commercial Production of BLDC Motors for 5 Speed AMT</p> <p>2019 • Started Mass Commercial Production of CVVD Actuator for CVVD Engine
• Started Developing SBW Motor for SBW(Shif by wire) System</p> |
|--|---|

LOCATION



CHANGWON PLANT & R&D Center

- Head Quarters
- R&D Center : BLDC, BLAC, Controller
- Automated Production Line : BLDC, BLAC
- 400,000 set/Year x Five(5) Lines , Totally 2,0mil set/year
- Customized R&D capability for Automotive & Defense & Aerospace and various industry applications



GUNPO PLANT & 2nd R&D Center

- Strategic location near to Hyundai & Kia Motors R&D Center
- Specialized in Prototype R&D, manufacturing
- Niche Volume Manufacturing
- Original Development Manufacturing

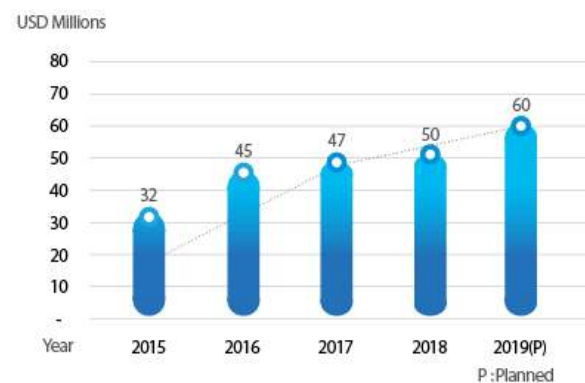


HAMAN PLANT

- Strategic location near to Samhyun Head Quarter
- Specialized in mass production for Automotive Motor & Driver
- Customized mass production capability for Automotive

BUSINESS

SALES GROWTH



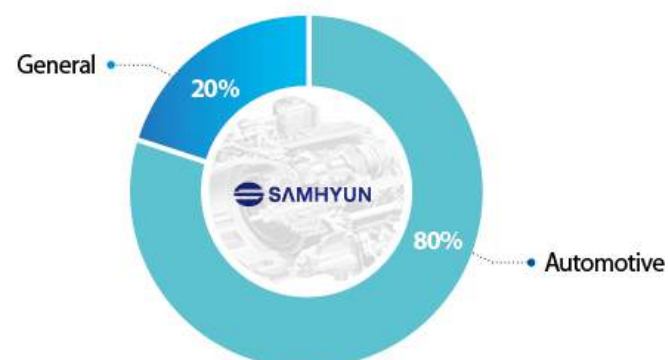
FINANCIAL STABILITY

(Unit: %)

Year	2015	2016	2017	2018	2019(P)
Debt Ratio	107.4	129.2	85.5	91.9	90.5
Current Ratio	121.4	148.1	162.4	149.2	169.3
R&D Cost/Revenue	9.5	7.6	10.1	11.7	10.5

• P:Planned

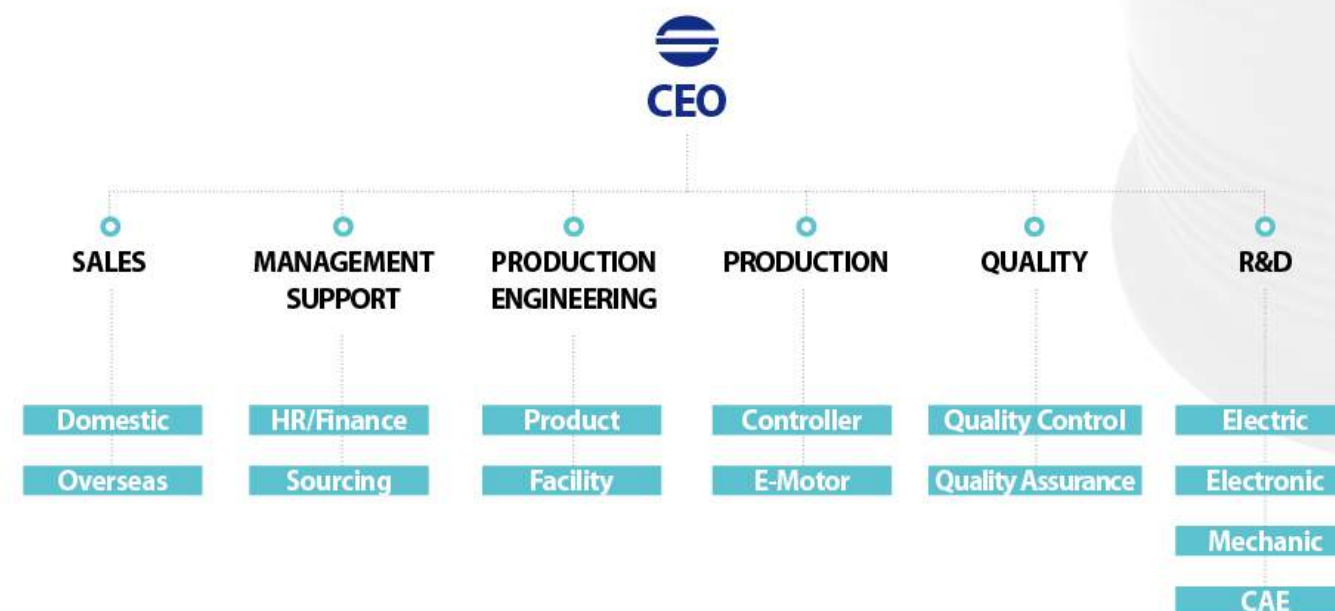
SALES PORTFOLIO



MAJOR CUSTOMERS



ORGANIZATION



Work Force **137**

Engineers **68** | R&D **55** | QA & Production **13**

CERTIFICATES



SQ FROM HYUNDAI/KIA MOTORS
(ELECTRIC/ELECTRONIC/WELD)

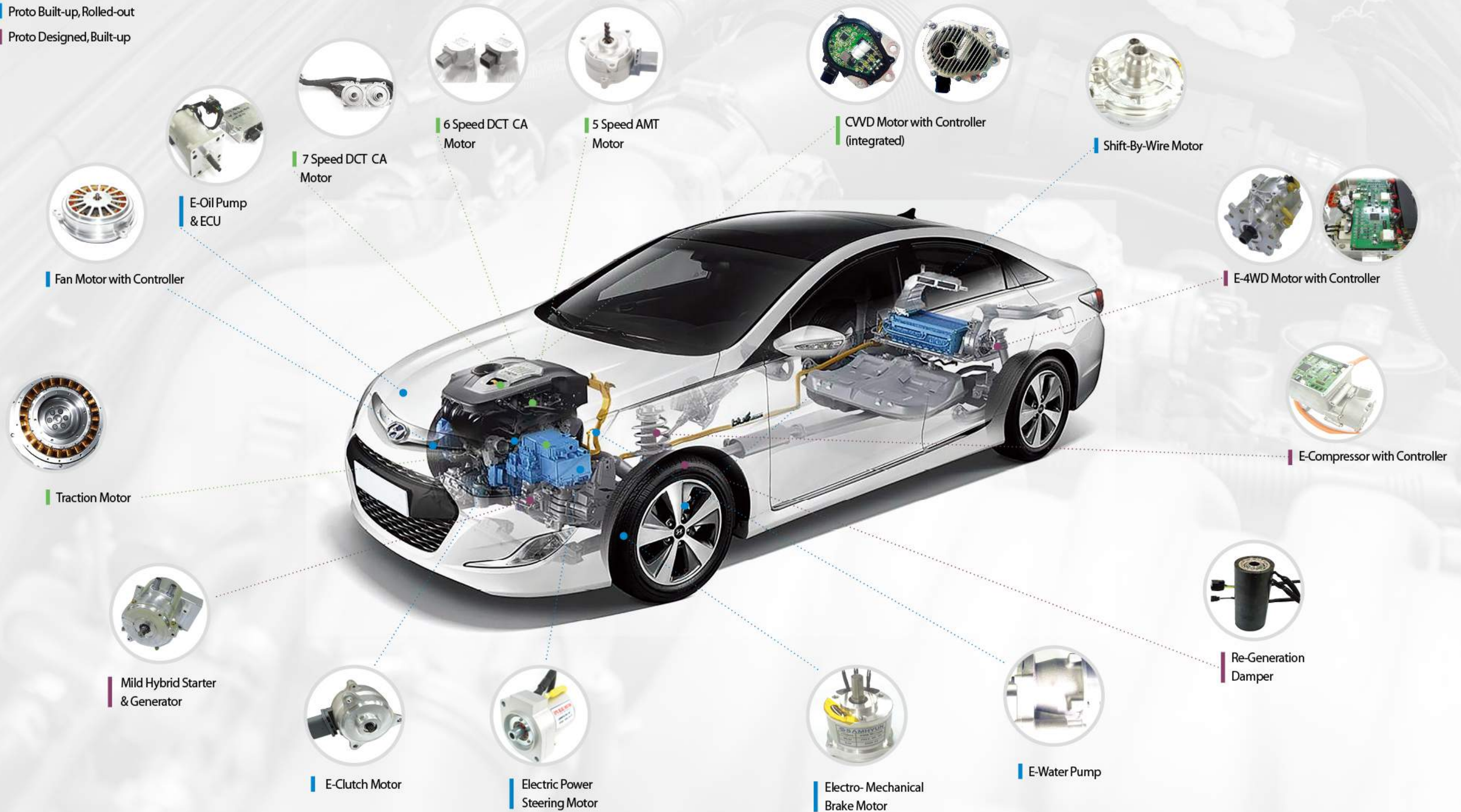


15 PATENTS ARE REGISTERED

Mass Production

Proto Built-up, Rolled-out

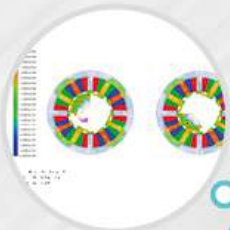
Proto Designed, Built-up



EXCELLENT COMPUTER AIDED ENGINEERING CAPABILITY

Electro-Magnetic Analysis

- J-MAG
- MAXWELL
- MOTOR PRO
- EMF



Optimized E-Motor & Controller

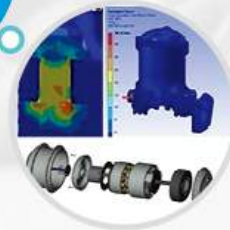
Controller Circuit Design

- OR-CAD
- MultiSIM
- PADS
- MPLABIDE



In-House Validation & Test

- ENDURANCE
- VIBRATION
- ENVIRONMENTAL
- LEAK, SHOCK
- TORQUE RIPPLE
- RESISTANCE



Structure, Dynamic & Heat Transfer

- ANSYS / ADAMS
- SOLID MODEL
- COMPATIBLE TO CUSTOMER
- UG, PRO-E, CATIA

- In-house motor & Controller design, Manufacturing & Validation
- Database & Know-how about boundary conditions → Reduce gap between simulation and Actual results
- Overcome technical challenges and Bring right mechatronic solutions to customer
- R&D oriented management & Culture

FLEXIBLE FROM NICHE VOLUME TO MASS PRODUCTION

NICHE VOLUME COST EFFECTIVELY FABRICATED BY IN-HOUSE EXPERTISES

- Flexible to various ranges of Niche Volume Applications such as Defense Industry and etc



COMMUNICATING / COLLABORATING TO CREATE MORE VALUES TO OUR CUSTOMER

- Brushless DC motor (BLDC)
- Brushless AC motor (BLAC)

MOTOR DRIVING

- Hall effect sensor
- Magnetoresistive sensor
- Resolver, Encoder
- Space vector control
- Sensorless, Contact / Non-contact

MOTOR CONTROL

- Pushing limits at early stage
- Simulation & Severe test
- Prototype

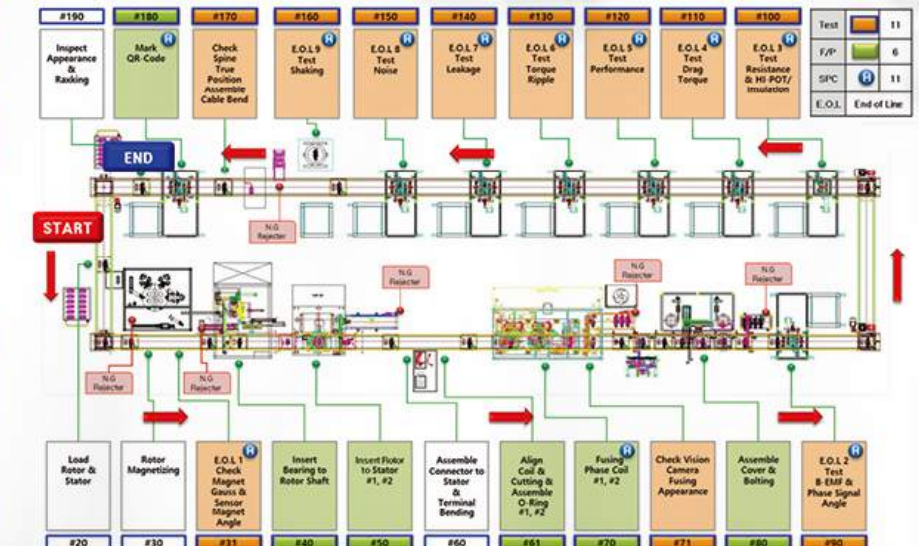
VALIDATION

Comitted to most value, what we call "Affordable premium" for customer

- Communicate & Collaborate in whole organization and even customers
- Reduce costs, Provide peak performance to customer
- Best cost to benefit ratio

MOST MODERN MACHINERY WITH HIGH LEVEL OF AUTOMATION

- Fool Proof Processes, QR Code traceability, In-Line Inspection and SPC
- Clean Room



- Manufacturing, Packing, Economical logistics & Safety stock near to customer site is our goal to be achieved at all times
- Highly responsive supply at a cost effective value



EX-WORK



LOADING



OCEAN



UNLOADING



IN-LAND



WAREHOUSING

Unloading : 1 day
Stacking : 1 day
Repackaging : 1 day
Loading : 1 day

**STRONG ENGINEERING ABILITY**

- Engineers more than 40%
- Spend R&D costs of approx. 7% from annual revenue
- The only approved BLDC / BLAC Motor with controller to Korean army

**PROVEN TECHNOLOGY & PRODUCT RELIABILITY THROUGH BLDC MOTOR MASS PRODUCTION TO HYUNDAI MOTORS**

- 1.2 Million BLDC Motors for DCT actuator annually

**MEDIUM SIZED BUT YOUNGER, FINANCIALLY SOUND & CONTINUOUSLY GROWING COMPANY ALWAYS COMMITTED TO CUSTOMER**

- Continuously improving, Innovated

**READY TO COLLABORATE WITH CUSTOMER IN TECHNICAL OR EVEN CAPITAL WISE**

- JV, Joint research center
- Warehousing near to customer Site based on long term Contract

