



For Technology, Quality & Value Start with **erae** AMS

Autonomous Driving &
EV Total Solution Provider





Reaching the highest levels of Technology, Quality and Value for Our Customers

1980s

Establishment

- 1984 : JV between GM and Daewoo

1990s

Technology Independence

- 1998 : Established new tech center in Daegu, Korea
- 1999 : Completion of climatic wind tunnel
- Developed independent design and production technology

2000s

Expansion

- 2001 : Changed name to Korea Delphi Automotive Systems
- 2007 : Established manufacturing site and tech center in Changshu, China
- Started to diversify customers and entered the global market

2010s

Globalization & Network Expansion

- 2010 : US tech center opened for US business
- 2013 : Established manufacturing site in Jilin, China
- 2014 : e-intelligence founded to develop ADAS tech
- 2017 : FATEC(Future Automotive Tech Center) founded
- 2017 : Changed name to ERAE AMS
- 2018 : Built US production site in Pontiac, Michigan
- Grown into a global company by establishing a global manufacturing, R&D and service network
- Received Excellent Supplier Awards from GM, Stellantis, Toyota

2020s

Transformation into a Future Technology Company

- 2021 : Selected as a “World Class 300+” company by the Korean government (title awarded only to the top 300+ companies in Korea)
- Growing into a company specialized in autonomous driving and electric vehicles
- Currently supplying autonomous driving and electric vehicle components to auto makers
- Integrated a smart factory line in Daegu plant

Excellence in Developing and Supplying Automotive Components to Global Car Makers



ERAE is an established global automotive parts manufacturer with a diverse portfolio of products.

ERAE, formerly known as Korea Delphi, is an automotive components & systems supplier headquartered in Korea with nearly 40 years of corporate history and a global footprint (13 locations in 9 countries, including Michigan, US). We produce a wide array of auto components & systems ranging from more traditional products (e.g., driveline, chassis, brake, steering products) to products geared towards the future (e.g., autonomous driving and smart car components). Since its establishment, its excellent technology has been acknowledged by world renowned automobile manufacturers (e.g., GM, Stellantis, Volkswagen, Rivian) as it has supplied compact and lightweight automotive components with outstanding performance and durability based on robust capabilities in management, production, and technology.

Our product quality has been acknowledged by the largest car makers.

Namely, ERAE received the “Supplier of the Year Award” for 5 years from GM which is granted only to 2% of GM’s suppliers worldwide. ERAE is fully dedicated to becoming a global leader in the automotive components industry by achieving a combination of world-class technology, quality, price competitiveness and service.

We have robust production and R&D capabilities.

ERAE has multiple state of the art manufacturing and R&D facilities worldwide. Our manufacturing facilities, including in Korea and Michigan, US (250 employees in the Michigan plant) ensure stable, reliable production of high quality products. The annual global production volume is over 2 million vehicle parts. They are backed by our strong R&D centers in which we invest significant resources (approximately 200 R&D specialists in Korea).

We supply components to global auto makers, including new EV makers.

Below are a few examples of our customers :

- Established car makers (longstanding and main customers): GM, Stellantis, Volkswagen
- High-end car makers : Audi, Porsche, Maserati
- New EV makers : Rivian, Canoo

ERAЕ is transforming into a future technology company.

We are making continuous efforts to transition into the new electric vehicle paradigm. We have developed and are enhancing autonomous driving and other smart car components, and its advanced new products, such as e-Axle, EV platform and competitive core products for the next generation automotive business environment, will be unveiled soon.



Establishment

1984



Headquarters

Republic of Korea



Business

Components of EV & Autonomous Driving



Intellectual Property

Domestic : 245
International : 137



Global Presence

13 Locations
9 Countries



Production Capacity

Over 2 Million
Vehicle Parts



Employees

1,283



R&D Personnel

197

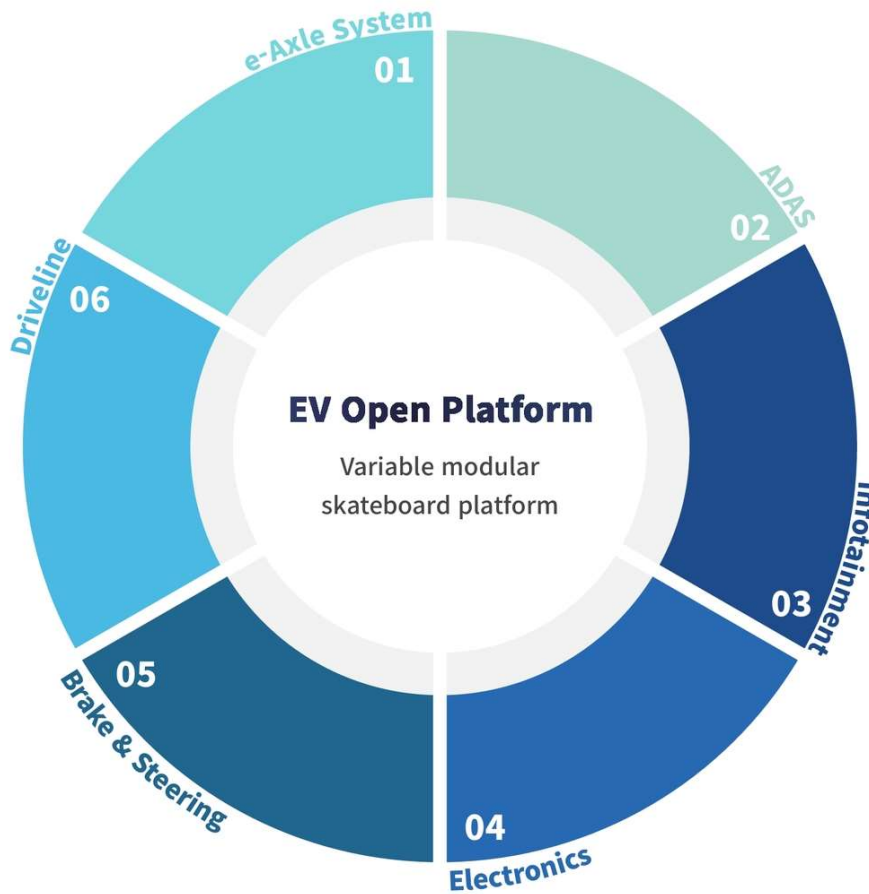


erae AMS

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ERAE's Vision is to lead the EV market by supplying EV core technology to our customers



01. e-Axle System

- Micro to M segment available (2WD or 4WD)
- 1 or 2 speed transmission
- Motor -Inverter Module
- Various options : e-Parking, e-LSD, e-DD, Dual clutch torque vectoring

02. ADAS

- Camera/Radar sensor
- Controller/Al
- Autonomous driving system

03. Infotainment

- Smart AV
- Integrated infotainment

04. Electronics

- Vehicle Control Unit for EV
- Alternator
- 48V BAS
- EGR valve

05. Brake & Steering

- Caliper brake/Brake booster
- ABS/ESC
- EPB (MoC, Cable Puller)
- Steering column
- Electric tilt & tele. Column
- Intermediate shaft

06. Driveline

- Halfshaft
- Rz/TP/DO/CG Joint
- Propeller shaft joint
- Monobloc tubular shaft
- Ball splined shaft

Driveline

Current Product Range

- Variable torque delivery capacity
- Joint type diversification with Rz/CG/TP/DO
- Solid or tubular interconnecting shaft

Current Product Features

- Lower GAF performance than conventional joint in anti-shudder joint
- Optimized outboard joint with enhanced cage strength at high angle

Advanced Products

- High Efficiency Rzeppa Joint (HERz)
- New Anti-shudder Joint (VSJ)
- 8-Ball CG Joint (CTPJ)
- Ball Splined Shaft (BSS)

Plant Location

- Korea - Daegu Plant
- USA - Pontiac Plant
- China - Jilin-Kdac Plant

Current Customers

- Stellantis, VW, GM, SYMC, Kubota, Daimler FUSO, VINFAST, Rivian, Canoo



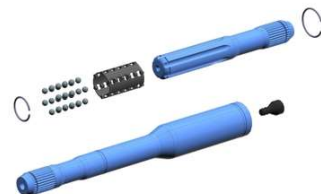
HERz (High Efficiency Rzeppa Joint)



VSJ (Vertex Straight Joint)



CTPJ (Counter Track Plunging Joint)



BSS (Ball Splined Shaft)

Brake

Current Product Range

- Single piston, Dual piston, 4-Piston, 6-Piston Caliper brake
- 7”~10” Single booster, Tandem brake booster
- EPB (MoC, Cable Puller)
- ESC, ABS-H, ESCi (ESC & EPB Integrated)

Current Product Features

- From small to large size applications of conventional brake
- Fast response with MoC and high hill hold capacity with Cable Puller EPB
- Various high end-added function available with ESC (e.g. ACC, AEB)

Advanced Products

- Under development of ESC for autonomous driving level 3 vehicle
- EMB for brake by wire operation is under development

Plant Location

- Korea - Daegu Plant

Current Customers

- GM, RSM, UAZ, NAMI, UzAuto, VINFAST
- EV Customers (Songuo, Myoungshin, Edison Motors)



Conventional Brake



EPB (Electric Parking Brake)



ESC (Electronic Stability Control)



EMB (Electro-Mechanical Brake)

Steering

Current Product Range

- Electric Adjustment Steering Column and Controller
- Tilt & Tele. Column with tooth lock mechanism
- 16 tooth aluminum sliding I-shaft
- Ball sliding I-shaft (Intermediate shaft)

Current Product Features

- Tunable energy absorbing mechanism (J-strap, Tear strap, Moving tolerance ring)
- Zero tooth on tooth mechanism for column position lock

Advanced Products

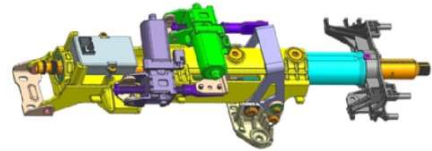
- Quiet motor operation (<50dBA)
- Column natural frequency (>50Hz)
- Low lash of I-shaft (< 10' @ $\pm 1\text{Nm}$)

Plant Location

- Korea - Daegu Plant
- China - Changshu Plant

Current Customers

- GM, NISSAN, HYUNDAI, KIA, BAIC, UzAuto, SYMC, VINFAST



EASC (Electric Adjustment Steering Column)



Tilt & Telescope Column



Aluminum sliding I-Shaft



Ball sliding I-Shaft

ADAS

Current Product Range

- Camera, Radar, Ultra Sonic Sensor, ADAS ECU
- Can be flexible depending on customer needs

Current Product Features

- LDW, FCW, LKAS, AEB, BSD
- ACC, RCTA, DOW, AHB

Advanced Products

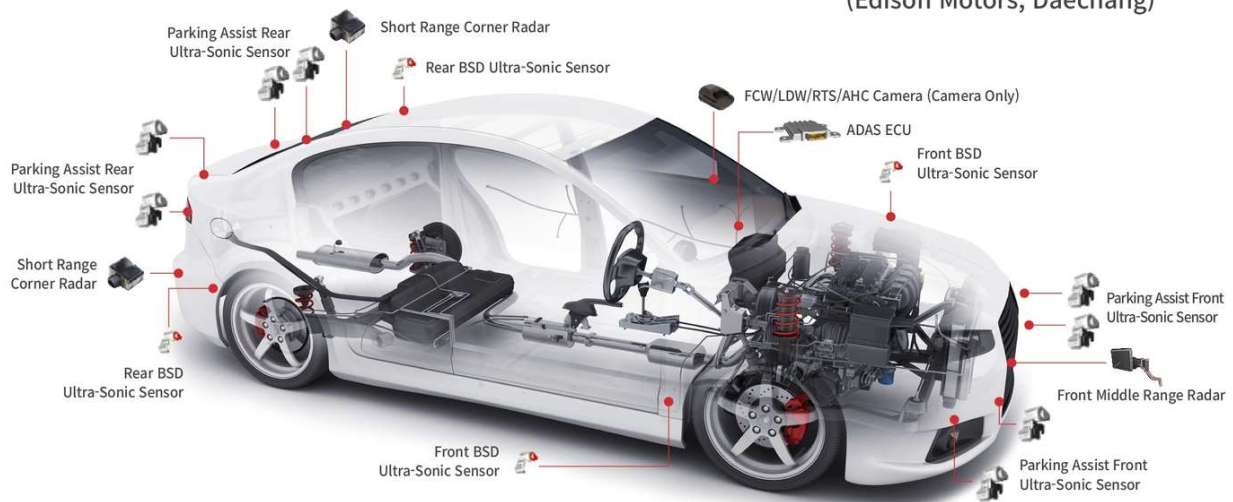
- HAD (Highway Autonomous Driving)

Plant Location

- Korea - Daegu Plant

Current Customers

- VINFAST
- EV Customers (Edison Motors, Daechang)



ADAS Sensor Configuration

System	Cost Effective	Function Effective	HAD (Highway Autonomous Driving)
Main Function	LDW, FCW, LKAS, AEB, BSD	ACC /AEB/LKAS RCTA/DOW AHB/BSD/RTD/ISA	HAD (HWP + TJP) SDS (Surround detection System) Rear AEB, RCTA/FCTA/DOW
Main Sensors			

Infotainment

Current Product Range

- 8”~14.6” Smart Audio
- 8” Multimedia Display Unit Rear

Current Product Features

- Phone connectivity (CarPlay/ Android Auto)
- Radio / Navigation / Climate control integration
- OTA Solution

Advanced Products

- Haptic feedback solution
- OTA Function/ Multi Display solution

Plant Location

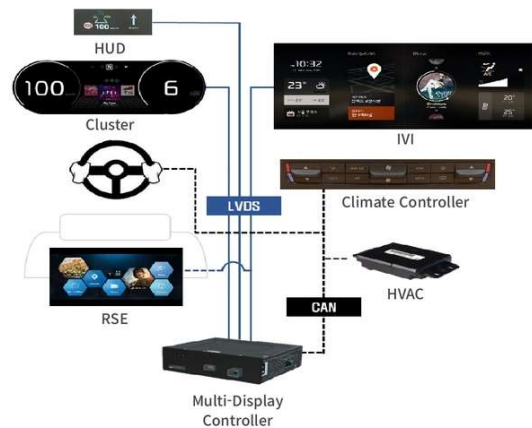
- Korea - Daegu Plant

Current Customers

- VINFAST
- Korean Domestic EV Customers



Smart Audio / Multimedia Display Unit



Multi-Display Controller

ERAE Total Infotainment Solution			
IVI	RSE	Full TFT Cluster	Multi Display
<ul style="list-style-type: none"> · In-Vehicle Infotainment · Vehicle Entertainment · Navigation · Mobile Connectivity 	<ul style="list-style-type: none"> · Rear Seat Entertainment · Movie · Music · TV · SNS 	<ul style="list-style-type: none"> · Digital Cluster · TFT LCD Display 	<ul style="list-style-type: none"> · Displays Control System · Hypervisor OS · IVI · Digital Cluster · RSE · HVAC Control

VCU

Overview

- Core product for EV system management
- Optimal motor torque calculation based on drive modes
- Power management considering drivability and battery state
- Cooperative control with other EV components



Main Function

- Powertrain System Control
 - *Optimal motor torque control using pedal map
 - *Speed governing control for cruise & max speed limit
- Driving/Regenerative Braking Control
- DC/AC Cooperative Charging Control
- Vehicle System Sequence Control (e.g. start-up, driving, charging)
- Component/System Diagnostic & Fail Safety



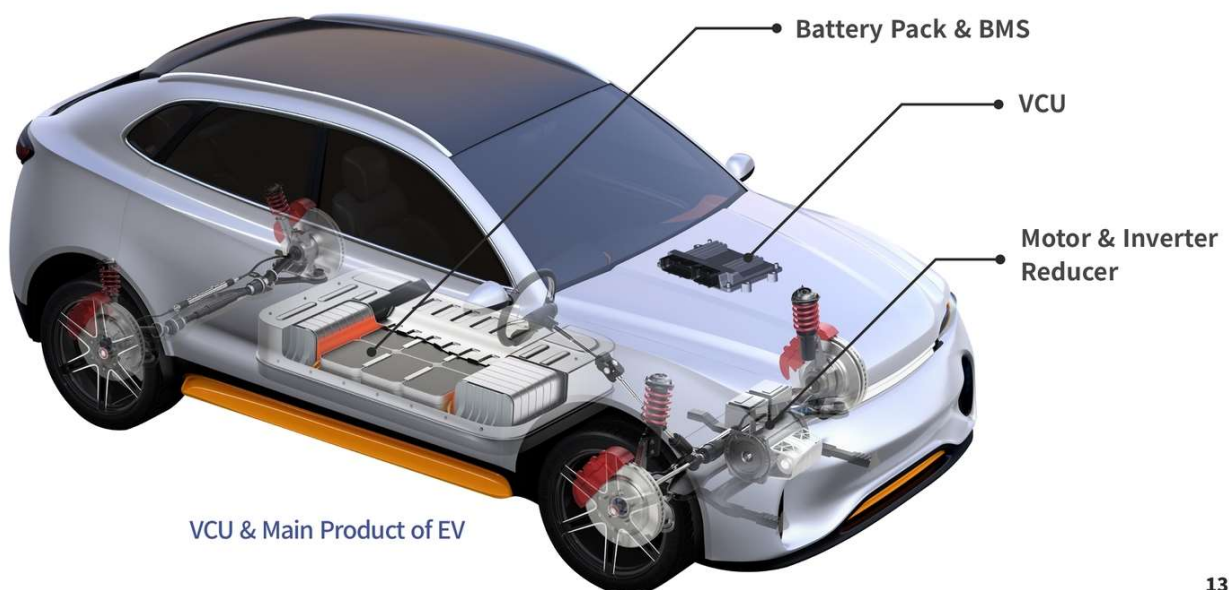
Logic & Calibration Development System

Plant Location

- Korea - Daegu Plant

Current Customers

- EV Customers (Songuo, Daechang)



VCU & Main Product of EV

e-Axle

Product Range

- Main e-Powertrain : Micro to D segment
- Main & Auxiliary e-Powertrain : D to M segment
- Vehicle drive type : FWD/RWD/AWD available

Product Features




- Increased energy efficiency & Driving performance
- Improved driving stability by torque vectoring option (Dual electric clutch, e-LSD, e-DD)
- Integrated motor-inverter and co-axial type for optimized compact package

Advanced Products

- 2 speed shift transmission
- Torque vectoring by dual electric clutch

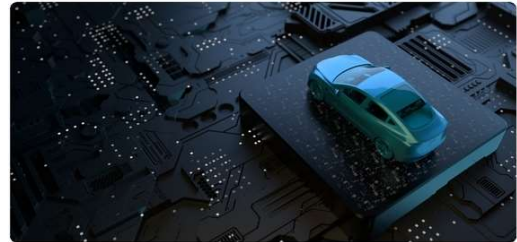
Tech Ready

- 2023. 12

Parallel type (3 axes)	Co-axial type (1 axis)	Co-axial type (1 axis)
T/M gear ratio : 1 speed	T/M gear ratio : 1 speed	T/M gear ratio : 2 speed
		
<ul style="list-style-type: none"> · Motor + Reducer + Differential Gear · Option : e-Parking · Commercialization Technology · For A Segment 	<ul style="list-style-type: none"> · Motor + Reducer + Differential Gear · Option : e-LSD, e-DD, e-Parking · Integrated motor – inverter · Commercialization Technology · For B/C Segment 	<ul style="list-style-type: none"> · Motor + 2 speed T/M + Dual electric clutch (Torque Vectoring) · Option : e-Parking · Integrated motor – inverter · Advanced Technology · For C/D Segment

EV Open Platform

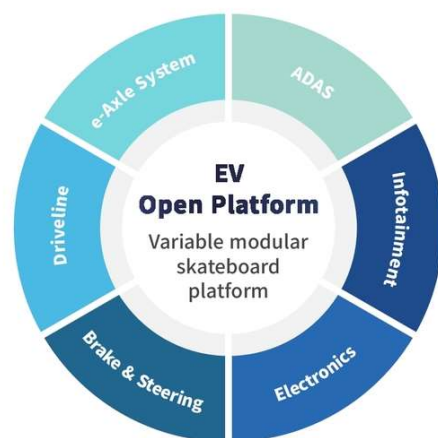
- ERAE is developing new solutions in the EV Open Platform field with its development experience in Vehicle Control, Driveline, Chassis and Autonomous Driving technologies
- As a result, ERAE can provide the following technologies to customers planning to enter new markets through co-development or technology transfer



- 01 Drive motor replacing internal combustion engine (Applied 3rd generation e-Axle)
- 02 Controls the speed of the drive motor (TCU, Inverter)
- 03 Regenerative braking and Emergency braking (VCU, ESC, ADAS)
- 04 Store electrical energy and supply the required electricity to the drive motor (Battery Module, BMS)
- 05 Charging the electrical energy of the battery (OBC)
- 06 Underbody constructed chassis and suspension modules for electric vehicles



- 07 Autonomous Driving (ADAS)
- 08 Electric Parking Brake (EPB)
- 09 Thermal Management (TMU)
- 10 Control/Information (Infotainment)
- 11 Reprogramming through AWS (OTA)
- 12 Integrated OS + Open API



Engineering Capability Research & Development

A highly qualified team of Product Engineers, Technicians, Researchers and Program Managers is delivering the next generation of high technology, quality and value-driven systems and components. ERAE has a complete range of Research, Test & Computer Aided Engineering facilities located at our main Tech Center in Daegu, Korea. ERAE is expanding its global presence with satellite Tech centers currently operating in the US and China.



Production Capability Production Technology

Production processes are highly automated as well as supporting functions such as material procurement, parts processing, manufacturing and testing are optimized to deliver efficient manufacturing of high quality products.



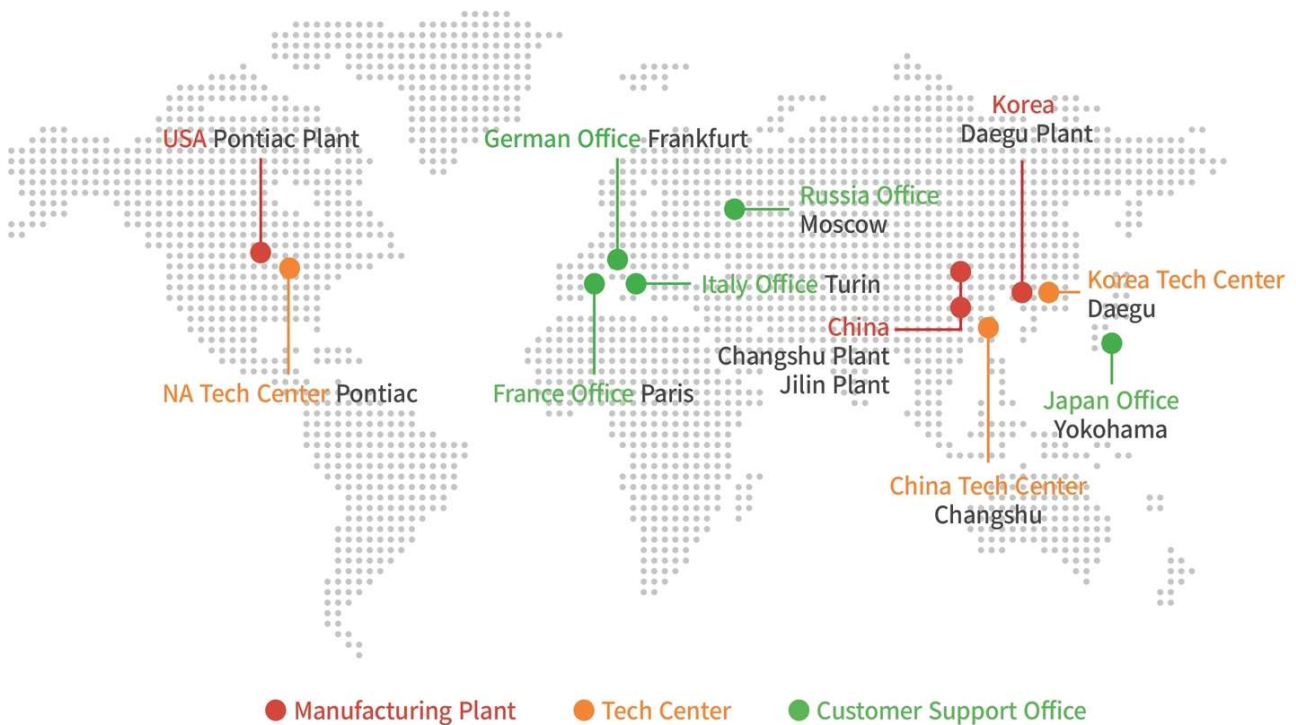
Vehicle Proving Ground



Global Footprint

4 Manufacturing Sites in 3 Countries

3 Technical Centers and 6 Customer Support Offices in 9 Countries



Korea Plant



USA Plant



China Plant

Customers



ERAE has gained trusted partnerships with customers through many years of technology & service. These relationships enable us to uncover market trends, understand the challenges and develop new solutions.



Awards



GM
Global Supplier of the Year Award
2006, 2012, 2013, 2014, 2015



Stellantis APAC
Awards Supplier of the Year
2014, 2016, 2017



Stellantis
Outstanding Quality Performance
2016, 2018



GM
Supplier Quality Excellence Award
2013, 2017, 2018, 2019, 2020



TOYOTA
Quality Performance Achievement Award
2005, 2006, 2007, 2008, 2010, 2014

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