Kreation Company Profile



Date: Jan.2022

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KET科瑞信(Quality島

E-Quality (Parent company)





(New headquarters under construction)

- E-Quality is located in Wuxi, Jiangsu Province, China.
- Focus on ECU hardware and software development.
 Chinese top automotive electronics supplier.
- 40000 square meters for R&D, manufacture.

Mission

Create value for our clients with our outstanding engineer team

Vision

Become a global Electronic Control Systems leader with our ECU technology at the core

System Certification

CMMI-3, TUV IATF16949,ISO9001,E-MARK

Over 70% Of Technical Personnel

Complete R&D system and leading innovation capability

87 Patents

Intellectual Property Constructs Patent Barriers and Leads in Technical Capabilities

226 Colleagues

All graduated from well-known universities, and have rich experience in ECU development and production

Founder Introduction





- Chinese Major Talent Engineering A Class Specialist, CAST Oversea Ex pert, 17 years of study and work in North America, focus on embedded ha rdware and software development.
- ▶ Bachelor's degree from Tsinghua University.Master's degree from the University of British Columbia, Canada.
- ► Worked at the Chinese Academy of Sciences, the Canadian National Academy of Sciences, Caterpillar, and Weichai.
- ► Have been working at Caterpillar in the United States for 9 years, responsible for electronic control work.
- Starting from scratch, help Weichai built a 150 person electronic control team from 2010, developed and mass-produced a series of ECUs, with a cumulative mass production of over 2 million units.
- ► Established in 2017, E-Quality has maintained long-term business relationships and cooperation with well-known automobile, engine and component manufacturers.

E-Quality Important History













2019.11

High and new technology enterprises

2020.05

CMMI3 Authorization

2022.12

Potential Unicorn
Enterprises in Jiangsu
Province

2023.07

National level specialized and innovative little giant

2023.08

Establishing a joint venture with **Cummins**

Business Segments



Vehicle Division

- Vehicle Controller
- Hybrid Controller
- Fuel Cell Controller
- Range Extender Controller
- Intelligent Driving Controller
- Braking and Steering Controller
- Onboard Remote Monitoring Terminal





Engine Division

- Light Duty Diesel Engine
- Medium and Heavy Duty Diesel Engine
- Aftertreament Controller
- Special Purpose Diesel Engine Controller
- Natural Gas Engine Controller
- Methanol Engine Controller





Smart Sensor Subsidiary (Kreation)

- NOx Sensor
- Exhaust Gas Temperature Sensor
- Urea Quality Sensor
- Smart Oxygen Sensor





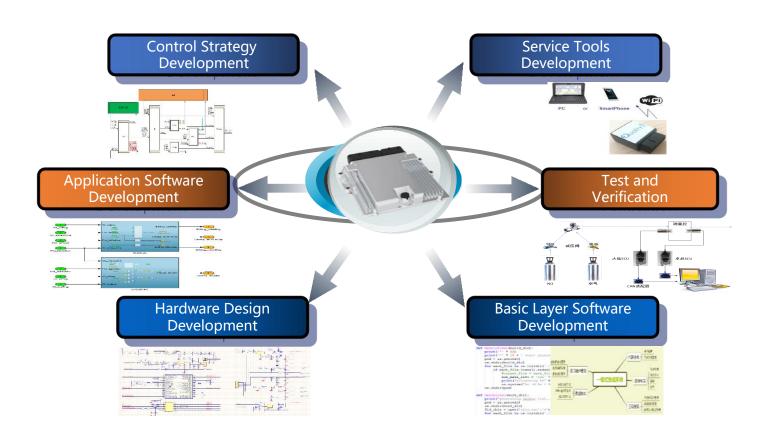
Tools and Outsourcing Division

- FAST ECU
- EQ APP
- Electronic Control Son Testbench
- HIL Test Equipment
- Diagnostics Equipm
- EOL
- Software and Hardware Development Engineering Services



E-Quality-Core Technology





E-Quality--Intellectual Property





Applied for 76 Patents

Granted Patents: 5 Utility Patents, 17 Software Copyrights, 3 Software Patents;

Strong technological foundation,

internationalized development process, and intellectual properties build up patent barriers.

€Juality 🕏



BorgWarner

















联合卡车





















































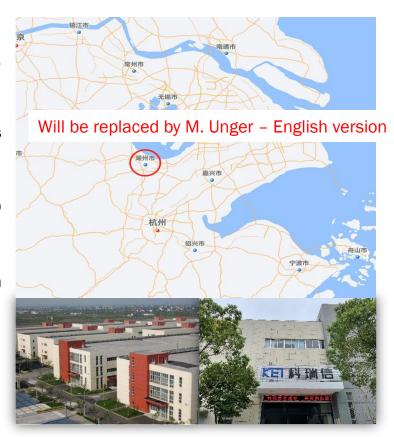
Kreation



Kreation



- Located in Wuxing District, Huzhou City, Zhejiang Province, Yangtze River Delta Economic Zone.
- Focus on the R&D, production of automotive smart sensors and other smart parts.
- 5400m² area for Company with 40 peoples, with R&D personnel 40%
- The total investment in NOx sensors is more than 30 million RMB, and nearly 20 patents have been applied



Technical competitive advantage



Industry Experience

- Deep understanding of commercial vehicles, rich experience in mass production of engine ECU
- 2. Vehicle CAN communication protocol
- ECU system integration capability
- Exhaust gas aftertreatment system control
- 5 Emission regulations, OBD

Excellent Process system

- CMMI development process system-global authoritative software development process
- Advanced V process development system
- Global authoritative quality system certification-TUV Rheinland IATF16949

Core Technologies

- 1. Intelligent-core control algorithm
- Integration-independent development of ASIC chips
- Quick customization modelbased embedded software development

The product technology is advanced internationally and domestically leading,

Achieve autonomous and controllable.

Certificates





High and New Technology Enterprises



TUV IATF16949



Huzhou Major Talents certificate



E-Mark certificate



CMMI3 certificate

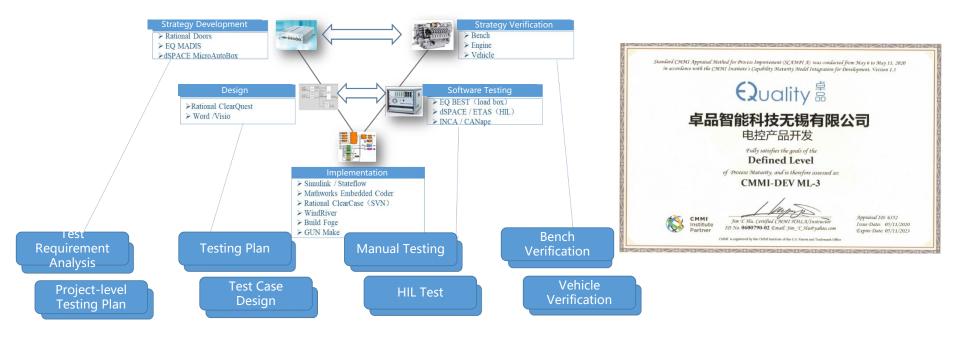


CE certificate

R&D Process

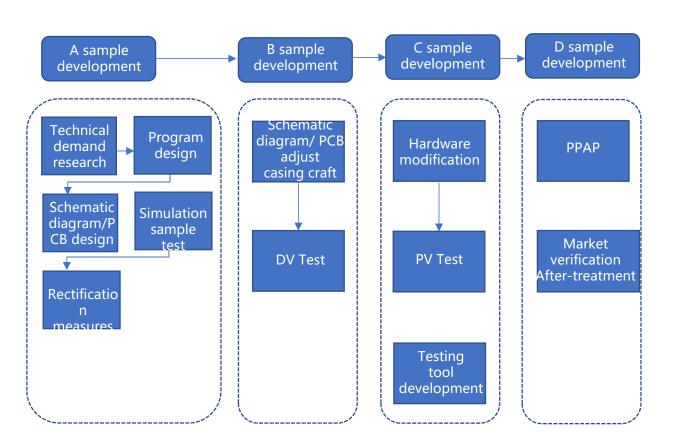


International advanced "V" process development, CMMI quality assurance system



Hardware Development







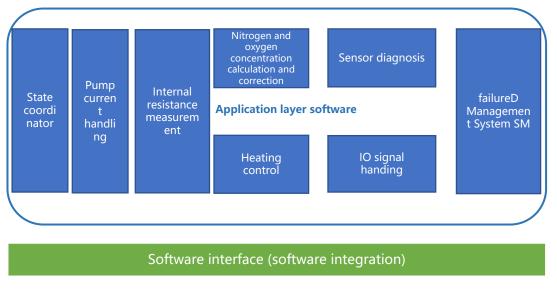


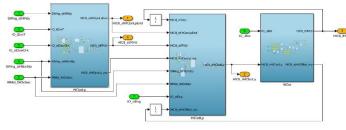




Software Development-NOx Sensor









Test Equipments





Harness Tension Tester

Mainly aimed at the mechanical properties of the product's wiring harness, such as static load, tension, compression, bending, shearing, tearing, and peeling.

2D Tester

Measure the two-dimensional dimensions of products and molds, such as positional accuracy, concentricity, straightness, contour, roundness, etc.

Horizontal test stand

Marble level test table.

Flying stone test bed

For the special reliable performance of the product: resistance to flying stone impact mechanical performance.

Salt spray tester

Mainly for metal shells, 40-60g/L sodium chloride solution concentration salt water spray corrosion test.









Test Equipments





8 Durability on power Tester



Engine Test Bench



10 Vehicle validation



Drop Test Stand



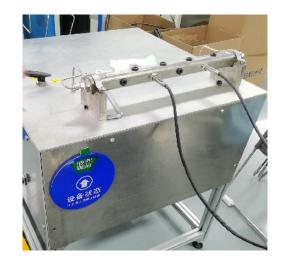
Transport vibration Test Bench



thermal shock test chamber

Test Equipments

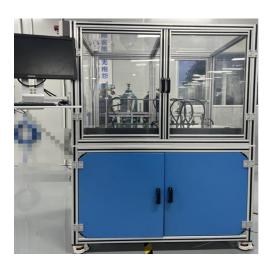




NOx Gas Test Bench



2 Ceramic Chip Function Test Bench



4 NOx Sensor Test & Calibration Bench

Smart Factory-NOx Sensor



- Annual capacity: 200,000pcs, two shifts.
- IT management platform: ERP+MES+WMS
- All smart testing equipments are self-developed





Automatic feeding



Automatic detection



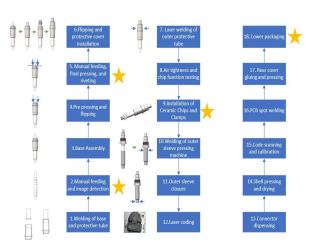
Automatic production line



Automatic press fit



Automatic offline

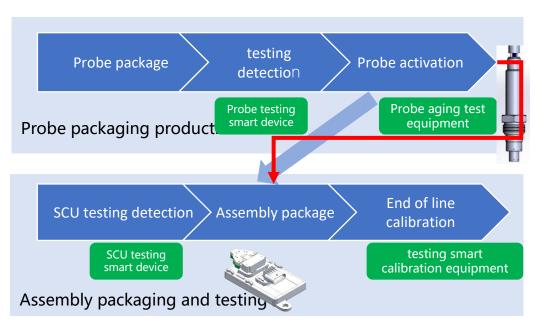


Manufacture Process

Test and Calibration system



The key of production-intelligent testing equipment



- Automatic detection
- Automatic calibration-a necessary solution for mass production

The test and calibration equipment guarantees the consistency of product quality!

The test and calibration software and hardware system is developed by KET.

Customer Audit



Customer	Product	Result	Comments
YuChai	EGTS (Exhaust Gas Temperature Sensor)	100%	Chinese top3 Engine Supplier-OEM
Niterra	Smart Oxygen sensor	100%	NTK Ceramic + KET SCU
Eminox	NOx sensor	100%	UK OEM and Aftermarket
Dinex	NOx sensor	100%	
Dorman	NOx sensor	100%	Aftermarket,
Vierol	NOx sensor	100%	Aftermarket
YuChai	NOx sensor	Achievement 97%	Chinese top3 Engine Supplier-OEM

Customer

































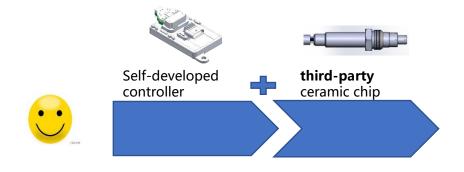


3. Product Introduction



Comparison product quality - competition





Kreation also adopts mode1

Mode 1, the global automotive Tier1: ceramic chip provided by professional ceramic manufacturers, controllers are independently developed, Powerful combinition!

Conti uses as well NGK Ceramic chip from Japan,

They developed ceramic(by NGK) and SCU(sensor controller, by Conti) ,joint development has been ongoing for nearly 8 years;

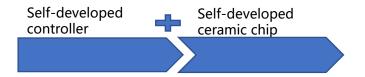
Kreation uses High quality third party chip (Taiwan manufacturer), Joint development lasted for nearly 7 years.

So powerful SCU(Self-developed) + powerful ceramic = powerful product!

Comparison product quality - competition







Model 2, Chinese sensor Manufacturer:

Controller and ceramic chip are all developed and produced by themselves.

Some Chinese NOx sensor manufacturers, They have much weaker capabilities compared to Conti, focusing only on ceramic materials and not possessing the development capabilities of SCU and ceramic materials. But they have developed both ceramic chips and SCUs, and the result is that they may not do well in both aspects, resulting in average product performance.

So average SCU + average ceramic = average product!

Comparison product quality - competition







Model 3, **Chinese assembly mills**: The controller and ceramic chips are all purchased and assembled.

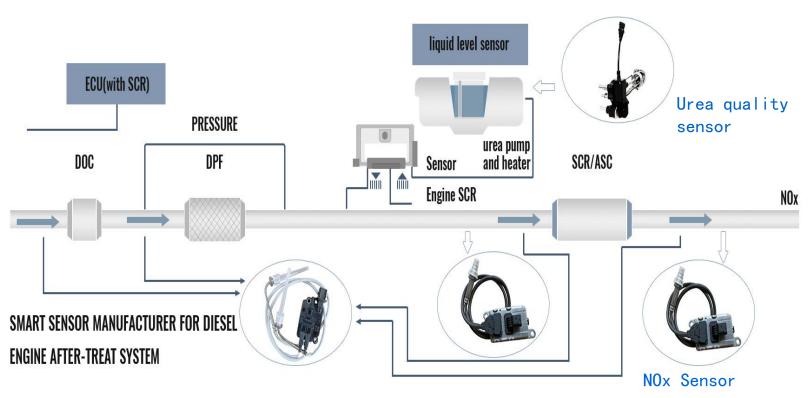
Thickness represents product performance!

Many small workshop, they do not have core technology. They purchase all the core components for simple assembly, testing, and calibration, but they also do not do enough.

So Lack of core technology + simple process = poor product!

Core Products





exhaust temperature sensor

Development History-NOx sensor









May. 2018

Aug. 2019

Mar. 2020

May. 2020

Apr. 2021

Sept. 2021

Jan. 2022

Undertake National

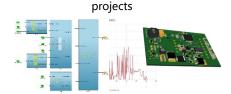
Small batch trial

2G: ASIC Batch Prodcution

Landed in Huzhou Automatic line in place

3 Generation - Chinese MCU Project Approval

3G Batch Production









Available NOx sensor Models



Brands	Model quantity	Application
Cummins	almost 30	24v,12V Cummins Diesel
SCANIA/MAN/VOLVO/ DAF/IVECO	36	Europen truck
Mercedes Benz	62	24V for truck,13 12V for car, 49
HINO/FUSO/HYUNDI/I SUZU	18	
AUDI/BMW/VW/PSA/R ENAULT	60	Europen car

- almost 40-50% percent products supply to overseas customers
- more than 200 models are released, 20 models added every month

Core technology of NOx sensor





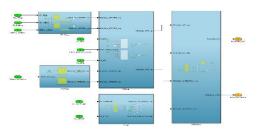
Intelligent-core control algorithm

Independently develop signal processing and control software algorithms, intelligently match domestic high-quality probes, and solve the congenital problems of domestic probes.



Integration-independent ASIC chip

The hardware design is based on the self-developed ASIC chip, with high integration, reliable quality and low cost.



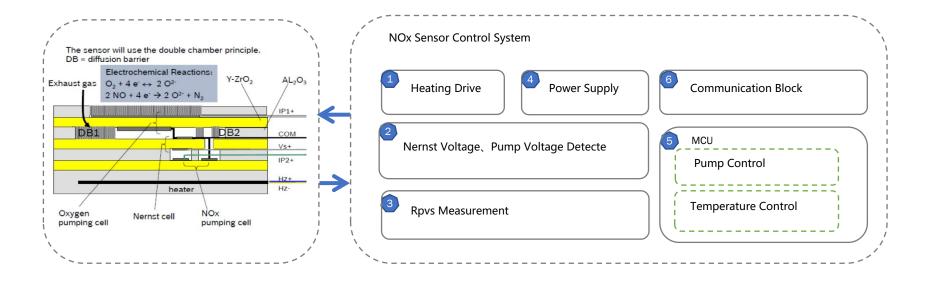
Customization-modelbased software

Model-based software development, the development speed is 5 times that of handwritten code, quickly meeting customer customization needs.

Based on the three core technologies, build a strong technical basis threshold!

Software Define Better NOx sensor

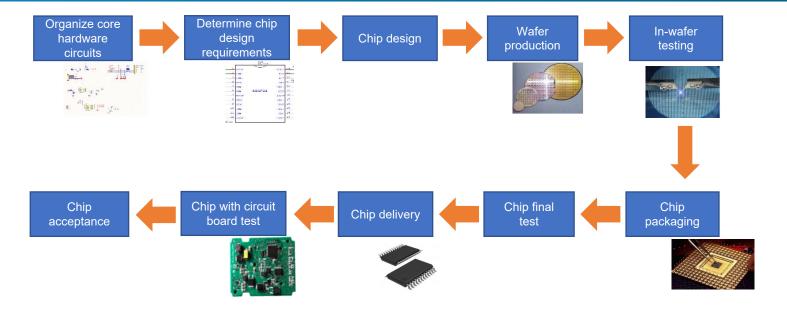




■ E-Quality, Kreation electronic control development ability, matching the domestic ceramic materials, software adjustment to achieve product performance optimization, defining the best state of the product!

Self-development of NOx Sensor ASIC





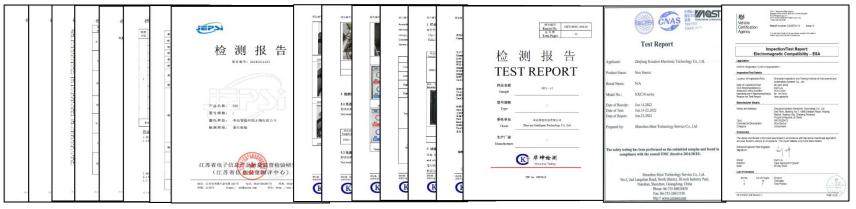
After several years, the independent and own KET ASIC chip was successfully developed!

Independ from market disturbances / supply chain interruptions

Product Reliability Certification



Third-party test report



Item	Tested by	Aera	Standard	Result
EMC/COP	VCA	European Union	ECE R10 (E-mark)	100%
EMC	Institute qualificated by CNAS	European Union	EN IEC61326(CE)	100%
EMC and Environment al Reliability	Institute qualificated by CNAS	China	OEM Standard(VS Conti)	100%
EMC	self declaration	UK	UKCA	

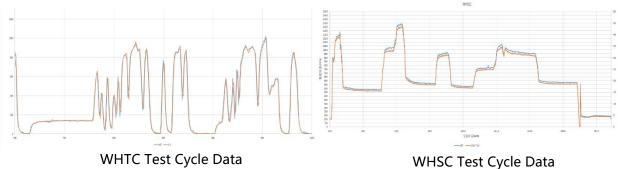
Product Performance Test



Chinese Customer Test



AVL gas analyzer & engine bench test



WHTC Emission	Kreation	Germany G3.5	China VI Limitation
NOx (g/kWh)	0.113	0.121	0.46
THC (g/kWh)	0.034	0.021	0.16
CO (g/kWh)	0.019	0.019	4
PM (g/kWh)	0.002	0.001	0.01

WHSC Emission	Kreation	G3.5	China VI Limitation
NOx (g/kWh)	0.216	0.297	0.4
THC (g/kWh)	0.014	0.016	0.13
CO (g/kWh)	0.022	0.022	4
PM (g/kWh)	0.001	0	0.01

Product Performance Test



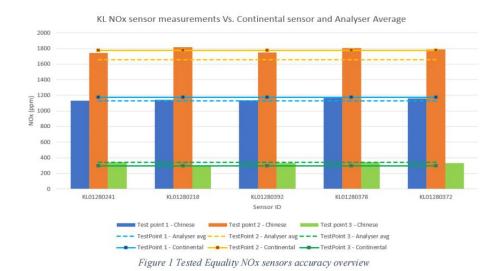


Table 2 Nominal difference of tested NOx sensors and analyser measurements (TP: Test point)

Sensor ID	Difference to analyser [PPM]		Difference to analyser [%]			
	TP1	TP2	TP3	TP1	TP2	TP3
KL01280241	4	84	2	0	5	1
KL01280218	12	162	-50	1	10	15
KL01280392	9	89	-8	1	5	2
KL01280378	37	146	3	3	9	1
KL01280372	30	132	-11	3	8	3
Continental UNINOX	46	120	-46	4	7	13

one UK Customer Test Report

- Batch Random test (ID number starting with KL is the Kreation NOx)
- Referring to the table, Compared against Continental and emission analyser, KET NOx sensor meet technical requirement
- more than 2 years batch purchase orders

Exhaust Gas Temperature Sensor



- Thermocouple exhaust temperature sensor products for Europen/China VI emission standards.
- Collect the temperature of multiple points on the processor after the engine exhaust (such as before DOC, before DPF, after DPF, and after SCR) to realize the post processor control.
- CAN communication transmits temperature data to ECU, with intelligent cold junction temperature compensation capability.
- The electronic control module can be **configured with 1-4 probes**, which can be customized according to requirements.
- The temperature measurement range is -40 ~ 950°C.



Sensor assembly

Mass-produced in a large engine factory(almost one hundred of thousands of sets), replacing a Germany product.

Availbale EGTS Models



Brands	Model quantity	Application
Cummins	more than 80	24v,12V Cummins Diesel
YuChai	6	YC diesel
FIAT/Chrysler	5	
Scania/DAF/MAN	4	



KET 科瑞信 THANK YOU