

Reliability | Flexibility | Sustainability



福联泰克
VOLKS TECH

Complete Solution Provider Of Exhaust Sensors

Suzhou Volkstech

Automotive Electronic Co.,Ltd

E-mail: info@volkst.com

PRESENTATION CONTENTS

01

Company Overview

Scale | Positioning | History | R&D | Service

02

Product Offering

Product Coverage & Development | Manufacturing Equipment | Quality Control



1. COMPANY OVERVIEW

Volks In Numbers
Our History and Heritage
Our Mission & Vision
Product Segmentation

» Volks In Numbers



Area: 22000 M2
Work shop: 8000 M2



Investment :
\$9 Million USD

Address:

No. 3 Jiasheng Rd, Suzhou
Industrial Park. **50**
minutes ride from
Shanghai Hongqiao Airport



Employees:

105 people



Volks Scene Set & Segmentation

Company Positioning

- ✓ Experts In Manufacturing Of Exhaust Sensors
- ✓ State Of The Art Manufacturing Footprint
- ✓ Partner Of Choice With OE Pedigree

Product Positioning:

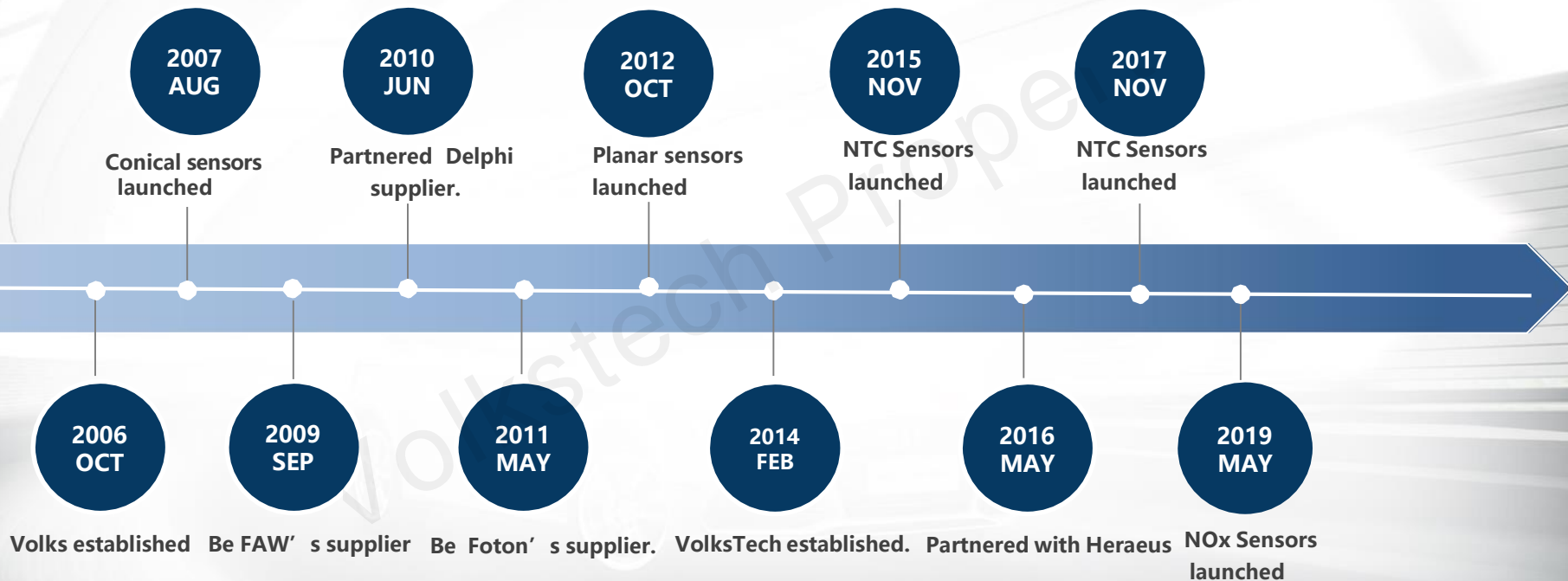
- ✓ Exacting OE Quality & Performance
- ✓ Industry Leading Range
- ✓ Best In Class Cataloguing
- ✓ Passenger & CV Applications

Target Markets

- ✓ Original Equipment & Aftermarket Customers
- ✓ Global Presence With Ongoing Geographic Expansion



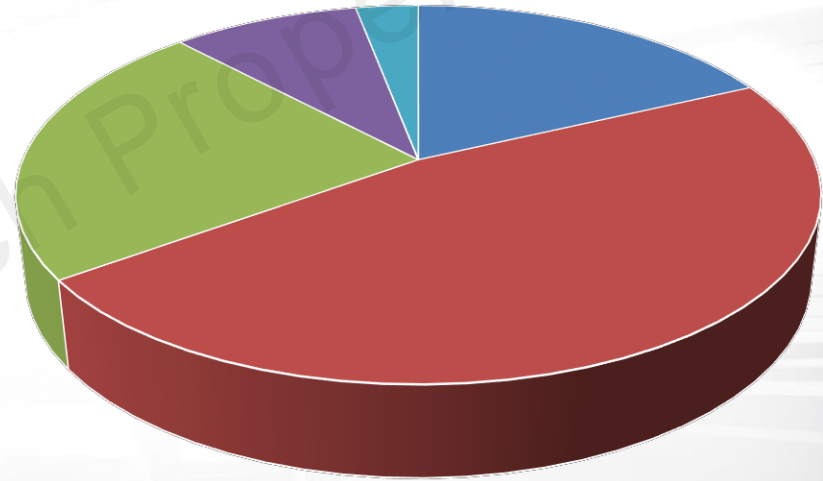
» Volks History & Heritage



Revenue Split By Region



VOLKS % REVENUE SPLIT BY REGION
2021



■ APAC ■ EMEA ■ NA ■ SA ■ OTHERS

REGION	APAC	EMEA	N A	S A	OTHERS
% OF REVENUE	22%	43%	19%	10%	6%

Certificate of Registration

nqa.

This is to certify that the Quality Management System of

Suzhou VolksTech Automotive Electronic Co., Ltd.
Floor 5, 6 of No. 3 Workshop, No. 3, Jiazheng Road, Industrial Park, Suzhou City, Jiangsu Province, 215216, China.

applicable to

The design and manufacture of exhaust gas temperature sensors, nitrogen oxide sensors and oxygen sensors

has been assessed and registered by
NQA, Warwick House, Houghton Hall Park, Houghton Regis, Dunstable LUS SXZ, Bedfordshire, England
against the provisions of

IATF 16949:2016

This registration is subject to the company maintaining a quality management system, to the above standard, which will be monitored by NQA.

NQA Certificate No: T83952
IATF Certificate No: 0453834
Date: 14 July 2022
Valid Until: 13 July 2025
Version: 1

Managing Director

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NQA is a trading name of NQA Certification Limited, Registration No. 08001758. Registered Office: Warwick House, Houghton Hall Park, Houghton Regis, Dunstable LUS SXZ. This certificate is the property of NQA and must be returned on request.

Revision Date: Feb 2017

Page 1 of 1

Issue 5

IATF 16949:2016

Certificate of Registration

nqa.

This is to certify that the Environmental Management System of

Suzhou VolksTech Automotive Electronic Co., Ltd.
Unified Social Credit Code: 91320594MA1MG28J8H
Operation Address: 5F, 6F, No. 3 Factory Building, No.3, Jiazheng Road, Industrial Park, Suzhou City, Jiangsu Province, China
Registered Address: No.3, Jiazheng Road, Industrial Park, Suzhou City, Jiangsu Province, China

applicable to

Production and sales of automotive exhaust temperature sensors

has been assessed and registered by NQA against the provisions of

ISO 14001:2015

This registration is subject to the company maintaining an environmental management system, to the above standard, which will be monitored by NQA.
Certified Clients shall accept regular surveillance assessments, the validity of certificates shall be maintained for the positive result of audit.
The information of this certificate can be checked on CNCA's website (www.cnca.gov.cn)
SNQA's website: www.snqa.com.cn

Managing Director

Certificate Number: 129859

Date: 03 June 2021
Valid Until: 03 June 2024
EAC Code: 19

UKAS
MANAGEMENT SYSTEMS
015

IAF

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ISO 14001:2015

Certificate of Registration

nqa.

This is to certify that the Occupational Health and Safety Management System of

Suzhou VolksTech Automotive Electronic Co., Ltd.
Unified Social Credit Code: 91320594MA1MG28J8H
Operation Address: Floor 5 and 6 of No. 3 Workshop, No. 3, Jiazheng Road, Industrial Park, Suzhou City, Jiangsu Province, China
Registered Address: No. 3, Jiazheng Road, Industrial Park, Suzhou City, Jiangsu Province, China

applicable to

The design, manufacture and sales of exhaust gas temperature sensors, nitrogen oxygen sensors and oxygen sensors for automobiles

has been assessed and registered by NQA against the provisions of

ISO 45001:2018

This registration is subject to the company maintaining an occupational health and safety management system, to the above standard, which will be monitored by NQA.
Certified Clients shall accept regular surveillance assessments, the validity of certificates shall be maintained for the positive result of audit.
The information of this certificate can be checked on CNCA's website (www.cnca.gov.cn)
SNQA's website: www.snqa.com.cn

Managing Director

Certificate Number: 131344

Issue Date: 25 July 2022
Valid Until: 25 July 2025
EAC Code: 19

UKAS
MANAGEMENT SYSTEMS
015

IAF

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Shanghai NQA Certification Co., Ltd. Address: Room 2201, 908 Luoke Road, China (Shanghai) Pilot Free Trade Zone.

ISO 45001:2018

ISO/TS
16949

Good Design
Development
& Verification

Good Raw
Material &
Equipment

Robust Process
Control &
Procedures

100%
inspected
end of line

No Compromise On Quality
Its Part Of Our DNA

□ Preparation and test of sample in R & D stage

➤ Sample formula experiment

➤ Accurate analysis and testing of components



Formula lab



Low temperature discharge furnace



Low temperature sintering furnace



Drying cabinet



High temperature sintering furnace



Common high temperature furnace



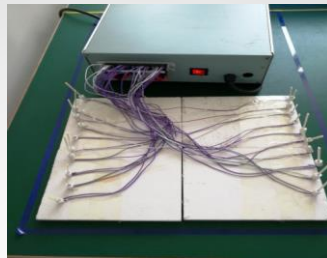
EDX analyze instrument



Vacuum spraying apparatus

Function test experiment

- Chip cycle test
- High temperature performance test
- Water-proof test
- Vibration test
- Wide band oxygen sensor test
- Chip performance test
- Oxygen sensor flame test
- Airtightness test



□ Environmental test experiment

- Temperature and humidity vibration test
- Salt spray test(outsourcing)
- Thermal shock test
- Rain Test
- Dust test(outsourcing)
- Temperature and humidity alternating test
- High and low temperature test
- Corrosion resistance test
- Thermal aging test(outsourcing)
- Pressure resistance test(outsourcing)



Temperature and humidity
vibration test bench



Rain Test carbinet



Salt spray test(outsourcing)



Dust test carbinet



High and low temperature
carbinet



Hot impact testing carbinet



Temperature and humidity
alternating test cabinet





3.Volks Service

One-Stop Shop

Flexibility & On Time Delivery

Volks One Stop Shop

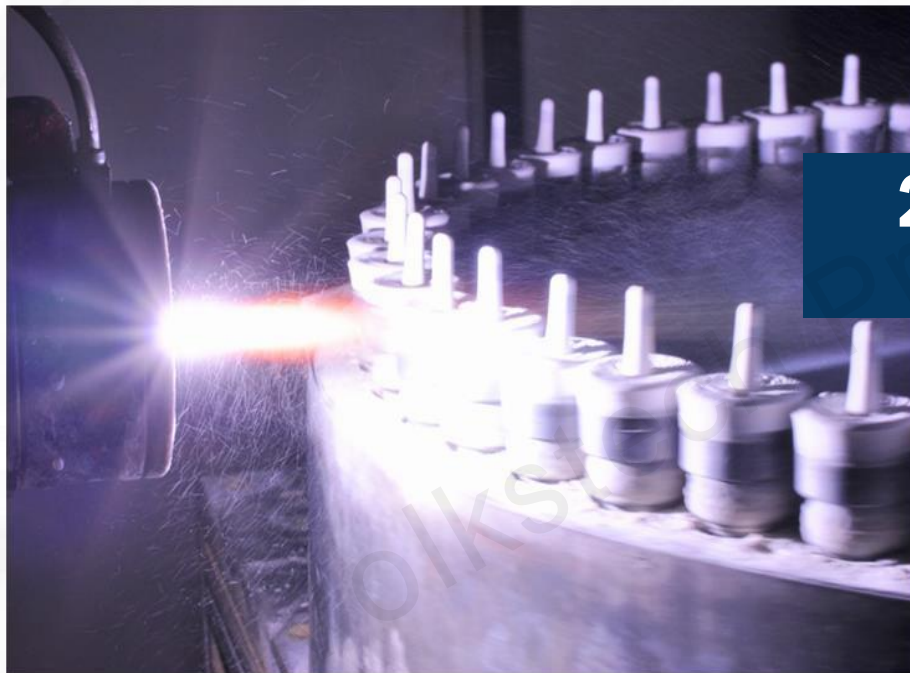
- **Industry Leading Range** Of O2/Nox/EGT Sensors Over 95% Vehicle Coverage
- **Commitment** To New To Range Products
- **Speed To Market** – On average 3 months to develop new parts
- **Flexibility** - Branding & Packaging Tailored To Meet Your Requirements
- **OE Quality** – First Time Fit



On Time Delivery Service

- **Good Availability** of all products
- **Quick** order confirmation
- **Short Lead Times** Of To 2- 4 weeks
- **Low MOQ** of 20 Pcs





2. Product Offering

Range Coverage & New Product Development

Manufacturing Processes & State Of The Art Test Equipment

Robust Quality Control Process & Procedures

Product O2 Oxygen Sensors

O2 sensors for gasoline, natural gas & diesel engines.

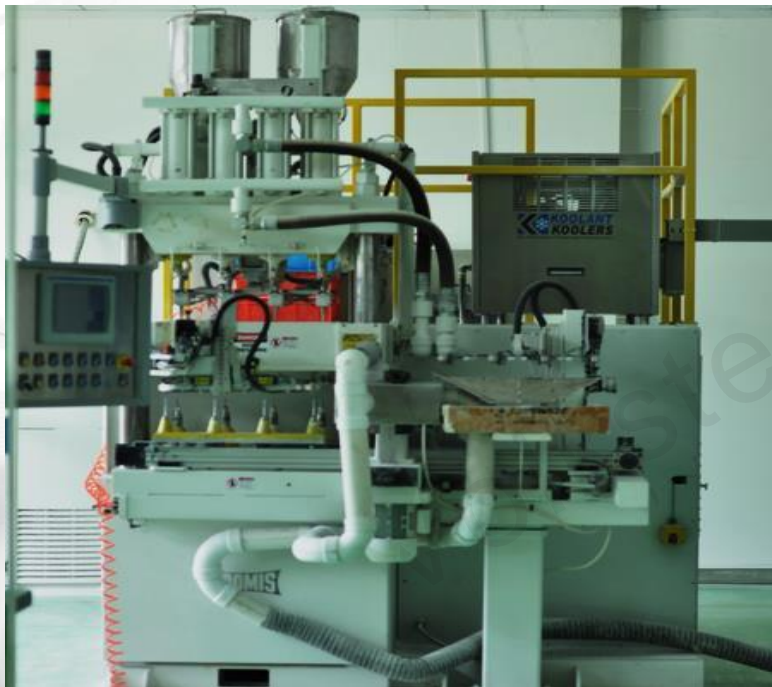
Product Type	Conical Type ,Planar Type
Technology	Switch Sensor(Pin:1-4); A/F Sensor(Pin:4); Wide-wand Sensor(Pin:6-7)
Range	More than 1800 Part Numbers
Coverage	98% Vehicle Parc Coverage
New Product Development Time	Less than 3 Months



Private Design



All OE Design Covered



Cold Isostatic Press Machine



Plasma Coating Machine

Volks Production Equipment - O2 Sensors



Film Casting workshop



Circuit Printing Plant

Volks Production Equipment – O2 Sensors



Sintering workshop



EOL test workshop for sensing element

Volks Production Equipment – O2 Sensors



Automatic production line 1



Automatic production line 2 under debug installation

Volks Production & Test Equipment – O2 Sensors



Oxygen sensor assembly workshop



O2 sensor calibration

Volks Production & Test Equipment – O2 Sensors



Oxygen sensor electrical test



EOL Test Workshop

Product EGT Sensor

Sensor for high temperature application-----up to 900 degree continuously

Product Type	PTC & NTC
Range	800+ Part Numbers
Coverage	90% Vehicle Parc Coverage For Passenger Car
New part number development cycling	Less than 3 Months

Volks Product Offering – EGT Sensors



Improved design covers all

Volks Production Equipment - EGT Sensors



Automatic production line 1



Automatic production line 2 & 3

Volks Production Equipment - EGT Sensors

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EOL test & Package



Harness assembly production line

Product Nox Sensor

Sensor developed for Euro VI emission system

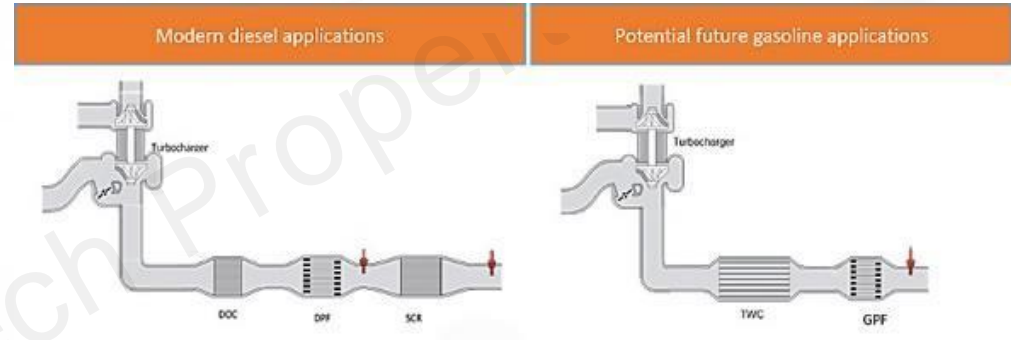
Product Type	Bosch Type & Continental Type
Range	260+ Part Numbers
Coverage	90% Vehicle Parc Coverage For Passenger Car
New part number development cycling	Less than 3 Months

VT NOx Sensors for ad-blue Technologies

- Sensor application:
 - Lean burn engines (NOx trap)
 - Diesel engines (SCR catalysts, NOx trap, closed-loop NOx control)
 - On board diagnostics, OBD (gasoline and diesel engines)

Working conditions

- ✓ Nox concentration from 0 ppm to 1500ppm
- ✓ O2 concentration from -12 % to 21%
- ✓ Temperature from -40 to 930 degree

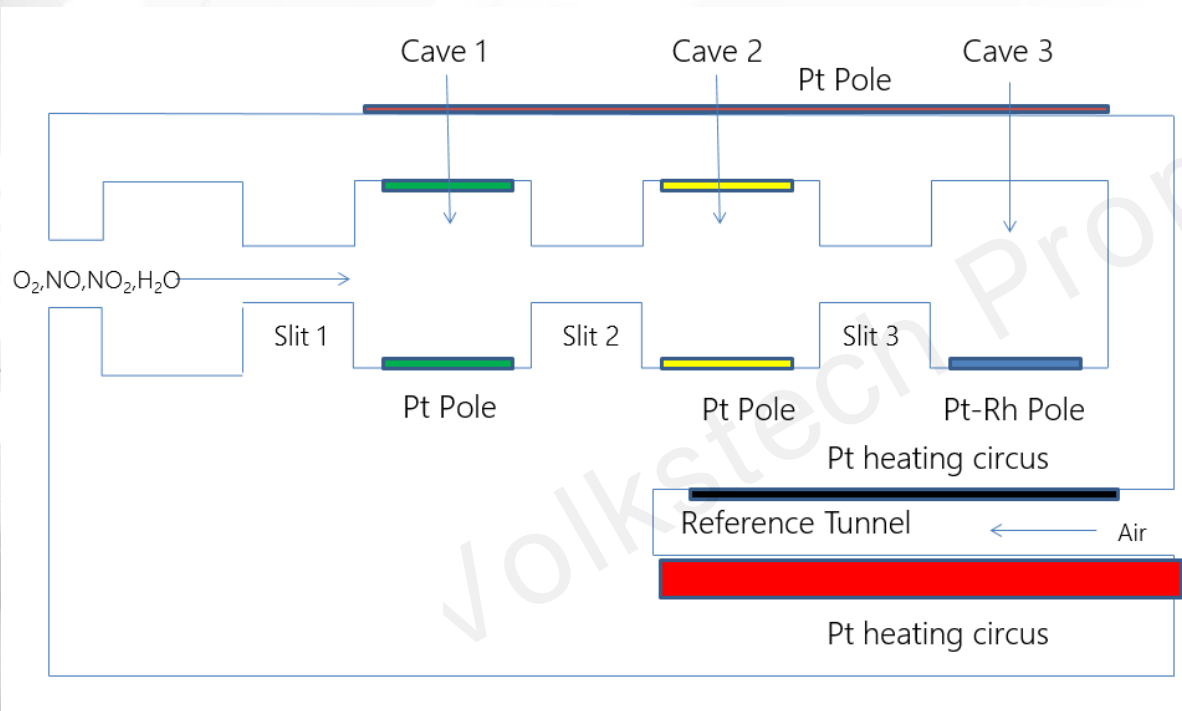


DOC: Oxidation Catalyst
DPF: Particulate Filter
SCR: Selective Catalytic Reduction
EGR: Exhaust Gas Recirculation
OBD: On Board Diagnostic
◆ NOx Sensor

› 1-2 NOx sensors applied in exhaust systems

Volkstech

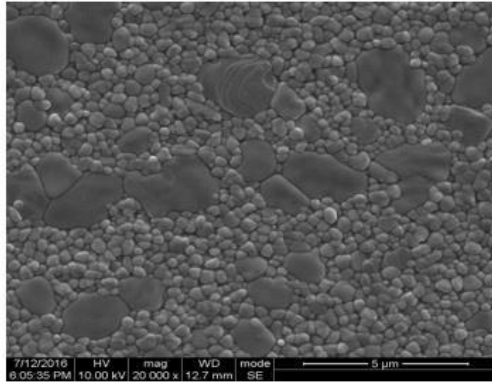
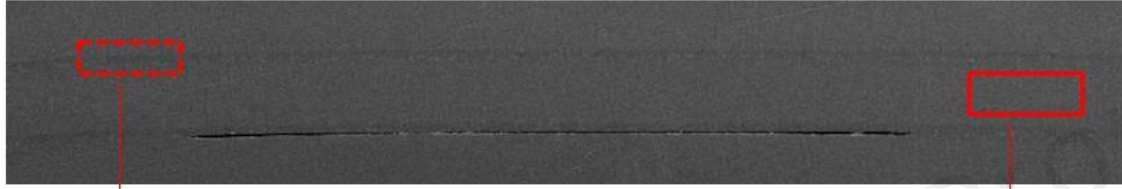
Design of sensing element



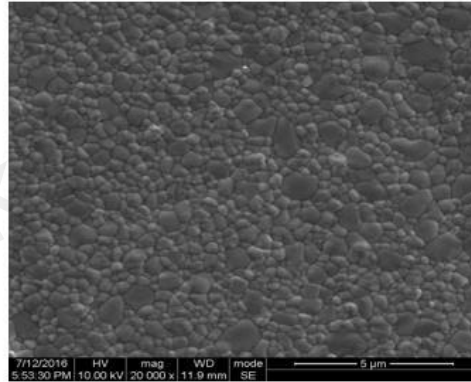
- Structure and circuit was designed by Volkstech, there would be no patent issue to customer in market
- 4-cave design improves the accuracy
- Formula of ZrO_2 , Al_2O_3 , Pt alloy & Pt-Rh alloy are totally figured out by Volkstech based on our know-how and 15-year experience on O_2 sensing element production.

Schematic view designed by Volkstech

Design of sensing element



Transitive ceramic layer

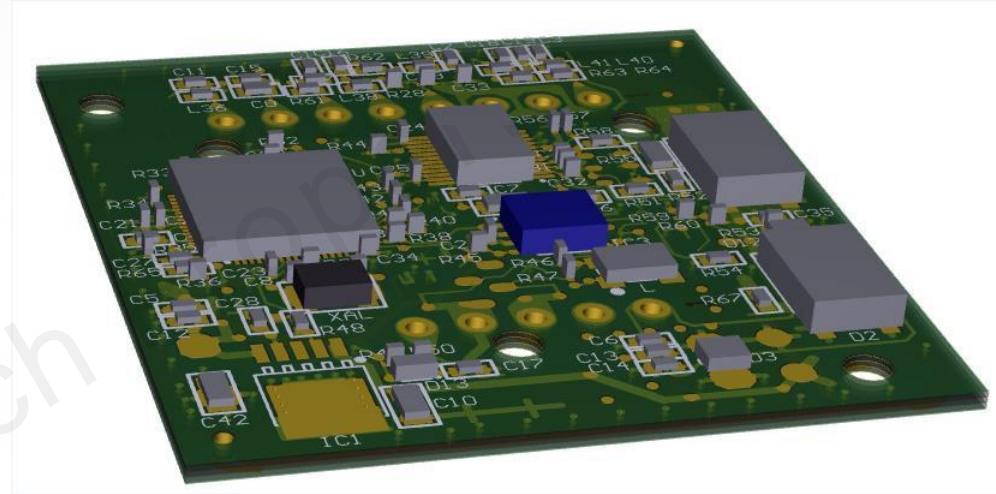
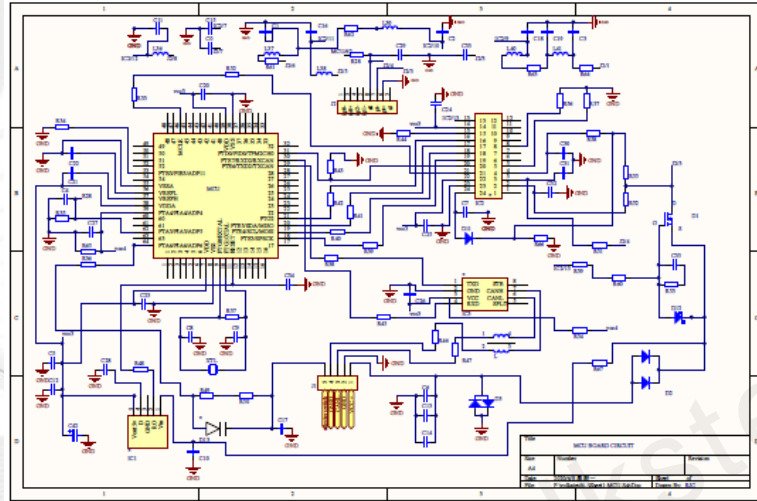


ZrO₂ Ceramic layer

Image captured by Volkstech

- Isolation layer is mostly by Al₂O₃, but function layer is by ZrO₂ stabilized by Y₂O₃, they are not easy to be combined together tightly, in this situation, we designed a transitive ceramic layer to combine them together.
- At the same time, we designed a additional Al₂O₃ layer to stronger the sensing element

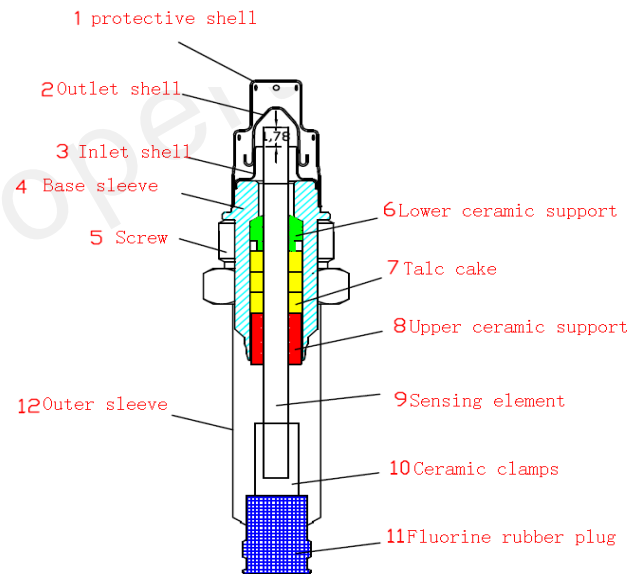
DESIGN OF CONTROL UNIT



- All-new design corresponding with our ceramic sensing element, NO PATENT ISSUE & STABLE
- All electronic parts and components are auto level, all of them can work well from -40 to 150 centigrade degree.

Image captured by Volkstech

Sensor Assembly



- More than 15 years experience to handle hot temperature sensor assembly
- All materials and assembly process are chosen based on the working conditions of exhaust with high temperature, moisture, acid dust and even water intrusion

Drawing designed by Volkstech

Volks Production Equipment - O2 Sensors



NOx sensor Assembly Line



NOx Sensor Activity & Calibration





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E-mail: info@volkst.com