
Mar. 2015
METHODOLOGY
Both primary and secondary research methodologies were used in preparing this study. Initially, a comprehensive and exhaustive search of the literature on this industry was conducted. These sources included related books and journals, trade literature, marketing literature, other product/promotional literature, annual reports, security analyst reports, and other publications. Subsequently, telephone interviews or email correspondence was conducted with marketing executives etc. Other sources included related magazines, academics, and consulting companies.

INFORMATION SOURCES
The primary information sources include Company Reports, and National Bureau of Statistics of China etc.

STUDY GOAL AND OBJECTIVES
This report provides the industry executives with strategically significant competitor information, analysis, insight and projection on the competitive pattern and key companies in the industry, crucial to the development and implementation of effective business, marketing and R&D programs.

REPORT OBJECTIVES
◆ To establish a comprehensive, factual, annually updated and cost-effective information base on market size, competition patterns, market segments, goals and strategies of the leading players in the market, reviews and forecasts.
◆ To assist potential market entrants in evaluating prospective acquisition and joint venture candidates.
◆ To complement the organizations’ internal competitor information gathering efforts with strategic analysis, data interpretation and insight.
◆ To suggest for concerned investors in line with the current development of this industry as well as the development tendency.
◆ To help company to succeed in a competitive market, and
Abstract

Three-way catalysis refers to the catalysis that converts harmful gases including CO, HC and NOx from automobile exhaust into harmless carbon dioxide, water and nitrogen via oxidization and reduction, mainly with a three-way catalytic converter, which is carried by a porous ceramic material and mounted on a special exhaust pipe. The reason it is called carrier is that it itself does not participate in catalytic reaction, but is covered with a layer of platinum, rhodium, palladium and other precious metals, and is the most important purification device outside the machine installed in an automobile exhaust system.

Chinese three-way catalytic converters for passenger cars are mainly divided into two parts, i.e. new demand and replacement demand. From the measured historical data, 2014 is the milestone year for three-way catalytic converter demand. Prior to that, the new demand, influenced by a large base of new cars and still not a replacement tide for three-way catalytic converter, had been significantly higher than the replacement demand, e.g. 17.93 million and 15 million respectively in 2013. However, the replacement demand (20.02 million) exceeded the new demand (19.92 million) in 2014. In the future, with a slowdown in domestic automobile production and sales and the arrival of peak demand for replacing automotive three-way catalytic converters, China's three-way catalytic converter and industry chain parts will be beneficiaries.
With regard to catalyst, 26.41 million liters were needed by passenger cars in 2014, of which, over 80% were provided by foreign companies and the remaining 20% by domestic Chinese peers. According to China Internal Combustion Engine Industry Association, as of 2013, all catalysts for joint-venture passenger cars were made by foreign companies, and even for independent brand passenger cars, only 55% of catalysts thereof came from domestic companies.

As far as catalyst encapsulation is concerned, the main market is still dominated by foreign-funded or joint-venture enterprises represented by Faurecia and Tenneco which mainly occupy the middle and high-end market and support joint-venture vehicle manufacturers. Wuxi Weifu Lida Catalytic Converter Co., Ltd., a large-scale domestic manufacturer of automobile exhaust purifier, mainly supports self-owned brands.

The report highlights the followings:

- Overview of three-way catalytic converter, including definition, structure, industry policies, etc.
- Global three-way catalytic converter market demand, including global automobile production and sales, demand estimation, etc.;
- China’s three-way catalytic converter market demand, consisting of the development status, competition pattern, market demand, etc. of China’s automobile industry;
- 18 manufacturers in three-way catalytic converter industry chain e.g. Implats, Kunming Sino-Platinum Metals, Heraeu, Cataler, BASF, Johnson-Matthey, Tianjin HySci Company, involving their revenue, net income, revenue structure, production base, catalyst business, etc.
1. Definition of Three-way Catalyst (TWC)
   1.1 Definition
   1.2 Composition and Structure
   1.2.1 PGM
   1.2.2 Catalyst
   1.2.3 Ceramic Substrate
   1.2.4 Liner
   1.2.5 Sensor

2. Global TWC Market Size
   2.1 Overview of Global Automobile Industry
   2.2 Global TWC Market Size

3. Chinese TWC Market Size
   3.1 Automobile Overview
   3.1.1 Automobile Market
   3.1.2 Passenger Car Market and Market Segments
   3.1.3 Commercial Vehicle Market and Market Segments
   3.2 Policies
   3.3 TWC Market Size
   3.4 Competition Pattern
   3.5 Driving Factors of Catalytic Converter

4. PGM
   4.1 Implats
   4.1.1 Profile
   4.1.2 Platinum Production and Sales
   4.1.3 Operation
   4.1.4 Development Planning
   4.2 Kunming Sino-Platinum Metals
   4.2.1 Profile
   4.2.2 Operation
   4.2.3 By Product / Region
   4.2.4 Gross Margin
   4.2.5 R&D
   4.2.6 Automotive Catalyst
   4.2.7 Development Planning
   4.3 Heraeus
   4.3.1 Profile
   4.3.2 Operation
   4.3.3 Catalyst Business

5. TWC
   5.1 Cataler
   5.1.1 Profile
   5.1.2 Major Clients and Production Bases
   5.1.3 Cataler (Wuxi) Automotive Environment Technology Co., Ltd. [CCC]
   5.2 BASF
   5.2.1 Profile
   5.2.2 Catalyst Business
   5.3 Umicore (acquired Delphi’s automotive catalyst business in 2007)
   5.3.1 Profile
   5.3.2 Operation
   5.3.3 Umicore Automotive Catalysts (Suzhou) Co., Ltd.
   5.4 Johnson-Matthey
   5.4.1 Profile
   5.4.2 Operation
   5.4.3 Johnson Matthey Shanghai Chemicals Ltd.
   5.5 Tianjin HySci Company
   5.6 Daiichi Kigenso Kagaku Kogyo Co., Ltd.

6. Substrate
   6.1 Corning (Shanghai) Co., Ltd.
   6.1.1 Profile
   6.1.2 Operation
   6.1.3 Corning (Shanghai) Co., Ltd.
   6.2 NGK Insulators
   6.2.1 Profile
   6.2.2 Operation
   6.2.3 NGK Insulators (Suzhou)
   6.3 Ibiden
   6.3.1 Profile
   6.3.2 Operation
   6.4 Jiangsu Province Yixing Nonmetallic Chemical Machinery Factory Co., Ltd.
6.5 Nanjing Kerui Special Ceramics Company Limited (a subsidiary of Gaochun Ceramics)

6.6 Weihai Pacific Industrial Development Corporation (PIDC), China

7. Gasket
7.1 3M (China) Co., Ltd.
7.2 Zhejiang Bondlye Motor Environmental Technology
7.3 Unifrax (Shanghai)

8. Sensor Companies
8.1 Bosch
8.1.1 Profile
8.1.2 Operation
8.1.3 Oxygen Sensor Business
8.2 Delphi
8.2.1 Profile
8.2.2 Operation
8.2.3 Oxygen Sensor Business
8.3 Denso
8.3.1 Company
8.3.2 Operation Condition
8.4 NGK
8.4.1 Global Sensor Production Base
8.4.2 NGK Spark Plug (Shanghai) Co., Ltd.
8.5 Kefico

9. Leading TWC Integrated Manufacturers
9.1 Faurecia
9.1.1 Profile
9.1.2 Operation
9.1.3 Revenue Structure
9.1.4 R & D
9.1.5 Performance in China
9.1.6 Major Supporting Models
9.1.7 Faurecia (Changchun) Exhaust System Co., Ltd
9.1.8 Shanghai Faurecia Honghu Exhaust System
9.1.9 Wuhan Faurecia Tongda Exhaust System
9.1.10 Faurecia Exhaust System Qingdao
9.1.11 Faurecia Exhaust System Chengdu
9.1.12 Faurecia Exhaust System Chongqing
9.1.13 Faurecia Exhaust System (Ningbo Hangzhou Bay New Zone)
9.2 TENNECO
9.2.1 Profile
9.2.2 Financial Data

9.2.3 Business in China
9.2.4 Major Clients in China
9.2.5 TENNECO's Major Supporting Models in China
9.2.6 Shanghai Tenneco Exhaust System Co. Ltd.
9.2.7 Tenneco Tongtai (Dalian) Exhaust System Co., Ltd.
9.2.8 Tenneco-Eberspach (Dalian) Exhaust System Co., Ltd.
9.2.9 Tenneco Lingchuan (Chongqing) Exhaust System Co., Ltd.
9.3 J. Eberspaecher GmbH & Co. KG
9.3.1 Profile
9.3.2 Financial Data
9.3.3 Production Base
9.3.4 Major Supporting Models
9.3.5 R & D Costs
9.3.6 Eberspaecher Exhaust Technology (Shanghai) Co., Ltd.
9.3.7 Tenneco-Eberspach (Dalian) Exhaust System Co., Ltd. (see 9.2.8)
9.3.8 Eberspach Exhaust Technology (Xi'an) Co., Ltd.
9.4 Weifu Group
9.4.1 Profile
9.4.2 Financials
9.4.3 Exhaust Gas After-treatment System
Selected Charts

- Main Structure of Catalytic Converter
- Average Prices of Exhaust Systems of Gasoline Engine and Diesel Engine, 2009 & 2014
- Global TWC Market Size, 2013-2018E
- Number of Automobile Makers and YoY Growth in China, 2003-2014
- Revenue and YoY Growth of China’s Automobile Manufacturing Industry, 2003-2014
- Total Profit and YoY Growth of China’s Automobile Manufacturing Industry, 2003-2014
- Gross Margin of China’s Automobile Manufacturing Industry, 2003-2014
- Chinese TWC Market Size, 2012-2014
- China’s Demand of TWC, 2009-2018E
- Implementation of National Standards for Pollutant Emission of Motor Vehicle
- Ownership Structure of Implats
- Mining Production of Implats, 2014
- Financial Data of Implats, 2010-2014
- Financial Data of Implats by Product, 2010-2014
- Employees of Sino-Platinum Metals, 2010-2014
- Gross Margin and Net Profit Margin of Sino-Platinum Metals, 2010-2014
- Gross Margin of Sino-Platinum Metals by Product, 2010-2014
- R&D Costs and % of Total Revenue of Sino-Platinum Metals, 2010-2013
- Revenue of Heraeus, 2009-2013
- Revenue Structure of Heraeus by Region, 2009-2013
- Revenue from Metal Products of Heraeus, 2009-2013
- Cataler’s Overseas Production Bases
- Cataler’s Revenue, FY2002 -FY2014
- Umicore’s organization structure
Selected Charts

- Global Distribution of Umicore’s Automotive Catalyst Business
- Umicore’s Layout in China
- Revenue of Johnson-Matthey, 2013-2014
- Revenue of Emission Control Technologies, 2014H1
- Johnson Matthey’s Light Duty Catalyst Sales, 2014H1
- Johnson Matthey’s Heavy Duty Diesel Catalyst Sales of 2014H1
- Johnson Matthey’s Total R&D Costs and Segment R&D Spending Percentage, 2012-2014
- Market Position of Johnson Matthey’s LDV Catalyst
- DKKK’s Revenue, FY2013-FY2015
- DKKK’s Operating Income and Operating Margin, FY2013-FY2015
- DKKK’s Main Factories
- DKKK’s Revenue from Catalyst, FY2014
- Corning’s Product Application
- Carrier/Filter Plants around the Globe
- NGK’s Production Bases Worldwide
- Revenue and Operating Margin of NGK, FY2007-FY2014
- Revenue of NGK by Division, FY2007-FY2014
- NGK’s Performance, FY2015E
- Capital Expenditures of NGK by Division, FY2010-FY2014
- Revenue and Operating Margin of NGK’s Ceramics Division, FY2008-FY2014
- Revenue of NGK’s Ceramics Division by Product, FY2012-FY2014
- Revenue of NGK’s Ceramics Division by Product, FY2004-FY2015
- Ibiden’s Revenue by Segment, FY2014
- Ibiden’s DpFs Revenue, 2011-2015
- Main Sales Territories of Coral Ceramics
Selected Charts

- 3M’s Regional Sales, 2011-2013
- 3M’s Financial Revenue, 2010-2014
- 3M’s Sales by Division, 2013-2014
- Bosch’s Number of Employees, 2009-2013
- Bosch’s Revenue Structure Division, 2012-2013
- Sales & EBIT of Bosch’s Automotive Division, 2012-2013
- Bosch’s Revenue Structure by Region, 2012-2013
- Delphi’s Number of Employees, 2011-2013
- Delphi’s Revenue, Net Income and Gross Margin, 2010-2013
- Delphi’s Top 5 Clients and Revenue Contribution, 2012-2013
- Name List and Revenue Contribution of Top5 Clients of Delphi, 2012-2013
- Delphi’s Oxygen Sensor Production Bases
- Number of DENSO Employee, FY 2009-FY2013
- Denso’s Sales and Profit, FY2013-FY2015
- Denso’s Operation Profit and Net Income, FY2011-FY2015
- Revenue Structure of Denso by Division, FY2011-FY2015Q1
- Sales and Operation Profit of DENSO by Region, FY2013-FY2015
- Denso’s Revenue by Customer, FY2010-FY2014
- Denso’s Customer Structure, FY2013-2014
- Kefico’s Main Customers
- Kefico’s Revenue, 2012-2013
- Faurecia’s Number of Employees (by Business), 2011-2013
- Faurecia’s Number of Employees (by Region), 2011-2013
- Faurecia’s Development Plan in China
- Faurecia’s Production Base in China
• Platinum Production of Implats, FY2010-FY2014
• Key Financial Data of Sino-Platinum Metals, 2010-2014
• Revenue Breakdown of Sino-Platinum Metals by Product, 2010-2014
• Revenue Breakdown of Sino-Platinum Metals by Region, 2010-2014
• Major Subsidiaries of Sino-Platinum Metals, 2014
• Cataler’s Development History
• Cataler’s Major Clients
• Mobile Catalyst Revenue of BASF, 2007-2013
• Umicore’s Revenue and EBIT Margin, 2005-2013
• Umicore’s Revenue Breakdown by Segment, 2010-2013
• Umicore’s Catalyst Revenue and EBITDA, 2008-2013
• Corning’s Revenue and Gross Margin, 2006-2014
• Corning’s Revenue Breakdown by Segment, 2011-2014
• Corning’s Revenue and Net Income from Environmental Technologies, 2005-2013
• Ibiden’s Financial Indicators, FY2010-FY2014
• Bosch’s Financial Indicators, 2009-2014
• Delphi’s Revenue (by Region), 2010-2013
• Delphi’s Revenue (by Division), 2010-2013
• Delphi’s Gross Margin (by Division), 2010-2013
• Revenue Breakdown of Denso by Division, FY2011-FY2015Q1
• Faurecia’s Revenue and YoY Growth, 2009-2014
• Faurecia’s Net Income and YoY Growth, 2011-2013
• Faurecia’s Net Profit Margin, 2011-2013
• Faurecia’s Revenue Structure (by Business), 2011-2014
• Faurecia’s Revenue Structure (by Region), 2011-2013
Selected Charts

- Faurecia's Revenue Structure (by Client), 2011-2013
- Faurecia's Investment (by Business), 2011-2013
- Faurecia's Investment (by Region), 2011-2013
- R&D Costs and % of Total Revenue of Faurecia, 2009-2013
- Faurecia’s Sales in China, YoY growth, % of Total sales, 2009-2013
- Major Supporting Models
- Major Financial Data of TENNECO, 2008-2013
- Revenue Contribution (%) of TENNECO’s Major Clients, 2011-2013
- TENNECO’s Major Supporting Models, 2014
- Financial Data of J. Eberspaecher, 2012-2013
- Revenue of J. Eberspaecher by Segment, 2011-2013
- Revenue of J. Eberspaecher by Region, 2011-2013
- Major Supporting Models of J. Eberspaecher, 2014
- R & D Costs of J. Eberspaecher, 2011-2013
- Revenue, Net Income and Gross Margin of Weifu High-tech, 2014
- Revenue Breakdown of WeiFu High-tech by Region, 2009-2013
- Revenue Breakdown of WeiFu High-tech by Business, 2009-2013
- Exhaust Gas After-treatment System Related Companies and Products of WeiFu High-tech
You can place your order in the following alternative ways:

1. Order online at [www.researchinchina.com](http://www.researchinchina.com)
2. Fax order sheet to us at fax number: +86 10 82601570
3. Email your order to: report@researchinchina.com
4. Phone us at +86 10 82600828 / 82601561

| Party A: | 
| --- | --- |
| Name: | 
| Address: | 
| Contact Person: | Tel |
| E-mail: | Fax |

| Party B: | 
| --- | --- |
| Name: | Beijing Waterwood Technologies Co., Ltd (ResearchInChina) |
| Address: | Room 502, Block 3, Tower C, Changyuan Tiandi Building, No. 18, Suzhou Street, Haidian District, Beijing, China 100080 |
| Contact Person: | Liao Yan |
| E-mail: | report@researchinchina.com |
| Bank details: | Beneficial Name: Beijing Waterwood Technologies Co., Ltd |
| | Bank Name: Bank of Communications, Beijing Branch |
| | Bank Address: NO.1 jinxiyuan shijicheng, Landianchang, Haidian District, Beijing |
| | Bank Account No #: 110060668012015061217 |
| | Routing No #: 332906 |
| | Bank SWIFT Code: COMMCHNBJG |

<table>
<thead>
<tr>
<th>Title</th>
<th>Format</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Choose type of format

- PDF (Single user license) ............ 2,400 USD
- Hard copy ................................ 2,600 USD
- PDF (Enterprisewide license) ........ 3,900 USD

※ Reports will be dispatched immediately once full payment has been received.

Payment may be made by wire transfer or credit card via PayPal.
About ResearchInChina

ResearchInChina (www.researchinchina.com) is a leading independent provider of China business intelligence. Our research is designed to meet the diverse planning and information needs of businesses, institutions, and professional investors worldwide. Our services are used in a variety of ways, including strategic planning, product and sales forecasting, risk and sensitivity management, and as investment research.

Our Major Activities

- **Multi-users market reports**
- **Database-RICDB**
- **Custom Research**
- **Company Search**

**RICDB** ([http://www.researchinchina.com/data/database.html](http://www.researchinchina.com/data/database.html)), is a visible financial data base presented by map and graph covering global and China macroeconomic data, industry data, and company data. It has included nearly 500,000 indices (based on time series), and is continuing to update and increase. The most significant feature of this base is that the vast majority of indices (about 400,000) can be displayed in map.

After purchase of our report, you will be automatically granted to enjoy 2 weeks trial service of RICDB for free.

After trial, you can decide to become our formal member or not. We will try our best to meet your demand. For more information, please find at www.researchinchina.com

For any problems, please contact our service team at:

Room 502, Block 3, Tower C, Changyuan Tiandi Building, No. 18, Suzhou Street, Haidian District, Beijing, China 100080
Phone: +86 10 82600828 ● Fax: +86 10 82601570 ● www.researchinchina.com ● report@researchinchina.com