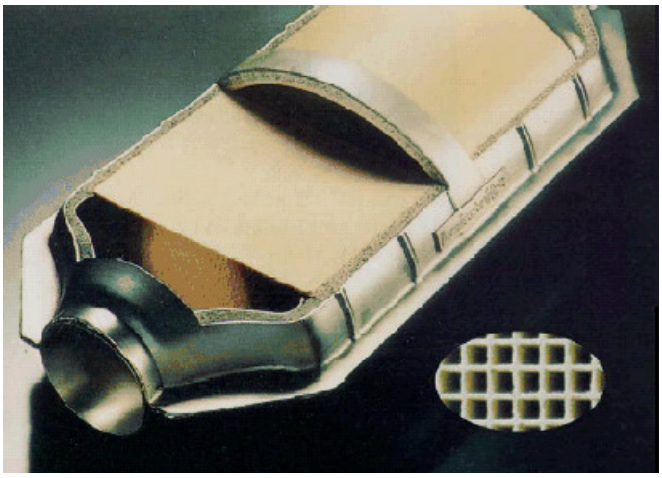
Catalytic Converter Export Market Opportunity



Catalytic Converts Export Market Opportunity
Product Code: 870899 Motor vehicle parts nes

Overview of the Catalytic Converts Export Market

The South African catalytic converter industry is a complex vertically-integrated supply chain with a local content in excess of 85 per cent, substantially more than any other exported automotive component. The industry remains one of the very few downstream manufacturing industries where South Africa has a significant global footprint. This is even more important when it is considered that this industry is the key end-user for two of South Africa's most important mineral resources, namely platinum group metals (PGMs) and chromium, and is in an industry which will see massive global growth as the developing nations of the BRICs grow their auto industries

Catalytic converters remained the main component exported under the APDP. This component reduces harmful emissions from vehicles, following increasingly stringent emission legislation in Europe and the USA. South Africa supplies approximately 10% of the global market for these converters.

In over 15 years of existence in South Africa, the catalytic converter industry has achieved remarkable growth, averaging compound growth in the region of 14 per cent per annum. The industry is the highest contributor to component export revenue and has the highest local content at over 85 per cent.

Product Description

A catalytic converter is a vehicle emissions control device that converts toxic pollutants in exhaust gas to less toxic pollutants by catalyzing a redox reaction (oxidation or reduction). Catalytic converters are used in internal combustion engines fueled by either petrol (gasoline) or diesel including lean burn engines. Although catalytic converters are most commonly applied to exhaust systems in automobiles, they are also used on electrical generators, forklifts, mining equipment, trucks, buses, locomotives, motorcycles, and airplanes. They are also used on some wood stoves to control emissions.

A catalytic converter is a device that uses a catalyst to convert three harmful compounds in car exhaust into harmless compounds.

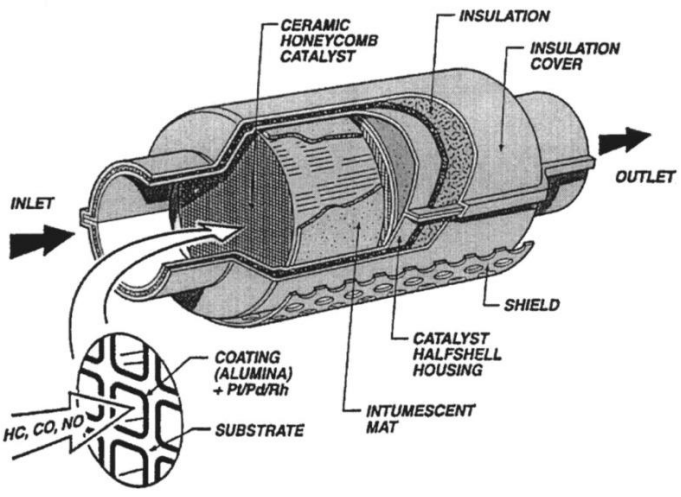
The three harmful compounds are:

- Hydrocarbons (in the form of unburned gasoline)
- Carbon monoxide (formed by the combustion of gasoline)
- Nitrogen oxides (created when the heat in the engine forces nitrogen in the air to combine with oxygen).

Carbon monoxide is a poison for any air-breathing animal. Nitrogen oxides lead to smog and acid rain, and hydrocarbons produce smog.

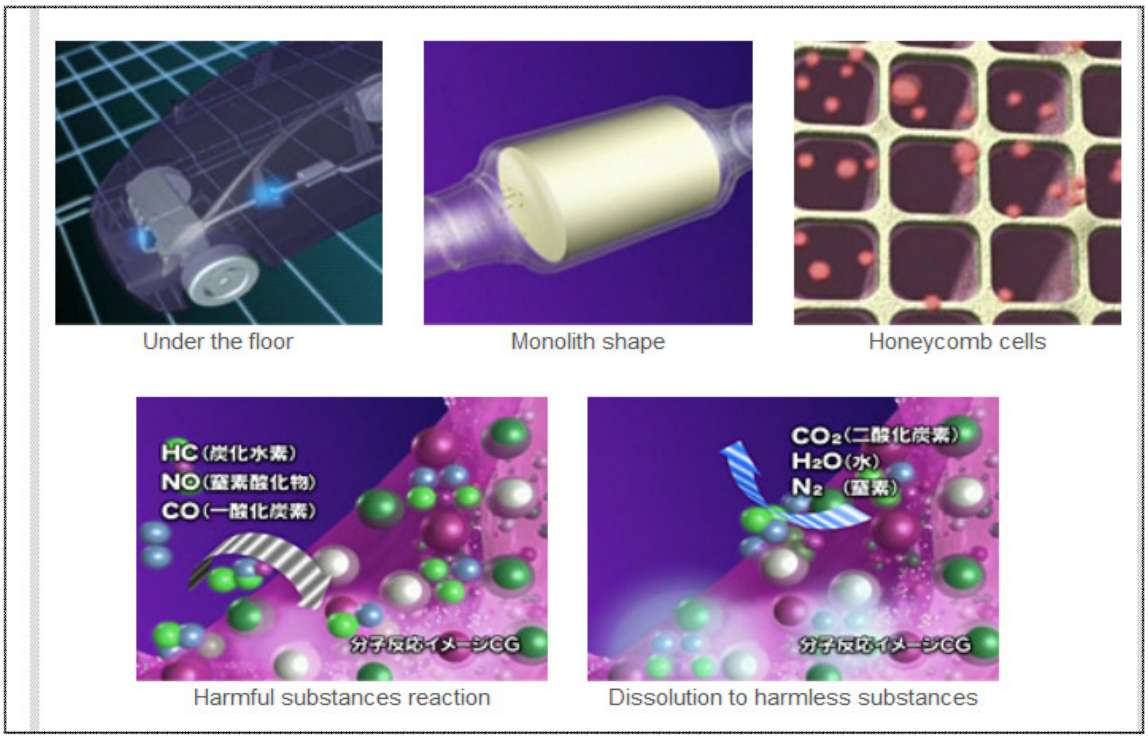
In a catalytic converter, the catalyst (in the form of platinum and palladium) is coated onto a ceramic honeycomb or ceramic beads that are housed in a muffler-like package attached to the exhaust pipe. The catalyst helps to convert carbon monoxide into carbon dioxide. It converts the hydrocarbons into carbon dioxide and water. It also converts the nitrogen oxides back into nitrogen and oxygen.

The industry is also the largest consumer of locally produced stainless steel (>50,000 t/a), exceeding 38 per cent of local consumption. The key component of the grades of stainless steels used in auto catalyst production is chromium, of which South Africa is also the largest producer in the world, with over 70 per cent of known reserves.



Mechanism of the automotive catalyst

The automotive catalysts are place near the engine under the floor. The outer shape is monolith and the inside has honey comb cells separated with thin walls . Harmful component such as carbon hydride, 3 way Catalysts detoxify the harmful exhausts emission, Co, HC and NOx. The Co is to be oxidized into the CO2, the HC is turned in to H2O and CO2 and the NOx is deoxidized into nitrogen.



Under the floor | Monolith shape | Honeycomb cells

Harmful substances reaction | Dissolution to harmless substances

Capacity of the Industry

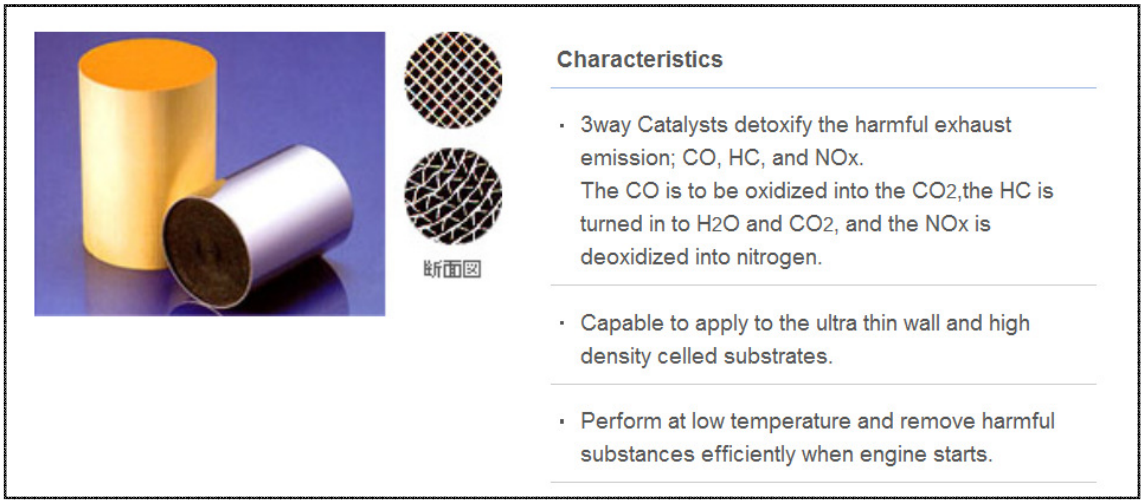
South Africa currently supplies in the order of 10% of the global demand for catalytic converters. The industry is currently capacitated to support 23.7 million units per annum. During 2011 it utilized about 70 per cent of this capacity, but forecast projections suggest that this will be at 46 per cent of this level by 2016. At full capacity the industry would represent 19 per cent of global auto catalyst production compared with the current 10 per cent in 2013.

Types of Catalytic Converters

Types of automotive catalysts that reduce harmful substances contained in the exhaust emissions:

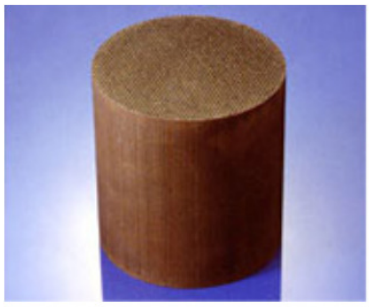
i. Three Way Catalyst

Three-way catalytic converters (TWC) have the additional advantage of controlling the emission of nitrogen oxides (NOx), in particular nitrous oxide, a greenhouse gas over three hundred times more potent than carbon dioxide,[15] a precursor to acid rain and currently the most ozone-depleting substance.[16] Technological improvements including three-way catalytic converters have led to motor vehicle nitrous oxide emissions in the US falling to 8.2% of anthropogenic nitrous oxide emissions in 断面図 2008, from a high of 17.77%



ii. Diesel Catalysts

This catalyst uses O2 (oxygen) in the exhaust gas stream to convert CO (carbon monoxide) to CO2 (carbon dioxide) and HC (hydrocarbons) to H2O (water) and CO2. These converters often operate at 90 percent efficiency, virtually eliminating diesel odor and helping to reduce visible particulates (soot). These catalysts are not active for NOx reduction because any reluctant present would react first with the high concentration of O2 in diesel exhaust gas.



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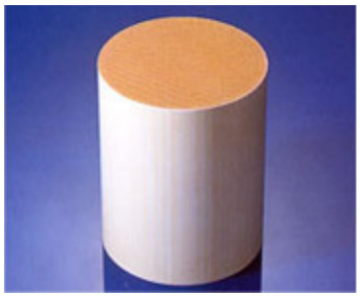
Characteristics

- Diesel Particulate Filter (DPF) accumulets and removes PMs.

What is the Catalyst?

iii. Lean NOx Trap (LNT)

For lean burn spark-ignition engines, an oxidation catalyst is used in the same manner as in a diesel engine. Emissions from Lean Burn Spark Ignition Engines are very similar to emissions from a Diesel Compression Ignition engine



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Characteristics

- Absorb and reduce the NOx in the lean atmosphere.

What is the Catalyst?

South African Export Markets

Catalytic converters remain the main component exported under the APDP. This component reduces harmful emissions from vehicles, following increasingly stringent emissions legislation in Europe and USA. South Africa supplies approximately 10% of the global market for these converters.

The exporting link for the majority of the multinational automotive component manufactures in South Africa consists of the South African based OEMs and their parent companies. Some of the locally owned component manufactures have also been successful in obtaining OEM export business, while many others focus on exports of replacement parts.

Year	Exports to the European Union (EU)	Exports to NAFTA	Exports to Africa	Exports to Southern African Development Community (SADC)
2010	11 886,1	1 810,6	29,2	18,4
2011	16 013,7	2 263,0	63,8	57,4
2012	12 389,9	2 416,1	90,2	75,6
2013	13 288,6	2 399,7	86,1	64,9

Source: AIEC 2013

The table above indicate that there is generally a steady growth of exports from 2011 to 2013, with project future growth of the product.

The following table reveal the major destination for the catalytic converters category exports from South Africa from 2010 through 2013.

COUNTRY	2010	2011	2012	2013
TOTAL (R million)	14 760,7	19 638,9	16 347,0	17 640,9
Germany	36%	39%	40%	41%
USA	10%	8%	11%	12%
UK	8%	10%	8%	9%
Spain	12%	7%	6%	7%
Czech Republic	4%	4%	5%	5%

Source: AIEC 2013

Main Catalytic Converter Trading Partners

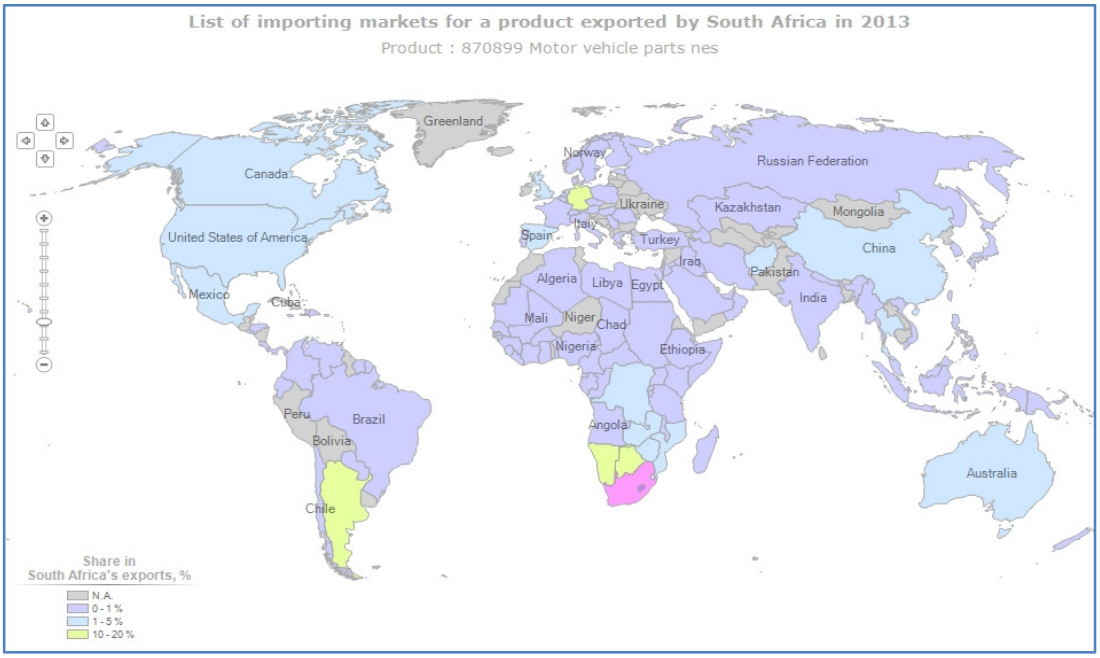
Main Catalytic Converter Trading Partners	
Country	**Exports (R Million) 2013**
Germany	7 179,8
USA	2 167,0
Japan	310,7
Thailand	357,5
UK	1 629,4
India	264,9
Korea Republic South	244,7
Spain	1 185,8
France	138,6

Source: AIEC 2013

Considering the expanding levels of South African automotive trade over recent years, South Africa forms an important part of international supply chains. South Africa's main automotive trading partners (exports and imports combined) for 2013 reflected the country's global linkages with the OEM parent companies in Germany, the USA and Japan.

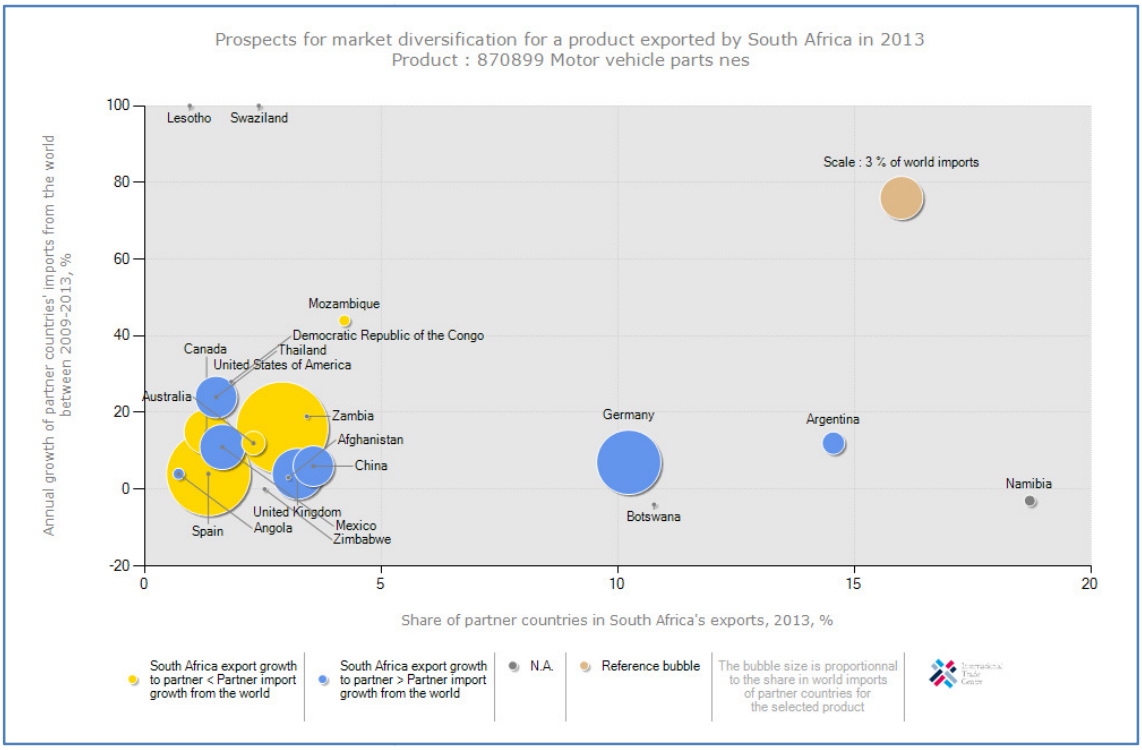
The trade map below outlines the markets importing catalytic converters from South Africa.

List of Importing markets for Product Code: 870899 Motor vehicle parts nes exported by South Africa in 2013



Source: Trade Map 2013

The figure below represents the prospects for market diversification for the catalytic converters exported by South Africa in 2013. It indicates, South Africa export growth to it partners and the partners import growth from the world.



Source: Trade Map 2013

Bilateral trade agreements between South Africa and African countries for the export of catalytic converters-870899 Motor vehicle parts nes

Product code	Product label	South Africa's exports to Botswana			South Africa's exports to Democratic Republic of the Congo			South Africa's exports to Lesotho			South Africa's exports to Mozambique			South Africa's exports to Namibia			South Africa's exports to Zambia			South Africa's exports to world		
		Value in 2011	Value in 2012	Value in 2013	Value in 2011	Value in 2012	Value in 2013	Value in 2011	Value in 2012	Value in 2013	Value in 2011	Value in 2012	Value in 2013	Value in 2011	Value in 2012	Value in 2013	Value in 2011	Value in 2012	Value in 2013	Value in 2011	Value in 2012	Value in 2013
'87089290	Silencers "mufflers" and exhaust pipes, and parts thereof, for tractors, motor vehicles for the transport of ten or more persons, motor cars and other motor vehicles principally designed for the transport of persons, motor vehicles for the transport of go	0	0	329	26	135	84	0	0	48	161	237	196	0	9	581	144	337	170	298371	211434	91130
'87089210	Silencers "mufflers" and exhaust pipes, and parts thereof, for tractors, motor vehicles for the transport of ten or more persons, motor cars and other motor vehicles principally designed for the transport of persons, motor vehicles for the transport of go	0	0	116	13	13	54	0	0	38	11	268	119	0	0	103	33	37	61	458	415	755
'87089220	Parts and accessories of the motor vehicles of headings 87.01 to 87.05: other parts and accessories: silencers (mufflers) and exhaust pipes; parts thereof: other parts	0	0	76	30	17	25	0	0	16	5	22	29	0	0	67	24	49	21	2095	2919	944
'87089215	headings 87.01 to 87.05: other parts and accessories: silencers (mufflers) and exhaust pipes; parts thereof: parts of unmachined cast metal	0	0	43	1	0	0	0	0	1	6	2	6	0	0	30	10	2	2	19	14	99

Source: Trade Map 2013

The figure above indicates that South Africa has developed new markets for export in Botswana, Lesotho and Namibia in 2013. There has been progressive growth in the African markets since 2011with Zambia and Mozambique being the key leaders in importing catalytic converters from South Africa.

Opportunities for future growth

Reduction of auto emissions is a rapidly growing imperative around the globe, with 'green issues' dominating policy decisions. Projections are that the demand for auto catalysts and diesel particle filters will more than double over the upcoming two decades. South Africa has a world-class industry that is already beneficiating more than 95 per cent of all locally consumed PGMs. This industry has the opportunity to develop substantially given the right support from Government