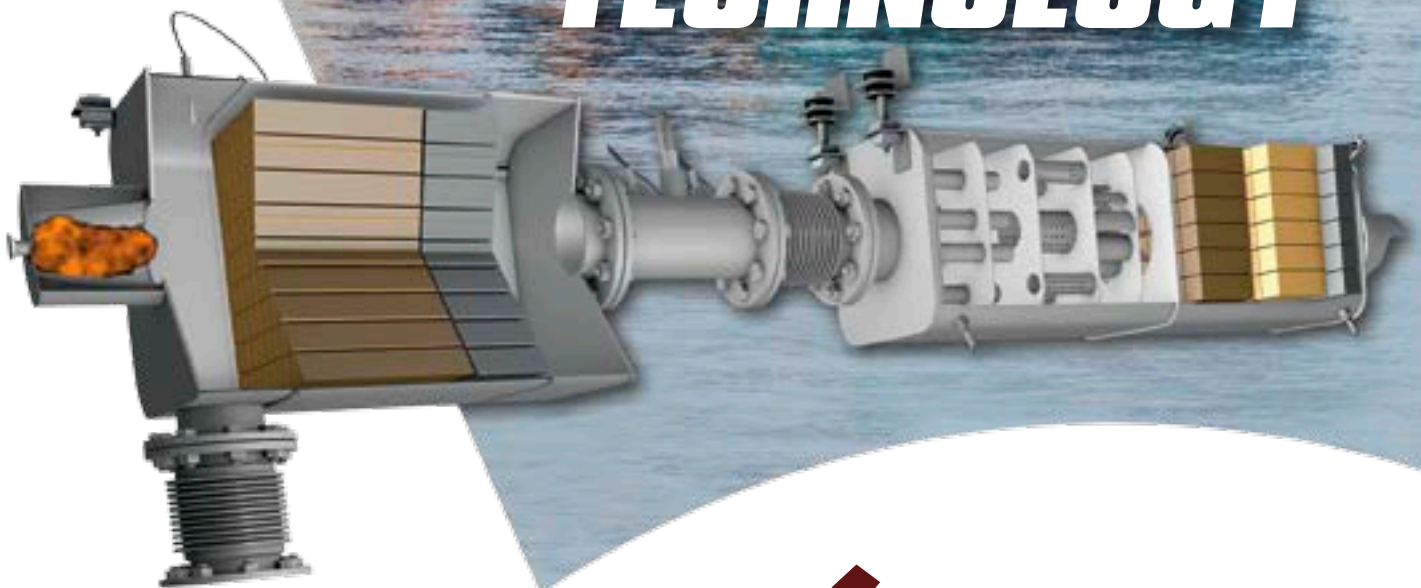


**AXCES EXHAUST SYSTEMS**

**EMISSION  
TECHNOLOGY**



 **AXCES**

## IT'S TIME TO BREAK THE SILENCE ON AXCES

AXCES consists of a group of companies that provide fully-integrated exhaust systems for combustion engines with exhaust silencers as its core-business. Anything installed after the outlet connection of a diesel engine, AXCES delivers. Fully customized to individual ships, propulsion systems or industrial machines. Specializing in the whole process of design, engineering, manufacturing and supply AXCES offers total exhaust system supply solutions. Relatively basic solutions can be found in its wide range of standard products. AXCES is also the technical and acoustical partner that meets the most challenging noise requirements and specific silencer configurations against minimum back pressure results. AXCES meets your needs with a clear focus on output, efficiency and reliability.

## ACOUSTICAL XCELLENCE IN COMPETENT EXHAUST SYSTEMS

AXCES represents: Acoustical Xcellence in Competent Exhaust Systems. Added value is offered by translating the results of extensive scientific research into practical, cost and time saving solutions. Combining intelligence with clearness. It is a philosophy that is proven to be very successful. In a few years time literally thousands of exhaust silencers have been installed both in inland and sea-going vessels, operating daily all over the world. Within AXCES, high-level scientists, team up, with field-experts to develop exhaust silencers and complete exhaust gas system for diesel engines that help our clients outperform competition.

## THE ADDED VALUE OF THE AXCES GROUP

The Axces Group consists of several Axces divisions working closely together to bring you the best possible solution in exhaust systems. Each Axces division has profound knowledge and experience in its own specialty and is equipped with the best tools to apply that knowledge. Because Axces is present worldwide, the Axes Group through cooperation between the different parts, has always quick access to the latest technologies. This means Axes can deliver the best possible exhaust system for every conceivable situation for the lowest price possible and at the best conditions.



## INDUSTRIES

### SHIPPING

AXCES delivers worldwide and in many industries, but is specialized in the shipping industry.

### ENGINE POWER

Axces engineers deliver ideal exhaust system for a wide range of energy systems.

### ENERGY SYSTEMS

Axces is leading the way when it comes to exhaust solutions. From basic parts that keep temporary power supplies running to essential parts for safe, efficient and clean generators.

### AUTOMOTIVE

Axces specializes in exhaust systems for really heavy-duty machinery that has to keep going, no matter what.

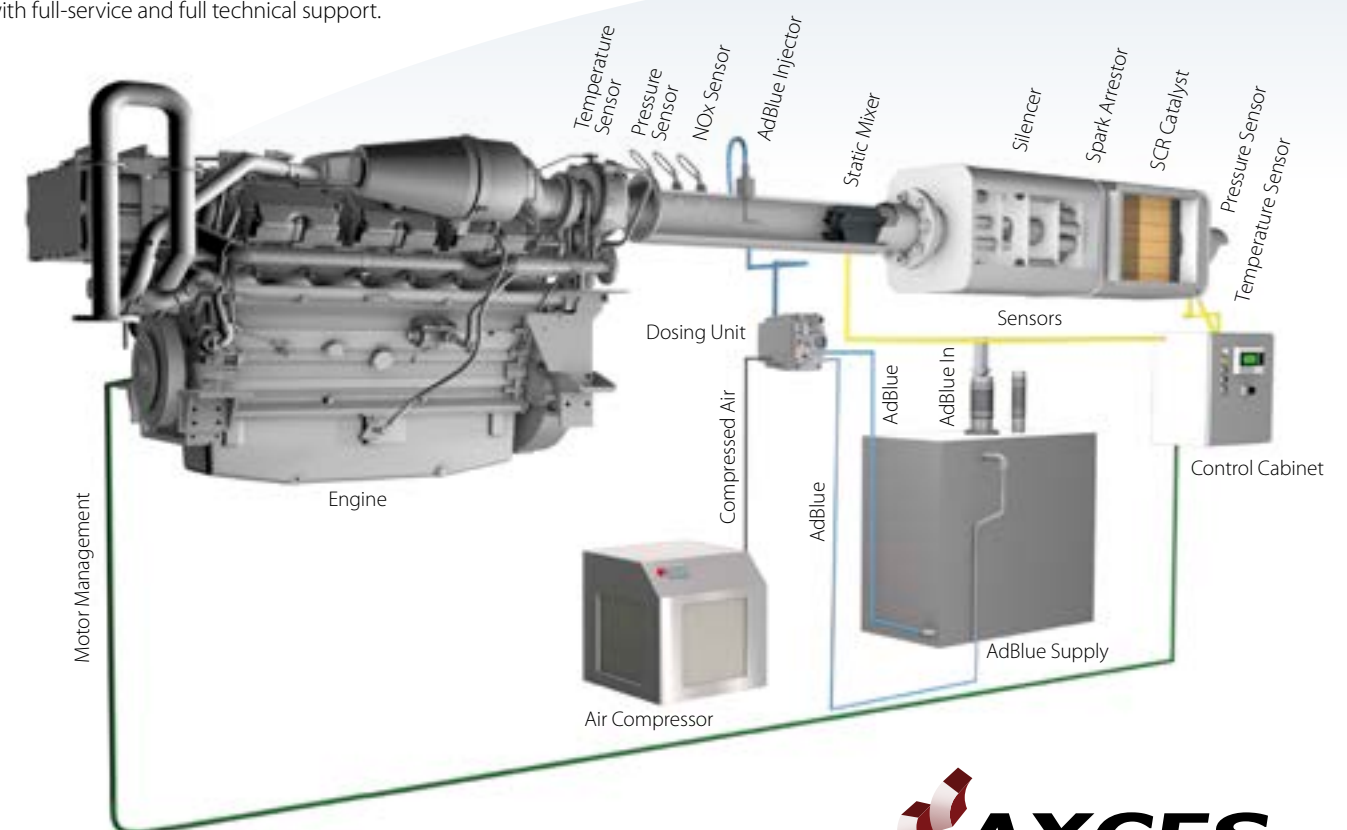
## FULLY-INTEGRATED EXHAUST SYSTEMS

AXCES' working field is defined within the framework regarding everything installed after the exhaust outlet of a combustion engine. Delivery of Fully-Integrated Exhaust Systems customized to the individual ship, is our key.

**DESIGN** AXCES is guaranteed to meet any noise requirement with tailor-made silencer solutions. With strong expertise both in acoustics and physics, AXCES specializes in custom engineering.

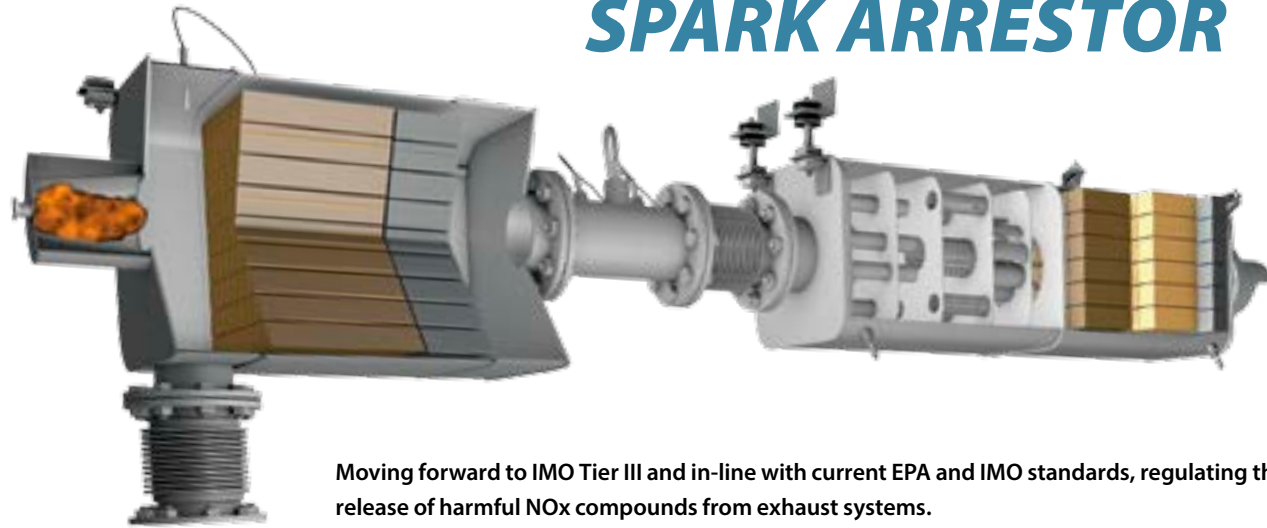
**MANUFACTURING** AXCES' knowledge centre, sales and distribution is based in the Netherlands. AXCES production in Poland produces top quality solutions at a very competitive price.

**SUPPLY** AXCES can provide you with everything you need. AXCES is able to deliver most common used accessories within 24 hours. Every part or system comes with full-service and full technical support.





## SCR SYSTEMS WITH INTEGRATED SILENCER AND TYPE APPROVED SPARK ARRESTOR



Moving forward to IMO Tier III and in-line with current EPA and IMO standards, regulating the release of harmful NOx compounds from exhaust systems.

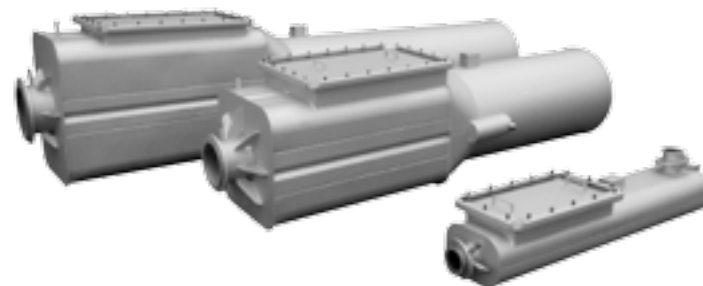
The integrated SCR/silencer reactor is a novel solution making Axces a market leader in this field. The new IDE - NOx reactor can very easily be swapped with the existing noise reduction elements.

This upgrade of reactor leads to a reduction in the release of toxic NOx compounds through selective catalytic reduction. At the same time it operates as a exhaust silencer, with noise reduction of more than 45 dB(A).

### THE IMO TIER III ZERO NO<sub>x</sub> SYSTEM

To comply with the IMO Tier 3 NOx requirements the Axces modular Zero NOx System for diesel engines in generator set applications offers reliable reduction of NOx for certain Emission Control Area's (ECA).

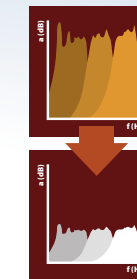
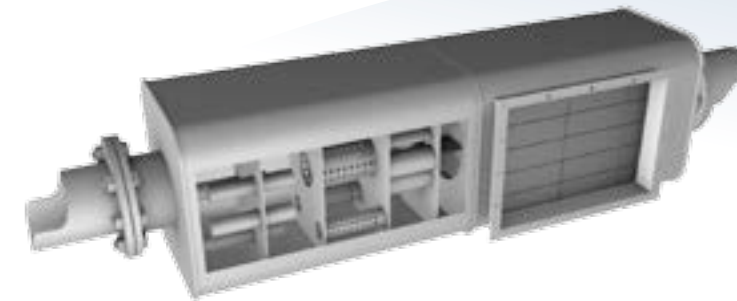
The Selective Catalytic Reduction (SCR) reduces NOx with use of UREA (Ad Blue) injection in the exhaust stream.



- Both Inline and Compact IDE-NOx System available in every size engine room.
- It is possible to combine a customised Zero Soot Systems, to avoid guests experience particulates on deck, common diesel fuel in swimming water and diesel fuel smell.
- The Axces system range has been designed to form a match with the auxiliary and generators from 100 kW up to 8.000 kW.
- The PLC control ensures an smart trouble free operation for all available parameters, alarms & events, history and data logging.
- Integrated sound attenuation.

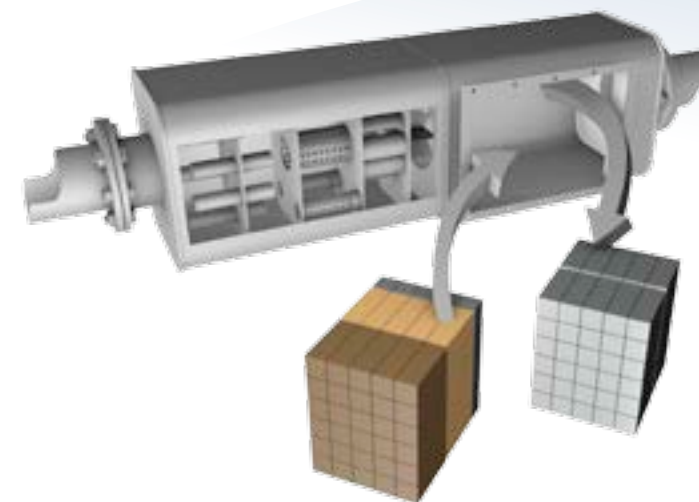
## SCR SYSTEMS

### EXCELLENT SILENCER UNIT



This system has an excellent Prepared Silencer to SCR unit with an attenuation of more than 45 dB(A), which silences the complete frequency range.

### NO<sub>x</sub> REDUCTION UNIT



The damping units are easily swappable and guarantee a NOx Reduction of more than 80%. The catalyst is a high quality Vanadium Based unit, which ensures minimum back pressure.

#### PERFORMANCE

NOx – Nitrogen oxides*	>80-90% reduction
HC (Hydro-Carbons)	20 - 30%*
CO (Carbon-Monoxide)	20 - 30%*
Sound attenuation **	ca. 35/45 dB(A)

\* depending on exhaust temperatures  
\*\* lower value for In-Line systems / higher value for compact systems

### SYSTEM PARTS

#### CONTROLLER

PLC control terminal  
(full colour 7" HMI touch screen)  
Logging: Yes  
Communication with motor management  
External I/O: Inputs: Engine load signal, Engine on. Outputs: System ON, Alarm.



#### REACTOR HOUSING

Rectangle shape to reduce overall volume.

#### UREA DOSING PUMP

#### UREA PUMP SET

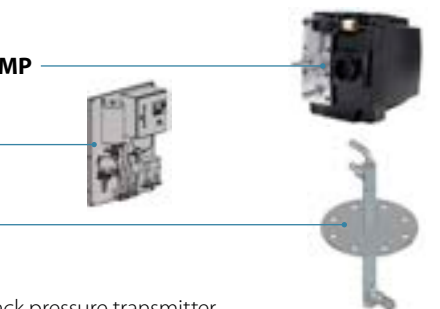
#### UREA INJECTOR

#### SENSORS

Temperature and back pressure transmitter

#### WIRING

Wiring by yard on terminals



# AXCES EXHAUST SYSTEMS

# AXCES EXHAUST SYSTEMS



## OPERATIONAL CONDITIONS

<b>Application</b>	Sea going vessels, inland vessels, superyachts
<b>Ambient Temperature</b>	5 + 60°C (lower temperatures on request)
<b>Degree of Protection</b>	IP55
<b>Relative humidity</b>	5 to 95% Non-condensing
<b>Inspection &amp; service interval</b>	1x per year or 4.000 operating hours
<b>Compressed air for urea atomizer</b>	8-12 Nm <sup>3</sup> /h @ min 6 barg (2-phase nozzle)
<b>Urea nozzle type</b>	2-phase nozzle, compressed air atomization
<b>Urea specification</b>	AUS32 or AUS40 or equivalent

## SUPPLIES

<b>Fuel</b>	EN590 (Diesel), DMA, DMX (max 2000 ppm S)
<b>Power supply</b>	230VDC

## DESIGN DATA

<b>Materials</b>	Aisi 304 / 316 (mixing tube)
<b>Temperature exhaust in</b>	0 - 520 °C (optional higher temperatures)
<b>Max system pressure (design)</b>	100 mbar (for housing design) design temperature 600°C
<b>Max pressure drop</b>	20 mbar (wet exhaust)
<b>Emission reduction</b>	NOx ca. 80% to reach IMO III Tier limit of 2 g/kWh CH / CO > 30-50% (depending on temperature)
<b>Operational temperature</b>	>220°C (EN590 fuel) >250°C (max 2000 ppm sulphur)
<b>Control strategy</b>	Open loop (Standard) Closed loop with NOx sensor (optional with EN 590 fuel only)
<b>Supports</b>	Bottom (standard), top support possible
<b>Thermal insulation</b>	Max. 80 mm insulation / Blankets or cladded insulation (by customer)

## AXCES ONLINE ACCESSORIES WEBSHOP

You can find all of our products in the "Complete Exhaust System and Emission Technologies Webshop". This online facility gives AXCES' clients direct access to more then 2.500 parts related to the exhaust gas system. Fast delivery from large stock.

### COMPENSATORS • FLEXIBLE HOSES • ROOF TRANSITS • WALL TRANSITS • SUPPORTING



### POINTS RAIN CAPS • MOUNTING SETS • FLANGES • GASKETS • NUTS AND BOLTS • COATINGS



### STEEL TUBES • THIN-WALLED TUBES • THIN WALL INSULATED SYSTEMS • INSULATION



### WET EXHAUST SYSTEMS • THIN WALL MODULAR SYSTEMS • MASURING INSTRUMENTS • ETC.

## AXCES PRODUCT RANGE

### DRY EXHAUST SILENCERS

### WET EXHAUST SYSTEMS

### EMISSION - CATALYSTS

### EMISSION - SCRUBBERS

### INDUSTRIAL STACKS

### PRODUCTION FACILITY

### PRODUCT CATALOGUE

## VISIT OUR ONE-STOP-SHOP WEBSITE

- ✓ Huge selection from small parts to complete exhaust systems
- ✓ Fast delivery
- ✓ top quality solutions at very competitive prices
- ✓ Every part with full-service and full technical support



**WWW.SHOP.AXCES.COM**







## THE AXCES GROUP

The Axces Group designs and manufactures industrial exhaust systems, silencers and chimneys including flue gas cleaning systems as well as acoustic enclosures, steel structures and steel products.

### AXCES EMISSION TECHNOLOGY

Ondernemersweg 12  
4691 SL Tholen  
The Netherlands

*Visiting address:*  
Langesteijn 134  
3342 LH Hendrik-Ido-Ambacht  
The Netherlands

+31(0)166 603 285  
[info@axces.com](mailto:info@axces.com)  
[www.axces.com](http://www.axces.com)

### AXCES INDUSTRIAL STACKS B.V.

*Visiting address:*  
Veersedijk 59  
3341 LL Hendrik Ido Ambacht  
The Netherlands

+31 (0)786 459 822  
[info@axces.com](mailto:info@axces.com)  
[www.axces.com](http://www.axces.com)

### AXCES STEAM AND FLOW CONTROL B.V.

*Visiting address:*  
Langesteijn 134  
3342 LH Hendrik-Ido-Ambacht  
The Netherlands

+31(0)172 619 246  
[sales@axces.com](mailto:sales@axces.com)  
[www.steam.axces.com](http://www.steam.axces.com)

### AXCES B.V.

Ondernemersweg 12  
4691 SL Tholen  
The Netherlands

+31(0)166 603 285  
[info@axces.com](mailto:info@axces.com)  
[www.axces.com](http://www.axces.com)

*Visiting address:*  
Langesteijn 134  
3342 LH Hendrik-Ido-Ambacht  
The Netherlands

Axces BV includes: Axces Wet Exhaust Systems,  
Axces Emission Technology, Axces Industrial  
Stacks, Axces Exhaust Systems

### AXCES Production

Młyny 16B  
37-550 Radymno  
Poland

+48(0)603 676 903  
[axces@axces.pl](mailto:axces@axces.pl)  
[www.axces.pl](http://www.axces.pl)

### AXCES Asia (Singapore)

No. 7 , Toh Guan Road East #07-07  
Alpha Ind. Building, Singapore

+65 6569-0570  
[info@axces.sg](mailto:info@axces.sg)  
[www.axces.com](http://www.axces.com)

