

**AXCES EXHAUST SYSTEMS**



**WET  
EXHAUST  
SYSTEMS**

 **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.

## 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.



## 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.

## AXCES WET EXHAUST SYSTEMS

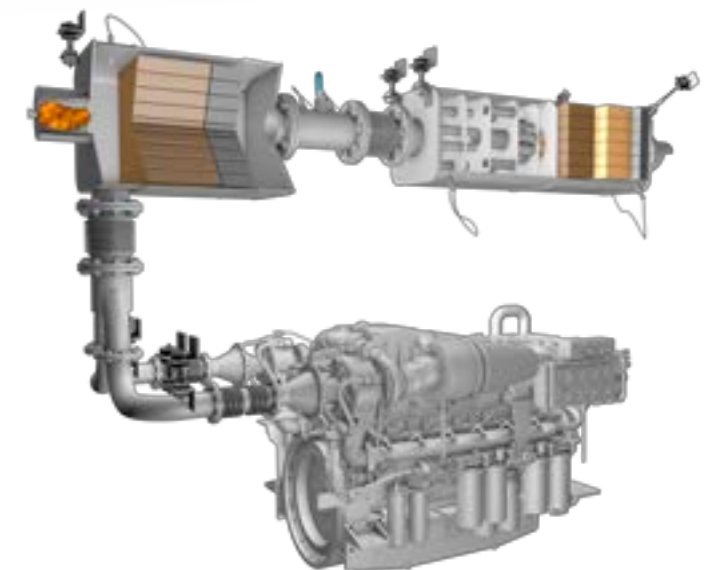
### 'Your partner in Water Injected Exhaust System Technology'

Axces Wet Exhaust Systems is specialized in the custom made design of water injected exhaust system technology. Delivery of Fully-Integrated Exhaust Systems customized to the individual project and customer is our key. In a Unique way Axces provides 'Value for customers' in total exhaust system supply solutions, with Acoustic & Physics as elementary field.

These fundamentals, together with an integrity of the coordinated specialties: Design, Engineering, Manufacturing & Supply, are supported by using a wide and complete product range.

Axces advice is based on directives which are established by several institutes, which are the result of scientific research. Regarding the activities of designing, our motto sounds: 'combining intelligence with clearness'. This basically means that our point of departure in designing has a scientific background, translated in a clear but for a client practical way.

The experience gained over many projects during the last decade, results in trustworthy reliable solutions for the customers in this unique market.



## COOLING WITH WATER INJECTION



### DRY EXHAUST SILENCER OUTLET ABOVE THE WATERLINE

- ✓ Attenuation of noise in the hot exhaust gas before water injection.
- ✓ The total back pressure in the hot exhaust section is relatively low.
- ✗ Noisy sound of injected water leaving the outlet.
- ✗ Hot exhaust section before the water injection has to be insulated.



### DRY EXHAUST SILENCER OUTLET UNDER THE WATERLINE

- ✓ Attenuation of noise in the hot exhaust gas before water injection.
- ✓ Exhaust gasses and the injected water leave the hull under the waterline.
- ✗ The total back pressure of the underwater outlet is relatively high.
- ✗ Hot exhaust section before the water.



### EXHAUST GAS-WATER SEPARATOR WITH INTEGRATED SILENCER

- ✓ The injected water will leave the hull under the waterline.
- ✓ The exhaust gas will be cooled down when leaving the hull.
- ✗ The possibility that exhaust gasses will be blown back onto the deck.



### WATERLIFT-SILENCER COMBINATION

- ✓ Very high attenuation of noise by the waterlift silencer.
- ✓ The possibility to place the combustion engine under the waterline.
- ✗ Noisy sound of injected water leaving the outlet.
- ✗ The total back pressure of the waterlift silencer is relatively high.

## WATER INJECTED EXHAUST SYSTEMS

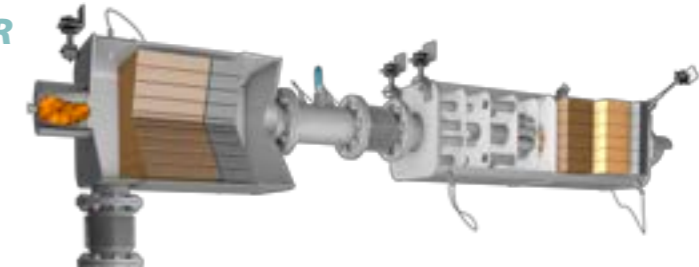


### SOOT FILTER WITH ATTACHED BURNER

A diesel particulate filter (or DPF) is a device designed to remove diesel particulate matter or soot from the exhaust gas of a diesel engine. Wall-flow diesel particulate filters usually remove 85% or more of the soot, and under certain conditions can attain soot removal efficiencies of close to 100%.

### SCR REACTOR WITH INTEGRATED SILENCER AND CERTIFIED SPARK ARRESTOR

In-line with current EPA and IMO standards, regulating the release of harmful NOx compounds from ex-haust systems, the integrated SCR/ Silencer reactor is a novel solution making Axces a market leader in this field. The new IDE – NOx reactor can be swapped with existing noise reduction elements.



## ADDITIONAL PRODUCTS



### EXHAUST GAS COOLING

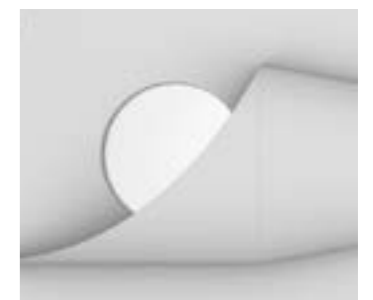
For yachts with an exclusive and durable coating system, it is of great importance that the exhaust gasses, which are leaving the outlet in the ship's hull are cooled down. By spraying seawater under great amount of pressure, into the streamline of the exhaust gas flow, the hot exhaust gasses are immediately cooled down to less than 70 °C over a length of around 1 meter piping length.

In order to manage this controlled process for variable outputs of the power of the engine, Axces has a test facility to study the optimum procedures in cooling of exhaust gas by spraying seawater. Tests are performed regarding the pump capacity and its work pressure, the unique spraying angle, its amount of waterflow and the individual temperature and pressure drop.

### SCOOP DESIGN FOR UNDERWATER OUTLET SOLUTIONS

In order to reduce the back pressure caused by the underwater outlet, Axces is able to design and produce an exhaust "scoop". The scoop creates a vacuum when the vessel is sailing. This vacuum creates the effect that exhaust gasses will be pulled out of the outlet pipe, greatly reducing the overall back pressure.

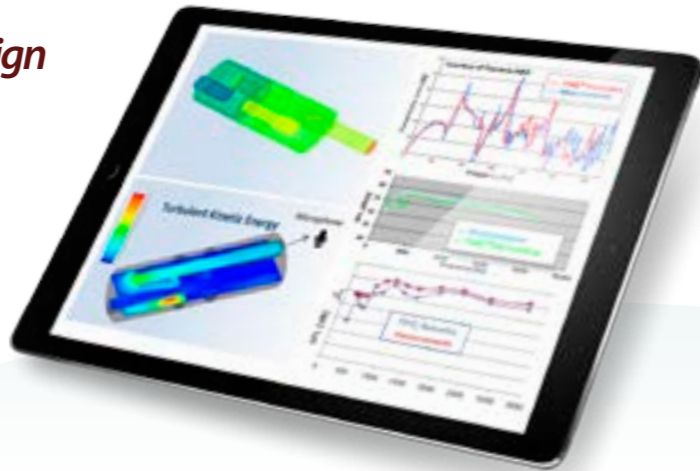
To design a scoop which operates properly it is of great importance that the difference in the design waterline (DWL) and the actual waterline (which may be higher or lower than the DWL) and also the length waterline or load waterline (LWL) are taken into account. The LWL is the length of the boat where it meets the water when loaded to its designed capacity.



## AXCES ACOUSTICS DESIGN

Axces designs its silencers and exhaust systems using the best Aero-Vibro-Acoustic Simulations software. This software can thoroughly calculate every aspect related to noise in an early stage of the design of the system. These calculations guarantee:

- ✓ Customized compact design
- ✓ Accurate efficient and simulation of:
  - Pipe noise
  - Transmission loss
  - Shell radiated noise
  - Flow generated noise
  - CFD Analyses
- ✓ Lower cost



## 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 than 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 • MEASURING INSTRUMENTS**

## AXCES PRODUCT RANGE



## 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**



# AXCES EXHAUST SYSTEMS



## 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.

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

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