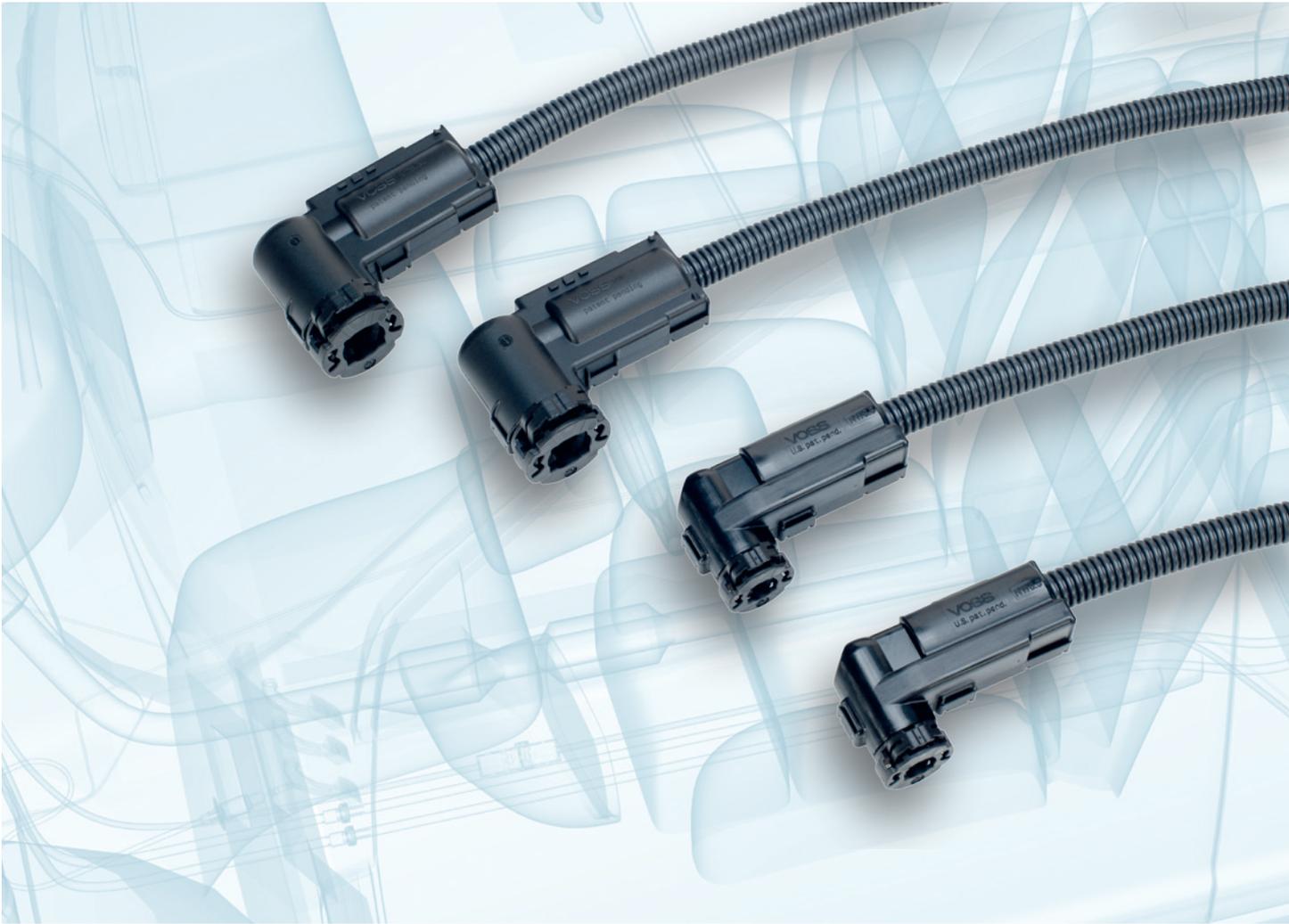


VOSS

When it comes to emissions, we're minimalists.
For the environment's sake.



Line and connection systems
for SCR technology



VOSS Automotive



Responsibility fills the air

Exhaust limit values have been around for some time. However, since Euro IV (2005), Europe's limit values for nitrogen oxides (NO_x) in exhaust have been so low that truck manufacturers have been forced to develop elaborate technologies to further reduce harmful emissions. This has only been escalated by Euro V (2006) and Euro VI (2013). Similar emission reduction standards were introduced in the US and Japan, and – with some delay – in Brazil and China. Consequently, the objective is to reduce NO_x across the board. And dramatically so.

The automobile industry has confronted this challenge, and Europe has backed selective catalytic reduction (SCR) technologies to cut NO_x almost without exception. The specific benefit: Not only are the limit values adhered to, the diesel consumption has declined, as well.

Responsibility is best shared.

We have made it our challenge to accompany the automobile industry in all its development efforts and to live up to ambitious demands. This is how we make sure that our solutions meet the requirements of ever smaller installation spaces. The function is guaranteed under all pressure and temperature conditions, as well as the most demanding uses. Because of this, we've efficiently reduced NO_x emissions, and renowned manufacturers in Europe – and market leaders in Japan, China and the US – employ VOSS SCR systems.

We have been involved with SCR technologies from the very beginning, and we continually look for innovative solutions with you so that, together, we can raise the bar. This has made us the international partner of choice and world market leader. We are rooted in our expertise, the economics and the sense of responsibility for safety, and a clean environment.



SCR systems

Coolant-heated SCR systems



Our expert engineering team designs each coolant-heated AdBlue®/DEF line according to customer-specific layouts and vehicle-specific routings.

We will support your concept development and validation efforts with our versatile infrastructure for testing and prototyping, and we are available for on-site support for vehicle analyses and installation services.

Electrically heated SCR systems

Our electrically heated SCR lines provide individualized solutions, based on customers' demands.

Additionally, their efficient and flexible heating concept features a thermally buffered heating wire, which is installed externally on the tube and enables short thawing times. The result: low heating power. Because of heated connectors and controlled heating wire routing, thawing at the connection point is secure.

Our electrically heated SCR systems are easy to assemble and provide the utmost in process reliability.



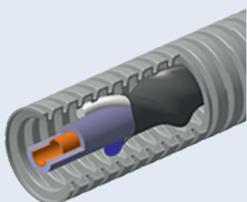
Unheated SCR systems

Certain application environments do not call for heated SCR systems because the AdBlue®/DEF is unlikely to freeze.

Our product line for unheated SCR systems includes:

- Nylon tubes (straight and form-bent)
- EPDM hoses
- Quick connect systems 241 (SAE J2044) and 246 ^{NX}

Tube types

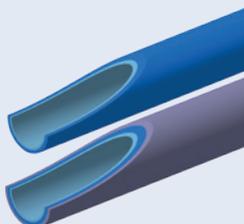


AdBlue® lines

- Non-heated and electrically heated lines
- PA 12 tubes, available in 4x1, 5x1, 6x1, and 8x1
- PPA/Multilayer tubes 4x1 for high-temperature applications in cars
- Hoses with ID 3.2 and 4.0 mm for applications with high demands on pulsation damping

Pressure lines

- PTFE hoses (NW 6) with stainless steel mesh
- VOSS screw fittings ES-4 as connecting element



Coolant lines

- Monolayer tubes made of hydrolysis-stabilized polyamide
- Corrugated tubes made of hydrolysis-stabilized polyamide
- Multilayer PA/PP tubes
- EPDM hoses
- Coolant tubes for high-temperature applications

Quick connectors for SCR systems

Quick connect system 246 ^{NX}



Quick connect system 246 ^{NX} connects AdBlue®/DEF and coolant lines.

- Very low height of plugs, adapters and connecting ports
- Easy handling
- Disassembly without tools
- Release mechanism latches in eight different positions
- Color coding on release clip indicates different fir-tree/tube sizes
- Operating pressure: 10 bar
- Operating temperature range: -40 °C to +120 °C
- Connecting profile made of nylon or metal
- Laser-welded or pressed onto the fir-tree

Quick connect systems 241, 241^N, 241^{N-SL}



At VOSS, we've developed a comprehensive connection system to connect SCR lines to SAE J2044 ports. For AdBlue®/DEF lines, there are electrically heated connectors and couplings. Two variants are deliverable: quick connect system 241 standard and quick connect system 241^N / 241^{N-SL}.

Features 241^N / 241^{N-SL}

- Connection of PPA tubes
- Straight and elbow connectors made of nylon
- Retaining clips can be pre-assembled in 4 possible positions
- Optional as standard or secondary lock versions (241^{N-SL})
- Operating pressure: 10 bar
- Operating temperature range: -40 °C to +120 °C, to +160 °C after having consulted VOSS

Sensors

Our new quick connect systems with integrated sensors offer several advantages:

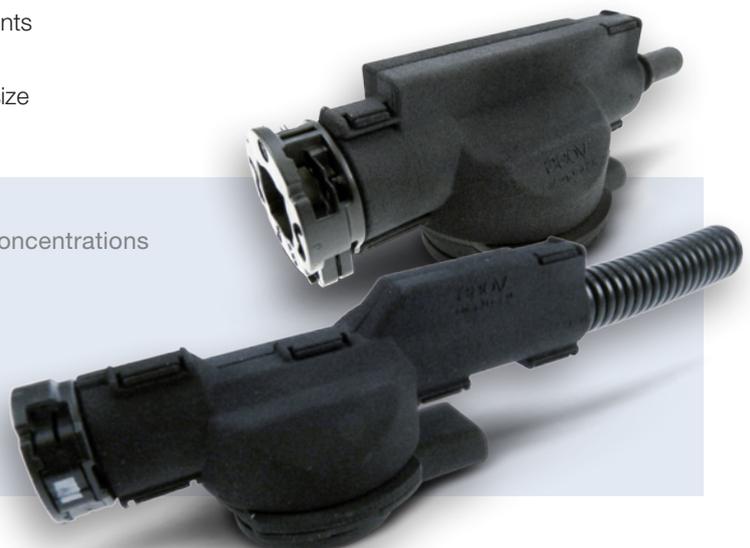
- They amplify the functional range of our lines and components
- They optimize system behavior
- They are suitable for limited spaces, due to their compact size
- They help save weight and construction parts

Urea quality sensor

- Determines pressure, temperature, medium and urea-concentrations
- Consistently heats the sensor and SCR line

Temperature sensor

- Directly integrated into VOSS quick connect systems
- Quick and easy installation
- Suitable for all VOSS ports



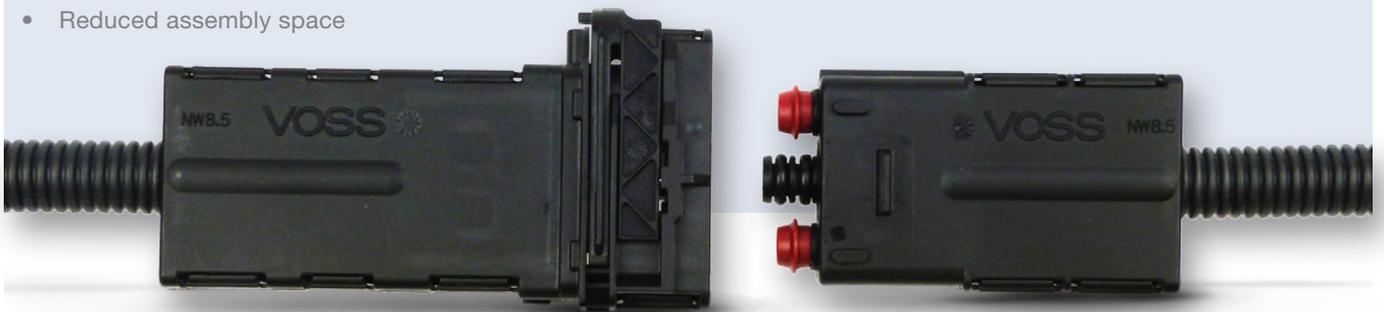


More solutions

Quick connect system 301 ^{EFSP}

Electric-Fluidic Separation Point

- Optimized AdBlue®/DEF thawing performance
- Continuous inner diameter for minimized pressure losses
- Designed for tube size 4x1
- Operating pressure 10 bar
- Operating temperature range -40 °C to +120 °C
- Compatible with high temperature resistant SCR lines
- Standard version includes secondary lock
- Reduced components
- Reduced assembly steps
- Reduced assembly space



DI-SCR (Double Injection SCR)

Our DI-SCR is a non-separable T-manifold for fluidic and electrical lines. It features:

- Fluidic T-manifold splits AdBlue® /DEF flow
- Electric connections separated by single contacts
- Combines all advantages of both SCR strategies: under-floor and closed-coupled SCR layout
- For increased flexibility of dosing strategy and decreased temperature load
- For better response times and more effective emissions reduction
- Connectable with VOSS quick connect systems, e.g. 241^N or 301^{EFSP}
- Compact packaging, only one E-connector
- Available for commercial and passenger vehicles
- Further individual solutions available upon request



VOSS



VOSS Automotive GmbH
Leiersmühle 2-6
51688 Wipperfürth
P. O. Box 15 40
51679 Wipperfürth
Germany
Phone +49 (0)2267 63-0
Fax +49 (0)2267 63-5982
automotive@voss.net
www.voss.net