

## Sasol Germany GmbH Herne factory

**“Reaching new frontiers”  
with speed and safety during loading:  
Sasol Germany GmbH, Herne site.**



# Chemical loading Sasol



When the tankers arrive on the industrial tracks on the factory premises of Sasol Germany GmbH Herne, your freight has already travelled a great distance. The ethanol solvent was manufactured in the Sasol main factory in Secunda, shipped to the South African coast, transferred by ship from Durban to Rotterdam and offloaded once again onto the railroad for further processing in the Herne factory. Nothing should go wrong there, of all things not at the very last minute. When Sasol built a new unloading facility in Herne for this purpose, naturally the safety of the employees, the environment and the surrounding area was given the highest priority; however, the economic aspect was given the second highest priority. An RS innovation made it possible to unify both priorities without making any compromises.

**Sasol rail loading station in Herne: raw materials for subsequent processing from afar.**

## TÜV requirement: breakaway coupling

In order to receive an official permit for operation of a new unloading station, it is standard procedure that the TÜV requires two types of safety couplings for the hose connection between the tanker and the pump: a breakaway coupling which prevents leaks during accidental separation and a dry disconnect coupling which prevents the leaks during a separation of both coupling halves during regular coupling and decoupling for operational reasons. On top of that, as an "additional network", compliant with the Federal Water Act, a 50 m<sup>3</sup> large concrete trough that can accommodate the escaping ethanol from an entire tanker to prevent it from flowing into the soil.

The first problem: safety is indispensable but until now had a high price tag due to technical reasons; namely a flow cross-section that is low in comparison to the hose diameter. The medium gets jammed at this "bottle-neck". The consequence: the loading times per wagon become longer and more expensive; the same is true of the loading station employees' "idle times".

The second problem: the more the filling level in the tank sinks, the lower the pressure due to gravity, which leads to "self unloading" (on average 0.3 bar). That leads to cavitation in the pump and its intake capacity has to be throttled. That also leads to an undesired loss of time during the unloading process



**Ethanol unloading at the Sasol rail loading station: with the ABVL and the TR from RS, safety and process-engineering are optimised.**

and can additionally damage the pumps. "Can't we do anything about that?" asks the responsible production engineer at the Herne site, industrial engineer Torsten Wupper. "Yes, we can!" replies Peter Badners, Head of the Hose Engineering Department of Technischen Großhandlung Schloemer (wholesaler for technical products), which has been supporting Sasol in Herne for over 20 years in all questions regarding hose and valve technology. "After all, RS has developed just the right solution for that, the ABVL."

## Applied bionics

ABVL is the name of the latest product line of breakaway couplings with breaking pins from RS. This product line is based on the proven RS valve principle and was developed especially under economic aspects to optimise the pressure loss of these breakaway couplings and to significantly improve the flow-through. In order to accomplish that, the design was based on models from nature such as dolphins and squids and then optimised using computer-based flow analysis (CFD – computer aided fluid simulation).

# Safety during any event



**High delivery rates, short throughput times: the new ABVL series breakaway coupling.**



**Fabricated, tested and installed by Schloemer: DN 100 hose line from a chemical hose along with a TR dry disconnect coupling, an ABVL breakaway coupling and an RS safety clamp.**

## High flow-through capacity and improved energy efficiency during the loading process

The result was a totally new design of breakaway couplings that feature the following attributes:

- Significant increase of flow-through with the same nominal width
- Significant reduction of the pressure loss
- Fewer parts for safe handling and simple maintenance
- Low amounts of emissions through fast closing valves
- Flow-through possible in both directions
- Only slight tendency of the coupling toward cavitation

Furthermore, the ABVL is also available as a joined marine version or with cable triggering.



**Test run successful and passed to everyone's satisfaction: (f.l.t.r.) Michael Adam and Holger Brandt (both RS), Torsten Wupper (Sasol), Mario Bastian (RS) and Peter Badners (Schloemer).**

## Flow-through rates

Description	$\zeta$	KV [m <sup>3</sup> /h]
ABVL 2"	0.93 (50 mm)	104
ABVL 3"	1.08 (80 mm)	246
ABVL 4"	1.38 (100 mm)	341

## Proven safety

At the same time, the new breakaway coupling provides full functionality for its actual task: namely to minimise the effects of an industrial accident and to protect people and the environment from an unwanted leak of mediums. If, for example, the tanker starts moving during the loading process, unforeseeable forces act on the coupling. Safe triggering is enabled at a breakaway angle of 90°. In other words, before the hose coupling breaks off or the hose itself rips apart – which for one can lead to serious damage to the tank, the flanged systems like the pump, or hose-line components, and for another could lead to the unobstructed escape of the critical medium – the breakaway coupling ensures a "controlled" separation at the predetermined breaking point. The only things that can break are the three breaking pins, the strength of which is designed for the hose line in use and which can be easily replaced. After the separation, the valves close and prevent the medium from escaping from the hose and tube side.



**The challenge to RS: make a safe company even safer – and more cost effective at the same time.**

# On the safe side

## Fluid handling without fluid leakage

The TR series dry disconnect coupling in the nominal width DN 100 from RS serves the same purpose during regular hose-line coupling and decoupling. It comprises two coupling halves each with one cut-off valve. The coupling halves are permanently connected through a control cam. In this state, the extant valves are open in both valve halves, enabling the flow-through. During decoupling, the cut-off valves close in the coupling halves, preventing the hose and tanker from draining, so leaks cannot occur.



## Fluid handling with the "good feeling of safety".

## 500 tons of customer benefits

In a mutual project discussion between Peter Badners of Schloemer and the RS team – engineer Holger Brandt along with engineer Michael Adam from RS project management and Mario Bastian from RS field sales – engineer Torsten Wupper precisely specified the specific requirements. The result was a hose line fabricated by Schloemer made of a homogenous fully vulcanised elastomeric-chemical hose compliant with DIN 2823/EN 12115 in the nominal width 100, which is, naturally, conductive since the entire unloading station is an Ex protection zone. And combined with that, the ABVL breakaway coupling and the TR dry disconnect coupling from RS, likewise nominal width 100. The hose engineering service provider Schloemer makes sure this functionality continues unchanged. In an annual cycle, Schloemer checks the conductivity in accordance with BGR 132 and the leak-tightness in accordance with the Pressure Equipment Directive and maintains the valves, i.e. replaces the elastomeric seals, for instance, for safety

reasons long before natural wear would have been expected. And they mark the hose and manage its test data in the Schloemer computer system.

Torsten Wupper is just as satisfied with this result as the employees at the unloading station. "Instead of restricting the flow-through, we can now work at full capacity. "Reaching new frontiers!" – that is also what the Sasol company slogan demands.

**An individual and customised solution developed together: (left to right) Peter Badners (Schloemer), Torsten Wupper (Sasol), Holger Brandt, Michael Adam and Mario Bastian (all RS).**



# Safety in the system

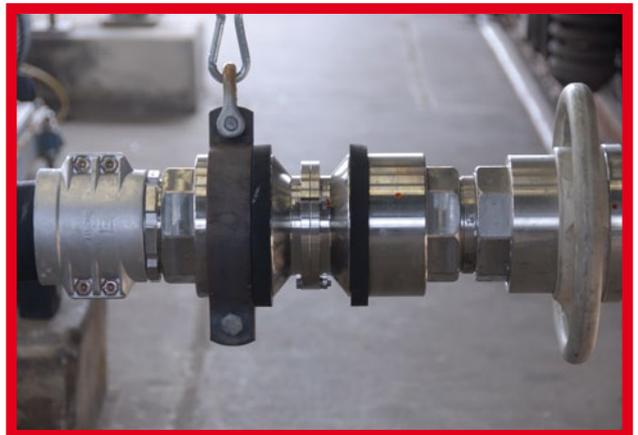
## Coupling in seconds

The hose line for unloading  
→ **with a TR series dry disconnect coupling** from RS (nominal width DN 100) can be coupled safely in seconds to its counterpart on the tank wagon. The TR ensures safe coupling and separation of hose lines – practically leak-free! Coupling, opening plus closing and uncoupling in one single step – just as quick as filling up during a box stop in a Formula-1 race.



## Protected for the worst possible case

The → **ABVL series breakaway coupling** prevents industrial accidents. It protects the hose and the connection to the tanker from excessively high stress. If, for example, the tank wagon starts moving due to being bumped by a train or wagon whilst unloading, both halves of the breakaway coupling separate through the breakage of the predetermined breaking point on the three bolts. After the separation, the valves close and prevent the medium from escaping from the hose and tank wagon side.



## Well integrated

The → **safety clamps in accordance with DIN EN 14420-2/-3/-5 (DIN 2817)** securely integrate the chemical hose and provide the connection to the breakaway coupling. The valves can be reused after cleaning.



## Weightless unloading

The Balancer, especially calculated and designed for this application, holds the hose-line load and prevents the valve and hose from falling to the ground or getting pulled over the ground. That reduces the physical stress for the employees and additionally protects the hose line from wear due to mechanical stress.



# Why we rely on RS



**Industrial engineer Torsten Wupper,  
Production Engineer Sasol:**

"The outstanding flow-through capacity in the new ABVL 100 turned the bottleneck of unloading into an optimised process step. The reduced throughput time increases the loading frequency by a factor of three and reduces the idle time at the track."

**Dirk Buschmeier,  
Sasol supervisor:**

"It is a good feeling to couple the hose line while being perfectly confident: nothing can go wrong. And, thanks to the simple coupling mechanics of the TR and the Balancers solution, the hose line can be easily handled despite weighing 40 kg."



**Peter Badners, Schloemer GmbH,  
Head of the SAT Dept.:**

"Using perfect technology that operates at a high level of quality, we want to deliver sustained safety to our customers. That is why in the valve technology sector we only collaborate with premium partners like RS Seliger with whom we can also develop individual customer solutions."

## What RS does for safety



**Engineer Holger Brandt,  
RS Product Line Management:**

"The ABVL was the right product at the right time. It not only meets the strict TÜV requirements placed on safety, but also the high demands made by the company Sasol placed on cost effectiveness, health and environmental protection."

**Engineer Michael Adam,  
RS Product Line Management:**

"Our objective is to provide the customer with practical solutions. That means high-tech products that are not merely safe but also cost-effective and, in addition, that further improve processing."



**Engineer Mario Bastian,  
RS Sales, Region East, West:**

"In the interest of the user, we bundle our strengths with those of our partners in technical retail business in order to implement our objectives: optimised fluid handling in connection with optimised service for the customer."



**RS**

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**Sasol Germany GmbH,  
Herne site**

## Facts, data and figures

The Herne factory has belonged to the Sasol Group since 2001. It is a globally operating oil, gas and chemical company with headquarters in Johannesburg, South Africa. About 150 employees work at the Herne location, which mainly manufactures the solvents isopropanol and ethanol but also diethyl ether and hydroperoxides.

Dr. Gregor Lohrengel is the Managing Director.

The Sasol factory is situated on premises where industrial use started over 150 years ago. At first by the Shamrock mine of the local Hibernia mining company, later also by coke plants. The beginnings of the today's chemistry operations developed after the Second World War. In the mid 60's, coal extraction was eventually stopped.

[www.sasol.com](http://www.sasol.com)