

Bominflot Bunkergesellschaft für Mineralöle mbH & Co. KG, storage tanks in Kiel

The first stop for ships on their way from the Baltic Sea to the North Sea: Bominflot storage tanks at the Kiel-Holtenau lock



Bominflot ship loading

The Kiel Canal, which runs from the Elbe estuary at Brunsbüttel to Kiel-Holtenau on the Kiel Fjord, is the most heavily used artificial waterway in the world. The canal cuts through Schleswig-Holstein and connects the North Sea to the Baltic Sea. In doing so, the canal eliminates the approximate 900 km route through the Skagerrak and Kattegat and around the Jutland Peninsula. 100 instead of 1000 km – that just doesn't save fuel, but especially time. And since every operating hour is quite expensive, it is clear that even the bunker stations along this waterway require time-saving loading technology – in other words a rapid flow-through for hoses and auxiliary equipment. However, also for the security of loading accidents: in light of the very sensitive ecological systems prevalent in the Baltic Sea and the Wadden Sea, an oil spill, for example, would have a catastrophic effect. For this reason, at Bominflot in Kiel they have been depending on the breakaway coupling technology from RS for decades.



Secure connection of land tanks and ship tanks: RS breakaway couplings provide the reassuring feeling that nothing can go wrong.

Bominflot's tank storage is located – as seen from the Kiel Fjord – at the east exit of the canal, immediately behind the Kiel-Holtenau lock. For all ships on their way from the Baltic Sea to the North Sea, it really is the first address for the storage of mineral products as well as the provisions of drinking water or the environmentally safe disposal of liquid gas waste. The storage tanks – with ten employees – are staffed 24 hours a day and seven days a week.

Safe loading, even during stormy seas

The storage or unloading of liquids via land-sea hose connections always creates a special type of strain on the hoses and the auxiliary equipment. On the land side, for each coupling the heavy hoses (up to DN 300)

are essentially pulled along the rough ground. Aside from this mechanical strain, the torsion and bending forces have an effect on the hose. On top of that, the hoses and the auxiliary equipment are permanently exposed to the elements – in other words to UV radiation and other natural elements, whereby at the coast the additional chemical strain posed by the salt-laden air comes into play.

On the ocean side, there are additional mechanical strains. Each ship is different, which means that the connection terminals on board the ship are at different distances from the loading stations, the hulls of the ships have differing heights, and that leads to bending and abrasion strains of the railing and

a pulling strain between the connection terminals on land and on the ship. Beyond this, the current, wind, and swell have an effect on the ship that – despite being tied to the pier with mooring lines – is always moving. These hoses have been designed to withstand these forces. However, if the drifting is too severe and if, for example, the mooring lines tear or loosen because they haven't been correctly secured on board, then the situation becomes critical. No hose can hold a ship that is drifting away. That means that in those types of cases, the hose would rip and then, for example, heavy crude oil would spill into the ocean or the canal until the accident has

been noticed and further leakage stopped through manual action.



Connection of water hose (without breakaway coupling), waste hose (via an ABV DN 80) and gas oil hose (via an ABV-S DN 150).

A key Bominflot customer: the chemical tanker "Eduard Essberger", which sails under a Portuguese flag.



Petroleum loading at the pier

RS protects against environmental damages

For this reason, these types of loadings require a breakaway coupling that – in case of emergency – can simultaneously perform two functions: a technical mechanism, which reacts at a safe distance from the maximum load, separates the line between the mobile unit and the loading system at a predetermined point. At the same time, an automatic fastening system functions for both separating points in order to prevent the leakage of the medium.

Bominflot has first-hand experience and knows just how important these types of safety systems are. "Years ago we had a situation where a ship that had docked was ripped from the pier by the so-called bow wave from a quickly passing large vessel," recalls Jens Weselmann, managing director of Bominflot. "Thank goodness we had a breakaway coupling from RS. It performed exactly as it should: it separated and both coupling halves locked."



winch before the hose line can even be strained through tensile forces. Today, as a general rule, these dimensions are used for the loading of ships, for example for the storage of gas oil (=ship diesel as fuel). Per ship a volume of between 10 m³ and 300 m³ is loaded.

Hose connections on board "Eduard Essberger".



ABV-S in DN 300 with three of its "fathers": (left to right) Michael Adam, Frank Witzmann and Jens Weselmann.

For larger ships, a volume of about 300,000 litres flows through the hose lines, the hose diameter and, in turn, the hourly flow through volume is a decisive factor for the feed duration. If Bominflot stores heavy crude oil or gas oil in the tanks, it expands into a completely different volume dimension by a factor of ten. Then between 300 t and 1000 t are discharged from the tankers. The ongoing operational expenses during the loading period per operating hour and ship amount to an at least four digit euro amount. For this, even a DN 200 hose line is too small. Otherwise, there are limits to growth during the loading at the pier. Even what is technically possible is almost impossible to overcome.

Shortens the discharge time for tankers by 30 to 40%: the new breakaway coupling ABV-S DN 300.

Another thing to overcome is a 300 hose line. Just recently, this size was not even offered in the RS product

Breakaway couplings from RS from DN 80 to DN 300

Bominflot puts value in RS loading security. At the four loading stations along the 400 metre long pier, the mountings for the various mediums in the tanks have different hose and auxiliary equipment sizes ranging from DN 80 to DN 300. The smallest breakaway coupling was created during the company's initial years: an ABV breakaway coupling in the nominal width DN 80 with a release function via three bolts. Conversely, hoses with larger diameters are equipped with the ABV-S breakaway coupling in the nominal widths DN 150 and DN 200. If a ship drifts away beyond a predefined radius, the ABV-S is released via a preset cable



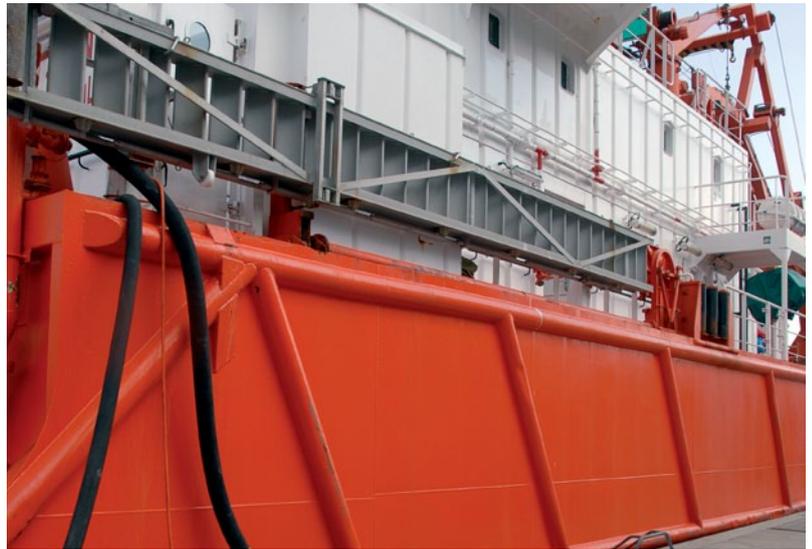
Safety and efficiency

range, however based on the good experiences that Bominflot has had with RS breakaway couplings in the past, they wanted to stay with the same manufacturer. So the question was posed to RS Seliger: "Can you deliver DN 300?"

Large ABV-S with high flow through

RS product line managers and engineers Holger Brandt and Frank Witzmann, who work for the RS sales staff in the northern region, sat down with Bominflot managing director Jens Weselmann and discussed the requirements. Thereafter, the RS development department began work and constructed an ABV-S the nominal width of DN 300. This required more work than simply proportionally enlarging the previous construction designs. It was important to precisely calculate the collapse loads and to demonstrate the reliable release during practice tests at the testing facility in order to receive Technical Control Board (TÜV) certification for the new ABV-S.

When the new breakaway coupling had been installed and the first test runs had been completed in practice, the Bominflot employees were ecstatic. If a tanker used to remain at the pier in order to discharge their load for a period of approximately twelve hours, the breakaway couplings have reduced this time to about eight hours. Jens Weselmann: "Between 30 and 40% time savings is an amount through which the investment costs amortise within a reasonable period of time."



Safe land-sea connection:
loading heavy crude oil via a breakaway coupling ABV-S DN 200.

Developed an individual and tailor-made solution together: (left to right) engineer Michael Adam (RS Product Line Management), Jens Weselmann (Bominflot) and engineer Frank Witzmann (RS sales).



Safety in the system

ABV-S series – secure for all situations

In case of emergency, the → **breakaway coupling of the ABV-S series** are activated with a cable winch release. Steering away, the ABV-S releases – without mechanical stress being placed on the hose line – the secure disconnection and prevents the release of environmentally damages mediums. It is appropriate for an operational pressure up to PN 25 and a temperature range from -20° to 70°C.



ABV – secure for all situations

The → **ABV series breakaway coupling**, here a DN 80, prevents operational emergencies. It protects the hose or the connected system from an overburdening. For non-axial burdens, e.g. if the ship begins drifting off, both halves of the breakaway coupling separate via the traction force transmitted through the hose from the breaking of the predetermined breaking point at the three bolts. After separation, the valves close and prevent the leakage of the medium on the hose and pipe side.



Well connected

The → **jacket threaded joint in accordance with DIN EN 14420 (DIN 2817)** ties the hose in securely.



Why we count on RS



Jens Weselmann,
Managing Director of Bominfлот storage facility in Kiel:
"Only eight instead of twelve hours holding time thanks to the ABV-S DN 300 – with this shortening of the storage process our customers as well as our company can save between 30 and 40% of their operating costs."



Jan Skallschus,
Bominfлот supervisor:
"During the loading process nothing can really happen, and if something does happen, then the breakaway coupling prevents anything dangerous from happening. With this feeling the work is easier to complete."

What RS does for safety



Engineer Holger Brandt,
RS Product Line Management:
"With the ABV-S in DN 300 we have not just entered, technically speaking, a new dimension in the production process, but also in a commercial sense within the customer's loading process."

Engineer Michael Adam,
RS Product Line Management:
"RS is more than just a technical solution from a catalogue. We make the customer's problems our own until we are able to find a solution."



Engineer Frank Witzmann,
RS Sales Staff, North Region
"RS and Bominfлот's long common history of safety shows how important sustainable quality is, not only in the safety of man and the environment, but also in the investment yield."



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Bominfлот,
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Numbers – Data – Facts

Bominfлот Kiel Tanklager GmbH belongs to the Bominfлот Group headquartered in Hamburg. Bominfлот, with over 35 years of market experience, is one of the largest globally operating independent storage tank traders and suppliers. The service portfolio includes the supply of marine fuel and oils as well as cargo trading through to numerous services for the international shipping industry, for example the agency services or also the waste removal, especially regarding oil bearing bilge water and oil polluted operating fluids. At the German locations in Hamburg, Bremerhaven and Kiel, Bominfлот also offers services in the area of storing of specific liquid products. As a co-signer of the international MARPOL Convention for the Protection of the Oceans, Bominfлот professes to adhere to the highest safety standards of work and environmental protection.

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