

## Infracor Lager- und Speditions-GmbH, Marl

**Ex-protection zone, hazardous chemicals:  
The highest safety requirements apply here.  
And the highest safety standards also.**



# Infracor Lager- und Speditions-GmbH

Logistics services providers in the chemical industry park are constantly faced with the same challenges: They are supposed to work quickly and the processes must be safe for people and the environment but must function reliably at the same time. At one particular point in the logistics process, speed, safety and reliability are in high demand: when refilling and reloading between mobile and stationary tanks. The coupling area interface is especially safety relevant and sensitive.

Central Europe has achieved quality and safety standards that meet most requirements. But there is still great potential to further optimise processes. That is demonstrated by the loading equipment at Infracor GmbH in the Marl Chemical Park. There, the new Unisex dry coupling, the TKU from RS which has made the filling process faster, even safer and more efficient, stands in the centre of attention.



**Infracor logistics center in the Marl Chemical Park: The latest technology, from low-oxygen storage up to dry coupling with ball valves.**



## Chemical logistics from a single source

Since 2002, the Infracor Lager- und Speditions-GmbH subsidiary with about 200 employees (at the Marl and Witten sites) has been taking care of the entire movement of goods in and for the chemical park. The logistics specialists have to professionally load or store everything at the right place at just the right time. To accomplish that, at the end of 2004 a new logistics centre arose on the west edge of the chemical park that is perfectly equipped to meet all requirements. The building provides the state-of-the-art on 30,000 m<sup>2</sup>: automatic high-

The Marl Chemical Park, covering an area of 6.5 km<sup>2</sup>, is one of the largest industrial chemical parks in Germany. Roughly 30 companies produce more than 4,000 products here. Infracor GmbH, which belongs to the Evonik Group, has been operating the Marl Chemical Park since 1998 and is a service provider for the companies located there along with providing for companies outside the chemical park.

# Safety in the system

bay storage along with a three-storey handling structure with incoming and outgoing goods, order picking, small-pack solids refilling, fluids filling, label printer, samples and a trial room. The high-bay storage system is designed for 23,000 palette positions and is operated for fire-prevention reasons with oxygen-reduced atmosphere. For flammable fluids, the logistics centre has a separate warehouse with about 900 additional palette positions.

## Fluid handling service

One part of this logistics centre is a modern filling plant. The plant is designed for filling diverse hazardous goods such as toxic, flammable, corrosive and water-hazardous fluids. The filled liquids find application in areas such as in the paint and resin industry, in the pharmaceutical industry, in the paper, textile and construction industry as well as in the cosmetics industry. They are needed, for example, to manufacture pre- and intermediate products for synthetics bonding, to manufacture super absorbers and finish coatings. The fluids to be filled are delivered to the south side of the logistics centre via tank container/ tanker. There are four unloading points there that can handle the tankers and tank containers with tank volumes of up to 36 m<sup>3</sup>. In turn, each unloading point has four discharge lines. Compressed air membrane pumps generate a vacuum, rapidly unloading the fluid truck-freight via the discharge lines to the filling plants. The pump movements in these compressed-air membrane pumps additionally strain the hoses and fittings with sudden impacts, so the hose and fittings

need to act simultaneously as compensators. These specific conditions demand high safety for one plant detail, namely the interface between the tanker/tank container and the discharge hoses. Absolutely safe connections were created here by using the TKU coupling.

## Standard solutions with compromises

The solutions used earlier satisfied the standard. But the coupling process was time intensive and interrupted the process. Because,



**In dialog onsite to find the ideal solution: (f.l.t.r.) Jörg Wittka, Michael Kluwe (both Infracor Lager und Speditions-GmbH), Peter Badners (Schloemer), Mario Bastian (RS).**



**(f.l.t.r.) Mario Bastian (RS), Michael Kluwe (Infracor) and Peter Badners (Schloemer).**

before the introduction of the TKU, the filling operation employees connected the various hose couplings with the truck tank by using special tools and a lot of effort. That was a tough and time-consuming job. This work was performed in the Ex-protection area, where the hose lines for products with the attributes "toxic", "flammable", "caustic", and "water hazardous" were coupled. When dealing with such substances, leaks were not just a trifle. So stainless steel troughs had to be used for each one to collect the leakages. These additional steps, getting the troughs ready, placing them underneath, removing them again and then cleaning them and disposing of the residual substances additionally hemmed the process and made it more expensive. On top of that were the risks of accidents for the employees and the added expense for personal protection equipment. The obvious solution, using a standard dry coupling with valve engineering against fluid losses would have helped little here. Valves reduce the flow and lead to pressure losses. Plus, they make exacerbate the cleaning process when flushing the lines. Also, fluids that crystallise at temperatures > 25 °C make cleaning more difficult in the standard dry couplings with valve engineering. So here and at most comparable loading points one stayed with a standard that was considered sufficient as long as no better technical solution was available.



**TKU with tanker connection and sampler. Christopher Ernst, Master, Fluid Filling.**

# Infracor Lager- und Speditions-GmbH

## Optimising far beyond the standard

That changed abruptly when Michael Kluwe and his team met during a company fair at their supplier Schloemer at an RS Roman Seliger stand, discovered the new Unisex Dry Coupling (German abbreviation: TKU) and immediately recognized the great potential of the new technology. As compared with a standard dry coupling based on valve technology, the TKU works based on a ball valve. That lets the TKU free up the entire line cross-section in the coupled state, preventing the above-explained restrictions (reduced flow or higher pressure losses, cleaning problems). And that with complete dry coupling functions – i.e. – safe and complete closing in the decoupled state and opening of the line cross-section solely in the coupled state. In detail, the symmetrical mechanism, i.e., a TKU consisting of two identical coupling parts, functions as explained below: In the decoupled state, each coupling half is closed via a ball-valve based lock. Thanks to the arrest, these coupling halves cannot be opened in this state. For coupling, the two halves are connected using a bearing lock, familiar from Storz engineering: The connection is secured by rotating both



**Von Schloemer und RS auf Stand gebracht: sichere Abfüllung mit der TKU, mit Schlauchdrehlagern und Schlauchaufrollern.**



**TKU mit Rohrverlängerung im Realeinsatz: vor dem Kuppeln.**



**Abfüllanlage im Innenbereich: Das RS-Schlauchdrehlager schützt vor Torsion, die RS-Schaleneinbindung sichert die Schlauchverbindung.**

coupling halves 90° relative to each other. The two ball valves can only be opened after this coupling process. That is done through one lever each. The balls then release the full flow cross section. In this opened state, an integrated lock function prevents the two halves from decoupling from one another. That means uncontrolled fluid escape can also be prevented during operation.

## Seal modification

The special situation at the Infracor loading station required services that extend past those that are normal. So grad. eng. Michael Adam from RS, together with Peter Badners from Schloemer tried various modifications during the trial phase that go beyond the standard. Normally, the TKUs are sealed with Viton® as a standard elastomer. At Infracor, Calrez® was used in order to ensure the leakproofness against the partially highly aggressive chemicals that were to be unloaded here, even long-term.

The customer needed extended connections to ease

# Sicherheit im System

docking in addition. The solution is a pipe extension of 300 mm, which is welded to the TKU. These measures provide the coupling process more play.

RS modified a coupling without rotating support especially for Infracor so that it is sufficient to rotate one side, meaning both hands are free. All the measures in the coupling area together have halved the technical setup time for the loading processes.

## Optimal loading process

At the moment, considerations are being made for further increasing the process safety by using ABV break-away couplings on especially hazardous transition points. But even without this step, the use of the RS TKU dry coupling significantly optimises the unloading process at the central interface between the truck tank and the discharge load. However, that also applies to the coupling periphery. Namely, to prevent mechanical damages on the hose lines, the company has additionally

installed hose reels for carbon dioxide, deionised water and compressed air. As a result, exposed hoses can no longer knot together. Also, the trucks at the unloading point can no longer drive over the hoses by mistake. RS hose swivel joints on the TKU – they are integrated here as an extra benefit – and on the hose reel, they protect from torsion. On modern cask racker machines, the discharge lines are also coupled with RS hose swivel joints to the filling point.

## Relaxed unloading

The decision in favour of the RS TKU dry coupling has already paid off. The employees in the unloading point for hazardous goods appreciate the contribution to optimising occupational safety and the fast and smooth operation, coupling and decoupling quasi in a flick of the wrist. The good feeling of a high degree of safety with a significantly faster unloading process permits concentrated and relaxed working.

### Unisex with full flow

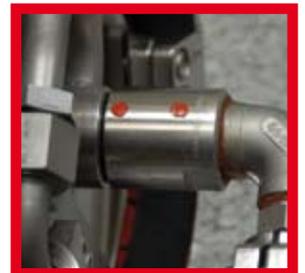
A professional hose coupling must generally ensure full flow. Moreover, it should prevent the escape of the fluid as far as possible during separation. These properties are unified in the **→ TKU dry coupling** from the company RS. As there are neither male nor female parts – both sides are identical – the TKU hose lines can be easily used in both flow directions. On top of that, the TKU makes using a swivel joint superfluous as its performance characteristic is directly integrated in the TKU.

The TKU is TA Luft conform.



### The turn against torsion

**→ Swivel joints** protect the hose from torsion strains that would otherwise shorten the service lives of the hoses. They can be combined with other RS fittings.



### Quality as the standard

Standard fittings are used for safely connecting hoses in the chemical industry during the rough day to day work. **→ Safety clamp screw couplings** from RS are suitable with correspondingly suitable materials up to 25 bar operating pressure.



# Why we rely on RS



**Michael Kluwe,**  
**Chief of Fluid Filling, Infracor Lager- und Speditions-GmbH:**  
"In the loading sector, the new TKU perfectly implements our high safety standard, and that without compromises in the process. Quite the opposite: We have a high flow volume, fewer process steps and a higher handling rate."

## What RS is doing for safety



**Grad. eng. Mario Bastian**  
**RS field representative:**  
"We rely on partners from the region. Who are fast enough to ideally serve our customers. Who keep enough stock. With whom we can develop solutions that really benefit all those involved."

**Jörg Wittka,**  
**Chief of Warehouse Engineering, Infracor Lager- und Speditions-GmbH:**  
"The advantageous geometry of the TKU improves the flow and protects certain chemicals from crystallizing. The high mechanical quality provides a safety buffer when the pumps surge."



**Peter Badners, Authorized signatory Schloemer GmbH:**  
"We do not supply everything that exists, but we give our best for that which we do deliver. While concentrating the suppliers, we have focused on RS for good reason. As a provider of hose and fitting technology, we need partners who have high capacity reserves."



**Berthold Tillmann,**  
**Employee, Infracor Lager- und Speditions-GmbH:**  
"For us, everything has become simpler. During practical use, the TKU convinces with its faster coupling and decoupling without tools. Practically no leaks mean clean work for us. And above all, safe work!"



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## Infracor Lager- und Speditions-GmbH, Marl site

### Facts – figures – data

Infracor Lager- und Speditions-GmbH in the Marl Chemical Park is an Infracor GmbH company. With the claim of "Safety and efficiency in complex chemical logistics", the 200 employees at the Marl and Witten sites provide both the industrial park companies and external companies customised logistics services from one single source. The managing directors are Dr. Thomas Grund and Dr. Weert Zell.