



# Rail Tankers

**DDCouplings®**  
Dry Disconnect Couplings



**Swivels**  
Swivel Joints



**SBCouplings®**  
Safety Break-away Couplings



# DDCouplings®

## Dry Disconnect Couplings

**Mann Tek Dry Disconnect Couplings are used for handling and transfer of liquids, gases and bulk powder in an economical, safe and environmental friendly way.**

Dry Disconnect Couplings are available in sizes from ¾" up to 6" and in a wide range of materials and seals to be the given choice for almost any application.

The self sealing design of the couplings guarantees both the highest level of safety and also the quickest way of connecting and disconnecting.

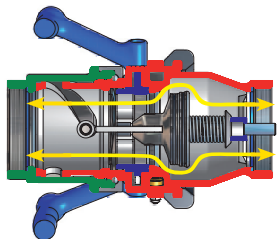


According to NATO STANAG 3756

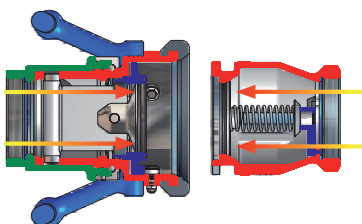
## How it works

### The coupling function

The principle of operation is similar for all types of Mann Tek Couplings



**To connect**  
Push and turn  
- it's coupled  
- full flow



**To disconnect**  
Turn and pull  
- it's released  
- no spillage

### Size:

The couplings are available with BSP- and NPT- threads in sizes ¾" (DN 20) to 6" (DN 150). Other threads are available on request (S60X6, Acme etc.).

The tank units and Hose units are also available in flanged connections (DIN, ANSI, TW, TTMA, EN 1092-1:2001).

### Materials:

Aluminium, Brass/Gunmetal, Stainless Steel, Hastelloy C and PEEK. Other materials on request.

### Seals:

FPM (Viton®), EPDM, Chemraz®, Kalrez®, NBR (Nitrile). Other materials on request.

### Maximum Working pressure:

MWP PN 10 / 16 / 25.

MAWP 150 / 300 psi

### Test Pressure:

15 / 24 / 38 bar

225 / 450 psi

### Selectivity - Avoid mixing products:

To avoid product contamination caused by connecting a Hose unit to the wrong Tank unit, selective versions of the Hose and Tank units are available. Each unit has a number of selective positions, designated by a coded part number according to the coupling size.

### Electrical conductivity

All DDCouplings® have electrical conductivity (<10 ohms).

### Interchangeability:

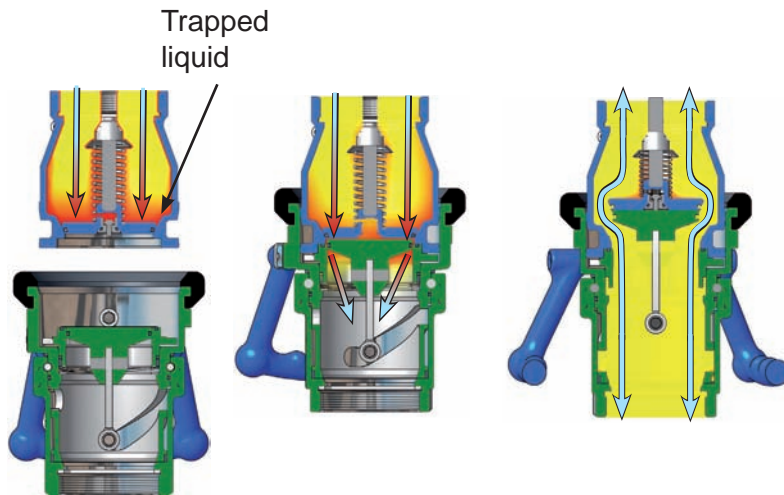
Compatibility with other existing brands according to NATO STANAG 3756 and ATOFINA SGM 2049.TUY.C.

### Special models:

With integrated break-away, pressure relief valve, etc. on request.

## Pressure relief valve in STANAG 3756 Tank unit

This system dissipates trapped fluid pressure into hose coupler without spillage, to allow easy connection.



Trapped liquid  
in Tank Unit

Open pressure  
relief valve  
Pressure expands  
into Hose Unit

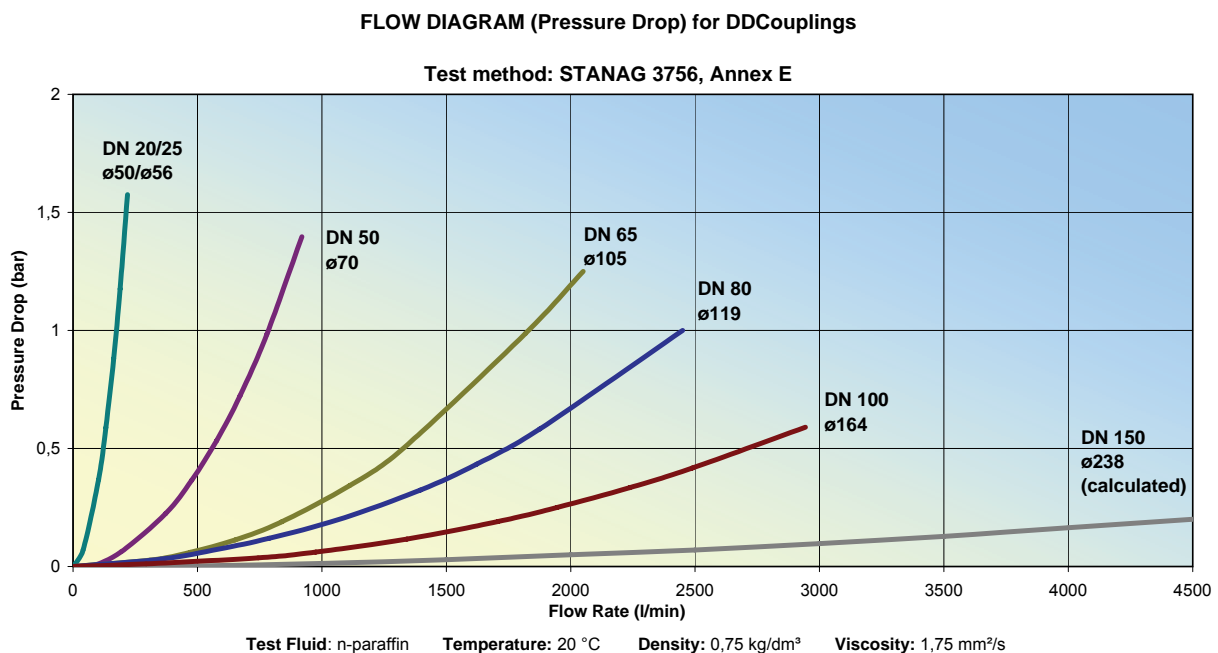
Open without  
pressure  
Full flow

## Advantages DDCouplings

- **Easy to handle**  
Push and turn - free flow.  
Turn and pull - closed.
- **Time saving**  
No need to drain hoses or pipe systems.
- **Economical**  
No loss or spillage of liquids at connection or disconnection.
- **Safe**  
The valve cannot be opened until the unit is coupled.
- **Environmentally friendly**  
Accidental spillage eliminated.
- **Reliability**  
No loss or spillage of liquids at connection or disconnection.

## FLOW DIAGRAM (Pressure Drop) for DDCouplings

Flow test have been done on all sizes of the DDCoupling sortiment. The results in the flow diagram below.







*Ammonia from storage tanks to Rail tankers.*



*Couplings in PEEK for extremely corrosive media*

## **DDCouplings®**

**Dry Disconnect Couplings**

### **Rail Tankers (RTC) and Dry Disconnect Couplings.**

2", 3" and 4" Dry Disconnect Couplings for transfer of liquids from manufacturing plants to RTC such as Ammonia, Acrylonitrile, Propylene Oxide, Ethylene Oxide, Benzene, Ethanol, Jet fuel e.t.c.

The RTC's are (off)loaded by loading arms or hoses equipped with Dry Disconnect Coupling Hose units. Size 1" for sampling, 2" for vapour recovery and 3" or 4" for liquid lines.

Most common material used is Stainless Steel with a wide variety of seals.



**ADR / RID / IMDG  
CE: PED / ATEX**

*Jet A-1 application using  
4" Dry Disconnect Coupling.*



Open threaded ACME couplings has been used for a long time on the rail tank resulting in high product losses, environmental effects and health risks.

**DGCouplings®**  
**Dry Gas Couplings**

## Implementing The Dry Gas Coupling system

DDCouplings can be installed on new RTC's as well as retrofitted to existing RTC's

Loading hoses equipped with Mann Tek DGC Hose unit permanently

Old Rail tanker equipped with Acme-type couplings

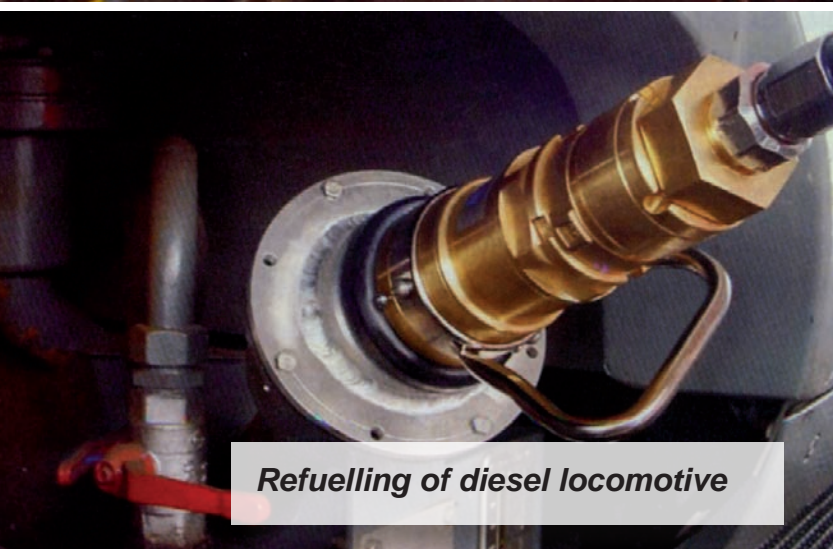
Dry Gas Tank units supplied with Acme-type threaded connections (adaptors) to be installed on the Rail-tanker.

Acme-type threaded connections (adaptors).





# Refuelling of locomotives with Dry Disconnect Couplings



**Refuelling of diesel locomotive**

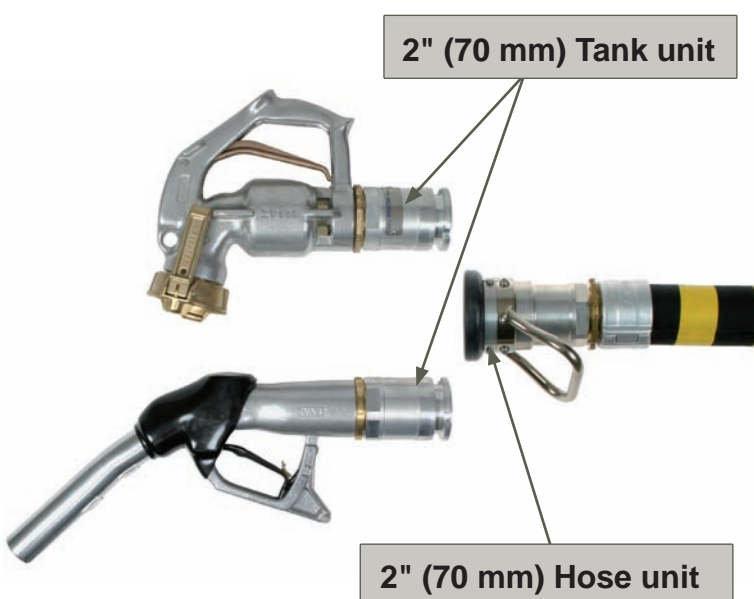
## Environment friendly refuelling of locomotives with Mann Tek DDCouplings

### Solution for refuelling

Using Mann Tek 2" (70 mm) DDC Dry Disconnect Couplings a change of non-automatic and automatic nozzles is possible on site, using only one hose reel.

### Advantages

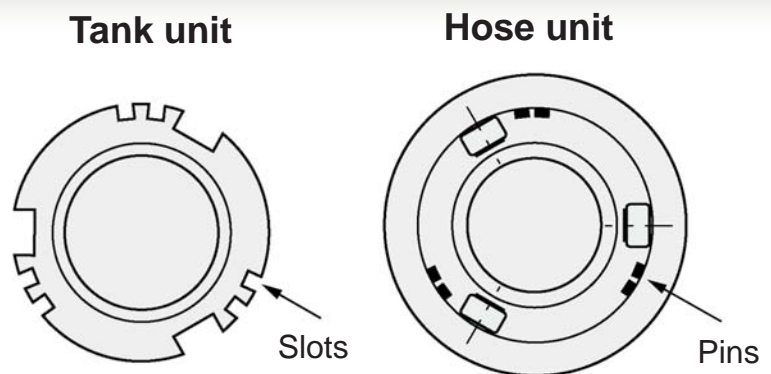
- Only one hose reel for different nozzles.
- **Tank unit and Hose unit close automatically** when separated. No liquid will flow out from the hose or nozzle
- Coupling is effected nya a simple rotation movement, up to max. 7 bar. The integrated swivel within the Hose unit will avoid torsion of the hose.
- Almost all parts are made of aluminium to reduce weight.



## Selectivity

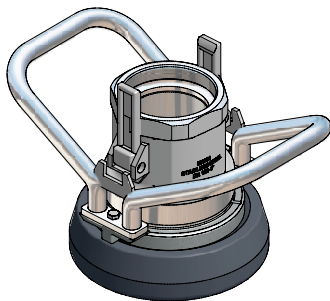
To prevent accidental mixing of media, selectivity versions of Hose and Tank units are available.

The Tank units are furnished with slots and Hose units with pins. Many different selectivity codes are possible depending on coupling size

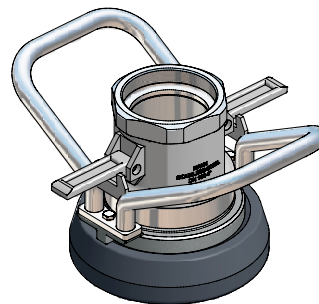


## Hose unit with lockable swivel

**Hose unit used for emergency unloading of Railtankers (RTC)**



Hose unit  
with Swivel  
and free  
hose move-  
ment



Locked  
Swivel

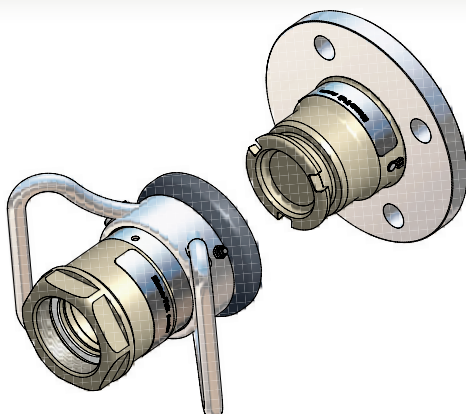
## None projecting piston spindle



**Tank units with no parts protruding from the coupling in connected position.**

For mounting directly on ballvalves, etc.

## DDCouplings® in PEEK

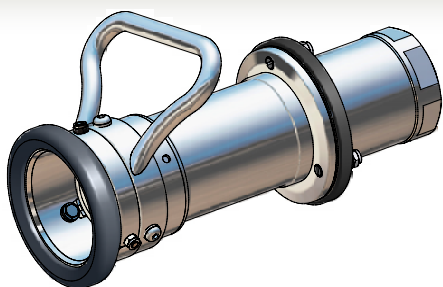


**Mann Tek DDCouplings®** in PEEK for extremely corrosive media, for example hydrochloric acid. Inner parts in Hastelloy.

2" DDCouplings in PEEK are used for Vapour line

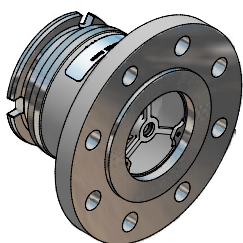
3" DDCouplings in PEEK are used for E.G loading/unloading of Rail Tankers

## DDCoupling Hose unit with Break Away integrated



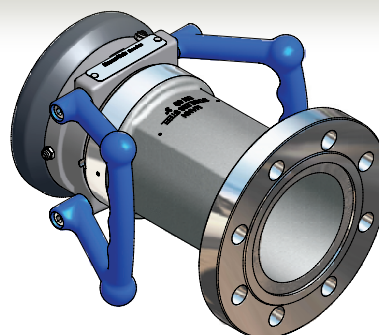
Where there is a risk of excessive force on the hose due to unexpected movement between the loading and unloading station, combining the Dry Disconnect Coupling with a Safety Break Away coupling.

## Tank unit / Hose unit, flange EN 1092-2001 Type E (Spigot) / Type F (Recess)



### Tank unit

Flange EN 1092-2001 Type E (Spigot)

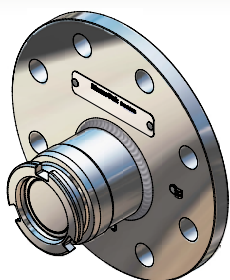


### Hose unit

Flange EN 1092-2001 Type F (Recess)

Spigot Type E and Recess Type F has a straight sealing surface which differs from standard flanges. It is a special version that some manufacturers of tankers (tank trucks) and railway-carriages (rail tankers) use as the default for certain applications.

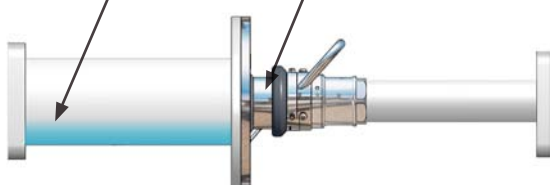
## Tank units / Adapters with excentrical flanges



### Traditional flange

Liquid left  
in the tube

Tank unit with  
traditional flange

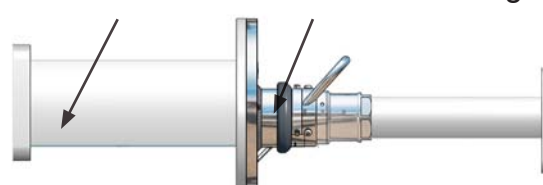


**Tank units / Adapters with excentrical flanges are available in sizes 1" to 6".**

### Excentrical flange

No liquid left  
in the tube

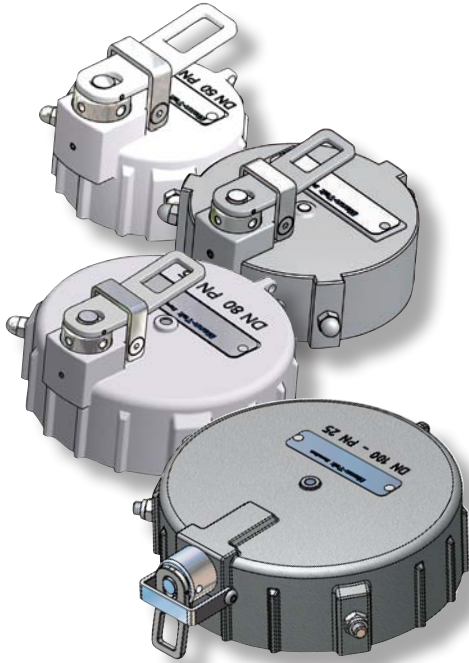
Tank unit with  
eccentric flange





## Pressure Cap for Tank unit / adapter - Working pressure PN 10 bar / PN 25 bar

Can be used as a second or third closing device according to ADR/ RID par 6.8.2.2.2



**Working pressure**  
PN 10 bar / PN 25 bar

The Mann Tek Pressure Cap for Tank units / Adapters is designed to maximize operator safety and containment safety.

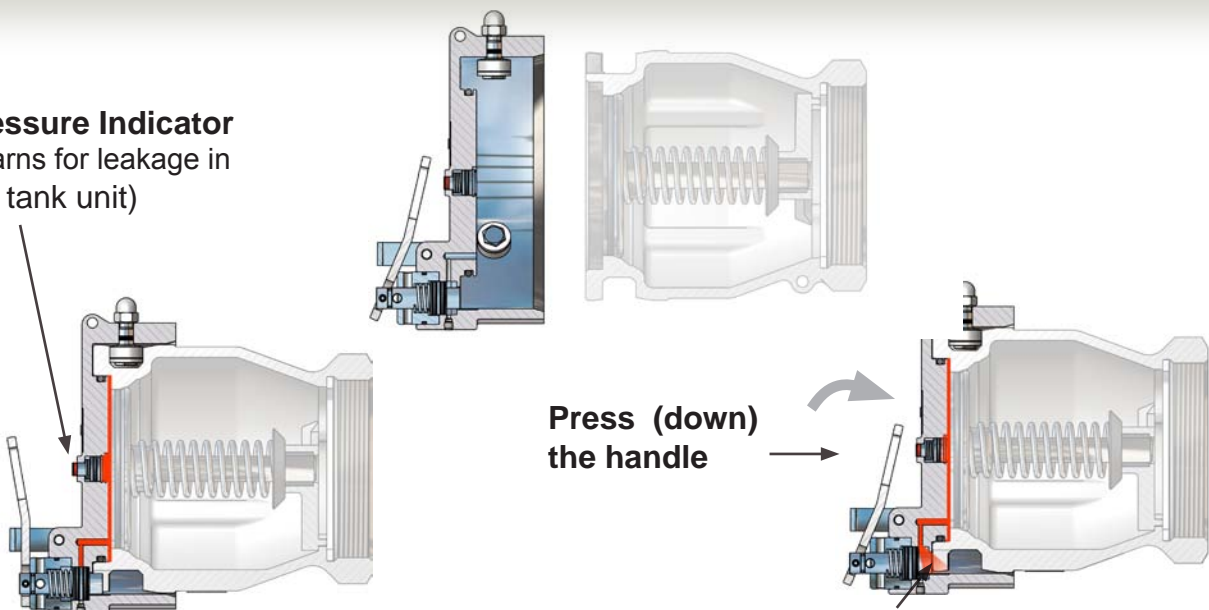
Should the possibility of an upstream closure leakage occur, the Pressure Cap provides identification of a system pressure and will hold this pressure until the problem can be safely resolved. Should the operator still choose to remove the cap it will reduce the static pressure to zero thus preventing the forceful expulsion of the transfer media.

### Features

- Pressure indicator
- Depressurization
- Customs / tamper seal feature
- Automatic locking
- Manually lockable (with padlock)

## Pressure Cap for Tank unit / adapter - How It Works

**Pressure Indicator**  
(Warns for leakage in the tank unit)



Possibly pressure evacuated through a valve and the cap can be opened

# Dust Cap

## Dust protection in rubber

A Dust Cap gives very good protection against corrosion, and withstands both hot and cold environments.

## Dust Cap for increased safety

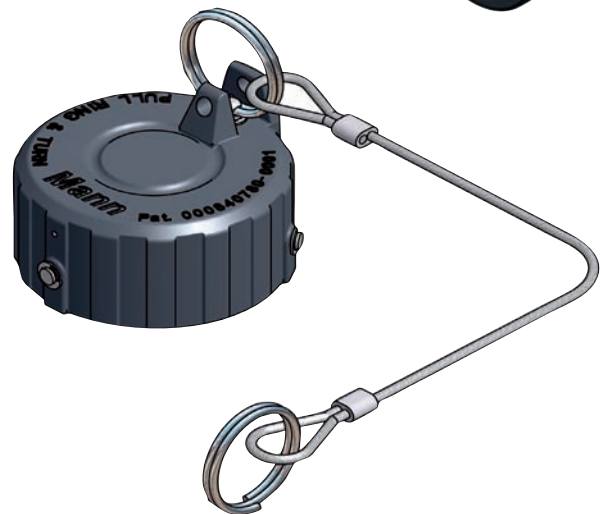
It's only possible to remove the cap from the Tank unit /Adapter after pulling the securing stift and at the same time twisting the cap. The Dust Cap is manually lockable with padlock.

## Standard Caps in Composite (Polyeten PE-HD 300).

It covers the widest range of chemical and petroleum products.

- ***Elastic v-ring seal in standard NBR that makes disassembly easier and seals of a larger surface than conventional O-rings***
- ***Lockable and sealed***
- ***Patented design***

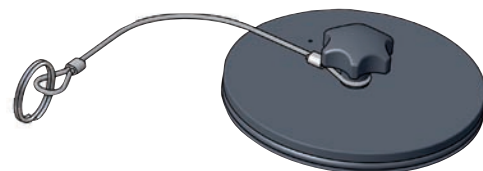
*Caps are also available in Stainless Steel and Aluminium. Other materials on request.*



# Dust Plug to prevent ingress of dirt and water

Use the Mann Tek Dust Plug to prevent ingress of dirt and water in the couplings.

The material in the Dust Plug is Composite, Aluminium and Stainless Steel.





# Swivels

## Swivel Joints

### Hose swivels

#### Sizes

¾" (DN20) to 4" (DN100)

#### Maximum Working pressure:

MWP PN 10 / 16 / 25.

MAWP 150 / 300 psi

#### Test Pressure:

15 / 24 / 38 bar

225 / 450 psi

#### Materials

Aluminium, Brass, Stainless steel,

Hastelloy, Titanium. Others on request.

#### Connections

Female and Male BSP / NPT, ACME, Witworth threads and flanged DIN and ANSI. Others on request.

#### NOTE

*Unsuitable for high bending moments.*

*Heavy Duty Swivels should be used in these applications.*



The use of swivel hose avoids torsion of hose assemblies, i.e. in filling machines, and improves the handling and coupling of nozzles for refuelling of petroleum based products and chemicals.

### Features

- ▶ **Simple design, low maintenance.** Each unit consists of two body halves. Stainless Steel balls and a single spring assisted O-ring seal.
- ▶ **Compact external dimensions**
- ▶ **High flow rate / low pressure drop**
- ▶ **Full range of sizes, materials, seals and connections**
- ▶ **Minimal maintenance requirements**
- ▶ **Safety Swivel function** - allows the hose to relax to its natural rest position whilst allowing freedom of movement without imparting torque stress at the point of connection - Torque stress is the largest single cause of Composite, PTFE and Stainless Steel convoluted hose failure.
- ▶ **Economical** Cost effective solution to prolong lifetime of hoses.

### Heavy Duty Swivels - double ball race

#### Sizes

1½" (DN40) to 10" (DN250)

#### Materials

Stainless Steel.

Other material on request.

#### Maximum Working pressure:

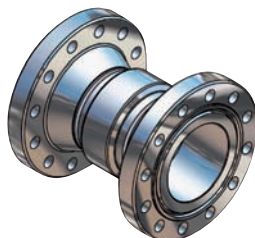
MWP PN 10 / 16 / 25 / 40

MAWP 150 / 300 / 600 psi

#### Connections

Female and Male BSP / NPT, ACME, Witworth threads and flanged DIN and ANSI.

Others on request.



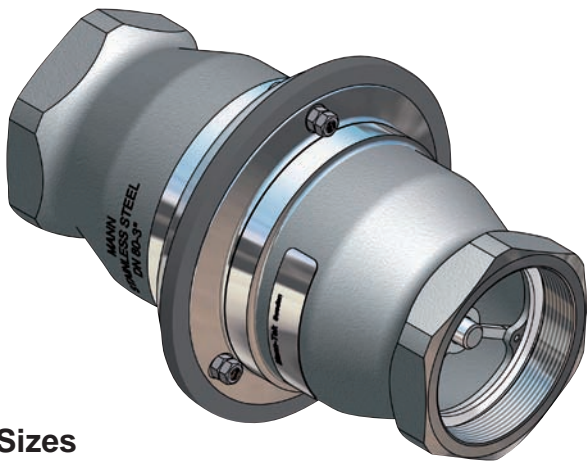
**Swivel Joints are used** in the industry wherever a movable pipe-connection system between two equipment parts is needed.

**The swivel joints are designed** for slow rotary motions under the influence of high internal pressures and/or big external stress such as traction and bending forces.

With an appropriate combination of swivel joints nearly all movements from the simple rotation or swivelling motion up to motional actions in space can be realized.

# **SBCouplings®**

## **Safety Break-away Couplings**



### **Sizes**

1" (DN25) to 10" (DN150)

### **Maximum Working pressure:**

MWP PN 10 / 16 / 25.

MAWP 150 / 300 psi

### **Test Pressure:**

15 / 24 / 38 bar

225 / 450 psi

### **Materials**

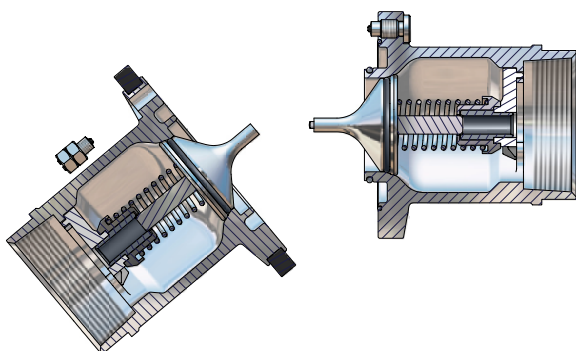
Aluminium, Brass, Stainless steel, Hastelloy, Titanium. Others on request.

### **Connections**

Female and Male BSP / NPT, flanges DIN and ANSI. Others on request.

### **Industrial Break-away**

Typically installed into loading arm and hose assemblies, where at least one side of the coupling is attached to a rig and fixed point.



*Release with a tensile force being applied at an angle to the plane of the coupling housing, up to 90 degrees.*

Safety Break-away couplings are used to prevent pull away accidents, the internal valves will close the flow in both lines and prevent unwanted release of product.

The Safety Break-away couplings are available as Industrial and Marine type.

Industrial Break-aways are used at fix points like manifolds, pipelines depots etc.

The Safety Break-away couplings are used in filling systems for airfields, rail tank cars, tank containers etc.

### **Industrial Break-away coupling is utilized in all industrial product transfer installations.**

The industrial SBCouplings are specifically designed to be able to activate with a tensile force being applied at an angle to the plane of the coupling housing, up to 90 degrees.

### **Features**

- Passive security against situations where a hose or loading arm could be subjected to inadvertent excessive loads.
- Design features are a simple mechanism and no loose components which could be lost after release.
- Operates independently of shut off safety system and does not require an external power source.
- Easy to reset on site with one person
- High flowrate / low pressure drop
- Very low loss, positive shut-off of both coupling halves results in minimum product loss.
- Lightweight and robust design.
- Available with ANSI/DIN flanges or threaded (BSP or NPT).



## **Cefic is the Brussels-based organization representing the European chemical industry.**

Since its creation in 1972, Cefic has grown to become one of the largest and most efficient advocacy network amongst the industry trade organizations in Europe and in the world.

- ▶ representing 29 000 companies that produce 30% of the world chemicals and employ about 1.3 million people.
- ▶ 22 national chemical federations and 6 associated federations across Europe.
- ▶ Over 170 multicultural staff.
- ▶ About 100 Sector Groups addressing issues relative to more than 120 product families.
- ▶ Over 50 Strategy Implementation Groups and Issue Teams dealing with the industry's strategic concerns such as REACH, energy, environment, international trade, research & innovation and many others.
- ▶ More than 4000 industry experts from companies and federations participate in the Cefic groups.
- ▶ Close cooperation with the US, Japan and other major chemical countries through ICCA and many federations and trade unions.

## CEFIC-Working group Ethylene Oxide:

Recommendation for the use of DDCouplings in EO-applications



### ETHYLENE OXIDE PRODUCERS ASSOCIATION

#### Environment friendly couplings for Ethylene Oxide Transportation Equipment

In its drive to improve the health and environment standards in the ethylene oxide distribution chain, the Ethylene Oxide & Derivatives Sector Group have agreed to recommend the use of dry disconnect couplings for EO distribution transport equipment. The Industry goal is to finalise the transition to dry disconnect couplings by 1<sup>st</sup> January 2007. The use of these couplings will virtually eliminate all releases of ethylene oxide during the connect / disconnect operations at the loading and unloading stations.

Dry disconnect couplings must comply with the NATO standard (STANAG 3756). In addition, they must be approved for Class 2 liquid / gas service. Rail tank cars, road tank vehicles and portable tanks used for ethylene oxide transportation need to be equipped with 3" couplings for liquid service and 2" couplings for gas service.



# CEFIC-Working group Acrylic Monomers:

Recommendation for the use of DDCouplings in acrylic monomers loading applications



September 2004

## EUROPEAN BASIC ACRYLIC MONOMER GROUP (EBAM)

### Dry Disconnect Couplings for Acrylic Materials Service

#### Industry Recommendation

In their drive to improve the health and environment standards in the acrylic materials distribution chain, member companies of the European Basic Acrylic Monomers Sector Group are recommending the use of dry disconnect couplings on the transport equipment for bulk shipments of acrylic acid, methyl acrylate, ethyl acrylate, butyl acrylates and 2-ethyl hexyl acrylate.

Caution needs to be exercised when connecting the fixed and mobile parts of couplings from different manufacturers. Compatibility information is available in the EBAM document entitled “*Use of dry disconnect couplings on transportation equipment for acrylic monomers service*”, which can be downloaded from the following address:

<http://www.petrochemistry.net/templates/shwArticle.asp?TID=5&SNID=22&AID=43>

Rail tank cars, road tank vehicles and portable tanks used for these acrylic monomers need to be equipped with either 2” or 3” couplings.

The connecting nozzle could be designed according to the November 1994 NATO standard. Couplings manufacturers must also show that they have introduced an ISO 9000 quality assurance system.

*The recommendation is given to the best of the EBAM member companies' knowledge, and is made without any guarantee as the conditions of use are beyond the industry's control. Neither Cefic nor any member of the Cefic EBAM sector group shall have any liability whatsoever for any decision based on this recommendation.*

## About Mann Tek

Mann Teknik AB is a Swedish company located in Mariestad, Sweden.

Mann Teknik AB designs, manufactures and markets products for safe and environmentally friendly handling of aggressive fluids for the chemical and petrochemical industries.

The main product is the Dry Disconnect Couplings, DDCouplings®, for spill free liquid handling. The products are marketed through independent representatives in more than 30 countries.



## Company Approvals

Mann Teknik AB are certified to ISO9001:2008. The products are CE-labeled. The main products are certified to PED, the European Pressure Equipment Directive and ATEX, the European directive for Equipment intended for use in Potentially Explosive Atmospheres.

The products are produced in accordance with several important standards, e.g. the NATO STANAG 3756



# KilltheSpill

## Product and company information



## Approvals



ISO 9001, PED 97/23/EC, TDT, TÜV, Apragaz, FMV, Gost, ATEX e.t.c

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Mann-Tek is a certified ISO9001-company.