

## Harmonisation of hoses with mechanical couplings

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### Working Together for Safety Recommendation 022E/2023



**SFS**  
Samarbeid for Sikkerhet

Prepared by the Working Together for Safety Working Group: <b>Feb 2023</b>	Version: <b>Version 02</b>	Working Together for Safety Project Manager: <i>Hugo Halvorsen</i> <hr/> Hugo Halvorsen
Applies from: <b>May 1, 2023</b>	Version history: <b>Ver. 00: Mai 2007</b> <b>Ver. 01: Apr 2018</b>	Approved by the Working Together for Safety Board, Chairman: <i>Håkon Bjerkeli</i> <hr/> Håkon Bjerkeli

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## **Introduction**

There are many different types of mechanical couplings currently available on the market, and this means that different companies have different practices regarding their use. Couplings are also used in connection with various substances, and the couplings used with each substance should therefore be unique in order to prevent incorrect connections.

It must be ensured that couplings and hoses are suited to the purpose and substance with which they shall be used, and that potential pressure and temperature fluctuations are taken into consideration. The couplings themselves should also be easy to handle and such that the risk of spillage and injuries in connection with any failure of the equipment remains as low as possible.

## **Purpose**

The purpose of the harmonisation of mechanical couplings and creation of a common standard for hoses is to increase safety by achieving harmonisation throughout the industry.

The work has been limited to the harmonisation of mechanical couplings for internal use (not import/export).

## **Target group**

The target group for this recommendation includes mechanics, operators, roustabouts, riggers and others who work with hoses and connections. The recommendation may also be useful for project engineers and procurers of hoses and connections.

## **Changes in this revision**

Some new text about different hose types (conductive and non-conductive) and associated connections have been included in this change. In addition, there are a few minor changes and clarifications.

## **General information about usage and harmonisation principles**

All mechanical couplings must have a functional locking system that is safe and easy to use. All mechanical couplings in use must be replaceable regardless of supplier. A safety wire should be used as an extra barrier. See Working Together for Safety Recommendation 039E/2022 Securing hoses.

In order to ensure that uncoupling can be performed safely and without shutting off the substance supply, couplings that prevent confined pressure from blowing out upon uncoupling must be used. The coupling must also be of a design that ensures good, sufficient flow of the substance through the coupling with minimal restriction.

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It is also important to select mechanical couplings of the correct material type. In addition to being suitable for the intended purpose, couplings must also be resistant to corrosion and oxidation, etc. The use of stainless steel type 316 is recommended.

Hoses can be divided into three types:

- insulating/non-conductive hoses
- partially conductive/electrostatically conductive/dissipative hoses
- conductive hoses (due to metallic contact between the couplings via reinforcement or integrated cable)

Insulating hoses with more than  $10^8$  ohms from coupling to coupling should not be used in areas with a risk of explosive gas mixtures. Here, antistatic (i.e. conductive or partially conductive) hoses should be used, so that the accumulation of static electricity due to fluid movement is prevented. Conductive hoses with insulating material can become insulating due to incorrect assembly, wear, cable breaks, corrosion mechanisms, etc., and electrical contact between the couplings for these should be documented by the supplier and then followed up with an inspection programme or a replacement program.

### ***Fastening***

Emphasis must be placed on ensuring the safe fastening of the mechanical coupling to the hose. In addition, all repairs made to hose couplings on the installations must be performed by competent personnel who have received training from the supplier. The use of crimping sleeves is recommended, and it should be ensured that the sleeve locks against the hose insert so that the sleeve cannot slide off with the hose.

### ***Storage***

In general, dust plugs and caps that effectively protect the mechanical couplings from knocks/damage and impurities should be used where necessary. This is especially important for systems that contain soft-sealing valves and sensitive instruments (e.g. lube oil / seal oil, nitrogen, hydraulics, etc.).

### ***Gaskets***

Regardless of the selected coupling type, good routines must be established for checking the relevant gaskets in mechanical couplings that contain them. This is to ensure that used gaskets do not pose a safety risk due to any deterioration in quality.

### ***Securing of hoses with connections***

See Working Together for Safety Recommendation 039E/2017: Securing of hoses.

### ***Pressure testing***

See Working Together for Safety Recommendation 028E/2016: Pressure and leak testing.

### ***Quality assurance***

The mixing of substances may have consequences for safety. A clear description of the substances each hose type may be used with must therefore be prepared to prevent the mixing of substances.

Set routines and criteria for the checking and replacing of hoses must be prepared and implemented. Inspections and condition assessments of hoses with couplings shall be performed by competent personnel.

A local register of unique numbers for hoses with couplings must be established at the individual company/installation. An overview of what couplings shall be used for what purpose must also be created.

## Connections for use with various substances

<b>Substance type</b>	<b>Connection type</b>	<b>Standard reference</b>
Air coupling	Unoflow series 27 S Safety, CEJN Series 410 eSafe, or equivalent compatible couplings	ISO 4414
Breathing air coupling before filter package	Rectus series 25 KD, Unoflow series 025 D SAFETY or equivalent compatible couplings	EN 14593-1 EN 14593-2 EN 14594
Breathing air coupling after filter package	Cejn series 341, Rectus series 96 KS, or equivalent compatible couplings	EN 14593-1 EN 14593-2 EN 14594
Coupling to fresh water	Camlock ¾" coupling, or equivalent compatible couplings	ISO/TR 17784 and EN 14420-7
Coupling to sea water	Camlock 1" coupling, or equivalent compatible couplings	ISO/TR 17784 and EN 14420-7
Chemicals	Todo-Matic/Fort Vale non-drip quick couplings or equivalent compatible couplings	ISO/TR 17784
Methanol and glycol	Cam-lock or equivalent compatible couplings	ISO/TR 17784 and EN 14420-7
Oils, lubrication oil, hydraulic oil	JIC coupling (7/16"-1 5/16"), Hammer lug (1 ½"-2") couplings or equivalent compatible couplings	ISO 1436 ISO 3862
N <sub>2</sub> low pressure	Snap-tite H-series coupling with shut-off valve on the female part or equivalent compatible couplings	IL-C-51234
N <sub>2</sub> high pressure	Snap-tite 72 series, Hansen HK series coupling, with valve and safety mechanism or equivalent compatible couplings	ISO 7241 series B
Helifuel	Clamp type coupling or equivalent compatible couplings, or Todo-Matic/Fort Vale non-drip quick couplings or equivalent compatible couplings	EI 1529
Steam	Dixon Boss or Campbell Ground Joint coupling, or compatible type	ISO 6134

## **Hose colour coding**

The overview below shows the usual hose colour codes currently used on the Norwegian Continental Shelf:

Air:	Yellow
Fresh water:	Blue
Sea water:	Green
N <sub>2</sub> high pressure:	Orange
N <sub>2</sub> low pressure:	Grey-white
Hydrocarbons:	Metallic (braided steel) or black hose (possibly with red stripe)
Diesel oil:	Brown
Steam hose:	Black
Helifuel:	Black
Methanol/glycol:	Green with white marker strip along the hose
Breathing air hose:	Black with green stripe along the hose, or solid green hose