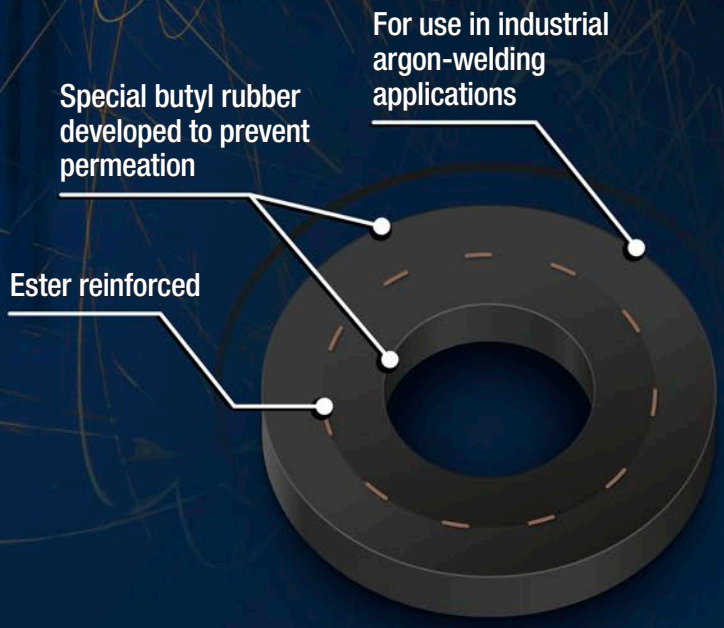
CODAN

# DryFlow®

## The high quality Argon hose from Codan reduces moisture contamination by 80%

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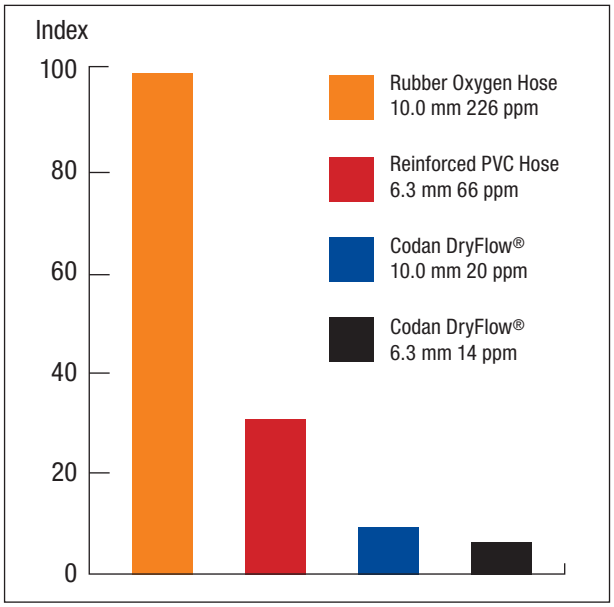
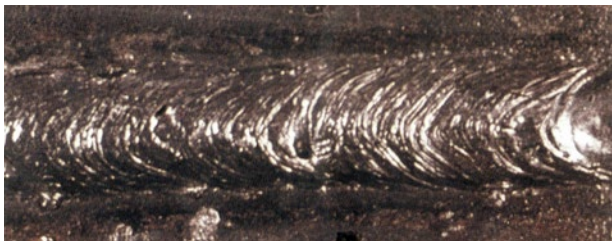
# Quality is established in production

A carefully controlled and managed production is the prerequisit of Codan's high quality standards and the basis for Codan's tradition for developing products with user specific characteristics. DryFlow® is an example of such objective product development.



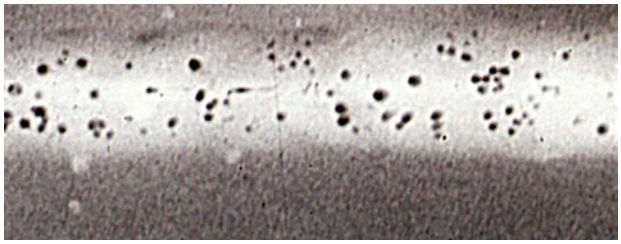

*Comparison of Moisture Diffusion*
*Argon hoses currently available in the market today are typically measuring over 55 ppm.*

In 1991 Codan was among the first Danish companies to be accredited with ISO 9001 certification for its quality systems. The accreditation acknowledges Codan's high quality standard and clearly defined quality policy.



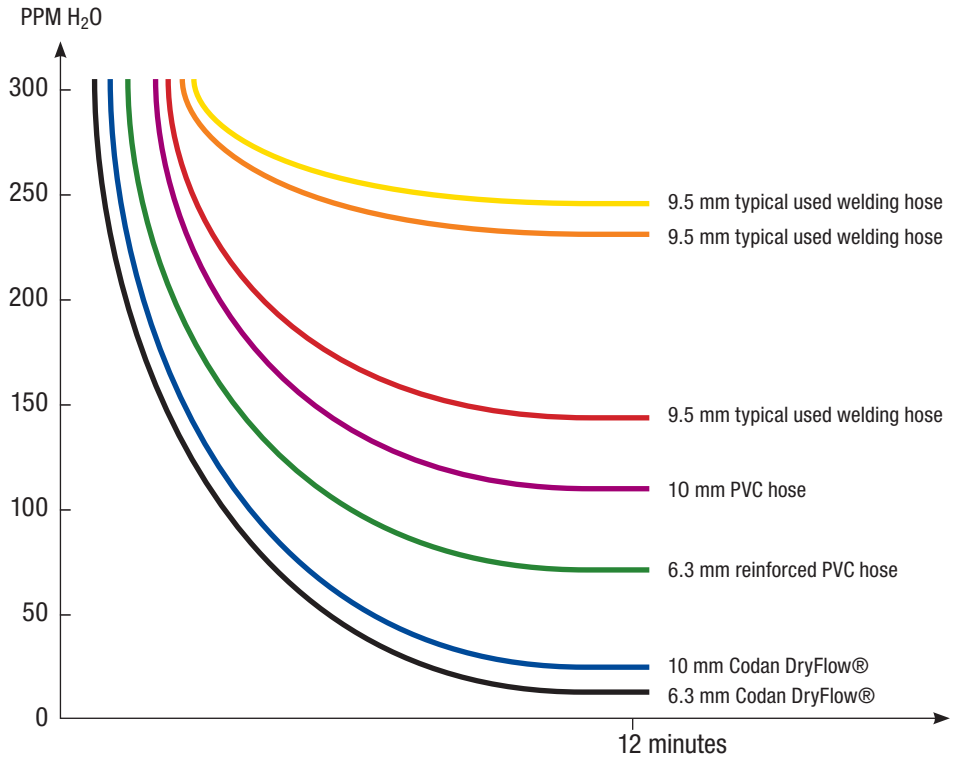
*Welding seam*

When the protection gas leaves the bottle or tank, it contains less than 10 ppm moisture. Measurements during welding at dockyards have shown a moisture content of 200-300 ppm at the point of welding, such an increase in moisture can considerably, affect the quality of the weld.



*X-ray of welding seam show effect of moisture contamination*

Even during extended intervals between welding and long distances from the gas supply to the work place, the Codan DryFlow® hose ensures clean, dry Argon right through to the arc. The construction of DryFlow ensures a strong, flexible and damp proof rubber hose. The lining and cover are constructed from specially developed rubber compounds that are weather, ozone and moisture resistant, as well as being resistant to welding flashes and mechanical abrasion.




Comparison of typical used welding hose with Codan DryFlow® based on:

**Interval:**
30 minutes

**Volume:**
4 L/min

**Coil length:**
10 meter

**Pressure:**
3 bar

**Hose dimension:**
3/8" / 9.5 mm ID

Source:
Hydro R&D Center Porsgrrunn

# Aluminium Welding

The forming of pores in welding seams is a continuous problem when welding aluminium. Moisture in the Argon gas is the main contributory factor in creating porous seams. Aluminium welding with x-ray requirements assumes in practice a totally dry Argon gas.

The length and construction of the hose has a decisive influence on whether the gas remains dry at the point of welding.

# Steel Welding

During steel welding the moisture content is not so critical compared with aluminium welding. High levels of moisture does however lead to increased hydrogen contents which causes welding faults such as porous seams, inconsistant arc and spray. There are therefore good reasons to restrict the moisture at the point of welding.

When welding high strength steel or constructions with large suspension loads, where the hydrogen levels have to remain below 3 ml per 100 gm, it is essential to restrict the moisture content of the Argon gas.

## Codan 2823 Welding & Gas Hose


**Codan 2823 - EN 559: 2003**

Black, flexible welding hose for argon.
For use in industrial argon-welding applications.
Special butyl rubber developed to prevent moisture from permeating the hose and mixing with the medium.
A very strong, non-porous weld is thus achieved.

**Type nr.** 2823
**Application:** Argon
**Standard Length:** 50 metres
**Working Temperature:** -25°C to 100°C
**Inside:** CIIR
**Colour:** Black
**Reinforcement:** Ester
**Outside:** CIIR
**Colour:** Black
**Standards:** EN 559: 2003

| Inside dia. (mm) | Outside dia. (mm) | Working Pressure BAR | Burst Pressure BAR | Bend Radius (mm) | Weight (g/m) | Product code |
|---|---|---|---|---|---|---|
| 5,2 | 12,6 | 20 | 60 | 60 | 138 | 2823005000 |
| 6,3 | 13,9 | 20 | 60 | 63 | 150 | 2823006000 |
| 10,0 | 18,4 | 20 | 60 | 100 | 233 | 2823010000 |
| 15,0 | 24,0 | 20 | 60 | 150 | 341 | 2823015000 |

WELDING AND JOINING INSTITUTE
RWTH AACHEN UNIVERSITY

# ISF Welding and Joining institute extensive Welding & Gas hose test

"The goal of this research project was the systematic study of the effect of hose materials on the corrosive gas components hydrogen and oxygen in the weld seam during the arc welding process. Conventional as well as innovative hose materials were examined to this effect and graded according to quality.

In order to classify hose materials according to quality grades, tests regarding oxygen and humidity as well as ageing behaviour were used. The tests on pure hydrogen diffusion rates were part of a preliminary investigation, leading to relatively rapid results as a result of the low atomic diameter of hydrogen. Due to the high time input required for the measurements, twelve hoses were comprehensively tested and quality graded as part of this research project. These were selected in consultation with the Project Conducting Research Group."

Conclusion:
**"When additionally taking flush times into consideration, the PTFE hose and butyl hose can be identified as the best suited hoses."**

# The Butyl hose (Codan 2823) performed best overall throughout the test

## Extracts from the test:

## Characteristic values

| Schlauchmaterial | Diffusion | | Effusion | Spülzeiten bis 100 $ppm_v$ | | Alterung | Gewichtung |
|---|---|---|---|---|---|---|---|
| | Sauerstoff | Feuchte | Feuchte | Sauerstoff | Feuchte | | **Mit Alterung** |
| Gewichtung | 3 | 4 | 3 | 2 | 5 | 3 | |
| PVC | 2 | 3 | 4 | 2 | 5 | 2 | 65 |
| Tygon | 4 | 3 | 5 | 3 | 6 | 2 | 81 |
| PU | 3 | 6 | 6 | 3 | 6 | 2 | 93 |
| PA | 2 | 5 | 4 | 2 | 6 | 5 | 87 |
| Viton | 2 | 3 | 3 | 3 | 3 | 5 | 63 |
| PVDF | 1 | 2 | 4 | 2 | 3 | 3 | 51 |
| PTFE | 3 | 1 | 2 | 3 | 1 | 3 | 39 |
| PA/Verbund | 3 | 3 | 2 | 1 | 5 | 5 | 69 |
| Butyl 1 | 3 | 2 | 1 | 3 | 1 | 2 | 37 |
| Viton/Verbund | 3 | 4 | 2 | 2 | 4 | 2 | 61 |
| Brenngasschlauch | 3 | 6 | 4 | 3 | 6 | 5 | 96 |
| Schutzgasschlauch | 3 | 3 | 1 | 3 | 2 | 2 | 46 |

*Tabelle 6.15: Klassifizierung der Schläuche*

## Effusion

| Schlauchmaterial | Masse Feuchtigkeit [mg] | Volumen Schlauch [ml] | Effusion [mg/ml] |
|---|---|---|---|
| PVC | 105,69 | 105,975 | **0,99** |
| Tygon | 244,57 | 160,768 | **1,52** |
| PU | 1456,18 | 290,921 | **5,00*** |
| PA | 174,46 | 173,328 | **1,01*** |
| Viton | 40,36 | 78,5 | **0,51** |
| PVDF | 64,75 | 78,5 | **0,82** |
| PTFE | 10,57 | 78,5 | **0,13** |
| PA/Verbund | 99,17 | 447,45 | **0,22*** |
| Butyl 1 | 8,34 | 549,5 | **0,03** |
| Viton/Verbund | 50,55 | 414,48 | **0,12** |
| Brenngasschlauch | 437,17 | 538,51 | **0,81*** |
| Schutzgasschlauch | 23,49 | 538,51 | **0,043** |

*Tabelle 6.6: Effusionskoeffizient*

## Ageing

| Schlauchmaterial | Diffusion | | Effusion | Spülzeiten bis 100 $ppm_v$ | | Gewichtung |
|---|---|---|---|---|---|---|
| | Sauerstoff | Feuchte | Feuchte | Sauerstoff | Feuchte | **Ohne Alterung** |
| Gewichtung | 3 | 4 | 3 | 2 | 5 | |
| PVC | 2 | 3 | 4 | 2 | 5 | **59** |
| Tygon | 4 | 3 | 5 | 3 | 6 | **75** |
| PU | 3 | 6 | 6 | 3 | 6 | **87** |
| PA | 2 | 5 | 4 | 2 | 6 | **72** |
| Viton | 2 | 3 | 3 | 3 | 3 | **48** |
| PVDF | 1 | 2 | 4 | 2 | 3 | **42** |
| PTFE | 3 | 1 | 2 | 3 | 1 | **30** |
| PA/Verbund | 3 | 3 | 2 | 1 | 5 | **54** |
| Butyl 1 | 3 | 2 | 1 | 3 | 1 | **31** |
| Viton/Verbund | 3 | 4 | 2 | 2 | 4 | **55** |
| Brenngasschlauch | 3 | 6 | 4 | 3 | 6 | **81** |
| Schutzgasschlauch | 3 | 3 | 1 | 3 | 2 | **40** |

*Tabelle 6.11 Klassifizierung der Schläuche ohne Alterung*

**Read the full test here:**
**ISF Welding & Gas Hose test 2007**