DOPAK®
Sampling Systems

Closed Loop Sampling Systems

DOPAK® PRODUCT OVERVIEW

Crane Instrumentation & Sampling

CRANE®

www.dopak.com
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DOPAK® Sampling Systems & Components

DOPAK® Sampling Systems & Components

Dovianus is an expert in sampling systems for the chemical, petrochemical and offshore industries worldwide. Our DOPAK® sampling systems set high international standards for closed loop and closed vent sampling systems. Our sampling systems offers safe working conditions for operators, are safe for the environment and safe for the samples.

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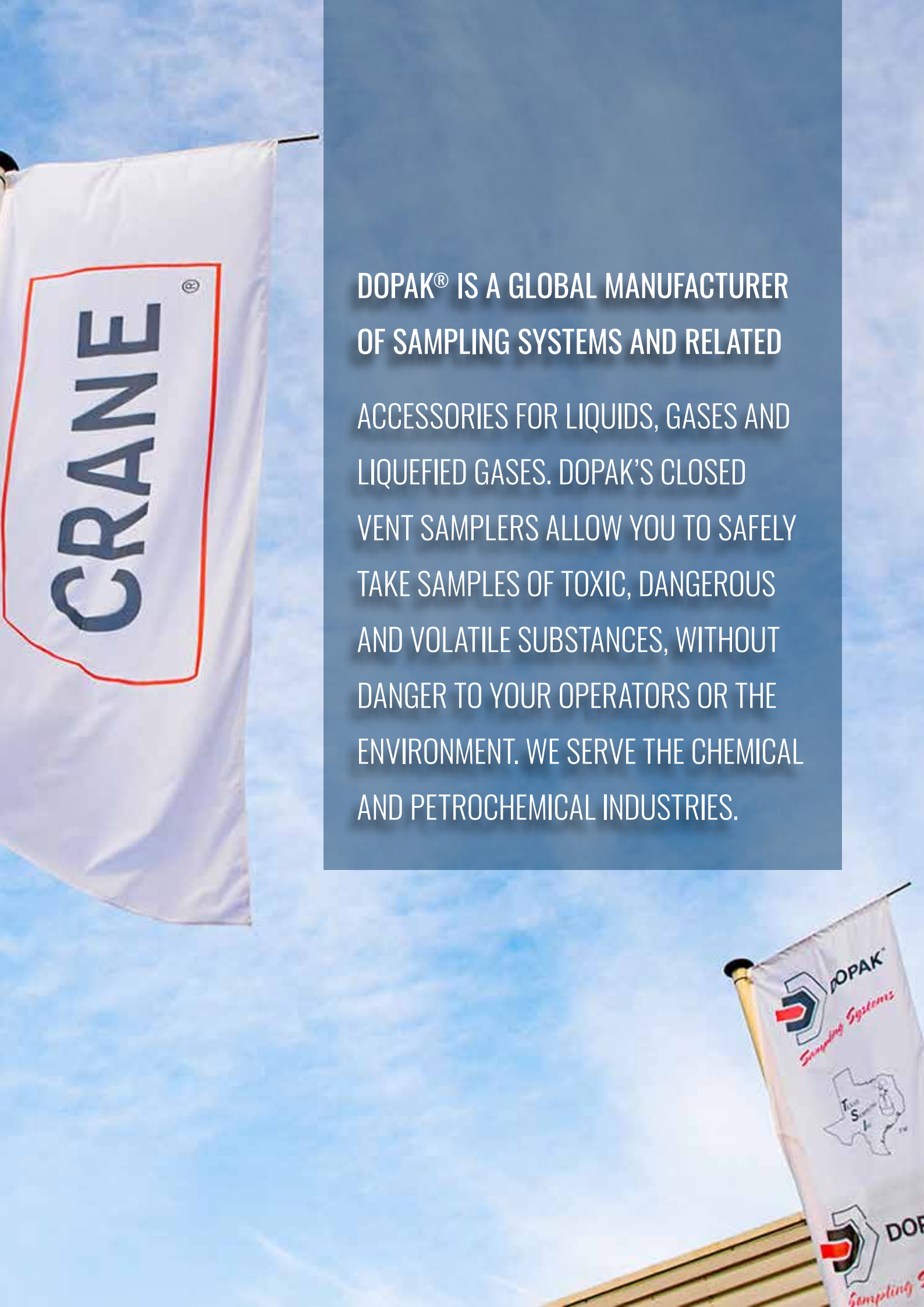


DOPAK® IS A GLOBAL MANUFACTURER OF SAMPLING SYSTEMS AND RELATED

ACCESSORIES FOR LIQUIDS, GASES AND LIQUEFIED GASES. DOPAK'S CLOSED VENT SAMPLERS ALLOW YOU TO SAFELY TAKE SAMPLES OF TOXIC, DANGEROUS AND VOLATILE SUBSTANCES, WITHOUT DANGER TO YOUR OPERATORS OR THE ENVIRONMENT. WE SERVE THE CHEMICAL AND PETROCHEMICAL INDUSTRIES.

DOPAK® Product Benefits

Safe Sampling

Safety is a crucial factor in the chemical, petrochemical and offshore industries. Industrial processes are often complex, products often dangerous and toxic. At Dovianus we understand this complexity and need for high safety levels. Therefore we are dedicated to develop better, safer samplers for our customers.

Benefits of DOPAK® Sampling Systems

1. **Safe for the operator**
2. **Safe for the environment**
3. **Safe for the sample (representativity)**
4. **Easy one handle operation**
5. **Sustainable**
6. **Low maintenance**
7. **Virtually zero pollution/contamination**
8. **Eliminate spills**

Dopak® Sampling Systems

Since the late 1970's, Dovianus focuses on the development, production and marketing of DOPAK® sampling systems. Our high-quality products and expertise are recognized and used by many leading companies in the chemical and petrochemical industry.

We continuously invest in, and build on our sampling expertise and the development of safe sampling systems. DOPAK® sampling systems meet or even exceed safety standards worldwide. Our sampling systems are safe for the operator, safe for the environment and safe for the sample. They protect the operator from coming into contact with the product. Spillage into the environment is avoided and volatile substances can't escape into the atmosphere, while the sample itself is protected from contamination and providing a representative sample.

Sampling in Bottles or Cylinders

There are two types of sample containers for the DOPAK® sampling systems: bottles sealed with cap and septum, and cylinders. What type of container you require, depends on the product properties and the type of sampling system you use.

Sampling in bottles - how it works

In general we advise to use a bottle for samples with a vapor pressure up to a maximum of typically 0.7 bar at ambient temperature. When using a bottle as sample container, the sample is drawn from the process and collected in the bottle at atmospheric pressure. The bottle is sealed with cap and septum for maximum closure. The sealed bottle is inserted into the sleeve until the septum is pierced by the needles of the needle assembly.

Once in position, the product can flow into the sample bottle via the process needle, while air and vapor are being vented by the vent needle. When the required amount has been taken, the operator stops the product flow and the bottle is pulled out of the sleeve. The septum reseals automatically.

In applications where a cap and septum cannot be used, an SBA (Sample Bottle Adapter) can be provided. In this configuration filling tubes are used instead of a needle assembly. This allows for semi-closed sampling.

Sampling in cylinders - how it works

A cylinder can resist vapor pressures of above 0.7 bar. When using a cylinder as sample container, the sample is drawn from the process and collected in the cylinder at process pressure. The sample cylinder has a needle valve and a quick connect coupling at both ends to connect to the sampling system.

Once in position, the product can flow through the sample cylinder. When sampling liquefied gases, partial filling of the cylinder should be ensured.

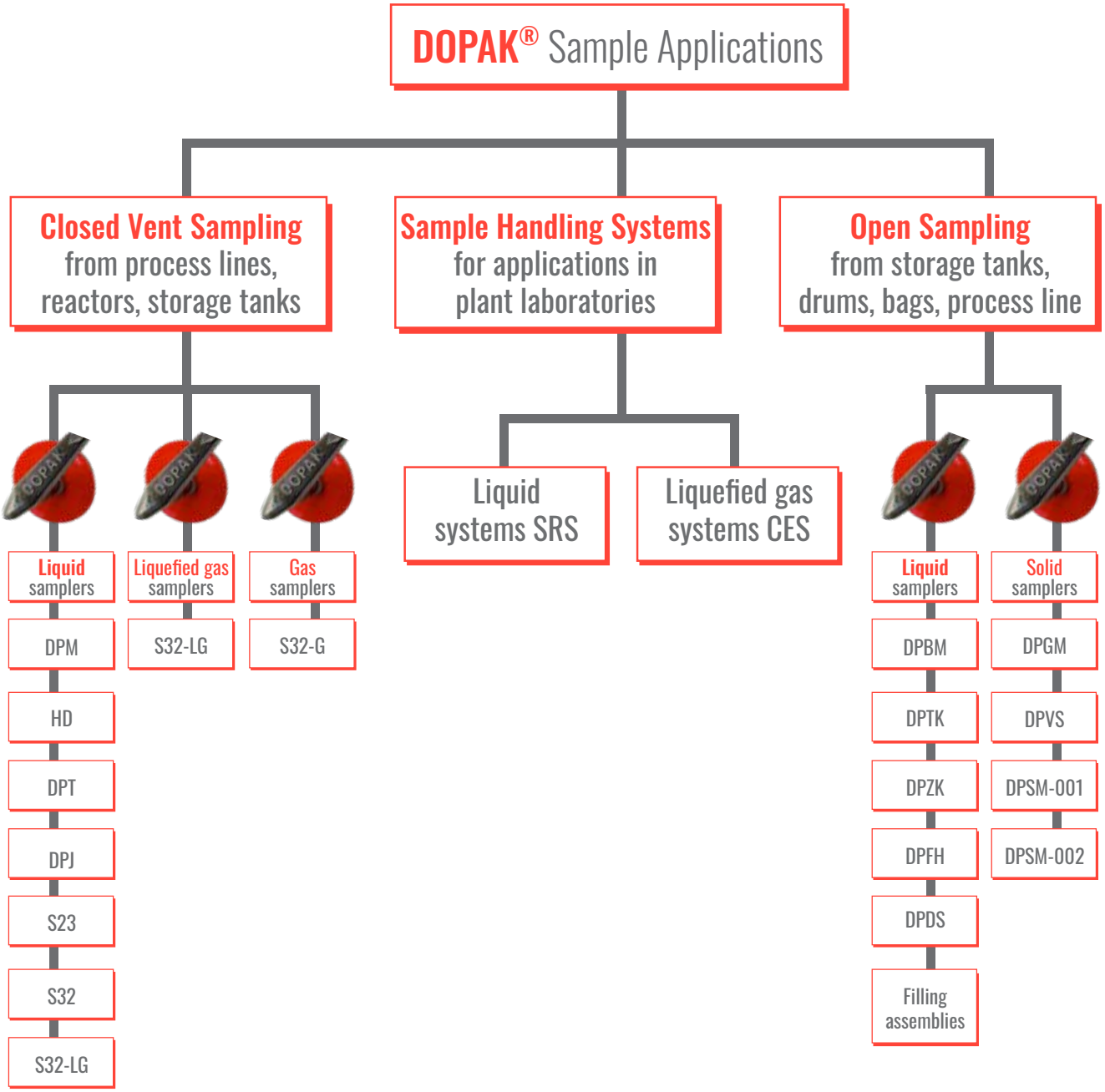
DOPAK® provides several possibilities to prevent the sample cylinder from being filled for 100% with liquid or liquefied gas. The operator closes the needle valves on the sample cylinder and allows the quick connect to be depressurized through a vent connection. Then the cylinder may be disconnected from the sampler.

DOPAK® Product Overview

What Sampling System To Use?

If your technical and safety requirements are more or less standard, an adaptation of one of our pre-engineered sampling systems could be a solid solution with a quick delivery. These selected samplers are pre-designed and partly pre-assembled and therefore need no further detailed engineering. Please refer to our "DOPAK® Sampling Express" for further details.

For more demanding sampling, our engineers will design a customized sampling system to your precise specifications. What sampler model to use, depends on the properties of the medium being sampled and the conditions of the process involved.



Closed Vent Sampling Systems

DPM series

The DPM series can be used for taking samples of liquids with a low vapor pressure (< 0.7 bar), at relatively low operating pressures. Purge options are available.

Applications for use

- Liquids with a low vapor pressure (P = < 0.7 bar)
- Sampling at low operating pressure (P = < 8 bar)
- Corrosive, hazardous liquids
- Sampling from pipelines and tanks
- Zero emission sampling

Available Configurations

- On/off (A1, A2)
- System purge (A3)
- Back purge (A4)
- Needle purge (A5)
- Back and needle purge (A6)
- System purge and continuous needle purge (A7)
- Inline, needle purge (A8)
- Flow control / pressure reducing device
- Portable sampler c/w air driven membrane pump
- Vessel sampler c/w dip pipe with submerged pump

HD series

The HD series have process valves. They are used for taking samples of liquids with a low vapor pressure (< 0.7 bar), at relatively low operating pressure (< 8 bar).

Applications for use

- Liquids with a low vapor pressure (P = < 0.7 bar)
- Sampling at low operating pressure (P = < 8 bar)
- Corrosive, hazardous liquids
- Sampling from pipelines and tanks
- Fire-safe, antistatic valves

Available Configurations

On/off (B1, B2)

DOPAK® Product Overview

DPJ Series

The DPJ series are based on piston valves. They are used for taking samples of liquids with higher viscosity. The outlet of the sample valve is purged to ensure clean sample value after sampling.

Applications for use

- Fixed volume sampling
- Liquids at vacuum conditions, low pressures (< 8 bar) and elevated pressures (> 8 bar)
- Corrosive, hazardous liquids
- Viscous liquids, slurries
- Sampling from pipelines, tanks, reactors
- Vacuum conditions
- High temperature (up to 650 ˚C)

Available Configurations

- Purge (C1)
- Fixed volume (C2)
- Fixed volume with cooling/heating jacket (C3)
- Solvent purge (C4)

DPT Series

The DPT series are based on inline valves. They are used for taking samples of liquids with low vapor pressures (< 0.7 bar) at relatively low operating pressures (< 8 bar).

Applications for use

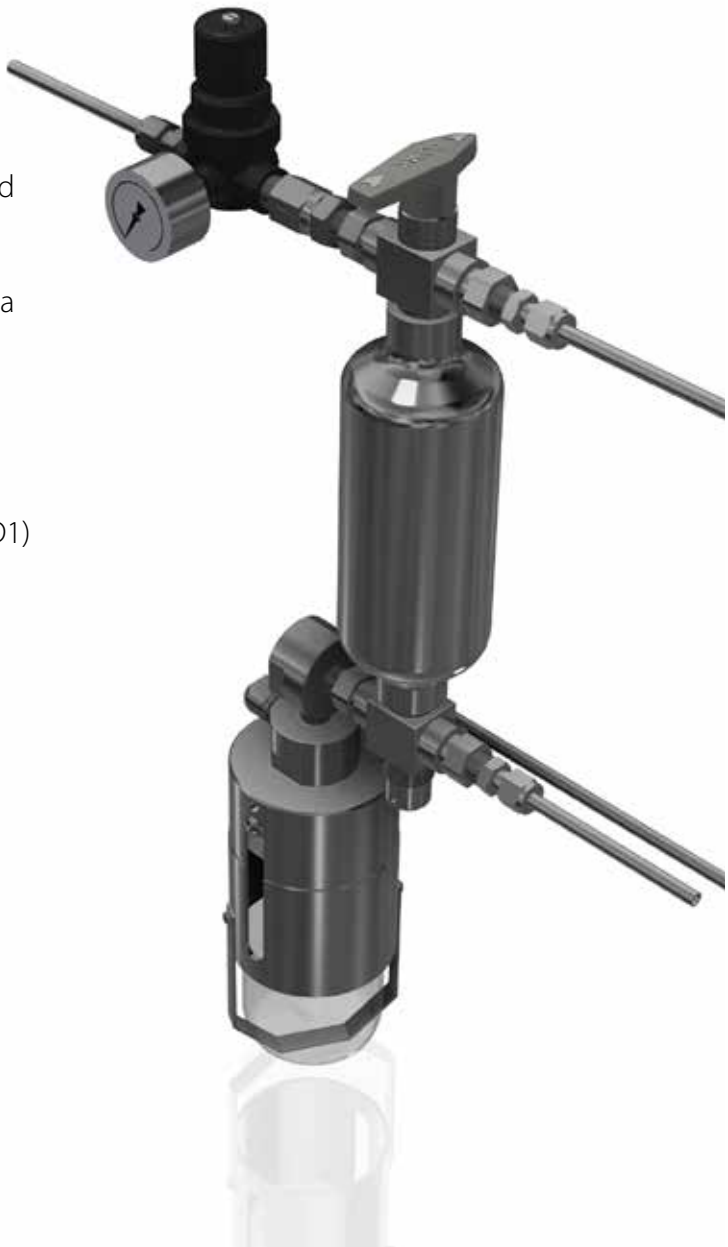
- Inline liquid sampling
- Corrosive, hazardous liquids (PFA lined version is available)
- Viscous liquids, slurries
- Sampling from pipelines

Available Configurations

- Inline, on/off (H1)
- Inline, continuous needle purge (H2)

S23 Series

The S23 series are based on internally coupled valves. They are used for taking predefined quantities of liquid with low vapor (< 0.7 bar) pressures. These sampling systems allow for taking samples independently of the process pressure and have zero dead volume.



Applications for use

- Fixed volume sampling
- Liquid sampling at low (< 8 bar) and elevated (> 8 bar) pressures
- Corrosive, hazardous liquids
- Small sample volume is possible (starting at a minimum of 1 cc)
- One handle operation
- Zero dead volume

Available Configurations

- Threaded, welded or flanged connections (D1)
- Continuous needle purge (D2)
- Cooling/heating jacket (D3)
- Third coupled valve (D4)
- HVP (High Vapor Phase) (D5)
- High temperature (D6)
- No purge (D7)
- No purge, cooling/heating jacket (D8)

DOPAK® Product Overview

S32 Series

The S32 series are based on externally coupled valves. They are used for taking representative samples of liquids from reactors at vacuum conditions. Or for predefined quantities of liquids with low vapor pressures, independently of process pressure.

Applications for use

- Liquid sampling at low (< 8bar) and elevated (> 8bar) pressures
- Corrosive, hazardous liquids
- Sampling from process lines or from top of reactors below atmospheric conditions
- Viscous fluids, slurries
- One handle operation
- Zero dead volume

Available Configurations

- Back purge vacuum (E1)
- Back and needle purge vacuum (E2)
- Back purge venturi (E3)
- Back and needle purge venturi (E4)
- Fixed volume (E5)
- Overflow vacuum (E6)
- Overflow vacuum venturi (E7)

DOPAK® Product Overview

S32 - LG Series

The S32-LG series are based on externally coupled valves. They are used for taking representative samples of liquefied gases and liquids with high vapor phase in cylinders with internal or external outage. Purge options are available.

Applications for use

- Liquefied gas sampling
- Fixed external outage
- High vapor pressure liquids
- Zero quick connect vapor release
- One handle operation
- Zero dead volume

Available Configurations

- System purge (F1)
- Vent to flare (F2)
- Outage tube (F3)
- Purge expansion (F4)
- Bypass purge cylinder (F5)
- Outage tube with bypass purge cylinder (F6)
- Process to flare (F7)
- System purge with additional safety expansion cylinder (F8)

S32-G Series

The S32-G series are based on externally coupled valves. They are used for taking representative samples of gases in cylinders. Purge options are available.

Applications for use

- Gas sampling
- One handle operation
- Zero dead volume

Available Configurations

- System purge (G1)
- Bypass purge cylinder (G2)
- Process to flare (G3)

DOPAK® Product Overview

Sample Handling Systems

Sample Recovery System (SRS) (I1)

The Sample Recovery System recovers a liquid sample from the sample bottle without the risk of spillage or contamination.

Applications for use

- To safely recover a liquid sample from a sample bottle
- Plant laboratories

Cylinder Emptying System (CES) (J1)

The Cylinder Emptying System empties a cylinder containing (liquefied) gas without the risk of spillage or contamination.

Applications for use

- To safely empty a (liquefied) gas sample cylinder
- Plant laboratories

(Partly) Open Samplers

Liquids

Filling assemblies, DPBM, DPTK, DPZK, DPFH, DPDS, SBA series

Applications for use

- Liquids at atmospheric pressure
- Low hazardous liquids
- Sampling from storage tanks, drums and pipelines
- Fixed volume sampling

Solids

DPVS, DPGM, DPSM series

Applications for use

- Solid sampling at atmospheric pressure
- Sampling from bags
- Sampling granulates, powders, grease
- Fixed volume sampling

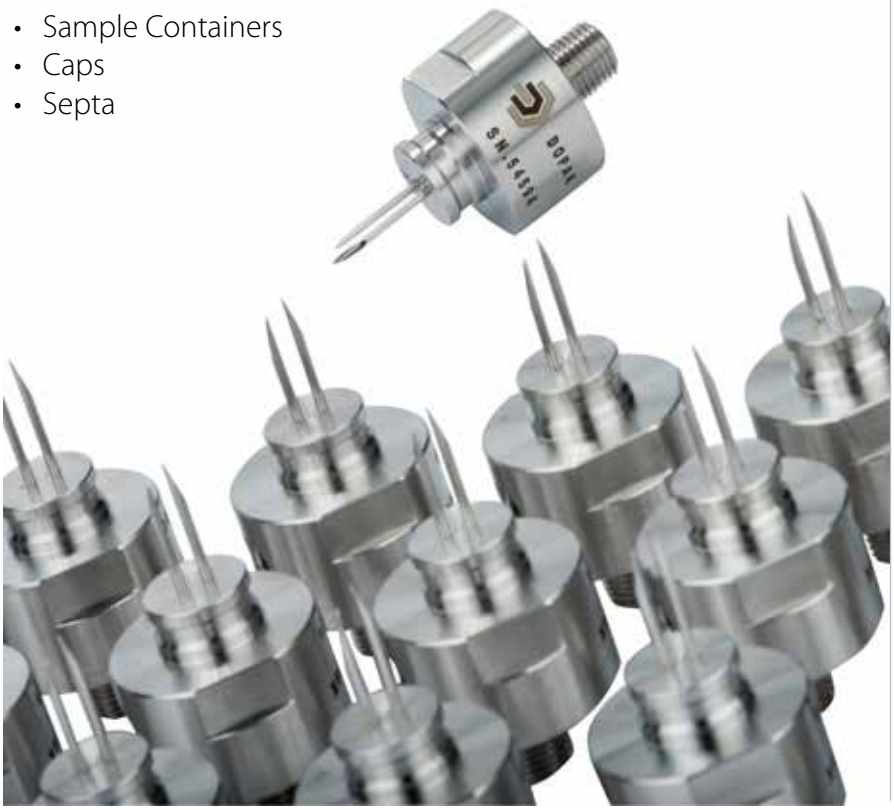
DOPAK® Product Overview

Consumables and Spare Parts

Any DOPAK® sampling system can be adapted to your needs with a wide variety of components and additional options.

Available consumables

- Sample Containers
- Caps
- Septa



Available spare parts

- Needle assemblies
- No Bottle No Flow (NBNF) needle assembly
- Sleeves
- Valves
- Enclosures
- (Spring Return) Handles
- Sample cylinders
- Gearbox
- Pressure gauge
- Pressure regulator
- Thermometer
- Heating / cooling jacket
- Carbon canister
- Flow meter
- Upstream single or double coil cooler
- Connection types
- Mounting plate, including brackets and pipe stand
- Electrical or steam heater
- Junction box
- Flexible hose

CRANE

CRANE INSTRUMENTATION & SAMPLING

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CPE-DOPAK-BU-EN-A4-2021_09_01