

KVID Vane Inlet Diffusers

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KIRK Process Solutions

London - Pune - Shanghai - Houston
www.kirkprocess.com

Key Benefits

- 1 Highly effective momentum breaking action with low shear
- 2 High volumetric throughput means reduced vessel size
- 3 Easy installation and removal for new or retrofit applications
- 4 Economic capital cost
- 5 Excellent turn-down / turn-up performance
- 6 Rugged construction gives long life - even in corrosive or sandy service



Product Data Sheet

From the K-SEP® Range of Separator Internals

Background

KIRK Process Solutions is a leading, international supplier of process separator internals to the oil, gas and petrochemical industries.

Technology Development

To maintain a leading technical position, KIRK has developed a range of proprietary internals designed for effective phase separation.

Our inlet distributor internals are marketed under the **K-SEP®** trade name.

KVID Vane Inlet Diffusers – A low shear, low pressure drop inlet device for high load service.

KBID Bifurcator Inlet Deflectors – A simple flow splitter and momentum breaker for moderate load applications.

KHPD Half Pipe Deflectors – A simple and traditional design for gas distribution in light liquid load services.



Typical unit during manufacture

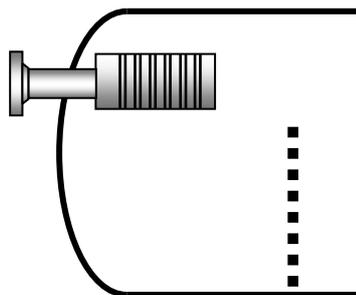
Boosts Performance of Production Separators

Summary

Early oilfield separator inlet nozzles utilised simple splash plates or dished deflectors to reduce the incoming fluid momentum. However, these early inlet devices suffered from a range of mechanical and fluid instability problems, and needed improvement.

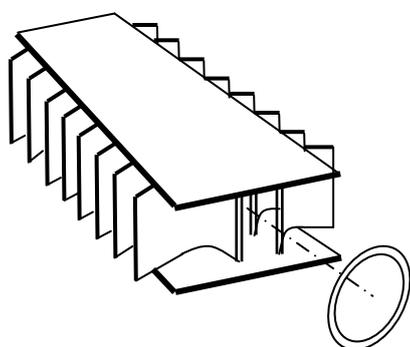
Development work was started by the major oil companies and the design of multi-vane inlet diffuser evolved led by Shell and their Schoepentoeter. The characteristics of these devices became better understood, and reliable performance envelopes were developed.

A characteristic of the KVID is its high flow capacity, meaning that more throughput is possible through any given size separator.



The **KVID™** is a multi-vane inlet device used in horizontal and vertical separators where there is a requirement for good flow distribution with minimum shear and pressure drop.

In horizontal vessels the KVID is suited to both end entry as illustrated above, and top entry by means of an elbow directed towards the head. Benefits of this device compared with simpler deflectors include reduced agitation and hence improved 2 and 3 phase operational performance, more stable level control, and reduced foaming.



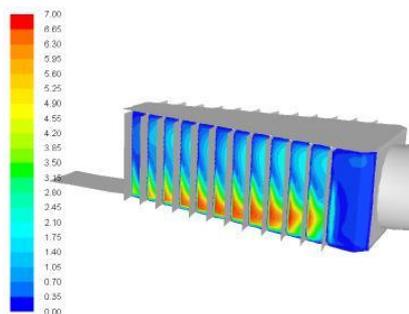
For vertical vessel installations, usually where there is a high gas flow relative to the liquid flow, the KVID provides excellent vapour distribution allowing a reduced height to the mass transfer or mist eliminator internals.

The KVID works by smoothly dividing the incoming flow into various segments using an array of curved vanes to suit the overall geometry of the inlet nozzle and distributor length. To achieve this effect the vanes start with a wide spacing and gradually reduce the gap, giving the unit its characteristic tapering shape.

Based on the well proven Shell Schoepentoeter™ design, KVID units are installed in a wide range of applications.

The KVID is usually constructed from stainless steel and is designed to be installed in sections through a vessel manway and assembled in the vessel.

When sizing the KVID to match the inlet nozzle, we recommend the fluid momentum ρv^2 is in the range of 3,000 - 10,000 although higher velocities are acceptable with reinforced designs.



Easy to Install

Manufactured as components that fit through a standard manway, KVID inlet diffusers comprise pre-stiffened components, requiring only simple supports and assembly within the vessel to achieve a secure fit.

KIRK provide full installation guidelines to ensure process integrity is not compromised. If required, we can also arrange to inspect equipment prior to start-up.

Wide Performance Range

KIRK will design the KVID to meet your specific requirements, but the design envelope of the whole separator usually means that performance can be guaranteed all the way down to zero turndown. In many cases there will be little loss in performance also should an additional 10-20% flow be required through the system.

KIRK also sometimes recommends the use of inlet weirs and flow distributor baffles, depending on the application.

Long Life Construction

Standard materials of construction are stainless steel grade 316 for all components. For very sour or corrosive service other materials such as Inconel can be furnished. Some contaminants may not be suitable for use with stainless steel; if in doubt please refer to KIRK.

KVID inlet diffusers can be used at any operating pressure and temperature likely to be experienced.

Applications

Common applications for KVID inlet diffusers include both horizontal and vertical:

- Production Separators
- Free Water Knock-Outs
- Degassing Vessels
- KO Drums & Scrubbers
- Absorber Columns
- Slug Catchers

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