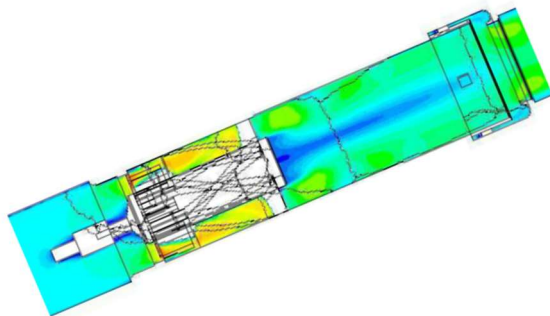


# OIL & GAS PRODUCTION & TREATMENT TECHNOLOGIES



## COMPACT GAS SCRUBBERS with KSME™ AXIAL SWIRL CYCLONES

*Part of the K-SEP™ range*



**KIRK**   
PROCESS SOLUTIONS

[www.kirkprocess.com](http://www.kirkprocess.com)

# 3 DECADES OF EXPERIENCE DESIGNING OIL & GAS SEPARATORS



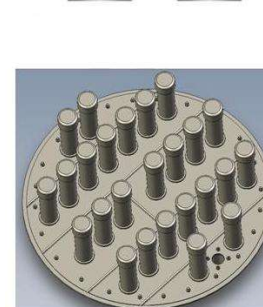
WE HAVE BEEN INVOLVED IN THE DESIGN OF THOUSANDS OF COST EFFECTIVE SOLUTIONS FOR THE INTERNATIONAL UPSTREAM OIL AND GAS INDUSTRY FOR OVER 30 YEARS

**KSME™ AXIAL SWIRL MIST ELIMINATORS** provide compact solutions to fine mist and particle separation at low, medium and high pressure

At the heart of each separating element is a special swirler developed at Berlin Technical University. The design and application is patented internationally. In summary:

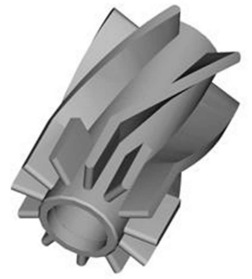
The incoming gas and liquid droplets are accelerated at high speed into a cyclonic swirl so that the liquid droplets are flung to the cyclone tube walls where they form a film and are swept upwards with the gas.

The top of each element is supplied with a centrifugal separator cap which captures the liquid film and sends it falling to the tray deck outside the element tube. Captured liquid drains from the tray deck via a down-comer pipe into the vessel's liquid sump for disposal.



*Removes >99.9% of particles  
above 10 microns at any  
operating pressure*

# COMPACT SCRUBBERS USING KSME™ AXIAL SWIRL CYCLONES



## GAS SCRUBBER SIZING COMPARISON

Liquid SG 0.8 and Gas MW 22  
 Gas flow 10 MM Nm<sup>3</sup>/d at 60 bar (1.93 am<sup>3</sup>/s)

### A) HORIZONTAL WIRE MESH in KO DUM

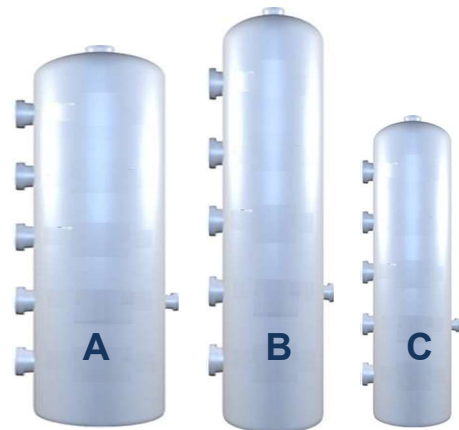
Gas density is 59 kg/m<sup>3</sup> and using a K-factor of 0.107 m/s the mesh pad velocity allowed is 0.38 m/s giving a vessel size of 2500mm ID x 3000mm T/T.

### B) VERTICAL VANE PACK in KO DUM

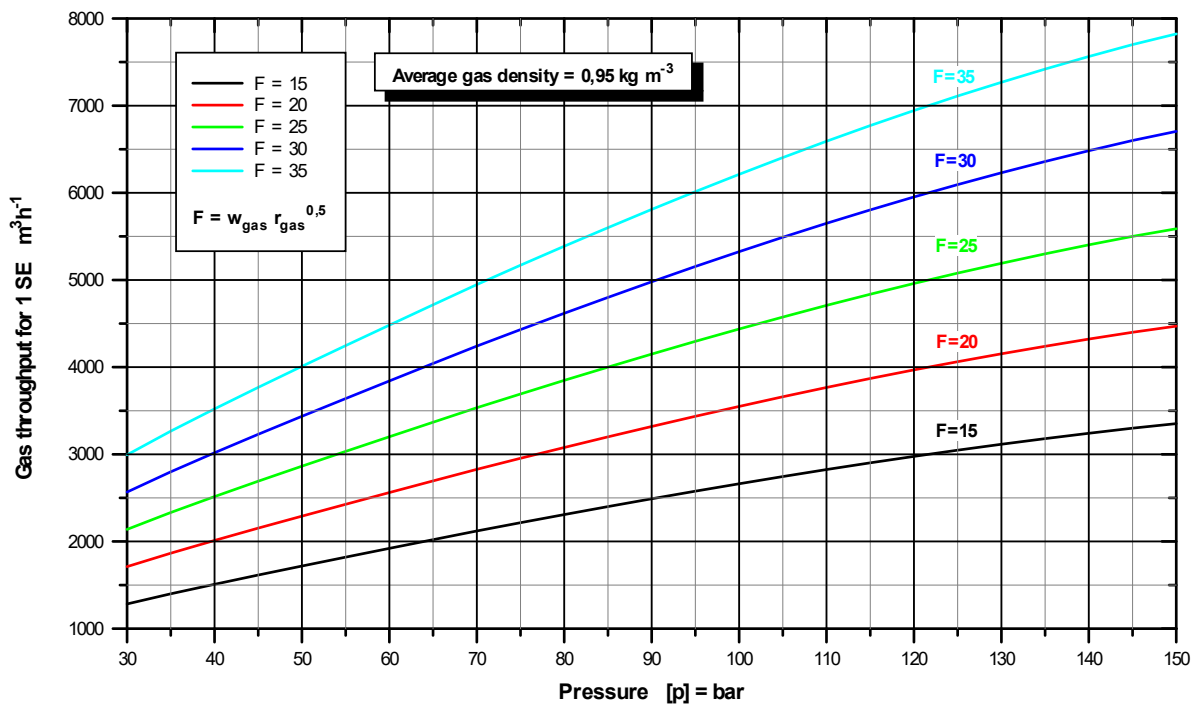
Using a K-factor of 0.25 m/s the vane pack velocity allowed is 0.89 m/s giving an area of 2.2 m<sup>2</sup> which can be fitted into a vessel of 1650mm ID x 3500mm T/T.

### C) VERTICAL FLOW KSME SWIRLTUBE KO DUM

Using a capacity F-factor of 30, each element can treat 3800 Nm<sup>3</sup>/h requiring 110 elements. This requires 1.4m<sup>2</sup> giving a size of 1350mm ID x 2700mm T/T.



Gas Throughput for 1 Separating Element (SE)  
 vs. Pressure for various F-Factors



# KSME™ AXIAL CYCLONES FOR ALL APPLICATIONS



The KSME™ axial cyclone provides a high degree of separation of fine droplets and dust even at high operating pressures. It can be positioned vertically or horizontally within a separator vessel.

Due to its high capacity it is ideal for retrofitting into existing separators when higher throughputs are required with improved efficiency. In new build applications these axial cyclones will result in significantly smaller vessels and hence give considerable weight savings and cost reductions.

The KSME™ cyclone is extremely efficient, even at higher pressures when vane packs lose their performance, and also when processing liquids with a low surface tension.



*Typical Highspeed Axial Cyclone Deck*

KIRK Process Solutions offers a range of products and services to support your front-end engineering including process simulations, internals selection and vessel sizing and optimisation.

Our separation expertise is evidenced by hundreds of operational vessels installed world-wide, spanning the full spectrum of operating pressures and environments and featuring many state-of-the-art separation technologies and components in their design.

## TYPICAL APPLICATIONS

- ✓ Compressor Suction Scrubbers
- ✓ Discharge Scrubbers
- ✓ Pipeline KO Drums
- ✓ Filter Pre-Separators
- ✓ Glycol/Amine Pre/Post KO Drums
- ✓ Fuel Gas Treatment
- ✓ High & Low Pressures
- ✓ Offshore and FPSO

## KEY FEATURES & BENEFITS

- Typically  $\frac{2}{3}$  of the size of a vane pack KO drum
- Typically  $\frac{1}{3}$  the size of a wire mesh KO drum
- Major savings in column weight and cost
- Excellent performance at very high pressures
- Tolerates solids; motion; cures foaming
- Low maintenance
- Elements available in stainless steel or lightweight plastics
- Excellent turndown in combination with mesh pre-coalescer
- Low pressure drop (30 mbar)

**Technical leaflets are available for all our K-SEP™ products.**

## CONTACT

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