# **Peerless** Vane Separators



# FOR HIGH-EFFICIENCY, HIGH-CAPACITY, COST EFFECTIVE GAS AND LIQUID SEPARATION



- Cnemical |
  - Ammonia and urea plants
  - Desiccant bed protection
  - Molecular sieve protection
  - SAGD (Wet Steam)

# making energy safe, efficient and clean

- Flexible separator designs
- High-capacity vanes
- Guaranteed performance

# PEERLESS... COMBINING INNOVATION WITH EXPERTISE IN SEPARATOR DESIGN AND FABRICATION



Peerless Single Barrel separators serve effectively as liquid slug-catchers and perform especially well in 3-phase applications.

### SINGLE BARREL GAS SEPARATOR

- High efficiency liquid removal
- Wide liquid handling operating range, including slug
- Extremely high gas throughput
- Options for 3-phase flow applications
- Large liquid retention volume

### PRINCIPLE OF OPERATION

- (A) Gas and liquid entering the vessel are diverted by the inlet baffle to remove slugs and bulk liquids.
- (B) Liquid falls to the bottom of the vessel through quieting plates into the first sump.
- (C) Gas and remaining mist enter the vane separator.
- (D) Remaining liquid collected at the bottom of vane pack and is drained by the down-comer pipes.



- (E) Submerged down-comer pipes and seal pots result in optimal drainage, whilst preventing gas bypass.
- **(F/G)** Drains and liquid level controllers ensure efficient liquid discharge out of the vessel.

### FEATURES

These separators are designed to provide efficient liquid removal at high gas flow capacities. They effectively handle large liquid slugs and are easily applied to 3-phase separation.



### HORIZONTAL SINGLE-BARREL SEPARATOR

Innovative Designs Cost-Effective Retrofits Guaranteed Performance

### **PRODUCT PERFORMANCE GUARANTEE**

Peerless Horizontal Slug Catcher Separators are guaranteed to remove 100% of all liquid droplets 8 microns and larger. The outlet gas will contain no more than 0.1 US gallon of entrained liquid per MMSCF at maximum rated capacity. (13 litres/Million SCM)



remove bulk liquids from high gas flows.



### **DOUBLE-BARREL SEPARATOR**

- High-efficiency liquid slug removal
- No liquid re-entrainment
- Extremely high gas throughput
- Lower barrel acts as a quiet retention chamber

### PRINCIPLE OF OPERATION

- (A) Gas and liquid entering the vessel are diverted by inlet baffle to remove slugs and bulk liquids.
- **(B)** Liquid drains into the lower barrel through the first down-comer pipe.
- (C) Gas and remaining mist enter the vane separator.
- (D) Remaining droplets collected at the bottom of the vane pack drain into the lower barrel through the second down-comer pipe.
- (E) The split lower barrel with two sets of liquid level controllers ensure proper discharge of the liquid from the lower barrel.



### **FEATURES**

Double-Barrel Separators are designed to provide efficient liquid removal. They achieve higher gas-flow capacities through the longitudinal arrangement of separation elements in the upper barrel. The lower barrel segregates the liquid away from the gas flowing in the upper barrel, thus eliminating re-entrainment. The lower barrel acts as a retention chamber providing residence time for gas bubbles to emerge from the liquid.



HORIZONTAL DOUBLE-BARREL SEPARATOR

### **PRODUCT PERFORMANCE GUARANTEE**

Peerless Double Barrel Slug Catcher Separators are guaranteed to remove 100% of all liquid droplets 8 microns and larger. The outlet gas will contain no more than 0.1 US gallon of entrained liquid per MMSCF at maximum rated capacity. (13 litres/Million SCM)

## LINE SEPARATORS



### VARI-LINE™ SEPARATORS









Figure D

Figure B

Figure C



### **PRINCIPLE OF OPERATION**

- (A) Gas with entrained liquid enters the vessel where the gas expands and enters the inertial vane mist extractor.
- **(B)** Inertial forces resulting from rapid direction change force liquid droplets against the vane walls. Liquid droplets coalesce on the vane wall surface.
- **(C)** The liquid is then drained by gravity to the liquid reservoir in the bottom of the vessel and away from the main gas stream.



### STANDARD LINE SEPARATOR

Peerless Standard Line Separators provide a direct, straight-through design most typically used in plant air or gas systems. Body nominal diameters from 150mm to 500mm and ratings up to 50 bar are available from stock.



### CUSTOM- DESIGNED VARI-LINE™ SEPARATORS

For applications where space is at a premium and piping limitations prevent the use of a straight-through line separator, Peerless VARI-LINE Separators are designed with several nozzle configurations. Internal baffling permits multiple combinations of inlet and outlet connection locations (see figures A –F).

### LINE SEPARATOR BENEFITS

- Efficient removal of liquids from gas streams
- Ideal for limited space installations
- Negligible pressure drop
- Wide range of gas capacities and pressure ratings
- Stock or custom (VARI-LINE) designs

### PERFORMANCE GUARANTEE

Peerless Line Separators are guaranteed to remove 100% of all liquid droplets 8 microns and larger. The outlet gas will contain no more than 0.1 US gallon of entrained liquid per 13 litres MMSCF at maximum rated capacity.

# **VERTICAL SEPARATORS**



Peerless Vertical Gas Separators operate in gas plants, refineries, petrochemical plants, and other applications where the vessel footprint must be minimised.

### VERTICAL GAS SEPARATOR BENEFITS

- High-efficiency liquid removal from gas streams
- Broad operating range
- Effective slug removal
- Minimal footprint
- High and low liquid:gas ratio compatibility
- Available as a retrofit to existing vertical separators





### PRINCIPLE OF OPERATION

- (A) Gas and liquid entering vessel are diverted by the inlet baffle to remove slugs and bulk liquids.
- (B) Gas and remaining mist enter the vane separator.
- (C) Removed liquid collects at the bottom.
- **(D)** The submerged down-comer pipe drains liquids to the bottom of vessel.
- (E) Liquid level controls monitor the collected liquid amounts for efficient liquid discharge out of the vessel.

### FEATURES

Peerless Vertical Gas Separators are designed to handle both high and low liquid-to-gas ratios. They are especially recommended for applications where heavy liquid entrainment causes a slugging problem. Peerless proprietary devices provide smaller vessel configurations when compared to mesh pad or other separation devices.

VERTICAL GAS/LIQUID SEPARATOR

### **PRODUCT PERFORMANCE GUARANTEE**

Peerless Vertical Gas Separators are guaranteed to remove 100% of all liquid droplets 8 microns and larger. The outlet gas will contain no more than 0.1 US gallon of entrained liquid per MMSCF at maximum rated capacity. (13 litres/Million SCM)

# VANE ELEMENTS AND ASSEMBLIES



# ••••• <

VANE PROFILES

Frequently used vane profiles comprising three double-pocket and single-pocket designs

### PRINCIPLE OF OPERATION

- (A) Contaminated gas entering the vane unit is directed into adjacent vertical channels where each one subjects the gas to rapid multiple changes in direction.
- **(B)** Inertial forces resulting from rapid direction change force liquid droplets against the vane walls. Liquid droplets coalesce on the vane wall surface.
- **(C)** Gravity, surface tension, and momentum drive the coalesced liquid into the vane pockets. Liquid flows down the pockets and collects in the liquid reservoir.
- (D) Clean gas exits the tail end of the vane pack.

### **SPECIAL FEATURES**

Peerless Vane Separators are configured to meet the needs of special applications, including:

- Fixed or removable vane elements
- Welded or bolted frameworks
- Wash systems
- Multi-stage systems
- Flow distribution manifolds
- Retrofit Kits

### VANE PROFILES

Peerless Vane Elements are available in several high-performance profiles. Peerless specifies the correct vane profile for each application.

### CROSS SECTIONAL VIEW OF PEERLESS VANE ELEMENT



### MIST EXTRACTOR CONFIGURATIONS

Vane elements of a specific profile are assembled into one of four major configurations: single-bank, double-bank, four-bank and eight-bank. Configurations are selected to match specific applications. Design solutions are developed for unique operational situations such as performance enhancement or retrofits.







Single Bank

# Peerless Europe Limited

Cardinals Court, Bradford Street, Braintree, Essex, CM7 9AT, UK Tel: +44 (0)1376 556030 Fax: +44 (0)1376 556059 Email: sales@peerlesseurope.com www.peerlesseurope.com

### Middle East Sales Office

Peerless Europe Limited c/o Teyseer Trading & Contracting Co. PO Box 1556 , Doha, Qatar Tel: +974 44626367 Fax: +974 44626369 Email: sales@peerlesseurope.com www.peerlesseurope.com



BS EN ISO 9001:2000 Registered

Registered Office: Cardinals Court, Bradford Street, Braintree Essex, CM7 9AT, UK Registration Number 2627558