**LINE SEPARATORS**

**VANE SEPARATORS**

**CUSTOM-DESIGNED VARI-LINE™ SEPARATORS**

For applications where space is 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 slot and single-pocket designs to meet the needs of special applications, allowing the correct vane profile for each application. Peerless Vane Separators are configured into one of four major configurations: single-bank, double-bank, four-bank and eight-bank. Configurations are selected to match specific applications. Performance guarantees are for Peerless Line Separators are guaranteed to remove 90% 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.

**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.

**LINE SEPARATOR CROSS SECTIONS**

- **Figure A**: Horizontal separator for handling high liquid rates and large slugs.
- **Figure B**: Vertical separator for slug removal applications and small footprint installations.
- **Figure C**: Peerless Line Separators are configured to meet the needs of special applications, including:
  - Fixed or removable vane elements
  - Vane or filtered configurations
  - Multi-bank systems
  - Flow distribution manifolds
  - Custom designs

**PERFORMANCE GUARANTEE**

Peerless Line Separators are guaranteed to remove 90% 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.

**LINE SEPARATOR CROSS SECTIONAL VIEW OF PEERLESS VANE ELEMENT**

- **Figure D**: Peerless Line Separators are configured to meet the needs of special applications, including:
  - Stock or custom (VARI-LINE™) designs
  - Fixed or removable vane elements
  - Vane or filtered configurations
  - Multi-bank systems
  - Flow distribution manifolds
  - Custom designs

**VANE ELEMENTS AND ASSEMBLIES**

**PRINCIPLE OF OPERATION**

(A) Gas with entrained liquid enters the vessel where the gas expands and entrains the inertial vane and collector.

(B) Vane elements resulting from rapid change in flow direction force the liquid against the vane wall surface. 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 banks.

**MIST EXTRACTOR CONFIGURATIONS**

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

**VANE ELEMENTS**

- **Figure F**: Peerless Vane Elements and Assemblies comprising three double-pocket and single-pocket designs.
HORIZONTAL SEPARATORS

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

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 slug and bulk liquids.
(B) Liquid falls to the bottom of the vessel. Through operating plates into the first sump.
(C) Gas and remaining mist enter the weir separator.
(D) Retaining liquid collected at the bottom of weir pack and is drained by the down-comer pipe.

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

DUAL-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 slug and bulk liquids.
(B) Liquid drizzles into the lower barrel through the first down-comer pipe.
(C) Gas and remaining mist enter the weir separator.
(D) Retaining droplets collected at the bottom of weir 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 through the longitudinal arrangement of elements in the upper barrel. This arrangement ensures slugging is removed.

HORIZONTAL DOUBLE-BARREL SEPARATOR

VERTICAL SEPARATORS

VERTICAL GAS SEPARATOR
- 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 slug and bulk liquids.
(B) Gas and remaining mist enter the weir separator.
(C) The submerged down-comer pipe drains liquids to the bottom of vessel.
(D) Liquid level controllers monitor the collected liquid amounts for efficient liquid discharge out of the vessel.

FEATURES
- Vertical Gas Separators are designed to handle high and low liquid-gas ratios. They are especially recommended for applications where liquid entrainment must be minimised.
- Vertical separators provide smaller vessel configurations often compared to mist pot or other separation devices.

VERTICAL GAS/LIQUID SEPARATOR

VERTICAL GAS SEPARATOR BENEFITS
- Compatiblity with other separation devices
- Variability of flow configurations
- Maintenance friendly design
- Can be horizontal, vertical, or other orientation

PRODUCT PERFORMANCE GUARANTEE
- Guaranteed to remove up to 100% of 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/MMSCF).

PRODUCT PERFORMANCE GUARANTEE
- Guaranteed to remove up to 100% of 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/MMSCF).

PRODUCT PERFORMANCE GUARANTEE
- Guaranteed to remove up to 100% of 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/MMSCF).
**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

**Features**
- Submerged down-comer pipes and seal pack reduce entrainment
- Dowels and liquid level controllers ensure efficient liquid discharge out of the vessel
- No liquid re-entrainment

**Double- or Single Barrel Separators**
- High-efficiency liquid slug removal
- No liquid re-entrainment
- Extremely high gas throughput
- Lower barrel acts as a quiet retention chamber

**Features**
- Double-barrel separators are designed to provide efficient liquid removal. They achieve higher gas-phase 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.

**Vertical Gas Separators**
- High-efficiency liquid removal from gas streams
- Minimal footprint
- High and low liquid gas ratio compatibility
- Available as a retrofit to existing vertical separators

**Features**
- Vertical 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 vertical gas separators are designed to handle large liquid slugs and are easily applied to 3-phase separation. They effectively handle large liquid slugs and are easily applied to 3-phase separation.

**Innovative Designs**
- Cost-Effective Retrofits
- Guaranteed Performance

**Product Performance Guarantee**
- Guaranteed performance ensures reliability over a wide range of applications, ensuring maximum productivity.

**HORIZONTAL SEPARATORS**

**Vertical Gas/Liquid Separators**
- Wide liquid handling operating range
- Gas and remaining mist enter the vane pack and are diverted by quieting plates into the first sump.
- Remaining droplets collected at the bottom of the vane pack drain into the second sump.
- Liquid drains into the lower barrel through the second down-comer pipe.
- The split lower barrel with two sets of liquid level controllers ensures proper discharge of the liquid from the lower barrel.

**Features**
- 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).

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

**Features**
- Double-barrel separators are designed to provide efficient liquid removal. They achieve higher gas-phase 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.

**COLOR BAR**
- 1. Inlet gas
- 2. Inlet liquid
- 3. Outlet gas
- 4. Outlet liquid
- 5. Vane pack
- 6. Quieting plates
- 7. Down-comer pipes
- 8. Liquid level controllers
- 9. Drainage valve
- 10. Liquid level controller
LINE SEPARATORS

PRINCIPLE OF OPERATION

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

CUSTOM-DESIGNED VARI-LINE™ SEPARATORS

For applications where space is a premium and piping limitations prevent the use of a direct, straight-through design most typically used in plant air or gas systems. Latest vane designs from 150mm to 500mm and ratings up to 50 bar are available to meet the needs of special applications, including:

- Multi-stage systems
- Vertical or tilted frameworks
- High pressures
- Multi-vane systems
- Flow distribution manifold
- High flow rates

VANE ELEMENTS AND ASSEMBLIES

PRINCIPLE OF OPERATION

- Condensate-rich gas entering the vane unit is directed into adjacent vertical channels of the mist extractor. Inertial forces resulting from rapid multiple changes in direction.

CROSS SECTIONAL VIEW OF PEERLESS VANE ELEMENT

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

MIST EXTRACTOR CONFIGURATIONS

- Peerless Line Separators are guaranteed to remove 100% of all liquid droplets 8 microns and larger. The outlet gas will contain no liquid.

ENERGY SEPARATION 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 liquid.

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TYPICAL APPLICATIONS

- Gas transmission and metering
- Fuel gas conditioning
- Oil mist removal
- Chemical plants
- Amea and urea plants
- Compressed air conditioning
- Molecular sieve protection
- SAGD (Steam Assisted Gravity Drainage)
PEERLESS... COMBINING INNOVATION WITH EXPERTISE IN SEPARATOR DESIGN AND FABRICATION

HORIZONTAL SEPARATORS

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
- Gas and liquid entering the vessel are diverted by the inlet baffle to remove slugs and bulk liquids.
- Liquid falls to the bottom of the vessel. Through operating plates, into the first sump.
- Gas and remaining mist enter the vessel.
- Remaining droplets collected at the bottom of the vane pack and is drained by the down-comer pipes.
- Liquid drains into the lower barrel.
- Submerged down-comer pipes and seal pots result in optimal drainage, whilst preventing gas bypass.

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.

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
- Gas and liquid entering the vessel are diverted by inlet baffle to remove slugs and bulk liquids.
- Liquid drops into the lower barrel through the first down-comer pipe.
- Gas entering lower end enter the vessel.
- Remaining droplets collected at the bottom of the vane pack drain into the lower barrel through the second down-comer pipe.
- The split lower barrel with two sets of liquid level controllers ensures proper discharge of the liquid from the lower barrel.

FEATURES
- Double-barrel Separators are designed to provide efficient liquid removal. They achieve higher gas phase 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.

VERTICAL SEPARATORS

VERTICAL GAS SEPARATOR
- 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
- Gas and liquid entering vessel are diverted by the inlet baffle to remove slugs and bulk liquids.
- Gas and liquid entering vessel are diverted by the inlet baffle to remove slugs and bulk liquids.
- Liquid droplets collected at the bottom of the vessel.
- Liquid level controllers 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-gas ratios. They are especially recommended for applications where low liquid entrainment is critical.
- The use of proprietary devices provide smaller vessel configurations often compared to multi-pot or other separation devices.

Innovative Designs
Cost-Effective Retrofits
Guaranteed Performance

PRODUCT PERFORMANCE GUARANTEE
- Peerless separator design guarantees that our separators are designed to remove 100% of all liquid droplets at a specific capacity. 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)

PRODUCT PERFORMANCE GUARANTEE
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PRODUCT PERFORMANCE GUARANTEE
- Peerless separator design guarantees that our separators are designed to remove 100% of all liquid droplets at a specific capacity. 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

PRINCIPLE OF OPERATION

(a) Gas with entrained liquid enters the vessel below 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.

CUSTOM DESIGNED VANE-LINE® SEPARATORS

Vane-separator-liner.png

For applications where space is a premium and piping limitations prevent the use of a straight through line separator, Peerless Vane-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.
- Standard 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 pressure.

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.

PRINCIPLE OF OPERATION

(a) Contaminated gas entering the vane unit is directed into adjacent vertical channels, resulting in rapid multiple direction changes.
(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 pack, liquid flows down the pockets, and collects at the liquid reservoir.
(d) Clean gas exits the tail-end of the vane pack.

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.

VANE ELEMENTS AND ASSEMBLIES

CROSS SECTIONAL VIEW OF PEERLESS VANE ELEMENT

Vane profile terminology.png

- Double V Bank
- Four Bank
- Eight Bank

VANE PROFILES

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

LINE SIMPLIFIED

CROSS SECTIONAL VIEW OF HORIZONTAL SEPARATOR

Horizontal separator.png

- Horizontal separator
- For handling high liquid rates and large slugs

LINE SIMPLIFIED

CROSS SECTIONAL VIEW OF VERTICAL SEPARATOR

Vertical separator.png

- Vertical separator
- For slug removal applications and small footprint installations

TYPICAL APPLICATIONS

- Gas transmission and metering
- Fuel gas conditioning
- Oil mist removal
- Chemical plants
- Ammonia and urea plants
- Crescent bolted equipment
- Molecular sieve protection
- SAGD (Steam Assisted Gravity Drainage)