

The logo features a red icon of a mist eliminator on the left, followed by the word "AMACS" in a large, bold, black sans-serif font, and "Mist Eliminator" in a smaller, black sans-serif font below it.

AMACS
Mist Eliminator



Installation Guide

The AMACS logo, consisting of a red icon of a mist eliminator followed by the word "AMACS" in a large, bold, white sans-serif font.

AMACS

AMACS Mesh Mist Eliminators are designed to provide exceptional performance in a wide range of applications. A proper installation is required to realize this performance. Proper installation involves a degree of common sense. However, this guide provides numerous helpful hints and recommendations that will simplify your installation and answer the most common questions we receive from customers.

AMACS Process Tower Internals appreciates and thanks you for your business. AMACS technical representatives are always available to assist you if questions arise during your installation. Our contact number is 800-716-1179.



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Key Observations Before You Begin

Your AMACS Mist Eliminator Mesh is oversized slightly to ensure a snug fit between the vessel wall and the mesh. Grids are undersized to provide clearance from the vessel wall. Over sizing the mesh will also compensate for a vessel's out of roundness. Any gaps between the vessel wall and the mesh will diminish efficiency and hamper mist eliminator performance. A tight fit ensures optimum mist eliminator performance.

Mist eliminators are manufactured from knitted wire, and it is important to maintain as much "spring" and uniformity as possible. Avoid any cutting or puncturing of the mesh during installation to assure optimum performance and service life.

Please Note:

The following information contains general guidelines. No guarantees and warranties are expressed or implied. Disregard of these guidelines or a modification to any product without written consent from AMACS may invalidate any warranties. If you have questions, please call 1-800-716-1179.

Step One

New Mist Eliminator Inspection

Check the Shipment

Always make sure you have the right mist eliminator for the job prior to doing anything, especially removing the old mist eliminator. Always check your shipment to make sure you have received the correct size and installation hardware (if ordered with the job) and for potential mist eliminator damage. Upon receipt of an AMACS mist eliminator, inspect and verify the dimensions. Also check for any hardware and documentation that is part of the order. If drawings are present, make sure that the mist eliminator corresponds to the drawing.

Mist Eliminator Storage

Store in a clean environment. Dust, sand and other contaminants may foul the mist eliminator. A warehouse is recommended for long term storage.

Ready to Install

Lay out the sections of the mist eliminator in a clean area close to the vessel. For dual density pads, check tags for correct orientation of flow direction.

By laying out the mist eliminator pieces you can confirm you have the right size, all of the pieces, etc. before you move any further forward. You can also make a better installation game plan when the time comes.

Keep in mind the mesh pad will be manufactured slightly larger than the diameter of the “to be installed into” vessel.

Step Two Removing Existing Mist Eliminator

(For new process vessels proceed to page 6.)

When replacing a mist eliminator, it is a good idea to study how the existing one was installed prior to any actual removal procedures. Compare the existing pad to the pad you have laid out on the ground. Some installers even like to orient or turn the new pad into the exact position as the pad that is to be removed for reference purposes later on. This is also an opportunity to inspect the old pad for indications of excessive corrosion or fouling, which can cause dislodged sections. Your AMACS engineer can assist you with recommendations to upgrade the materials and implement process improvements. AMACS can provide systems that include dual-density mesh pads, wash systems, mesh/vane combinations and relief doors.

If the existing pad was built in sections, pull the center section area first. Remove one section at a time and remove section by section to avoid accidentally dropping anything. Remember that a properly installed mist eliminator is going to fit snug

so pulling the center section may require a more aggressive tug. Once the center section is removed, the other sections should remove much more easily.

After removing all of the mist pad sections, it is important to carefully inspect all of the support structures. Look for cracks, excessive corrosion, and damaged support hardware. Repair all defects that might impair the proper installation and operation of the new mist eliminator. Make certain the existing supports are suitable for your new mist eliminator, taking note as to what hold down hardware you will be employing.

Safety Considerations:

- Prior to entering any vessel, it is important that confined space entry requirements have been met, and all federal, state and industry safety regulations have been addressed.
- Mist eliminators are not designed to support a person. Do not step directly on a mist eliminator. Place boards across several sections to distribute weight. Verify that spans of more than 6' have heavy-duty metal grids or intermediate supports.

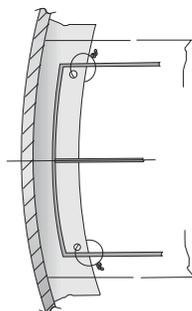


Hold Down Options

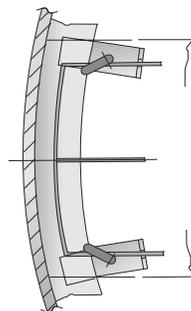
Tie Wires

Tie wires are the most common and simplest way of attaching the mist eliminator to its supports. The tie wires are typically .051" in diameter and are made of the same material as the mesh. This can be achieved by looping the tie wire between the bottom support grid and the annular ring hole and twisting the ends to tie it in place. (Do not run the wire through the mesh, just the support and grid.) Tie down the four corners of the grids in each section. Annular ring hole spacing is typically 4" to 5" apart with 1/4" diameter holes.

For plastic mesh materials, use several loops of tie wire. AMACS recommends optional Tefzel™ tie straps as a more secure fastener.



Tie Wires



J-Bolts

J-Bolts

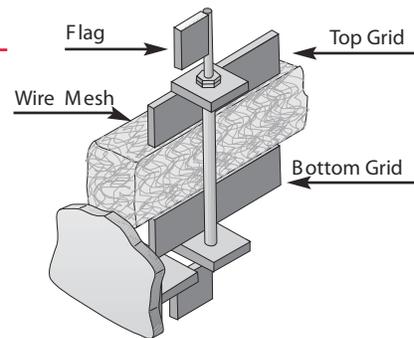
J-bolts can be used instead of tie wires and are stronger. The hook portion of the "J" connects around the mist eliminator's bottom grid, extends through a clamp or holes in the annular ring and is secured by a nut and lock nut. Once again, 4 bolts should be used per section. Another variant is a "welded stud."

Please Note:

It is important that your J-bolt connections are secure and can withstand heat and vibration. We recommend double nuts or locknuts.

Latch Keys

Latch Keys can be used to secure a mist eliminator when having to work from the top, and access to the bottom is not possible. Simply turn the flag toward the vessel wall and tighten the double lock nuts.



Optional Latch Key

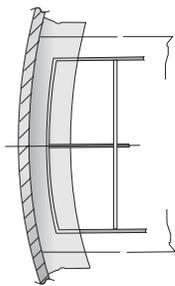
Caution:

If your mist eliminator is installed in a critical or severe service, AMACS recommends a more secure hold down method. Check with your AMACS sales representative about optional relief doors, heavy duty grids and other special features.

Hold Down Options

Dual Support Rings

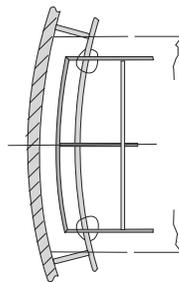
Dual support rings have removable ring sections on the manway side. After the last mist eliminator section is installed, bolt the ring sections into place. Dual support rings are more common for topside installations but are also used in bottom installations. Dual support rings also help prevent wall bypass.



Dual Support Rings

Offset Rings

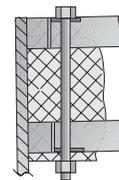
Offset rings are held away from the vessel wall by a standoff. Secure the mist eliminator using tie wire or J-bolts and clamps.



Tie Wire with Offset Ring

Pipe Sleeve and Spacer Bolt

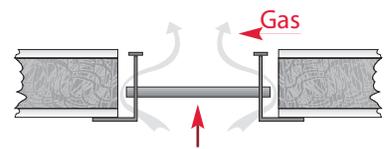
These designs have through-bolt sleeves that run through the mist eliminator spacer bolts. Although more secure for process upset applications, these designs are not recommended because they are difficult to install (matching up the holes particularly in replacement applications) and often distort the mesh and allow gas by-pass. Instead AMACS recommends either dual support rings or J-bolts.



Through Bolts

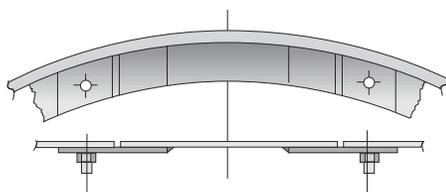
Relief Doors

Relief doors can be incorporated into your mist eliminator design for fouling service to prevent blowout in upset conditions.



Relief Door

Relief door moves up and down on the guiderods

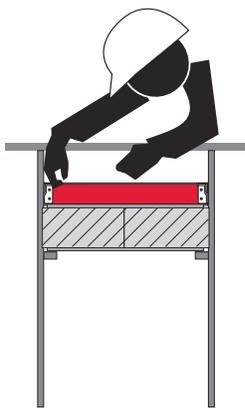


Removable Section of Support Ring

Hold Down Options

Hold Down Bars

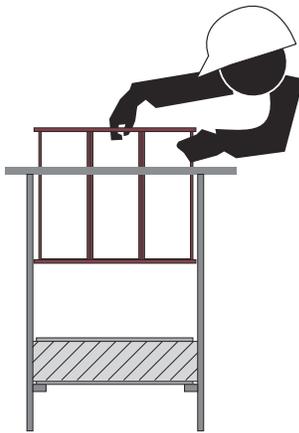
Hold down bars bolt into position above the mist eliminator after it is installed and are an effective means to keep the mist eliminator pieces intact.



Hold Down Bar

Basket Cages

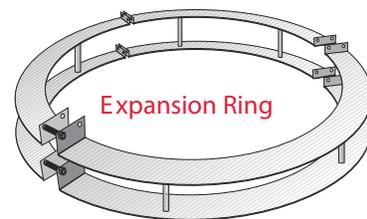
Basket cages for one-piece mist eliminators are held in place by the vessel top flange. You simply slide the cage on top of the mist eliminator and fasten the head or top flange, when installing one-piece mist eliminators.



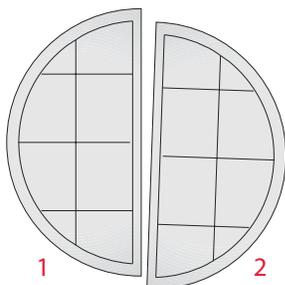
Hold Down Basket

Expansion Rings

Expansion rings can be used for either a support ring or a hold down ring when welding to the shell is a problem.

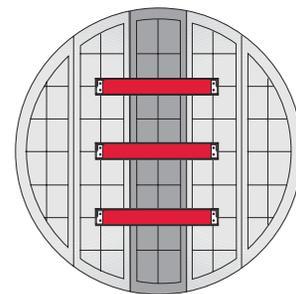


For mist eliminators installed in small diameter vessels with a flanged top, the pad must be made in two sections to clear hold down bar clips welded to shell.



Hold down method with exit above mist eliminator

If installers must exit from manway above the mist eliminator, install mist eliminator tie wiring from below working from the outer sections toward the center. Install the last section from the top and secure to adjacent sections by placing 3 hold down bars (1/4" x 1" flat bar) across the last section installed and tie wiring or J-bolting to adjacent sections.

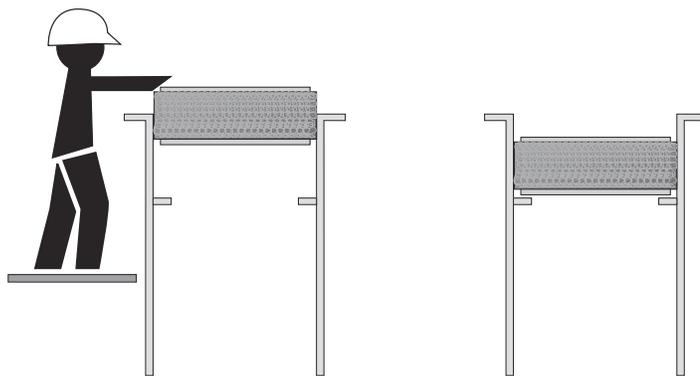


Manway Section and Hold Down Bars

Step Three Installation

One Piece Mist Eliminators

Any fastening method except J-bolts can be used for one piece mist eliminators. For new vessels make sure the vessel walls are smooth and free of weld splatter and other debris before pushing the mist eliminator into the vessel. Keep in mind the mesh diameter should slightly exceed the vessel diameter to ensure a snug fit.



Installing Multi-Section Mist Eliminators in Vertical Vessels

Larger AMACS Mist Eliminators are manufactured in manageable sections to facilitate installation through the manways of vessels. Remember to have the new mist eliminator “set up” outside the vessel before you begin.

Please Note:

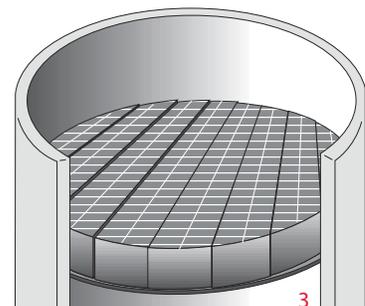
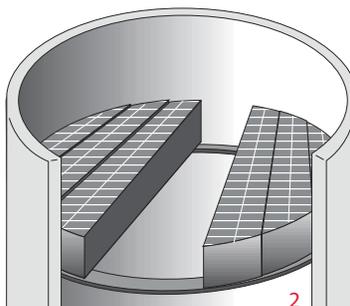
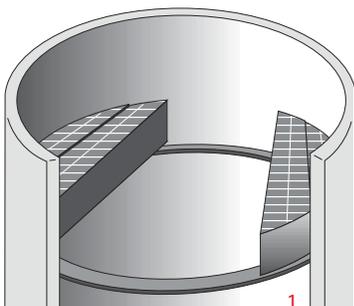
With last sections expect resistance. Some installers use a thin piece of sheet metal or cardboard sized to fit the last section to help slip it into place. With opposing rough mesh services, you will need to push or pull alternating ends of the last section of the mesh pad to fit it in. Keep in mind a compressed fit is necessary for optimum mist eliminator performance. (See figure, p.12.)

Vessels with Single Support Rings

1. Before installing any sections, mark lines on the support ring that indicate where each section edge should sit. Align the sections in accordance to your marks as you install each section.
2. Work from the outside in on each side by placing the end sections on top of the support ring.
3. Compress the installed sections to fit your measurements and keep opposing sections parallel.
4. Use a hold down to secure each section after it is properly in place.
5. Move toward the center as you add sections until only one section remains. Use sheet metal or cardboard to facilitate installation.
6. If you are installing from below, lift the entire last section through the void space between the opposing pad sections, position it carefully and then pull it down into place.
7. If you are installing from above, simply push the section into place after a careful alignment.

Large Pads :

For large pads, total compression can be several inches. It is very difficult to “work out” all of the compression when installing the last section. AMACS recommends this easy method: Loop tie wire around adjacent grids as the sections are installed. This loop should be close to the down rods, where the mesh is fixed to the grids. Twist the tie wire, pulling the grids towards each other, until the grids of each section are spaced 1 1/2” apart. Using this procedure will ease installation of the last sections.

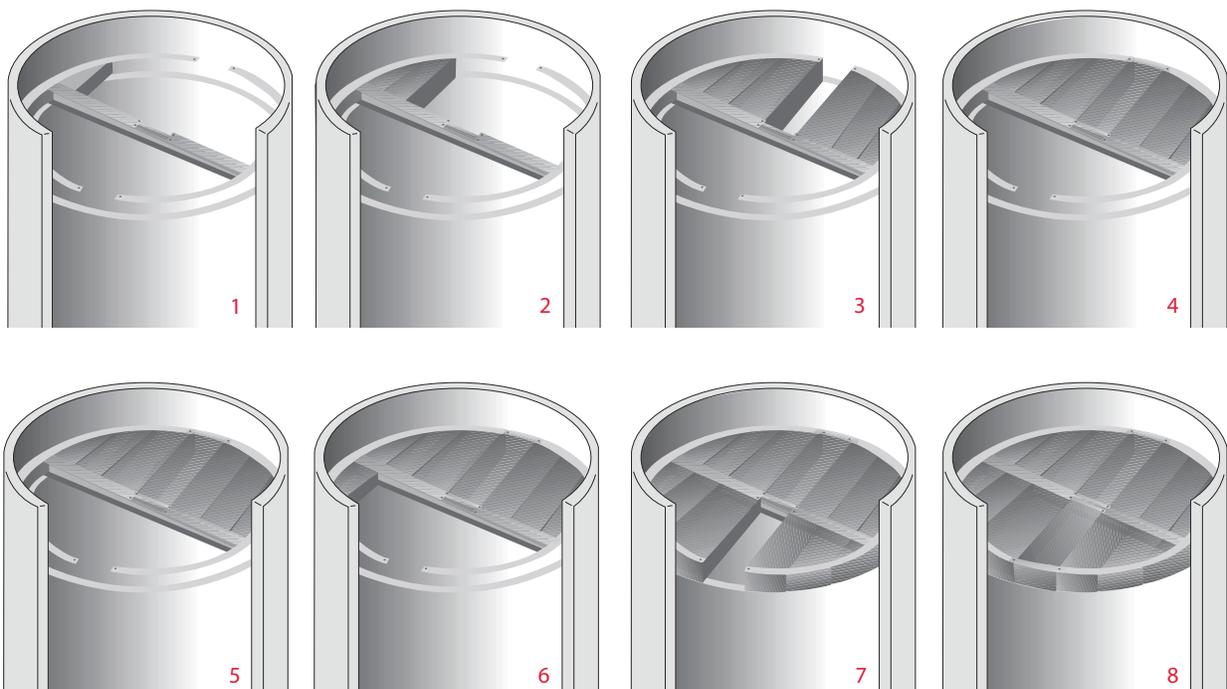


Installing Multi-Section Mist Eliminators in Vertical Vessels

Generally with this type of support design, support rings secure the mist eliminator sections from below and above. Wider vessels may also have a center support beam or beams. With standard metal grids AMACS does not recommend greater than a 6 ft. span between support beams (for plastic grids a 3 ft. maximum span). Use greater care when installing plastic mist eliminators to avoid breakage. The top ring and support beams have removable sections for removing and replacing mist eliminators.

Vessels with Dual Support Rings

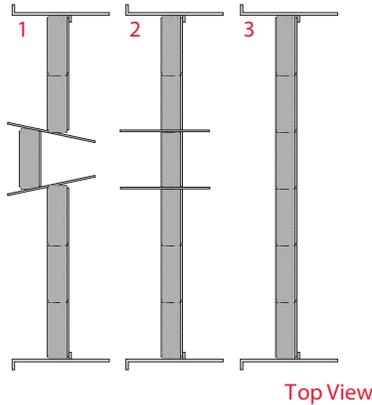
1. Mark lines on the support grids that indicate where the mesh sections should sit. Align the sections in accordance to your marks as you work from the vessel wall inward, one side of the vessel at a time.
2. Compress the installed sections to fit your measurements and keep the opposing sections parallel. Use C-Clamps or an equivalent on the ring to hold the sections in place as you proceed.
3. To install the final section, make a simple installation aid using two thin pieces of sheet metal or some smooth yet strong material that extends the length of the section and is taller than the section. You may even wish to cut handles in the aid. Place the installation aids on either side of the mesh to reduce the friction of the mesh surfaces. A compression fit is necessary, so expect resistance as you push the final section into place. Push the section in and pull the aids out.
4. Replace the removable section on the support ring and beam(s).



Installing Multi-Section Mist Eliminators in Horizontal Vessels

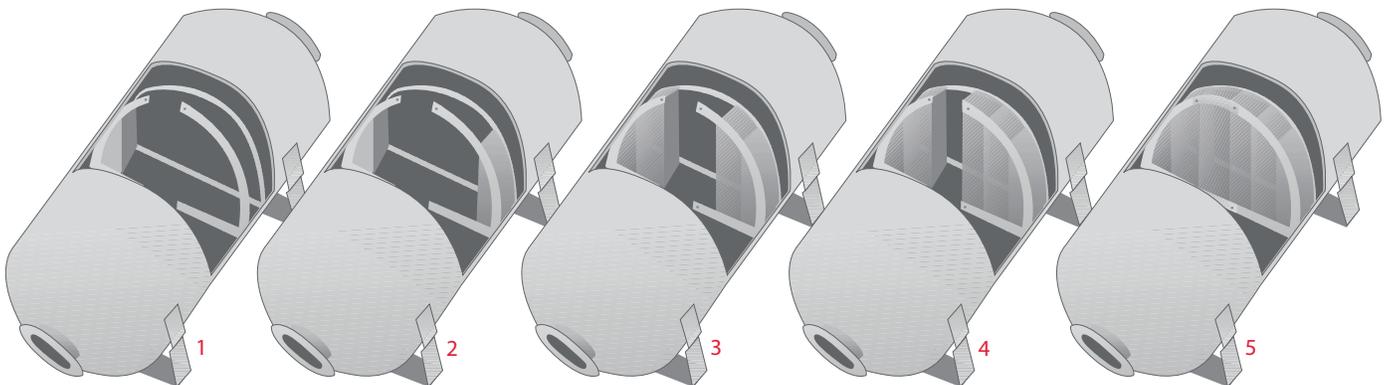
Mist eliminators are generally secured by two support rings. The ring on the manway side will have removable sections to allow access to the mesh pads. Other fastening methods may be used if there is only one support ring. In horizontal vessels we recommend vertical seams to prevent settling.

Installing Final Section:



Horizontal Vessels with a Vertical Mist Eliminator

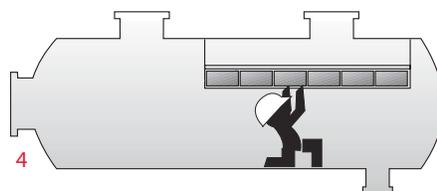
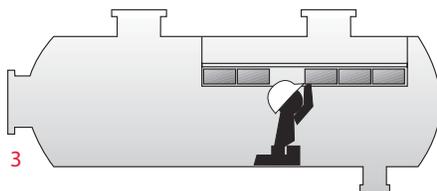
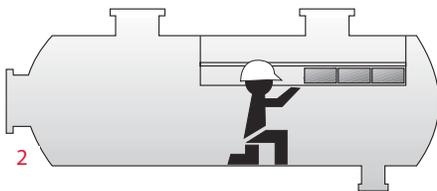
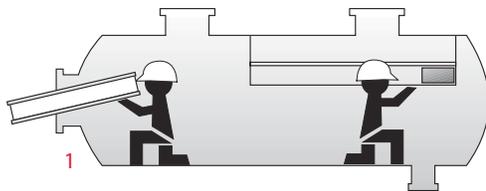
1. Mark the support ring and beams indicating where each compressed section of mesh should sit.
2. Work from the vessel wall toward the center aligning each compressed section to your support ring and beam marks.
3. To install the final section, make a simple installation aid using two thin pieces of sheet metal or some smooth yet strong material that extends the length of the section. You may even wish to cut handles in the aid. Place the installation aids on either side of the mesh to reduce the friction of the mesh surfaces. A compression fit is necessary, so expect resistance as you push the final section into place. Push the section in and pull the aids out.
4. Replace the removable sections on the support ring and beam(s).



Installing Multi-Section Mist Eliminators in Horizontal Vessels

In this configuration the mist eliminator is mounted inside a housing below the gas outlet nozzle.

Common hold down methods include tie wire, J-Bolts, double annular rings and hold down beams. Each mist eliminator support structure (beam or strut) will most likely employ some sort of removable section.



Horizontal Vessels with Horizontal Mist Eliminators

1. Mark the supports to indicate the position of each section.
2. Start at the ends, making sure each section is properly aligned, compressed and tied down securely. Move toward the removable section, adding sections to both sides until the final section remains.
3. To install the final section, make a simple installation aid using two thin pieces of sheet metal or some smooth yet strong material that extends the length of the section. Place the installation aids on either side of the mesh to reduce the friction of the mesh surfaces. A compression fit is necessary, so expect resistance as you push the final section into place. Push the section in and pull the aids out.

Final Notes:

Make certain and check your work when you complete installation procedures.

1. Check for any gaps between sections. A uniform compression fit throughout the mist eliminator is important.
2. Check to make sure your tie-downs are secure and even with one another. Make sure the rings and beams adequately support your mist eliminator.
3. If your mist eliminator is of a dual density design, make certain all of the sections are installed with the correct flow orientation.
4. Be sure to remove all tools and installation materials before start-up.

Maintenance and Cleaning

Routine Maintenance

Solids in a mist eliminator will eventually cause plugging, leading to excessive pressure drop and reduced performance. A cleaning regimen is a good idea and as with any piece of equipment, should be performed before accumulations or plugging severely affect mist eliminator performance. AMACS can design integral spray systems to continuously or intermittently wet the mist eliminator to minimize plugging issues.

Spraying with cleaning liquids, boiling or soaking, or passing steam will help clean the mist eliminator. In choosing any of these options, be sure that they will not damage the mesh pad.

Removing Fouled Mist Eliminators for Cleaning

To achieve thorough cleaning, it is often helpful to remove the mist eliminator. Keeping a spare mist eliminator is ideal in such situations.

Important Note:

When your mist eliminator is removed, examine the cleaned mesh carefully for corrosion and reduced wire diameter. When your mist eliminator is new, it is a good practice to measure the wire diameter using a micrometer. When you reach a 20% reduction in wire mass, replacing the mist eliminator should dramatically increase your efficiency.

Depending upon the degree of plugging (for instance coking or polymerization), it is often more economical to go ahead and replace the mist eliminator. Contact your AMACS separations specialist if you are experiencing continuous plugging problems, dislodged sections and short intervals between maintenance. Alternative design selections such as dual density mesh pads, spray systems, mesh/vane combinations and relief door options may extend your maintenance intervals. In severe fouling applications, AMACS recommends you consult with your separations specialist for more secure hold down options.



Troubleshooting

Monitoring pressure drop across the mist eliminator may be the best option for determining acceptable operation. It is a good practice to record initial pressure drop at start-up under clean conditions for future observation.

In addition to pressure drop, monitor downstream process conditions, particularly after an upset. Increased liquid accumulation in downstream low points or vessels may indicate bypassing through the mist eliminator. Decreased pressure drop may indicate holes in the mist eliminator.

AMACS mist eliminators are manufactured under strict conformance and quality control guidelines. They are designed to provide optimum performance in a variety of process applications. If you are experiencing chronic plugging problems or frequent maintenance, contact your AMACS separations specialist. Alternative mesh selections may extend your maintenance intervals.

Note:

For mist eliminator design and performance information, ask for the AMACS Mesh and Vane Mist Eliminator brochure.

- If pressure drop increases more than an inch of water column above start-up conditions, some sort of plugging is most likely taking place. To rectify the situation, clean the mesh pad.
- When pressure drop decreases across the mist eliminator, there are likely holes or voids in the pad or significantly reduced mesh density. Corrosion over time will reduce the mesh wire diameter, mesh density and in turn reduce pressure drop. Gaps in the mesh pad will cause channeling and a significant reduction in collection efficiency.



Other AMACS Products

When it comes to effective mass transfer separations and pollution control, come to AMACS Process Tower Internals. With the full range of separation products, we offer individual components or turnkey systems built to your specifications and/or performance requirements.

MESH and VANE MIST ELIMINATORS

from knitted mesh pads to vane mist eliminators. We also manufacture our patented MistFix® insertion cartridge mist eliminator for applications where vessel access is prohibitive.



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many designs available including diffuser plates and cyclonic type distributors.



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for gas liquid contacting in distillation, absorption, and stripping applications—valve, sieve, bubble cap & special designs.



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to facilitate mass transfer under a wide range of applications.



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STRUCTURED GRID PACKING

for severe fouling applications



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we manufacture a variety of mesh and plate internals as well as turnkey systems for liquids and oil/water separations.



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