Overview

Mist eliminator louvers are used for air intakes for separation of water droplets, moisture and some salt spray from the air stream. This reduces corrosion, mold and other moisture related problems, and usually mean reduced maintenance and significant savings for the owner.

Models:

- DRS-F and DRS-G
  - Standard mist eliminator
- DRSL-F and DRSL-G
  - Mist eliminator with weather tight hatch
- SSvent-FS/DRS-G
  - Mist eliminator with integrated shut off damper.
- DRS-FiMO-F and DRS-FiMi-F
  - Mist eliminator with filter – prefabricated modules
- DRS-FiZO-F and DRS-FiZi-F
  - Mist eliminator with filter – filter from roll, tailor made sizes
MIST ELIMINATOR LOUVERS

DRS - F

DRSL - F

NYBORG AS
N-6230 SYKKYLVEN, NORWAY
TEL +47 70 25 40 80 - FAX +47 70 25 29 08
office@nyborgfan.com - www.nyborgfan.com
Performance:
Recommended face (gross) air velocity is 4,5-5 m/s. For louvers with e.g. area < 0,3m² it is recommended to reduce this velocity by 5-10% due to smaller net area.

Calculation of face velocity
Face velocity \( [m/s] = \frac{\text{air flow} [m^3/s]}{B \times H \ [m^2]} \)
(face velocity = air flow / louver gross area)

Pressure drop, material: aluminium (standard)

Pressure drop, material: stainless steel Aisi304/316 (optional)

Water separation
General:
The SSVent-FS is a single stage mist eliminator louver with an integrated closing damper. The louver is made in customer specified sizes.

Applications:
The SSVent-FS/DRS-G is used as an air intake where weather tight closing is not demanded. The damper is primarily intended as a shut off damper, but can also be used as an air volume control / regulating damper.

Design and drain
The louver has vertical profiles with grooves/water traps where the water is led down and drained out to the front (outside) at the bottom of the louver. The damper is operated by lever / regulating arm from the outside. The louver is intended for flange mounting to bulkhead and is penetrating the bulkhead.

Execution
The frame is as standard in mild steel, hot dip galvanized, the mist eliminator is made in sea water resistant alum. All movable parts like damper blades, bolts, shafts, hinges and regulating arm are in stainless steel execution.

Optional material execution
- Frame and mist eliminator louver in sea water resistant aluminium (damper blades in stainless steel).
- Frame and damper blades in stainless steel and mist eliminator louver in alum.
- Complete louver in stainless steel (aisi 304) or aisi 316 execution.

Cut out
\[ W_{\text{cut out}} = W_{\text{louver}} + 50\text{mm}, \quad H_{\text{cut out}} = H_{\text{louver}} + 50\text{mm}. \]
Radius on cut out: max 50mm.

Actuator
As standard manual closing from outside (actuator as standard on the right side). Where access to actuator from outside is difficult an electric or pneumatic fail safe actuator can be used. (See chapter for dampers for more info).

Options
- With wire mesh (12x12x1 aisi316) in front or back side of louver.
- With sand filter in front
- With filter
- Painted (after galvanization).
- Electric or pneumatic actuator for damper.
- With regulating arm on left side.
- With regulating arm from operated from inside.

Special designs:
- With flange on specified placement of louver (louver partly penetrating bulkhead)
- Complete louver designed for mounting on outside of bulkhead
- Without flange for mounting to bulkhead
NYBORG BLADE DAMPER SSVent B x H FS, made of hot dipped galv. St.37. Damper blades and shafts in AISI 316L.

NYBORG WEATHER LOUVRE DRS B x H G, made of high tensile alum. alloy, salt resistant.

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Bulkhead: H + 50 x B + 50

Cutout Bulkhead: H + 50 x B + 50

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R. Berge
4-2104
General
The DRS-F is a rectangular single stage mist eliminator louver for separation of water droplets and moisture from the air stream.
Delivered in customer specified sizes.

Applications
The louver is primarily used as intake louver. Typical examples are engine room intakes, intake for accommodation, cargo hold etc.

Models:
- DRS-F with flange for mounting onto bulkhead
- DRS-G without flange for insertion into steel duct, frame or similar.

Design and drain
The louver has vertical profiles with water traps where the water is led down and drained out to the front (outside) at the bottom of the louver.
As standard the mist eliminator louver is penetrating into the bulkhead.

Execution:
The complete louver is made of sea water resistant alum.

Optional material execution:
Entire louver in stainless steel, aisi 304 or aisi 316L

Cut out:
W_{cut\,out} = W_{louver} + 20, H_{cut\,out} = H_{louver} + 20.
Max radius on the cut out is 35mm. For a bigger radius the louver must be made with wider flanges..

Options:
- With wire mesh behind (or in front of) the louver (12x12x1 stainless steel)
- With sand filter in front for easy removal / cleaning (filter class G2 or G3)
- With filter behind louver (for dust/soot) (G3 or G4)
- With drain pipe either with drain to front or to inside.
- Painted

Special designs:
- With integrated access door (e.g. 800x800mm)
- Hinged execution (entire louver) for access
- For mounting entirely on the outside of bulkhead.
- One or more sides of louver inclined (e.g. triangular shape).
NYBORG HIGH EFFICIENCY DROPLET SEPARATOR
DRS B x H F,
made of high tensile alum.alloy, salt resistant.
Bulkhead Cutout : H + 20 x B + 20
NYBORG HIGH EFFICIENCY DROPLET SEPARATOR

DRS B x H G,
made of high tensile alum. alloy, salt resistant.
MIST ELIMINATOR LOUVER
with weather tight closing

DRSL-F &
DRSL-G
BxH

General:
The DRSL is a single stage mist eliminator for separation of water droplets and moisture with a weather tight hatch. The louver is made in customer specified sizes.

Applications:
The louver is primarily used as air intake / supply louver where you have demand for weather tight closing. It can also be used as an alternative to a shut off damper. Typical applications are intake for accommodation, technical rooms, etc.

Models
• DRSL-F: with flange for bolting to bulkhead
• DRSL-G: without flange for welding to bulkhead (e.g. for curved bulkhead)

Design and drain
The mist eliminator part of the louver has vertical profiles with water traps. The water is led down and drained out to the front (outside) at the bottom of the louver. The hatch can be top-, bottom-, left- or right hinged. The hinges are equipped with grease nipples for lubrication.

Execution
The frame and hatch are executed in mild steel, hot dip galvanized. The mist eliminator part is executed in sea water resistant alum. Locking bolts, toggles and nuts are in aisi 316

Optional Execution.
• All louver in sea water resistant aluminium
• Frame and hatch in stainless steel (aisi 304 or 316), mist eliminator louver in sea water resistant alum.
• All louver in stainless steel (frame, hatch and mist eliminator).

Cut out
W_{cut \ out} = W_{louver}, H_{cut \ out} = H_{louver}.
Radius on cut out: For standard design the louver will not conflict with cut out. If the louver is special designed to penetrate the bulkhead Rmax is 20mm.

Options
• Wire mesh (12x12x1 aisi316) behind (or in front) of louver.
• With sand filter in front of louver
• With filter behind louver
• With locking arm for keeping louver in open position at specified angle (e.g. 30deg) – for top hinged louvers
• With locking bolt for locking hatch to bulkhead (must be welded to bulkhead) (for side- or bottom hinged louver).
• With drainpipe either to outside or to inside.
• Painted (after galvanization).

Special designs:
• Folded hatch (e.g. where space for hatch is limited).
• Divided hatch (e.g. one louver with one bottom- and one top hinged hatch).
• Louver with hatch for 270 deg opening.
• With short frame (louver is partly penetrating the bulkhead).
Weather Louvre with Vertical Blades and Hinged Cover

* Heavy Duty Neoprene Gasket. * Top- or Sidehinged Cover.
* Hinges and Screw Joints in Stainless Design.
* B x H, Measurement for Cutting Torch on Bulkhead.
General
The DRS-F w filter is a two stage intake louver with a mist eliminator louver in front followed by a filter as the 2nd stage. The filter section is made up by prefabricated modules in standard sizes.
The filter prevents soot, dust, sand, insects or salt etc from being sucked into the ventilation system and the rooms to be ventilated.

Applications:
Used for air intake where removal of soot, sand, dust, moisture, insects etc from the air stream is desired. Typically used for engine room intake, accommodation, but can also be used as pre-filter, e.g. for turbo intake.

Models
- DRS-FiMO-F with hinged louver for access to filter from front (outside).
- DRS-FiMi-F with access to filter from inside (back side of louver).

Design and drain
The louver has vertical profiles with grooves/water traps where the water is led down and drained out to the front (outside) at the bottom of the louver. The louver is only made in certain step sizes due to using prefabricated standard filter modules. Standard filters from most filter manufacturers can be used.
For the DRSFaF-F, there is one detachable bar, giving an opening of min 560x900 (WxH) if access to inside is needed.

Execution:
The louver and the filter frame are made in sea water resistant aluminium. The frames for the prefabricated filter usually are made of plastic.

Special execution:
Louver and filter frame in stainless steel.
Mist eliminator louver in alum and frame in stainless steel.

Cut out:
\[ W_{cut\; out} = W_{louver} + 20, \quad H_{cut\; out} = H_{louver} + 20. \]
Max radius on the cut out is 35mm. For a bigger radius the cut out can be increased to +40mm.

Special design.
- Louver and filter section for mounting completely on outside on bulkhead (e.g. if limited space behind louver/filter).
- With access to filter from the side (through inspection hatch).

Filter/Performance
Filter can be delivered in EU 3, 4, 5, 6 and 7 class. The prefabricated modules gives a high effective filter area, superior filtration, lower pressure drop and long time between filter change compared to plan filters

(Filter) Maintenance
When filter has reached recommended pressure drop it should be cleaned or changed.
Time between change of filter will depend of environment for ship operation. A quick locking system makes filter changes quick and simple.

Options:
- Louver equipped with pressure meter for indication of time for filter change.
- Drainpipe, either to outside or inside.
- Wire guard for louver on inside (or outside), 12x12x1 stainless steel.
- Pre-filter (EU2) in front of louver to prolong lifetime for the (more expensive) main filters.
Filters

<table>
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<tr>
<th>Filter characteristics</th>
<th>G3 (EU3)</th>
<th>G4 (EU4)</th>
<th>F5 (EU5)</th>
<th>F6 (EU6)</th>
<th>F7 (EU7)</th>
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<td>Initial pressure drop [Pa]</td>
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<td>85</td>
<td>90</td>
<td>135</td>
<td>140</td>
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<tr>
<td>Rec. final press. drop</td>
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<td>400</td>
<td>290</td>
<td>650</td>
<td>650</td>
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<tr>
<td>Average arresistance</td>
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<tr>
<td>Dust holding cap</td>
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<td>3kg/m2</td>
<td>3kg/m2</td>
<td>6kg/m2/@800Pa</td>
<td>5kg/m2/@800Pa</td>
</tr>
<tr>
<td>Filter suitable for</td>
<td>course dust, insects, sand</td>
<td>also soot, some moisture</td>
<td>also finer soot, some moisture</td>
<td>also moisture</td>
<td>also salt, moisture,</td>
</tr>
<tr>
<td>Depth of filter [mm]</td>
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<td>48</td>
<td>292 (140)</td>
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<tr>
<td>Max rec. face velocity [m/s]</td>
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<td>3,25</td>
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Table 14.1 - filter characteristics

Dimensions:
Only stepwise sizes available. Face area indicated in table.

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<th>620</th>
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Table 14.2: face area as function of louver dimensions.

= not applicable

Calculation of air flow through louver

\[
\text{Air flow [m}^3/\text{s}] = \text{face velocity [m/s]} \times \text{face area [m}^2]\]

Pressure drop

Total pressure drop = pressure drop louver + pressure drop filter.
MIST ELIMINATOR LOUVER
with FILTER, Prefabricated filter modules
Hinged for access from front

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Calculation of air flow through louver
Air flow [m³/s] = face velocity [m/s] * face area [m²]
MIST ELIMINATOR LOUVER
with FILTER, Prefabricated filter modules
For access to filters from inside

SECTION A-A

SECTION B-B

Dimensions, WxH [mm], and face area [m²]

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Calculation of air flow through louver
Air flow [m³/s] = face velocity [m/s] * face area [m²]
General
The DRS-FIZO and FiZi are two stage mist eliminator louvers with the filter behind as the 2nd stage. The filter is cloth from roll that is fastened to a frame. The louver can be made in tailor made sizes, but has standard heights in steps of 60mm.

Applications:
Used for air intake where removal of soot, sand, dust, moisture, insects etc from the air stream is desired. Typically used for engine room intake, accommodation, but can also be used as pre-filter, e.g. for turbo intake.

Models
- DRS-FIZO-F with hinged louver for access to filter from outside (front).
- DRS-FiZi-F with access to filter from inside (back side of louver).

Design and drain
The louver has vertical profiles, and the separated water droplets are led down and drained to the front (outside)

Execution:
the louver is made in sea water resistant aluminium, while the frame for the filter is as standard stainless steel, aisi 304.

Special execution:
- Louver and filter frame in stainless steel.
- Mist eliminator louver in alum and frame in stainless steel.

Cut out:
\[ W_{cut\ out} = W_{louver} + 40, \quad H_{cut\ out} = H_{louver} + 40. \]
Max radius on the cut out is 60mm. For a bigger radius the louver must be made with wider flanges.

Special design.
- Louver and filter section for mounting completely on outside on bulkhead (e.g. if limited space behind louver/filter).
- With access to filter from the side (through inspection hatch).

Filter/Performance
Filter can be delivered in EU 3, 4 or 5 class. The filter cloth is synthetic filter and is vashable.

(Filter) Maintenance
When filter has reached recommended pressure drop it should be cleaned or changed.
Time between change of filter will depend of environment. A quick locking system makes filter changes quick and simple.

Options:
- Louver equipped with pressure meter for indication of time for filter change.
- Drainpipe, either to outside or inside.
- wire guard for louver on inside (or outside), 12x12x1 stainless steel.
### Filters

<table>
<thead>
<tr>
<th>Filter characteristics</th>
<th>Filter class</th>
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<td>G3 (EU3)</td>
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<td>Initial pressure drop [Pa]</td>
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<td>Rec. final press. drop [Pa]</td>
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<td>Average arrestance [%]</td>
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<td>Filter suitable for</td>
<td>course dust,</td>
</tr>
<tr>
<td></td>
<td>insects, sand</td>
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<tr>
<td>Depth of filter [mm]</td>
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<td>Nominal face velocity [m/s]</td>
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<td>Max rec. face velocity [m/s]</td>
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</table>

*Table 14.3 - filter characteristics*

Pressure drop with depth of filter = 250mm (D=250).

**Calculation of air flow through louver**

Air flow [m³/s] = face velocity [m/s] * face area [m²]

**Pressure drop**

Total pressure drop = pressure drop louver + pressure drop filter.

Pressure drop is based on standard depth of filterbox of 230-240mm. A shorter filter box will give a higher pressure drop.
MIST ELIMINATOR LOUVER
With FILTER, customer made sizes
Hinged for access from front

DRS-FiZO-F
B x H

<table>
<thead>
<tr>
<th>H [mm]</th>
<th>280</th>
<th>340</th>
<th>400</th>
<th>460</th>
<th>520</th>
<th>580</th>
<th>640</th>
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</table>

Dimensions:
- B min 200mm
- H min 280mm
- D (Depth) 180 standard. Min 130mm
MIST ELIMINATOR LOUVER
With FILTER, customer made sizes
Access from inside (back side)

DRS-FiZi-F
B x H

Standard heights in steps of 60mm

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Minimum dimensions:
B min 200mm
H min 280mm