



DRICONPLUS

ON DEMAND
EFFICIENCY

DRIFT ELIMINATOR
FOR COOLING TOWERS AND
AIR TREATMENT UNITS

COTOR

In water cooling and air treatment systems - cooling towers and air treatment units - drift removal efficiency is an issue: failure of interception and removal of water droplets entrained in the existing air stream causes various problems from practical and environmental points of view such as damage to the components the air is going to come across past this point and the likely spread of Legionnaires' disease bacteria.

Drift eliminators

In order to reduce or avoid the issues caused by water droplets entrained in an air stream, the systems mentioned above are fitted with components known as drift eliminators. Many static drift eliminators use the different inertia of air and water flows: by provoking sudden directional changes of airflow, suspended droplets, which have higher inertia than air, will maintain the original direction for a period of time and end up impacting the obstacle which first caused the change in direction. When several droplets accumulate, they create a larger droplet which cannot be airborne thus it will descend.

Over the years, there have been various attempts of improving static drift eliminators; yet no truly innovative product has been achieved.

Currently, the most widely used models are:

- Thin PVC or PP thermoformed surfaces coupled together to obtain modules made of various air flow sections, 130 mm to 150 mm high. The air flow is forced to two sudden changes of direction; after each change of direction droplets can still be drifted on.
- Drawn plastic surfaces, with variable length, approximately 130 mm to 150 mm, coupled together with various types of spacers. The surfaces are arched width wise and often show a snag which stands out at the top of the convexity. The air flow follows the curved surface and the droplets lying on the walls are hampered by the snag.

The drift eliminators made of plastic material available on the market are not likely to feature both critical concepts - a sudden change of direction and a snag past each change the droplets come in contact with which stops them from continuing to travel along the wing with no obstacle.



DRICONPLUS. On-demand efficiency

COTOR SRL, which specialises in components for cooling towers, has devised and produced a **really innovative drift eliminator**: it can be installed also in air treatment units past humidification sections or cooling and dehumidifying batteries.

Made of propylene and obtained by single injection moulding, DRICONPLUS reproduces a single unit of the original metal drift eliminators. These are flat surfaces angled at 45° to the air flow direction, with a 90° deflector facing the incoming air flow where it impacts the surface: this creates a gutter which is needed to collect the water droplets. The surfaces are held by two side supports: this constitutes a single block i.e. a unit.

Appositely designed components make the **coupling of one or more modules easy and secure**. These are arranged following the direction of the airflow, with the surfaces inclined in opposite directions

After coupling, all the modules put together make up a section, a single homogenous unit. Two sections coupled together are a Type A drift eliminator made of "one bend/two faces", three sections create a "two bends/three faces" drift eliminator, four sections are a "three bends/four faces" drift eliminator, etc.

Potentially, sections can be coupled infinitely and at different times.

As a consequence, **the desired efficiency rate can be decided in advance and it can also be varied in case results obtained are not satisfactory or if needs have changed.**

The units are then placed side by side along a plane which constitutes the air passage section. This injection moulded drift eliminator is mechanically robust and easy to handle.

DRICONPLUS is therefore an on-demand drift eliminator.

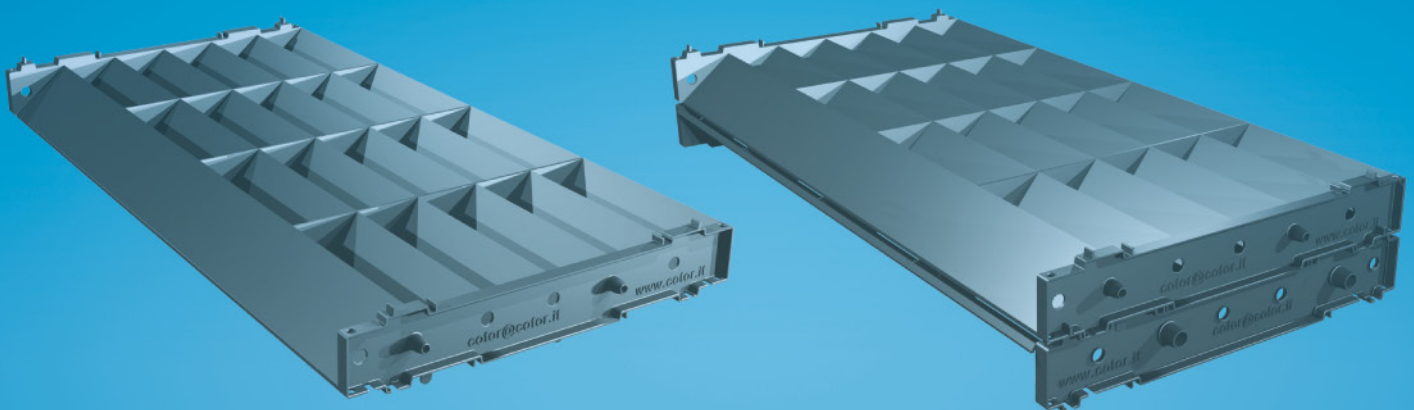
What does this mean?

The drift eliminator can be adapted to meet the desired efficiency rate.

The efficiency rate obtained can be varied during a system's working life in order to meet new needs.

DRICONPLUS is currently the most economical and rational system on the market to limit the discharge of non-productive water in an environmentally friendly way. The sections can be assembled either vertically (for air treatment units) or horizontally (for cooling towers).

Most of the time **DRICONPLUS** can substitute any other inertial type of system currently in use.



Specifications

DRICONPLUS is made of propylene and obtained by single injection moulding

Dimensions:

(+0/-1) 600 mm (length of the directional discharge blades)
300 mm (length of the side supports)
approx. 50 mm (thickness)

Endurance

Up to above 90° C

Advantages

- Retention capacity can be chosen to meet individual needs
- Efficiency can be further increased later on if required
- Interchangeable with nearly all inertial drift eliminators currently in use
- High mechanical endurance
- Light weight
- Corrosion resistant
- Easy cleaning and sanitation

Structure

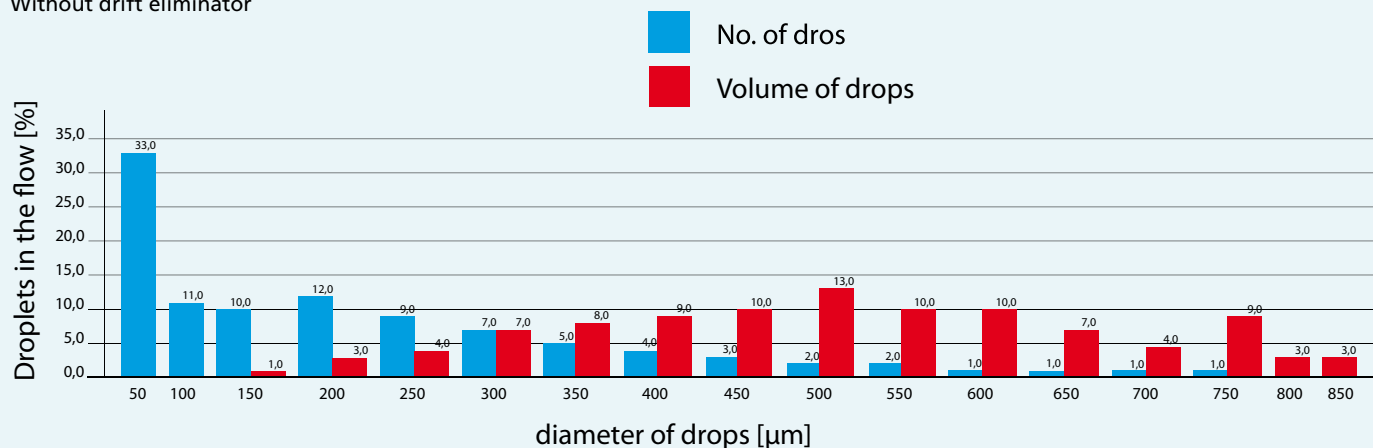
- Side supports
- Directional discharge blades
- Bends/Gutters to retain droplets (discharge side of directional discharge blades) facing the flow
- Coupling and centring system - discharge side (of the airflow)
- Coupling and centring system - inlet side (of the airflow)
- Coupling and centring system - lateral
- No lateral sliding system
- Slots to insert brackets (optional)

Applications

- Forced or induced draught cooling towers
- Air cooling units
- Gas turbine air intake duct

Graph (1)

Without drift eliminator



The valued indicated are rounded off to the nearest integer

The tests carried out by Politecnico di Milano

Checking the efficiency of a drift eliminator can be difficult; as far as we know, in simple applications such as cooling towers, the yield may be stated as a percentage of water NOT retained (lost) out of the circulating water flow.

For a statement to be valid, this should be accompanied by a report which certifies that tests have been carried out under the same conditions of water flow ($\text{m}^3_{\text{water}} \text{m}^{-2} \text{h}^{-1}$), same air speed, and same size of water droplets: this means that the test conditions need to be stated.

At COTOR Srl we have chosen to provide certified indications which refer to precisely defined and stated working conditions: airspeed, water load, size and quantity of droplets.

DRICONPLUS drift eliminator has been tested at Politecnico di Milano (Milan, Italy) and the tests carried out have confirmed the data shown below:

- a) The smaller the diameter of droplets, the harder they are to stop
- b) At the same airspeed, the larger the water flow ($\text{m}^3_{\text{water}} \text{m}^{-2} \text{h}^{-1}$), the larger the amount of droplets entrained
- c) The higher the airspeed, the larger the amount of droplets entrained by the flow

The count of the droplets and their size was obtained by means of laser measurements.

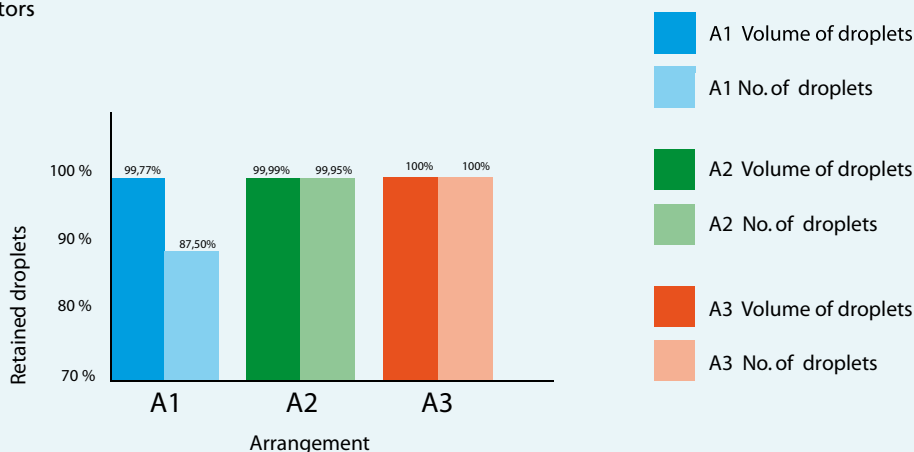
With a water load of approximately $30 \text{ m}^3_{\text{water}} \text{m}^{-2} \text{h}^{-1}$, airspeed of over 3.5 m/s in vertical direction from bottom to top, number of the droplets was counted and their size determined first without any drift eliminator, then with one layer, then two and finally with three layers of drift eliminators.

Graph (1) provides information about the droplets (Volume and Number) in the section without drift eliminators.

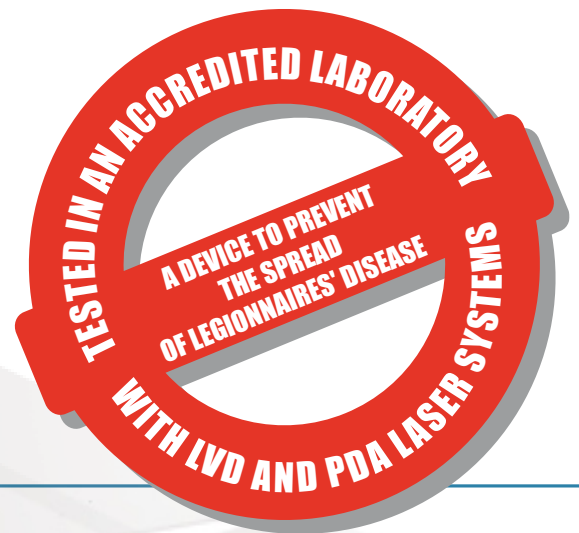
Graph (2) provides information past the drift eliminators; three arrangements are shown: A1 (single layer), A2 (double layer); A3 (three layers).

Graph (2)

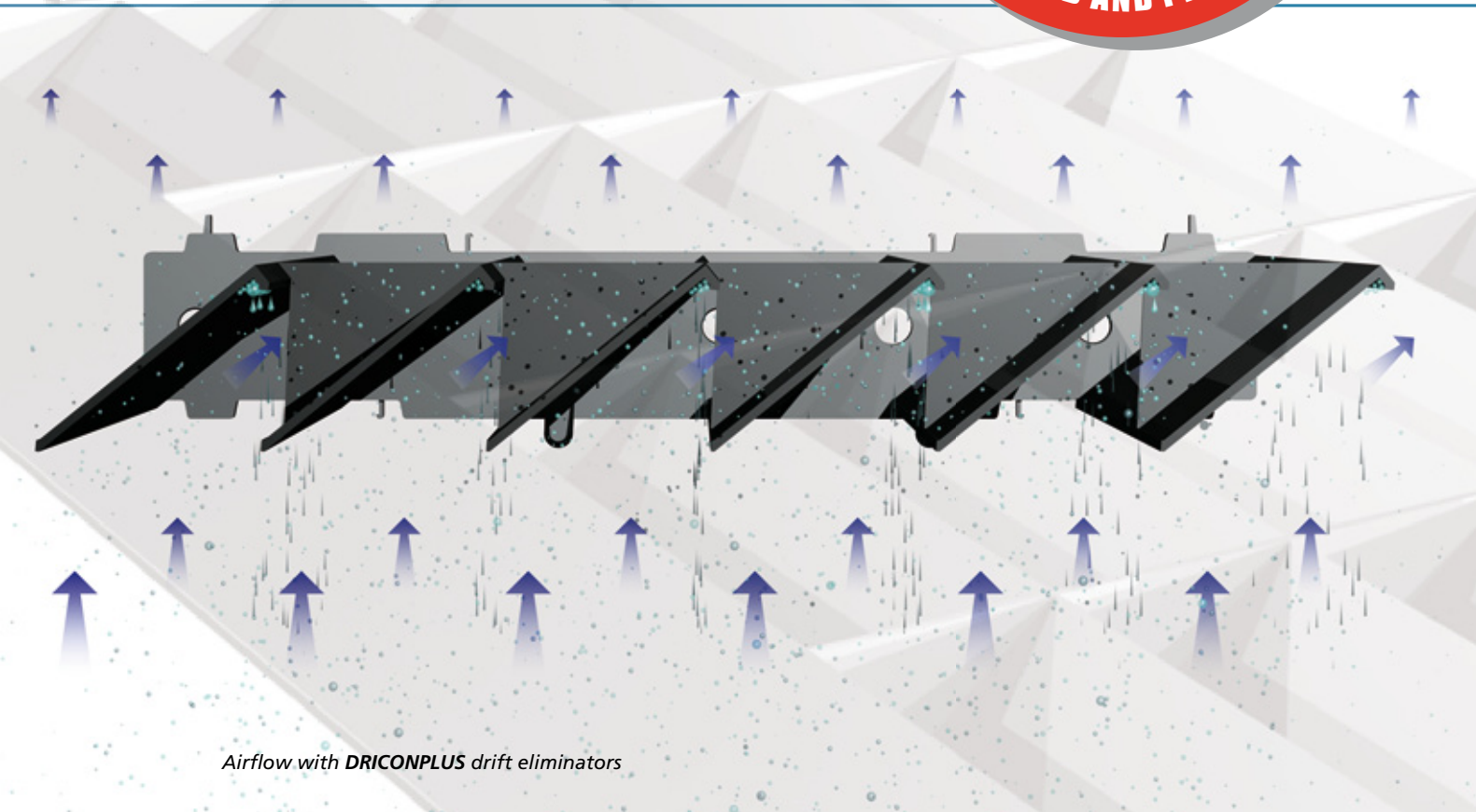
With drift eliminators



Please note: the data reported are for information only and cannot be considered as reference values; upon request, COTOR SRL will provide certified data.



DRICONPLUS. How does it work?



*Airflow with **DRICONPLUS** drift eliminators*

The air flow, which entrains suspended water droplets, runs into DRICONPLUS directional blades and is forced to a sudden change of direction. The water droplets impact upon the directional blades, gather on their surface and at this point their drift – which has been fostered by the airflow - comes to a halt in the gutters located at the end of the surface. The droplets are forced to accumulate and create droplets of greater mass which cannot be airborne thus they will descend.

Environment and sustainability: an environmentally-friendly system

Water consumption in cooling towers⁽¹⁾ can be quantified as follows:

Evaporation

approximately one litre every 600 Kcal/h (0.6977 KW) dispersed

Blow-down

resulting from both the quality of raw water and the type of treatment in use

Drift⁽²⁾

In some countries it is strictly defined; where not imposed, a drift loss of 0.005% of the circulating water has been considered acceptable so far.

Limiting drift loss has gained more and more relevance recently; the reason for this is the need for Public Authorities to control the spread of the Legionnaires' disease.

In addition, the volume of dispersed water should not be underestimated: both the intrinsic cost and the cost for its treatment must be taken into account.

In light of these considerations, **DRICONPLUS** is regarded as having a positive influence on environmental, health and cost-related aspects.

⁽¹⁾ For air treatment units certificates are not available but we believe that the same data obtained in the tests described in the previous apply

⁽²⁾ We would like to point out that, while in this case the percentage refers to the total water load (to be cooled), the percentages measured by Politecnico di Milano and certified by COTOR SRL refer only to the quantity of the droplets contained in the airflow, which are understandably much fewer.

ENQUIRY

Please ask for a detailed offer by specifying the following:

- Length and width of the section to be covered
- Type of section
(horizontal for cooling towers; vertical for air treatment units)
- Required efficiency (see diaphragm page 6)

IMPORTANT

DRICONPLUS drift eliminators are produced in standard dimensions. The gross dimensions for the air passage section are reported on page 5; The area which is going to host DRICONPLUS drift eliminators must be divided by multiples of mm 600 mm and 300 mm. If needed, DRICONPLUS can be mounted to fully cover the section available (only a small area will remain free).

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