

BILLETCOOLER FLEX

With today's standard diameters of up to 40 in., bloom casters place significantly higher demands on cooling compared to smaller formats.

New steel grades and increasing format sizes are significantly more susceptible to cracking, they demand more homogeneous cooling with reduced water flow rates.

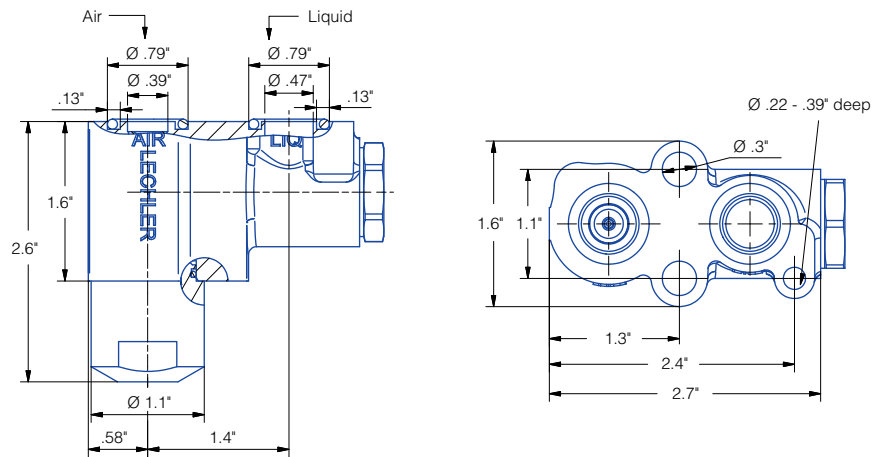
Secondary cooling in continuous casting machines for long products, normally consists of several cooling zones. The nozzle arrangement is usually defined for a specific format range. In order to permit casting of different steel grades under these conditions, the nozzles themselves must have a wide operating window.

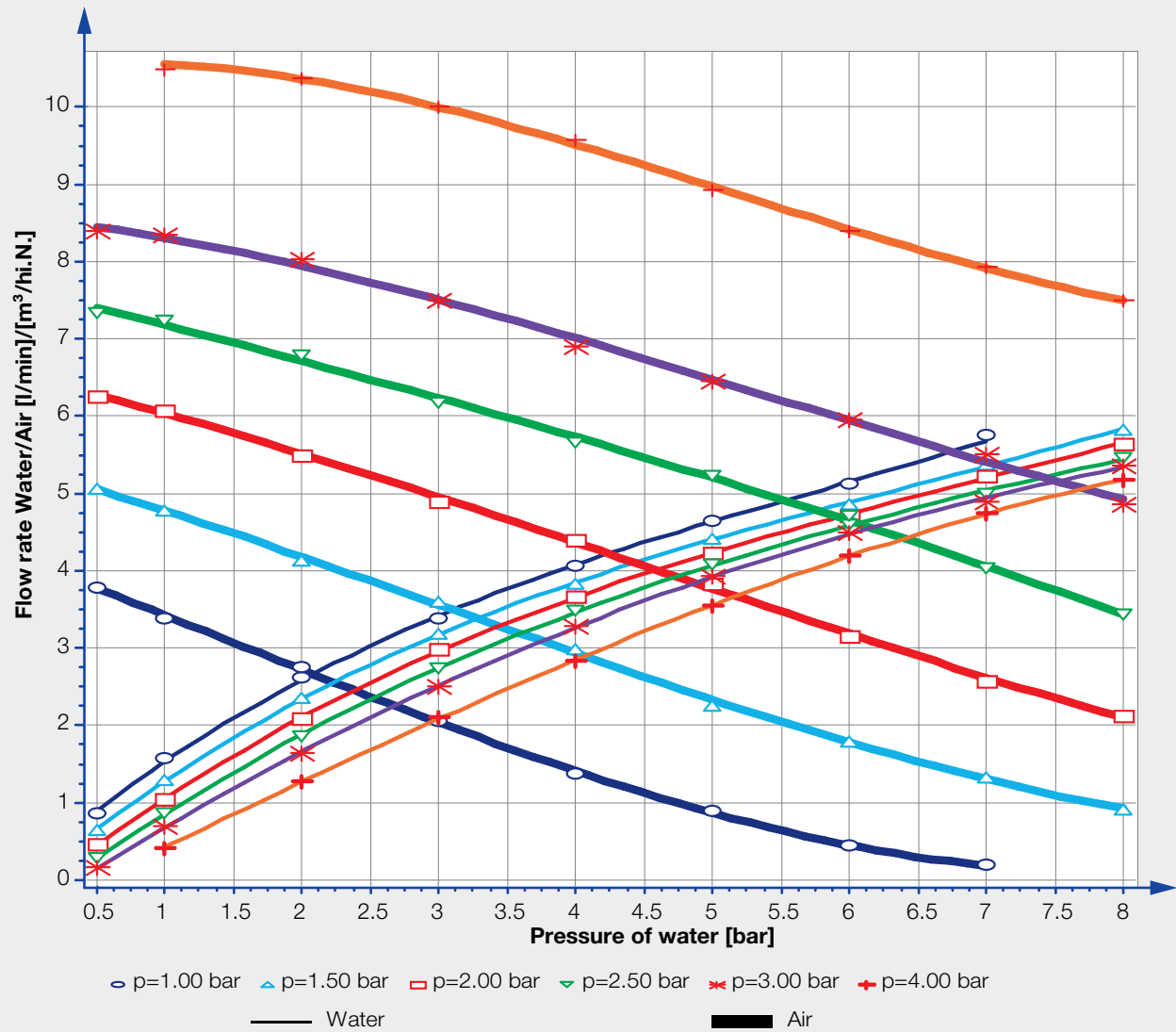
Conventional air mist nozzles quickly reach their limits here. The degree of cooling is determined above all by the flow rate of the cooling water, which is adjusted by means of the water pressure. In the past, however, the spray geometry usually also changed with the water pressure.

A modified spray angle led to a change in the liquid distribution which results in non-uniform cooling.

On newer bloom formats with larger cross sections can result in surface stresses and even cracks in the finished product.

Our goal was therefore to develop a nozzle that guarantees a stable spray angle over the entire turn-down ratio, thereby ensuring optimum cooling.





Typical pressure-flow rate diagram of a **Billetcooler FLEX**® nozzle. The large turn-down ratio of 1:10 (0.5 to 5 l/min) can be clearly seen in the lower curves for water.

The diagram on this page demonstrates the flexibility of the new **Billetcooler FLEX®**. As an example, the selected nozzle size shows the adjustable liquid distributions as a function of the flow rates with indication of the respective air pressures.

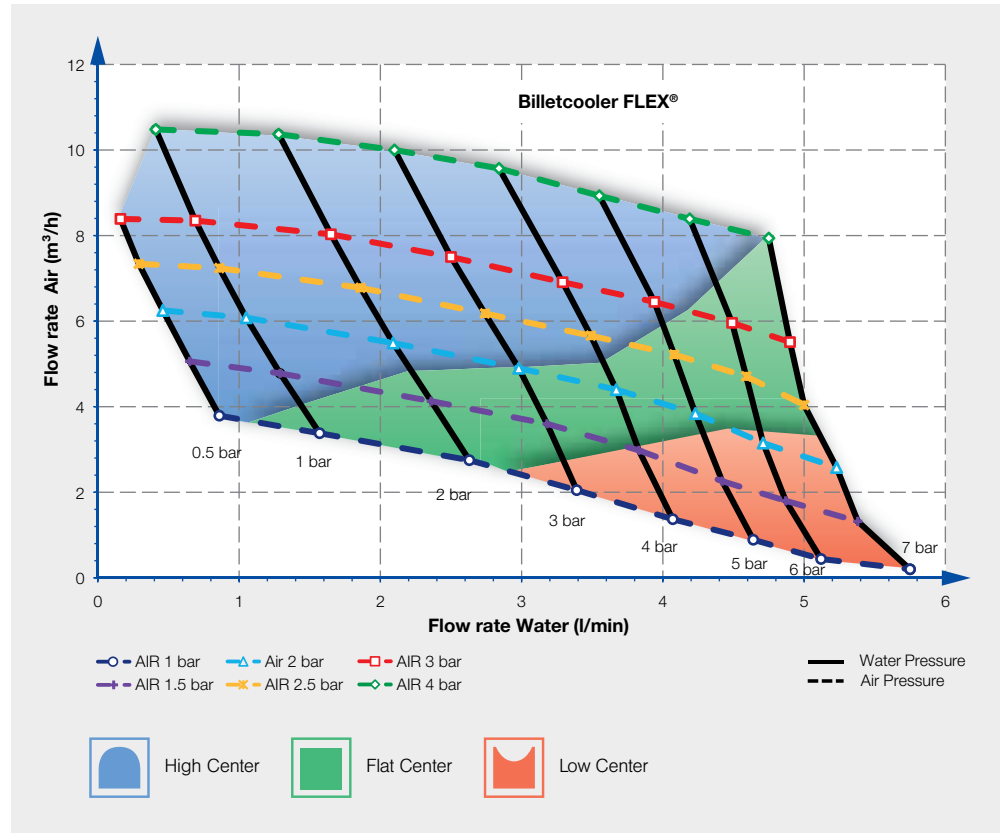
The liquid distribution can be controlled by the correct selection of the air pressures for comparable water flow rates. As described on the previous page, this allows the local cooling to be adapted to the process-specific requirements.

From the diagram, it is possible to see how a large operating range can be covered with varying air and water supply pressures.

The colored areas represent the different spray characteristics of the nozzle.

In the blue area, the liquid distribution is concentrated and decreases towards the edge of the spray.

The green area is characterized by homogeneous liquid distribution, while the spray characteristic in the red area is similar to a hollow cone nozzle with ring-shaped distribution.



Typical flow distribution chart of a **Billetcooler FLEX®**

Flexible water flow rate – stable spray angle

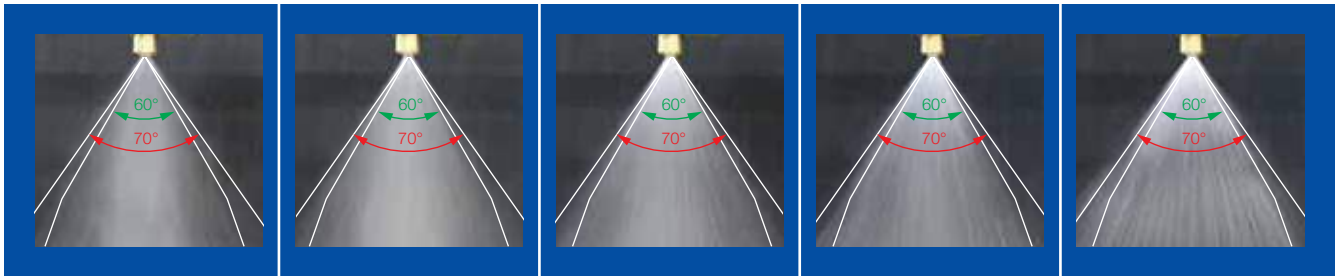
The new **Billetcooler FLEX®** nozzle is characterized by its constant spray angle over the entire turn-down range.

We offer three different nozzle sizes, each with a turn-down ratio (min./max. water flow rate) of 1:10.

Lechler therefore covers the requirements of most bloom and billet casters with just three standard nozzles.

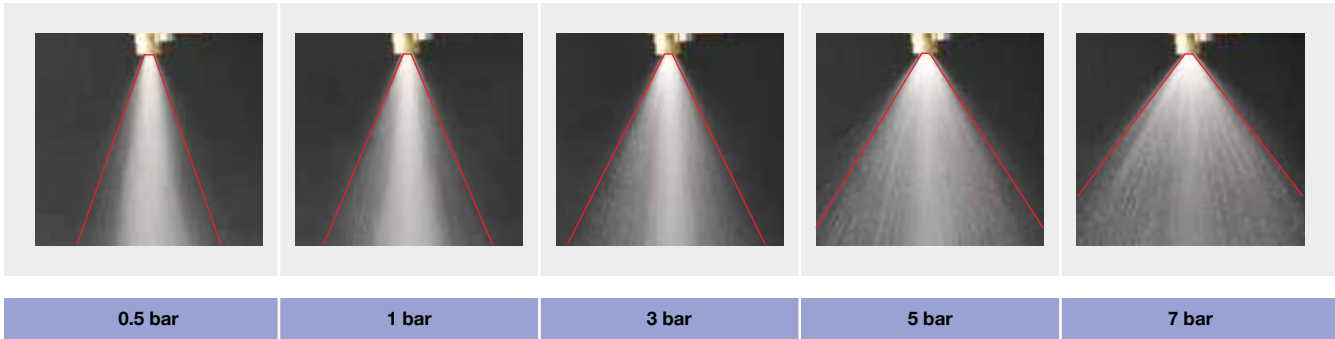
This minimizes the number of different nozzles, reduces logistics costs and helps to avoid maintenance mistakes.

BILLETCOOLER FLEX




Typical example for 60° version

Conventional nozzle



At varying water pressures and with a constant air pressure of 2 bar, the spray coverage of the **Billetcooler FLEX®** (top row) is much more homogeneous than with conventional nozzles (bottom row).

Technical specifications

Spray angle 	Type	Nozzle size	Min. water flow rate [l/min]	Max. water flow rate [l/min]	Narrowest free cross-section [mm]		Material		Weight
					Water	Air	Nozzle	Gasket	
45°	1PM.150.30.33	0.80	0.3	3.0	1.40	1.40	Brass	Viton	0.9 kg
	1PM.150.30.35	1.25	0.5	5.0	1.90	1.90	Brass	Viton	0.9 kg
	1PM.150.30.38	2.00	0.8	8.0	2.15	2.15	Brass	Viton	0.9 kg
60°	1PM.150.30.03	0.80	0.3	3.0	1.35	1.35	Brass	Viton	0.9 kg
	1PM.150.30.05	1.25	0.5	5.0	1.90	1.90	Brass	Viton	0.9 kg
	1PM.150.30.08	2.00	0.8	8.0	2.20	2.15	Brass	Viton	0.9 kg

BILLETCOOLER FLEX® – advantages and benefits

Stable spray angle

The **Billetcooler FLEX®** is characterized by its constant spray angle over the entire turn-down range.

➡ **No strand overcooling or undercooling**

Flexible cooling

With **Billetcooler FLEX®**, the water distribution can be individually adjusted for different formats.

➡ **Optimum cooling guaranteed at all times**

Large free cross-sections

Clog-resistant and maintenance-friendly, thanks to very large free cross-sections for air and water.

➡ **High operating reliability**

New design

All nozzle variants of the **Billetcooler FLEX®** have a forged, space- and weight-saving nozzle body.

➡ **Maintenance-friendly design**

Lower air consumption

Thanks to the new nozzle design, the **Billetcooler FLEX®** requires less compressed air than basic air mist nozzle designs and therefore helps to improve the energy efficiency of the overall installation.

➡ **Reduces operating costs**

Low noise emissions

Compared with conventional nozzles for secondary cooling, the **Billetcooler FLEX®** reduces noise emissions by up to 15 dB.

➡ **Improved work safety**

