Pre-deep drawing lubrication in cookware production

How PNR Italia has improved the distribution of silicone liquid

INDUSTRY
Food and beverage industry

APPLICATION
Lubricating

PROBLEM
Excessive viscosity of the lubricant

SOLUTION
Bi-fluid atomizers with internal mixing

SCENARIO FOR THE SECTOR

The importance of lubrication in the production of kitchen utensils

Lubrication is an essential step in the production process of kitchen utensils, especially before the drawing phase. Deep drawing is the process that transforms the sheet metal disc into the characteristic shape of a pot or pan.
At this stage, **excessive friction of the press could damage the sheet metal** or dies, compromising the quality of the final product.

Lubrication reduces friction, allowing smoother and more precise machining. Moreover, it facilitates the sliding of the sheet inside the molds during the deep drawing. This helps to obtain pots with a uniform surface and free of defects.

In the metalworking industry of cookware production, **the most common lubrication technique is the application of a lubricating coating** on the sheet's surface, which can be in the form of oil, grease, or a mixture of specific substances. The coating is evenly sprayed on both sides of the sheet in this case study.

THE PROBLEM OF OUR CLIENT

The lubrication process is traditionally performed using air/liquid atomizers, which **generate a fog during working hours, creating discomfort for machine operators**.
Recently, a customer contacted us to find a solution regarding the lubrication process in a manufacturer. In addition to the fog generated, there was a problem with ineffective dosing and distribution of the lubricant.

In this production phase, the initial stainless steel material comes as a circular plate placed inside the lubrication system.
During the rotation of the metal disc, the lubricant is sprayed on both sides to create a fan jet. Next, the disc is ready for the drawing process.

PNR ITALIA SOLUTION

We proposed using **our MX bi-fluid atomizers with internal jet mixing** to the customer. They minimize fog formation and ensure accurate lubricant dosing and distribution.

Since the lubricant used is silicone based, which has a low viscous consistency and good fluidity, we suggested the customer **keep the lubricant pressure values almost equal to those of air**.

ADVANTAGES FOR OUR CLIENT

The solution of PNR Italia has been able to minimize fog formation and ensure accurate dosing and distribution of lubricant. This has improved the efficiency of the production process and resulted in a high-quality end product.

After a month of testing, the customer declared himself very satisfied.

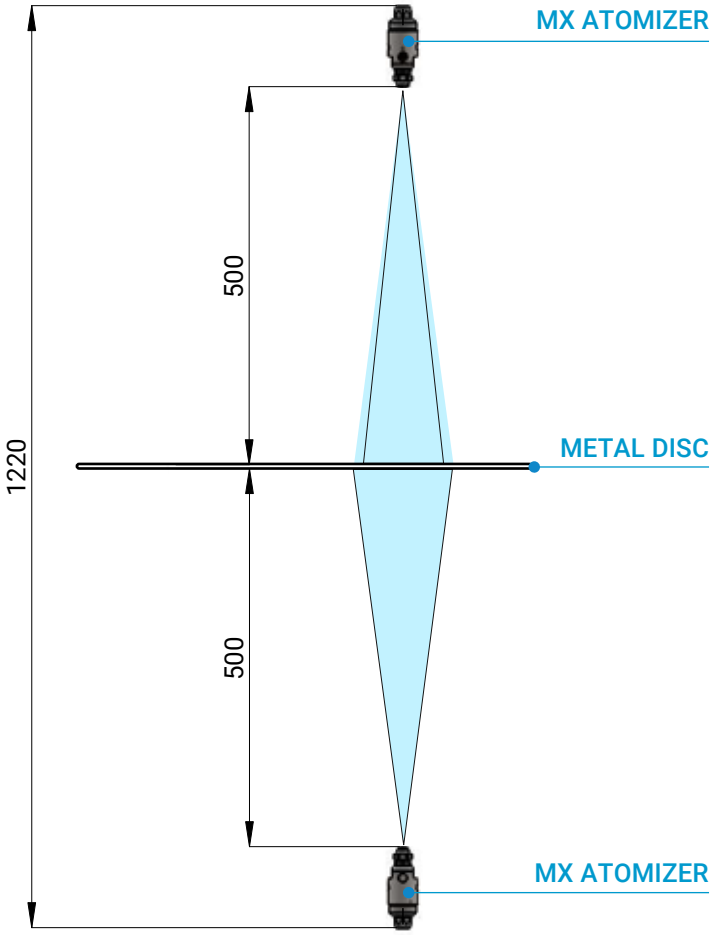
FOCUS ON THE PRODUCT

MX
TWIN FLUID ATOMIZER

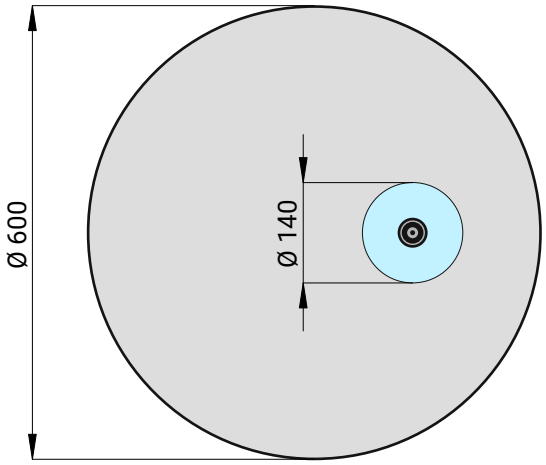
The MX bi-fluid atomizer units from PNR Italia produce an atomized cone-shaped jet with a spray angle of up to 20°.

OPERATIVE CONDITIONS
N.2 MX ATOMIZERS

WATER FLOW RATE	0.46 lpm *@3bar*
AIR FLOW RATE	5.16 Nm³/h *@3bar*
SPRAY ANGLE	15°



SHEET METAL
FRONT VIEW



SHEET METAL
TOP VIEW

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