

The YTRON-Y ByPass system

A simple but effective method of introducing difficult-to-wet powders into a liquid phase.

Problem : Long production times.

We were approached by pharmaceutical manufacturer, **Peter Black Healthcare Ltd.**, to reduce the production time taken by the existing process to incorporate HPMC into water in the production of tablet coating solutions.

Cellulose tends to form lumps of undissolved product with the outside wet and the core dry when made with conventional stirrers. These are also referred to as "fish eyes" These mixers also tend to create foam because of the freely rotating shaft creating a vortex.

Peter Black Healthcare previously used this type of high shear mixer to disperse this powder. This created a lot of foam due to the vortex effect which had to be used to draw the powder to the mixing head. The powder was tipped into the top of the vessel so this created a lot of dust which was also a problem.

The main drawback with this method was that it had to stand for up to 8 hours for the solution to de-aerate.

Solution: The **YTRON-Y** Directed Jet Mixer with ByPass System

The rotating shaft of the **YTRON-Y** does not come into contact with the surface of the liquid but is contained within a stator tube. This means that there is no vortex created as there is with a freely rotating shaft.

The stator tube also has a stator cage welded or bolted to it, shrouding the rotor. This creates a very good mixing action because it converts the radial movement of the impeller into axial movement allowing a rapid top to bottom movement of product in the vessel.

The ByPass system comprises a stainless steel tube which is positioned within the stator cage in close proximity to the top of the impeller. The other end of the stainless steel tube, outside the vessel, has a powder flow control valve and hopper.

Operation: Powder is loaded into the hopper and the **YTRON-Y** is switched on. The action of the impeller rotating in the liquid, close to the

end of the ByPass tube, acts like a liquid ring vacuum pump. The negative pressure created enables the powder in the hopper to be drawn down the stainless steel ByPass tube once the valve has been opened. The powder is wetted at high velocity forming a solution without lumps

Result: In the words of the customer " We have found that the **YTRON-Y** ByPass system has certainly improved the production of our coating solutions. The ByPass system is able to produce a lump free product in a very short time. With the **YTRON** ByPass system we are able to carry out the operation in 30 minutes."

We received similar comments from other leading Pharmaceutical companies.

Merck Sharp & Dohme Ltd. "The addition of the **YTRON-Y** ByPass to the **YTRON-Y** mixer has enabled us to incorporate cellulose powder in a very short time, with no evidence of rat holes or bridging and to produce a homogeneous lump free product.

AstraZeneca Pharmaceuticals have a number of **YTRON-Y** mixing units and following trials on a **YTRON-Y** Bypass system in our test plant passed the following comments. " The **YTRON-Y** ByPass system will certainly improve production of our coating solutions. It will enable us to incorporate the cellulose powder in a very short time and to produce a homogeneous lump free solution. It also allows the hopper to be filled with powder under controlled conditions in the Dispensary. The hopper is then connected to the stainless steel ByPass tube and the powder sucked into the liquid phase below the surface. This eliminates the previous dusting problem.