

TECHNICAL BULLETIN – DDR06

SUBJECT: DOUBLE DRUM DRYERS
DRUM DRYING RESOURCES STEAM VAPOR REMOVAL SYSTEM

Steam vapor removal from a double drum dryer is a critical part of the dryer operation. Usually, a single overhead hood is used with a system of splash panels to contain the boiling liquid between the drums. The disadvantages of this system can be observed as follows:

1. Large quantities of air are removed from the dryer room along with vapors, because of the nature of the open hood. An expensive air make-up and heating system is required to replace this air.
2. The high velocity of air and vapors being removed usually entraps particles of slurry, which are discharged on the roof to present a sanitation problem and increase cleanup costs.
3. Vapors are trapped under the dryer drums and must migrate to the ends of the drums to rise upward and hopefully be captured by the open overhead hood. The vapors under the drums adversely affect drying efficiency.
4. Vapors being removed by the massive hood condense and tend to drain back toward the slurry puddle between the drums. Also, drops of slurry caught in the air streams impinge on the hood and are retained. A potential sanitation problem could result from these conditions.
5. In order to contain the violently boiling slurry between the drums, a system of splash panels are used. Slurry usually collects on these panels and tends to build up and even fall back into the puddle. Contamination of the puddle is a potential problem and may therefore require a shut down and cleanup of the dryer. Material build up that can fall back into the puddle is generally partially dried; when a piece of this material reaches the nip of the drums it causes a dense spot on the sheet which does not completely dry. This damp material produces what is known as a damp “dough-ball”, with a moisture content high enough to permit contamination and high plate counts in food productions.
6. The nature of the hoods and splash panels presents a sanitation and cleanup problem. A great deal of time and labor is required to remove, clean, and replace the panels. Access to the hood is restricted and presents a safety risk to workers who are involved in the cleanup operation.

Drum Drying Resources (DDR) offers a vapor removal system, which addresses the problems of the conventional open vapor hood. The system includes the following elements as noted in our vapor removal system diagram.

1. A tight fitting hood is located above the drums. The hood is fitted to remove steam vapors and to entrain as little ambient air as possible. The hood is configured to contain slurry in the puddle and to maintain a humid, hot environment above the puddle, in order to prevent slurry from drying and accumulating. Vapors are removed through a horizontal duct at one end of the hood, to eliminate condensation from returning to the puddle. The hood is hinged and raised with an air cylinder to provide complete access by an operator for cleaning.
2. To remove vapors from under the drums, a nozzle delivers a stream of purge air from a small blower to move the vapors to a suction shroud at the opposite end of the drums. Constantly purging the vapors from under the drums aids drying efficiency.

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3. Vapors captured by the hood and the lower vapor shroud are removed by a vertical duct connected to an axial blower located on the roof of the dryer building. The blower includes a discharge damper and a roof curb for mounting.
4. The system removes vapors and a minimal amount of room air (about 2000 CFM). The system is balanced for efficient operation with a variable frequency speed control on the blower, and a damper to control vapor flow from the hood.
5. Slurry is introduced to the puddle between the drums with a distribution pipe or a DDR Pendulum Slurry Feed System mounted on the hood. A bulletin covering the pendulum feed system is available from DDR, Technical Bulletin DDR-08.
6. The level of slurry between the drums is sensed with a DDR Level Control Sensor mounted in the hood. A bulletin covering the slurry level control and feed system is available from DDR, Technical Bulletin DDR-07.
7. Cleanup of the vapor removal system is simplified. The hood is raised to expose the inside of the hood. The pendulum product feed pipes and level sensor is exposed. Flushing with a pressure hose and foaming the hood with a cleaner usually accomplishes the cleanup requirements. Spray balls can be located in the hood and vapor duct and integrated into a CIP system.
8. An operational water spray vapor scrubber is available to remove product slurry particles and dry product particles, which may become entrained in the vapor, exhaust stream. The vapor scrubber reduces or eliminates materials, which may fall out of the vapors being discharged to the atmosphere.

This improved vapor removal system is available on all new and remanufactured double drum dryers produced by DDR. The system can also be retrofitted to existing drum dryers. Contact Drum Drying Resources for additional information and pricing.

Drum Drying Resources supplies new, rebuilt, and retrofitted Double Drum Dryers to the drying industry. Each dryer is configured to specific designs, specifications, and systems to produce your product at maximum quality, sanitation, and productivity levels.

Check our Technical Bulletin section often in order to learn more about how our products and services can help you become more productive.