

TECHNICAL BULLETIN – DDR03

SUBJECT: USED DOUBLE DRUM DRYER CHECKLIST

The following information is presented as a guideline for inspecting used double drum dryers.

1. One Set (2) Dryer Drums

- a. The drum must pass a hydrostatic pressure test of 1.5 times the rated pressure for 1 hour.
- b. Drums must have a wall thickness which will permit the reconditioning of the drum surfaces and pass a Hartford Boiler recertification pressure rating test. The drum diameters must not be less than a 1/2 inch under the original drum diameters.
- c. The faces of the drums must not be damaged or have indentations more than .015 inches deep.
- d. The shoulders of the drum faces must not be damaged or worn in excess of 1/32 of an inch.
- e. The bearing shafts must not be damaged. For shafts with roller bearings, the shafts must measure to a tolerance of + .000 - .006 inches of the bearing diameter. For shafts with sleeve bearings, the shafts should measure no more than .012 inches below the bearing diameter.
- f. Threaded holes in the shafts and drums for mounting covers, steam joints, caps, etc., should not be stripped or worn.
- g. Key-ways in the shafts for drive gears or sprockets should not be worn.
- h. Documents on the registration of the drums, as well as National Board of Boilers and Pressure Vessel Inspectors numbers should be available.

Note #1

The above conditions can generally be confirmed with a field inspection by the owners of the drums. However, if the drums are to be re-chromed, the drums should be purchased on the condition that the drums pass the inspection and meet the specifications of the plater.

Note #2

Drums must be shipped from the chrome plater in individual shipping cribs which support the drums on the shafts and protect the precision cylindrical drum surfaces. The drum surfaces are further protected by a heavy paper wrap and wooden slats banded to the drums. Care must be taken to protect the drums surfaces when being handled and shipped to the plater without shipping cribs. Drum Drying Resources fabricates heavy duty permanent shipping frames for safe handling of the drums when required for present and future transportation of the drums.

Note #3

See DDR drawing "Drum Dryer Inspection List" 05/01/97 for a diagram of drum inspection points.

2. Bearings - Four (4) required

- a. Roller Bearings
Manufacturer, size and model numbers are required. The bearing housing should be in good condition. It can be assumed that a new bearing insert would be installed in the housing. The bearings should fit the particular drum being considered.
- b. Sleeve Bearings - (Bronze Inserts)
The same conditions apply as above. New bronze inserts, which are sized to the particular drum shaft diameter with a positive clearance of about .012 inches, should be installed in good condition bearing housings.

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3. Bearing Oiler - One (1) required (Sleeve Bearings)

An oiler with six outlets is required to oil sleeve bearings and drive gears or chains. The oiler is usually driven from the dryer drums with connecting arms and rods.

4. Drum Drives - One (1) System Required

a. Gear Drive

Two (2) drive gears are required. Each drum has a bull gear which meshes with the opposite drum gear. The faces of the teeth can show normal wear. Excessive wear or damaged teeth requires gear replacement in sets.

b. Drive Pinion

One (1) drive pinion is required. The drive pinion is mounted on the output shaft of a gear reducer. The drive pinion should be replaced if excessive wear is noted. A spare drive pinion is recommended.

c. Variable Speed Motor/Reducer Drive

One (1) drive is required. The drive unit should be sized to provide the range of speed and horse power needed for the particular drying process being considered. Consideration should be given to replacing very old drives which may be obsolete and without service for parts. If an overhaul is required, the cost of the overhaul may exceed the price of a newer modern drive unit. Drum Drying Resources offers many choices of drum drive configurations to suit production requirements.

d. Guards

One (1) system required. The drive system requires guards for the gearing and rotating drive components. The guard system should provide easy access for cleaning if food products are processed on the dryer, and easily removed for maintenance of bearings, gears, etc.

5. Movable Drum Operators

One set (2) of movable drum operators are required. All parts should be intact. Depending upon the system used, the gap between the drums is adjusted and maintained with the drum operators. The operator system may also provide protection against foreign materials between the drums, by opening against a spring or pneumatic pressure to allow an object to pass between the drums. All parts should be operational.

6. Dryer Frames

One (1) set required. They can be castings or fabricated. The dryer frames support the dryer drum bearings which support the dryer drums. The frames also support and maintain the alignment of the doctor blade holders which remove product from the drums. The frames may also include the base for mounting the drive motor to maintain drive component alignment. The frames should include two (2) end frames and any cross support beams necessary to tie the end frames together.

7. Doctor Blade Holders

Two (2) doctor blade holders are required. The doctor blade holders position and control the removable knives which remove the dry product from the dryer drums. Each blade holder includes the following:

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- Main doctor blade support beam
- Pivot bearings, two (2) per beam
- Doctor blade clamping plate
- Lever arms, two (2) per beam
- Lever arms operators, two (2)
- Air cylinder operator or Mechanical operator

All mounting holes and tapped holes should be in good condition. No stripped or eroded threads. Mounting and adjusting bolts should be replaced with stainless steel fasteners. Air cylinders normally require new seals and cylinder rebuild kits.

8. End Dams - Two (2) required

End dams are usually stainless steel frames with a phenolic backer which seals liquid product between the drums. The phenolic backer is replaceable, but the mounting frames are a part of the general dryer configuration. The system for supporting the end dams and maintaining the contact with the dryer drum shoulders should be intact. Drum Drying Resources can offer improved end dam systems which contribute to drum dryer productivity, with the elimination of damp product at the ends of the dryer.

9. Vapor Hood - One (1) required

There is usually a single stainless steel hood mounted over the dryer drums for extraction of steam vapors from the boiling puddle between the drums, and steam vapors which migrate from below the drums as they are produced by the drying process. Interior baffles are usually included to retain the violently boiling product above the drums, if thin liquid slurry (20% solids) is the material that is being dried. The hoods and baffles should be in reasonably good condition, and should be designed to prevent condensate from dripping into the dryer to contaminate a food grade product being produced on the dryer.

10. Steam and Condensate Hardware - One (1) system required

Steam is supplied to the dryer drums as energy to promote drying at a regulated pressure, and condensate is removed to be returned to the boilers to conserve energy.

The following items are required for a complete system and are sized depending upon the dryer operations requirements:

- a. Steam pressure regulating and control valve. One (1) required.
- b. Rotary steam and condensate joints to introduce steam and extract condensates from each dryer drum. Two (2) required.
- c. Condensate removal traps to control removal of condensates from the dryer drums. Two (2) required.
- d. Various strainers, hand valves, flexible connections and gages, as may be available.

Hardware available may not be suitable or sized properly for operations other than the operation of the dryer in its original installation. Usually new hardware is required or old hardware is rebuilt.

11. Product Removal Conveyors - Two (2) required

Conveyors to collect finished product from each dryer drum are usually available with a drum dryer. The conveyors collect product from each dryer drum and convey the product to a central collector conveyor when several dryers are operating in production or to an air conveying system.

The “side screw conveyors” should include drive motors and guards to provide safety to the dryer operators. Systems differ greatly and are usually tailored to specific operations.

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12. Optional Equipment

Optional hardware can include the following:

- a. Slurry distribution header.
- b. Slurry level control system.
- c. Slurry supply metering pump.
- d. Ventilation blowers and fans.
- e. Electrical and controls panel.

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.