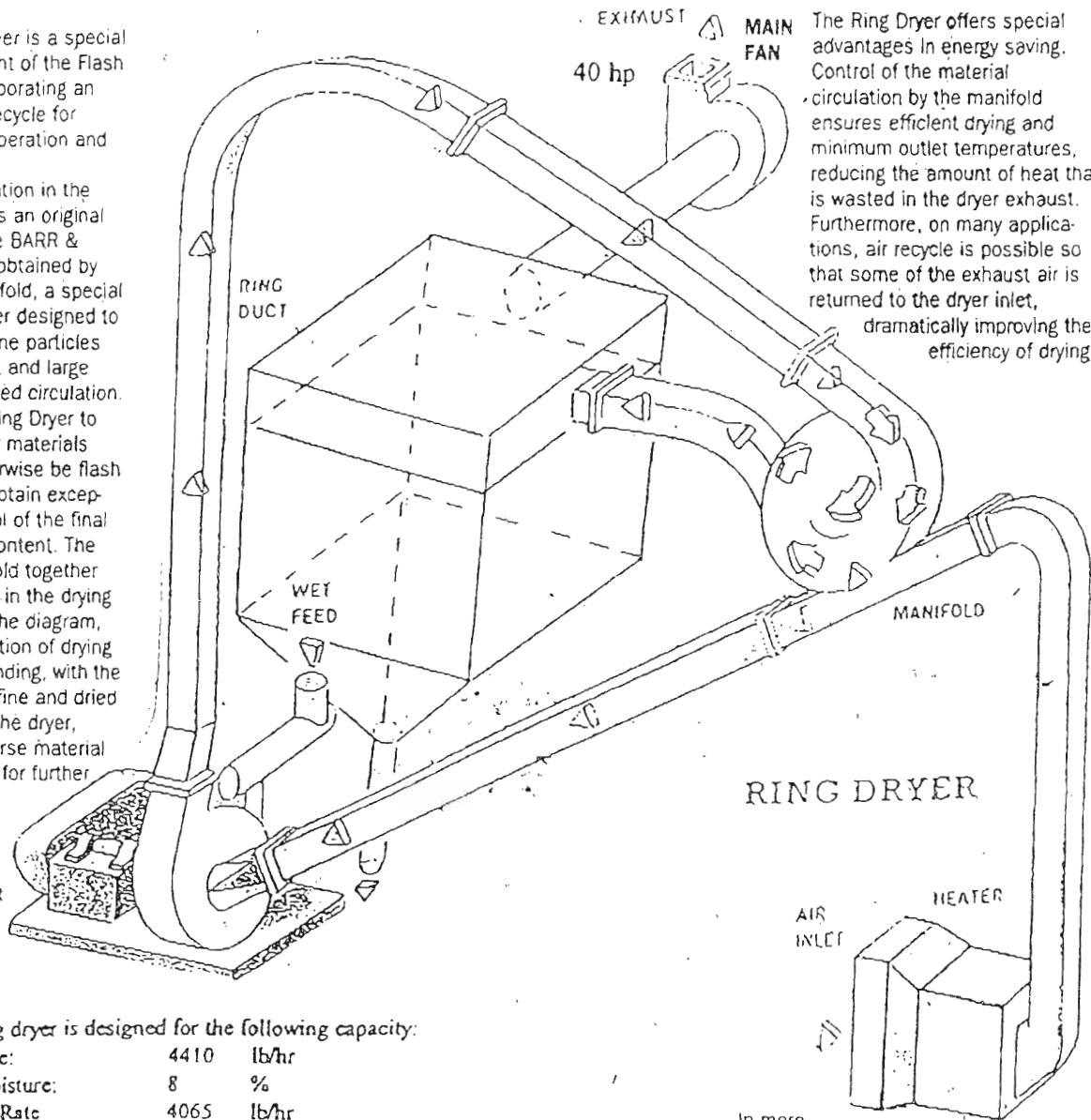


# RING DRYERS

The Ring Dryer is a special development of the Flash Dryer incorporating an internal air recycle for greatly improved operation and efficiency.

The internal circulation in the Ring Dryer, which is an original development of the BARR & MURPHY team, is obtained by means of the manifold, a special centrifugal classifier designed to separate dry and fine particles while holding moist and large particles in prolonged circulation. This enables the Ring Dryer to dry efficiently many materials that could not otherwise be flash dried and also to obtain exceptionally good control of the final product moisture content. The effect of the manifold together with a disintegrator in the drying duct, as shown in the diagram, can give a combination of drying with screenless grinding, with the manifold releasing fine and dried material only from the dryer, whilst returning coarse material to the disintegrator for further drying and grinding.

15 hp  
DISINTEGRATOR



The Ring Dryer offers special advantages in energy saving. Control of the material circulation by the manifold ensures efficient drying and minimum outlet temperatures, reducing the amount of heat that is wasted in the dryer exhaust. Furthermore, on many applications, air recycle is possible so that some of the exhaust air is returned to the dryer inlet, dramatically improving the efficiency of drying.

RING DRYER

The ring dryer is designed for the following capacity:

Feed rate:	4410	lb/hr
Feed moisture:	8	%
Product Rate	4065	lb/hr
Product Moisture	0.20	%
Evaporation Rate	345	lb/hr.
Exhaust Volume	3800	acfm
Inlet Temperature	650	degree F.
Exhaust Temperature	450	degree F
Total Install Power	64	HP
Normal Absorbed Power	45	HP
Combustion Unit	1.5	MMBtu/hr
Product collector	Wheelabrator, 180 bags, 1700 sq ft.	

In more sensitive applications, where air recycle is not possible, it is still frequently possible to insert heat exchangers in the air exhaust, collecting some of the waste heat from the exhaust air and returning it to the air inlet where it can be used for preheating the drying air. We can also provide dryers designed to use sources of waste heat from elsewhere in the plant, such as boiler or turbine exhaust gases.







# BARR & MURPHY (CANADA) Ltée/Ltd.

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 Atlanta, GA  
 30338-3344

January 28, 1996

**TENDER FOR ONE RING DRYER FOR ZINC OXIDE**  
**BARR & MURPHY ENQUIRY 00149 Rev.B**

**I PROCESS DESCRIPTION:**

Wet feed from the customer's upstream filter press would be continuously received in the stirring pan, which would act as the surge device for feeding the dryer. The wet feed would be metered into the dryer with a variable speed feed screw, discharging into the disintegrator while providing an air seal at the feed point. Any agglomerates in the material would be broken up in the dispenser, the feed being distributed into the hot air stream and accelerated into the dryer.

After passing once around the ring duct the zinc oxide would enter the manifold where it would be centrifugally classified. Semi-dry material would be returned to the dryer for a further pass while dried product would continue with the exhaust air to a bag filter. Ambient air would be drawn into the system to temper the dryer exhaust, prior to entering the bag filter. Here the final product would be collected and discharged through a screw conveyor and rotary valve.

The drying medium would be drawn through the entire system by an induced draught fan, developing sufficient pressure to overcome the pressure drop of the entire system.

Fresh air would be heated to the required temperature with a gas fired air heater. The dryer would be controlled by maintaining a constant exhaust temperature and modulating the inlet temperature to compensate for fluctuations in evaporative rate.

**II DUTY:**

The ring dryer would be designed for the following capacity:

Feed Rate	4410	lb/hr
Feed Moisture	8	%
Product Rate	4065	lb/hr
Product Moisture	0.20	%
Evaporation Rate	345	lb/hr
Exhaust Volume	3800	acfm
Inlet Temperature	650	°F
Exhaust Temperature	450	°F
Total Installed Power	64	HP
Normal Absorbed Power	45	HP
Heat Requirement ( $T_{max} = 0^{\circ}\text{F}$ )	1.5	MMBtu/hr



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28 January 1986  
Enquiry 85148 Rev.B, Page 2

**III SCOPE OF SUPPLY:**

The ring dryer would be comprised of the following components:

- ITEM 1:** ONE STIRRING PAN, 3'-0" diameter x 24" high in grade 316L stainless steel, to act as a surge device from the upstream process and to break up and introduce the wet feed into the screw conveyor. Including stirring arm assembly, drive and 3 HP TEFC motor.
- ITEM 2:** ONE FEED SCREW, 6" diameter, fabricated in grade 316L stainless steel, for metering wet feed material into the dryer. The screw would be designed to operate under flooded conditions in order to provide an effective seal against the suction of the system. The unit would be supplied complete with cylindrical casing with drop bottom section for easy cleaning access, continuous screw flight, 2 HP TEFC motor, reducer, and drive guard. Excluding frequency inverter.
- ITEM 3:** ONE DISINTEGRATOR, 30" diameter x 9" wide, fabricated in grade 316L stainless steel, designed to break up agglomerates in the feed material to ensure easy dispersion into the drying stream. Complete with casing, beaters on rotating shaft, shaft seal, vee-belt drive, belt guard, and 15 HP TEFC motor.
- ITEM 4:** ONE INLET AIR FILTER, for removing particulates from the incoming fresh air. The filter would provide 6 ft<sup>2</sup> of filtration surface and be supplied with replaceable elements mounted in a galvanized steel housing. A birdscreen would also be included in the filter unit.
- ITEM 5:** ONE COLD AIR DUCT, in mild steel construction, approximately 10' overall length, connecting the air filter to the air heater. The ductwork would be supplied in flanged sections, stiffened where necessary.
- ITEM 6:** ONE AIR HEATER, for elevating the temperature of the process air to that required by the dryer. The duct mounted burner, in mild steel construction, would be supplied complete with flanged casing, prewired main and pilot trains to IR/IFM standards, flame failure safeguard system and local panel giving fault annunciation. Nominal heat release 1.6 MMbtu/hr.
- ITEM 7:** ONE HOT AIR DUCT, in mild steel construction, approximately 10' overall length, connecting the air heater exhaust to the ring duct. Supplied in flanged sections, stiffened where necessary.
- ITEM 8:** ONE RING DUCT, 6" x 12", in grade 316L stainless steel. The ring would be supplied in rectangular flanged sections, connecting the manifold and disintegrator in a continuous loop.

Quotation on 316 SS collector in Texas.



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23 January 1990  
Enquiry 85149 Rev.B, Page 3

- ITEM 8: ONE MANIFOLD, 9" x 12", in grade 316L stainless steel, for the centrifugal classification of zinc oxide. Fine, dried product would leave the dryer with the exhaust air while larger, semi-dried particles would be returned to the dryer for a further pass. The unit would be supplied with adjustable blades and inspection windows.
- ITEM 10: ONE INTERMEDIATE DUCT, in grade 316L stainless steel construction, approximately 20' overall length, connecting the manifold exhaust to the bag filter inlet. Supplied in flanged sections, stiffened where necessary.
- ITEM 11: ONE AIR TEMPERING SYSTEM, to cool the dryer exhaust, prior to entering the bag filter. A louvre type, mild steel damper would be provided for airflow control.
- #M. ITEM 12: ONE BAG FILTER, in grade 316L stainless steel, to collect dry product from the exhaust gas stream prior to discharge to atmosphere. The unit would provide approximately 1700 ft<sup>2</sup> of filtration area and would be supplied complete with Nomex (16 oz) singed bags, mild steel cages, aluminum venturis, and reverse jet cleaning system. (Compressed air requirement 20 scfm at 60 psig.) The unit would be provided with hinged roof doors to allow access to the clean air side of the tubsheet for bag removal.
- ITEM 13: ONE DISCHARGE SCREW CONVEYOR, 10" diameter, in grade 316L stainless steel, for discharging dried product from the bag filter. The trough screw conveyor would be supplied complete with casing, continuous flight, inlet and outlet connections, and 3 HP geared motor drive unit.
- ITEM 14: ONE ROTARY VALVE, 10" diameter, in grade 316L stainless steel, for discharging the dry product from the bag filter while providing an air seal. The unit would be supplied complete with body, rotor, outboard bearings, and 1 HP TEFC geared motor drive.
- ITEM 15: ONE EXHAUST DUCT, in grade 316L stainless steel, approximately 20' overall length, connecting the bag filter exhaust to the fan inlet. Supplied in flanged sections, stiffened where necessary.
- ITEM 16: ONE MAIN FAN, fabricated from grade 316L stainless steel, for drawing the process air through the system. The centrifugal type fan would be supplied complete with casing, impeller, baseframe, access door in fan scroll, belt guard, condensate drain, flanged inlet and outlet, and 40 HP TEFC motor. An inlet damper would be provided for start-up and airflow control.

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JOE