



# Quintus® Cold Isostatic Dry Bag Presses

## The CIP Process

Cold isostatic pressing (CIP) is a compaction process for powders enclosed in an elastomer mold. The mold is placed in a pressure chamber, a liquid medium is pumped in, and high pressure is applied uniformly from all sides.

**CIP Applications**  
CIP is used with powdered metallurgy, cemented carbides, refractory materials, graphite, ceramics, plastics, and other materials.

- Process Benefits**
- High compaction and uniform density provides predictable shrinkage during the subsequent sintering process.
  - Ability to process large, complicated, and near-net shapes saves time and cost in after-treatment.
  - Capability to produce large aspect ratio parts (>2:1) with uniform densities.
  - Green strength allows in-process handling and treatment, and lowers production costs.

## Dry Bag Vs. Wet Bag Technology

In the wet bag process, the powder material is contained in a flex mold bag, which is submerged into a high-pressure liquid in a pressure vessel. This process is suitable for multi-shape and small to large quantity production, and for the pressing of large size products.

**Dry bag** pressing differs from wet bag in that a flexible membrane is built in to the pressure vessel and is used during all pressing cycles. This membrane isolates the pressure fluid from the mold, which becomes “dry bag”. This process is cleaner because the flex mold does not become contaminated with wet powder. Also, less cleaning of the vessel is required. This method features rapid cycles and is very suitable for automated mass production of powder products (see reverse).

### Prestressed Wire Winding

The Quintus® press utilizes a prestressed wire wound vessel and yoke frame, and is considered the safest and most reliable pressure containment system available today. Both upper and lower closures are threadless and are held in place by the yoke frame, thus avoiding any stress risers in the body. This design meets the “leak rather than break” criteria. The intensifier pump also uses prestressed wire winding for dry bag pressing.

Fig. 1. Wet Bag Process

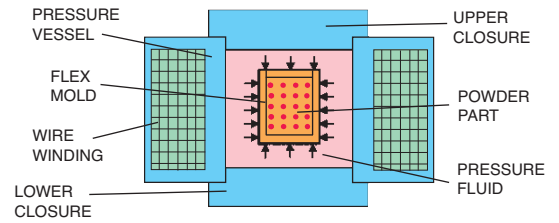


Fig. 2. Dry Bag Process

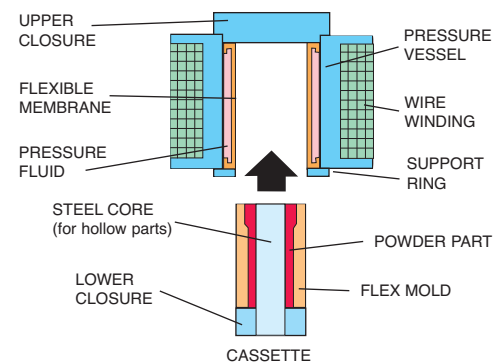


Fig. 3. Quintus® Vessel and Frame

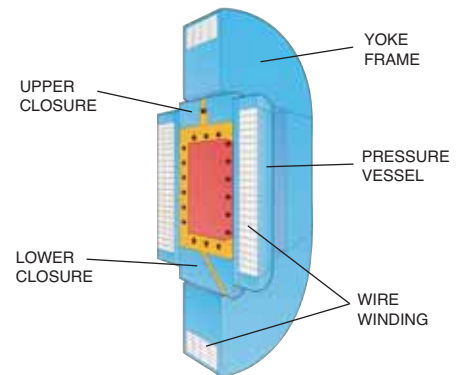


Table 1. Standard Models (Other pressures and sizes available on request)

Model	Maximum Working Pressure PSI (MPa)	Vessel Size ID x IL (in.)	Part Size* Dia x L (in.)	Production Rate** (Parts/Min.)
QDB 23	60,000 (414)	10.5 x 20	~7 x 12	~1
QDB 32	60,000 (414)	15 x 25	~12 x 17	~1
QDB 87	60,000 (414)	25 x 28	~21 x 20	~1
QDB 175	40,000 (276)	35 x 32	~31 x 24	~1

\* Part size depends on shape, mold and powder characteristics.

\*\* Production rate depends on shape, powder characteristics, level of automation and pump capacity. Contact factory for ASME code stamping, CE mark, or other national code requirements.

# An Integrated Manufacturing System

The Dry Bag Isostatic Press is available as a complete automated system, with individual stations for powder filling, pressing, demolding and cleaning, and part discharge. Generally, one compact is processed per cycle, and is automatically transported to the different stations of the press. Partial automation, with selected manual modes, is also an option (machining and sintering of parts are separate operations).

A number of fully automated dry bag systems are in operation today using the latest computerized controls and user-friendly software. An advanced powder filling technique assures product homogeneity. The pressure is generated using either a reciprocating or single-stroke intensifier, depending on cycle speed.

## Rapid cycling for high productivity

Dry bag pressing can produce one compact per minute or faster. This quick cycling translates to an annual production rate of 240,000 parts based on 66 percent uptime, three shifts per day, five days per week, and 50 weeks per year. This rapid cycling, performed at high pressure, demands a high cycle fatigue rating for all stressed parts, particularly the vessel and intensifier pump. The Quintus® wire-wound design for the vessel, frame and intensifier meets these stringent requirements.

Fig. 4. Cross-Section of Dry Bag Press

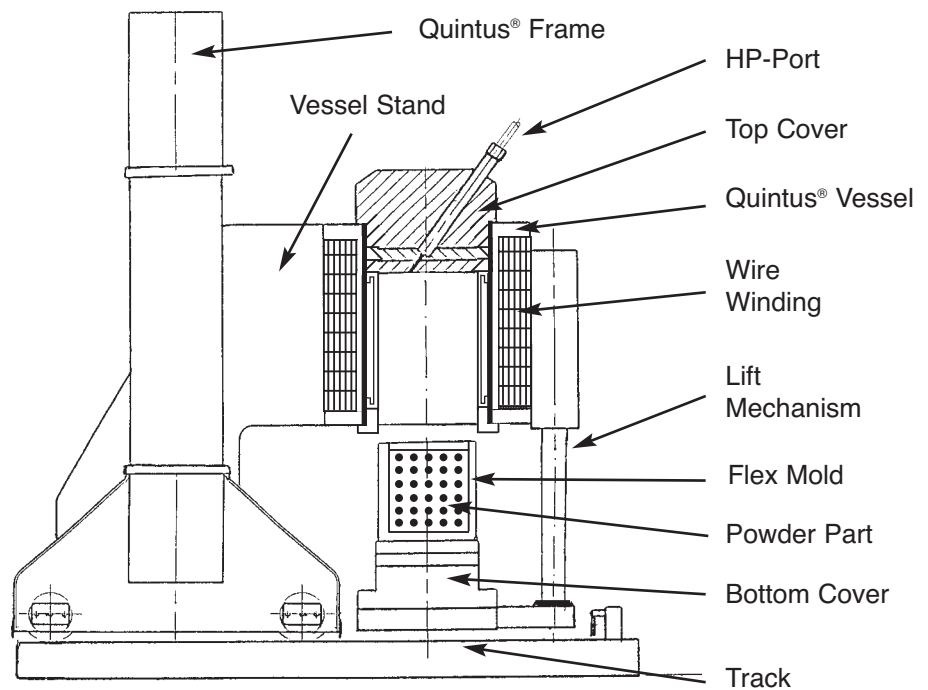
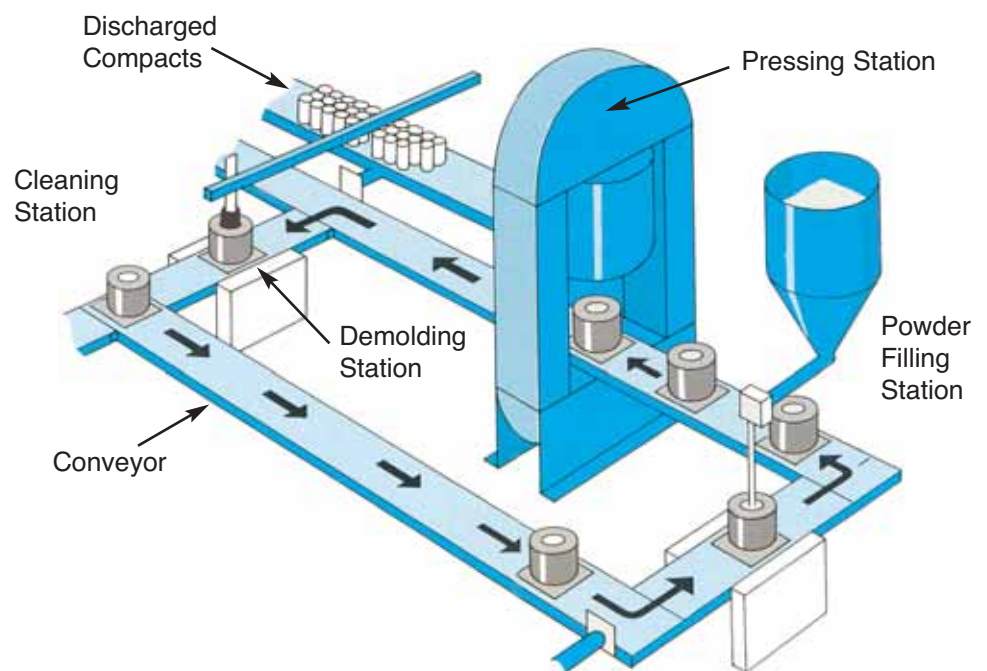


Fig. 5. Automated Dry Bag Press



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