Application Note: RIECO Automatic Bag Slitting Machine (BSM)

The **RIECO Automatic Bag Slitting Machine (BSM)** is an engineered, fully automated system designed for the high efficiency cutting, emptying, and separation of raw material bags containing powders or granules up to 50 kg.

Unlike manual bag dumping stations which introduce ergonomic strain, inconsistent feed rates, and significant dust hazards the BSM utilizes a high-speed rotary cutting assembly combined with a balanced trommel separator to ensure **over 99% emptying efficiency** with minimal product retention. The system is fully enclosed to guarantee a **100% dust-proof operation**, making it the standard for critical hygiene industries such as Food, Pharmaceuticals, and Chemicals.

With a robust throughput of up to **15 TPH** and construction options in MS, SS304, or SS316, the BSM provides long-term reliability and a rapid ROI by reducing manpower requirements by 50–70%.

1.0 Design and Operating Principle

The BSM operates on a continuous, multi-stage principle that automates the entire material handling cycle from in-feed to waste disposal.

Operating Sequence:

Step 1: Automated Bag Feeding Bags are loaded onto an inclined belt conveyor that aligns and feeds them into the slitting chamber at a controlled, consistent rate.

- **Capacity:** Handles bag widths mm and heights between 80–140 mm.
- **Engineering Benefit:** Eliminates skewing and ensures ergonomic, low-height loading.

Step 2: High-Speed Rotary Cutting Inside the chamber, the bag passes over heavy-duty rotary cutters driven by dual 1.5 HP motors.

- **Mechanism:** Surface speeds of ~18 m/s ensure clean, full slitting of multi-layer and woven bags.
- **Stability:** Designed for low vibration and extended cutter life.

Step 3: Trommel Separation The cut bag falls into a rotating trommel screen operating at ~28 RPM.

- **Action:** The rotation tumbles the bag, allowing fine product to pass through perforations while retaining the empty bag.
- **Durability:** PU-coated drive and idler wheels provide long operational life.

Step 4: Empty Bag Compaction & Discharge Empty bags are automatically ejected into a compactor driven by a 3 HP gear motor, reducing waste volume and simplifying disposal. Simultaneously, the recovered product is transferred via a sealed screw conveyor.

2.0 Major Components & Engineering Construction

Component	Engineering Description	Material Options	Design Advantage
Belt Conveyor	Inclined feed mechanism with height adjustability.	MS, SS	Vibration-free feeding; ensures consistent alignment.
Bag Slitting Unit	Dual-motor rotary cutters (300/400/500 mm).	MS, SS304, SS316	High-speed (~18 m/s) ensures clean cuts on multi-layer bags.
Rotary Trommel	Balanced cylindrical screen with PU-coated wheels.	MS, SS	Extended retention time for >99% emptying efficiency.
Vent Filter	Integrated 3 HP extraction fan with filtration.	MS, SS	Creates negative pressure for a zero-leakage, dust-proof zone.
Bag Compactor	Screw/hydraulic compression unit.	MS, SS	Jam-free compression; reduces waste volume significantly.
Control Panel	PLC-based automation with safety interlocks.	-	Full process sequencing, AZM150 door interlocks, and UV/OV protection.

3.0 Performance Features & Engineering Benefits

Engineering Constraint	BSM Feature	Resulting Technical Benefit
Prevention of Airborne Hazards	Integrated Vent Filter (3 HP) & Enclosed Housing	**100% Dust-Proof Operation:** Protects operators from respirable hazards and prevents cross-contamination.

Maximizing Material Recovery	Balanced Trommel with ~28 RPM Rotation	**>99% Emptying Efficiency:** Extended retention ensures valuable product is not discarded with waste bags.
Operational Continuity	Dual 1.5 HP Cutter Motors & PU Coated Wheels	**High Reliability:** Ensures uninterrupted cutting of tough bags and long-life operation of rotating parts.
Operator Safety	AZM150 Door Interlocks & Emergency Stops	**Compliance:** Prevents access to rotating parts during operation, meeting industrial safety norms.

4.0 Application Engineering

Food & Beverage

- **Materials:** Flour, sugar, starch, milk powder
- **Pain Point:** Hygiene risks and dust clouds from manual dumping
- **Engineering Solution:** SS316 contact parts, food-grade seals, and CIP ports to ensure sanitary compliance

Pharmaceuticals

- **Materials:** APIs, excipients, fine powders
- **Pain Point:** Exposure to potent powders and cross-contamination
- **Engineering Solution:** HEPA filtration integration and fully enclosed discharge for GMP compliance

Chemicals & Pigments

- **Materials:** TiO2, carbon black, resins
- **Pain Point:** Highly dusting, abrasive materials and static buildup
- **Engineering Solution:** Anti-static linings and abrasion-resistant materials to handle tough operating conditions

Plastics & Polymers

- **Materials:** PVC resin, polymer granules
- **Pain Point:** Granule breakage and inconsistent flow
- **Engineering Solution:** Gentle handling via trommel separation and level sensors for flow control

5.0 Technical Performance Data

Parameter	Specification

Throughput Capacity	Up to 15 TPH
Bag Specifications	Weight: Up to 50 kg; Width: < 800 mm
Emptying Efficiency	> 99%
Cutter Speed	Surface speed ~18 m/s
Power Rating	Cutters: 1.5 HP x 2; Trommel: 1 HP x 2; Fan: 3 HP
Construction Material (MOC)	MS / SS304 / SS316
Overall Dimensions	4.5 m x 1.75 m x 3.5 m
Safety Features	AZM150 Interlocks, UV/OV protection, Emergency Stops

6.0 Installation & Maintenance Summary

- **Foundation:** A level foundation is mandatory for vibration-free operation
- **Clearance:** Minimum 12” clearance required around the equipment for maintenance access
- **Maintenance:**
  - **Daily:** Visual inspection of structural components
  - **Weekly:** Inspection of bearings and PU wheels
  - **Wear Parts:** Cutter blades and PU wheels are identified as key wear parts requiring periodic monitoring