CPM Crown's
Hot Dehulling Process

THE ULTIMATE DEHULLING SYSTEM

CPM Crown's Hot Dehulling system produces "High Protein" meal 12 months a year, even with hard to dehull 'new crop' beans.

Before beans enter the Crown Hot Dehulling process, they should be properly cleaned to remove sticks, pods and trash. After cleaning, the beans enter the Crown Whole Bean Aspirator to remove loose hulls and field dust. The beans then enter the Crown Vertical Seed Conditioner (VSC) to condition the beans by a slow heating process that raises the temperature of the beans. As bean temperature rises, bean moisture migrates to the surface, allowing the patented Crown Aspiration System to remove the moisture, which drys the beans and softens the hulls.

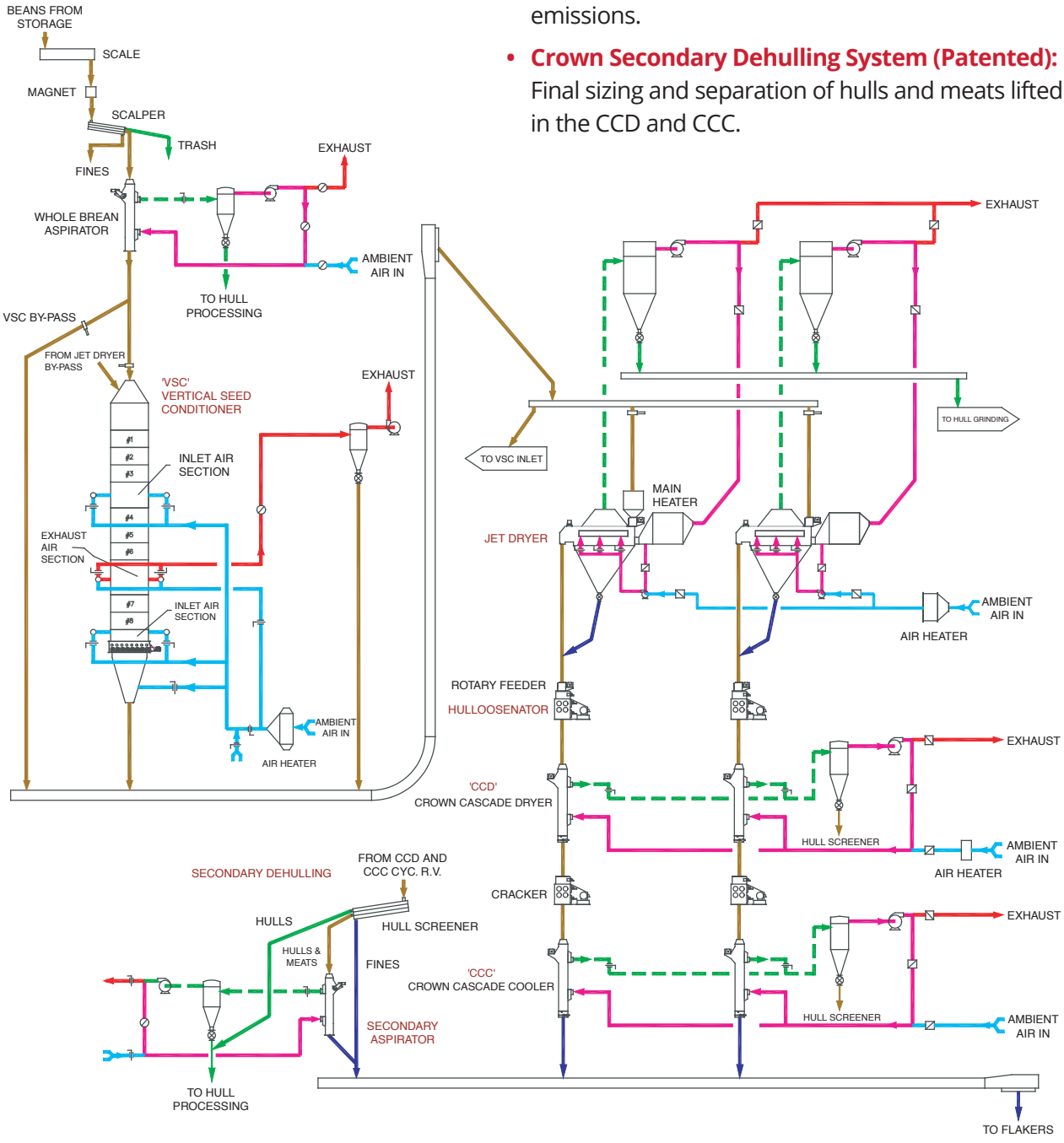
After the beans are properly conditioned in the VSC, they enter the patented Crown Jet Dryer, which injects heated fresh air and recirculates filtered hot air to shrink the hulls, releasing the hull/meat bond. After the Jet Dryer, the beans enter the Crown Hulloosenator® which uses chilled iron corrugated rolls to split the beans in half, which allows much of the soybean hulls to be removed without creating fines. The half beans and loose hulls then enter the Crown Cascade Dryer (CCD). In the CCD, the half beans and hulls cascade downward, releasing even more hulls. Re-circulated countercurrent heated air will lift the hulls and separate the two products. After the CCD, the meats enter a double-stand Cracker where the meats are sized for flaking. The sized meats and loose hulls enter the Crown Cascade Cooler (CCC). As in the CCD, the meats cascade downward, releasing the remaining hulls. The heavier meats fall out the bottom of the CCC as the lighter material is lifted with the countercurrent airflow. In the CCC, fresh air is introduced to cool the meats for proper extraction temperatures. The product lifted in the CCD and CCC is a combination of hulls and small meats that are separated in the Crown Secondary System. A two-deck Hull Screener is used to size the material in three cuts: hulls sent to hull processing, meats sent to flakers, and the middle cut, a combination of small meats and hulls. The middle cut is sent to a Crown Secondary Aspirator where the final fiber and hull fat separation is controlled.

Benefits of CPM Crown Hot Dehulling System

- Can process beans with moisture up to 13.5 percent, producing high protein meal without installing expensive/high maintenance grain dryers, tempering silos or rotary conditioners.
- Crown Vertical Seed Conditioner (VSC), heats, dries and conditions beans, preparing the beans for ultimate hull removal in only 30 minutes.
- Low electrical energy requirements.
- Patented Jet Dryer uses less power than fluidized bed and ensures uniform retention and aspiration for all beans.
- Gravity flow through system from jet dryers through conditioners.
- Low heating requirements due to recycled air.
- Hulloosenator® provides highly efficient separation of meats and hulls.
- Patented Crown Aspirator allows for highly efficient particle size distribution.
- System creates a minimal amount of fines with extended roll life.
- Low volume of air discharged to atmosphere.

Typical Two-Line Hot Dehulling Flowsheet

- **Crown Vertical Seed Conditioner (VSC) (Patented):**
  Heats, dries, and conditions all beans evenly, preparing the beans for hull removal.
- **Crown Jet Dryer (Patented):**
  Assures even heating and drying of all beans.
- **Crown Hulloosenator® (Patented):**
  Breaks beans in halves and rolls hull loose of meats while creating minimal amount of fines.
- **Crown Aspirators CCD, CCC, and Secondary (all Patented):**
  counter-current, re-circulated air flow gives ultimate particle size separation while reducing the amount of emissions.
- **Crown Secondary Dehulling System (Patented):**
  Final sizing and separation of hulls and meats lifted in the CCD and CCC.



LEGEND

MEATS & HULLS OR SEED		HULLS, SMALL MEATS & AIR		PNEUMATIC DAMPER	
RECIRCULATING AIR		HULLS, DUST & AIR		MANUAL DAMPER	
EXHAUST AIR		HULLS, TRASH		SLIDE GATE DAMPER	
AMBIENT AIR		MEATS OR FLAKES			

NOTE: ALL EQUIPMENT AND DUCTWORK CROSSHATCHED TO BE FIELD INSULATED

Specifications of the Two-Line Cold Dehulling system may be modified or changed to meet specific client requirements and/or manufacturing necessity.

For ongoing innovation, Crown's technology and team are second to none.

CPM Crown's Global Innovation Center is a facility unlike any other. A fully functional 15,000 sq. ft. pilot plant, analytical lab and training facility, the GIC offers piloting capabilities from benchtop lab scale to multiple tons per day of continuous production, simulating real life and enabling customers to develop and test new product concepts in a confidential, controlled environment.

The GIC has capabilities in preparation, extraction, desolventizing, drying, deodorizing, refining, fat splitting, renewable diesel and specialty extraction (including Hemp CBD Oil). Crown's technical expertise, R&D and full lifecycle process provide guidance and support at every step from feasibility, trials and custom processing to commercial-sized operations and aftermarket.

Feeding, Fueling and Building **a Better World.**

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