The typical VSC is mounted on a steel platform level with a discharge hopper below. A take away conveyor, typically an L-path conveyor, elevates the conditioned beans to the next phase of the process. A VSC can be installed inside the preparation building, or just outside the walls of the preparation building. It is essential to insulate the VSC to maintain temperatures and reduce the risk of moisture build-up inside the unit.

The largest single VSC Crown offers will condition 3,500 MTPD of soybeans. If more production is required, multiple units will be offered. Smaller capacity units can be easily expanded by installing additional heating sections and increased drying. When market conditions warrant, the VSC can easily be expanded into a full Crown Hot Dehulling system.

**CROWN VSC HIGHLIGHTS:**
- Five (5) models available (25 – 3,500 MTPD)
- Stack up to 12 heating sections in one unit
- Easily expandable by adding sections
- FIFO, a true first in first out system
- Oval tubes increase heating surface area
- Low pressure steam (1 BAR or 15 PSI)
- Up to 15% drying with the Crown patented air system
- Low pressure volumetric river discharge (1/2 to 1 bar, maximum)
- Heating sections: oval 304L SS tubes and tube sheets
- Access to all tubes with removable covers
- Wear protection armor on top row of tubes
- Side inspection covers to watch product flow during operations
- No need for expensive and high maintenance grain dryers
- Optional heat sources include hot water or flash steam
- Proven technology as a canola pre-heater, soybean crack conditioner, and corn germ conditioner
- Many other seeds can be tested in the Crown laboratory

**Vertical Seed Conditioner**
Crown Iron Works Company
A CPM Company

**Crown Iron Works Company**
A CPM Company

**TYPICAL VSC INSTALLATIONS:**
- First (1) model available (25 – 3,500 MTPD)
- Stack up to 12 heating sections in one unit
- Easily expandable by adding sections
- FIFO, a true first in first out system
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**OFFICE LOCATION**
2500 West County Road C, Roseville, MN 55113 USA

**OFFICE LOCATION**
NORTH AMERICAN HEADQUARTERS
CROWN IRON WORKS
A CPM COMPANY
P.O. Box 1364
Minneapolis, MN 55440-1364 USA
Ph: +1-651-639-8900
Fax: +1-651-639-8051
sales@crowniron.com
www.crowniron.com

EUROPEAN HEADQUARTERS
EUROPA CROWN LTD.
A CPM COMPANY
Waterside Park, Livingstone Road
Hessle, East Yorkshire, HU13 0EG England
Ph: +44-1482-640099
Fax: +44-1482-649194
sales@europacrown.com
www.europacrown.com

**ARGENTINA, BRAZIL, CHINA, HONDURAS, INDIA, MEXICO, RUSSIA AND UKRAINE**
Vertical Seed Conditioner

**General Features**

The Crown Vertical Seed Conditioner (VSC) is a combination heater and dryer used for soybean flow conditioning. The heater is a stacked design with multiple heating sections using steam or water. The vertical seed conditioner system shown in the diagram is used for feedstock drying and conditioning. It can be used to dry and condition seed before entering the VSC. The beans enter the VSC through the inlet hopper and are discharged from the VSC at the discharge speed from the VSC. The VSC can be used for other applications including canola feedstock for feedstock conditioning.
**Vertical Seed Conditioner**

**GENERAL FEATURES**

The Crown Vertical Seed Conditioner (VSC) is a combination heater and dryer used on free flowing granular solids such as soybeans and rapeseed. The heater is a stacked design with multiple heating sections using low-pressure (1 Bar or 15 PSI) steam heated oval tubes. Crown's patented aspiration system draws the beans by suctioning the fine moisture from the surface during heating. A low-powered rotary style discharge creates a steady material flow to the plant with minimum electrical load requirements.

In soybean applications, seeds up to 14 percent moisture can be fed into the VSC, eliminating the use of grain dryers for processing. The typical residence time in the VSC ranges from 25 to 35 minutes depending on the required results for conditioning, drying and heating.

The VSC can be used for other applications including cane sugar pre-treating fluid conditioning of soybean cracks prior to flaking in conventional dehullers, corn germ preparation, along with conditioning of many other oil seeds.

**CROWN BRAN HEATER/VSC PLOWHEADER FOR SOYBEANS:**

With multiple soybean preparation systems, beans are received and spread prior to processing. Traditional systems typically utilize a press dryer and a stripping operation which include a high degree of labor, maintenance, handling losses, along with other costs associated with the dryer. These systems also heat the beans twice which can deteriorate the oil quality.

Unlike the traditional system, all of the operations are performed in the preparation plant with a Crown vertical seed conditioner eliminating the need for the traditional dryer and its associated costs. The beans are heated once and kept hot, throughout the whole process.

With drying ability of up to three percent, a processor can receive beans at 14 percent moisture and reduce seed cost or eliminate additional drying prior to processing. The VSC also eliminates the need for grain dryers for processing. The typical retention time in the VSC, is controlled by belt speed, supplied by Crown.

**HEATING SECTIONS:**

VSC heating sections are arranged with a stream inlet header on one side and a condensate header on the other. Multiple oval 304L stainless steel tubes are welded into a 304L stainless steel tube. Before cores are supplied on both steam and condenser heating sections allowing full access for maintenance and replacement.

Removable roofs with lever operated plates are supplied on each side to view the seed movement and allow internal access. During installation, sections are stacked and treated to allow for proper mixing of the seeds, avoiding short-circuiting. The condensate header on one side and apertures for maintenance and discharge as they are traveling through the VSC. This design results in consistent heating and conditioning in all seeds.

**ASPIRATION SECTIONS:**

Each VSC is equipped with a patented Crown aspiration system. This system is designed to remove fine moisture situated within the seeds as they are being heated. The dryer exit exhaust sections specifically designed to distribute fresh air through the entire bed of beans is installed between the heating sections.

As the seeds flow down the VSC, the wind in contact with the tubes heating and also bringing the moisture to the surface of the seeds. During aspiration, the direct air contact pulls the fine moisture away.

**CROWN LABORATORY VSC:**

At the Crown Laboratory located in Roseville, Minnesota, Crown’s VSC is installed and available for clients and potential clients to test various products. Customers are shown Crown’s VSC by test runs prior to making any final purchasing decisions.

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**VSC PARTS**

**Inlet Hopper:**

The inlet hopper allows for a short-run capacity before beans enter the VSC heating sections. A level of seeds is maintained continuously above the top edge of the intake to ensure intake tube wear does not occur. A Flange is supplied for bolting an airtight level device to the inlet hopper. The airtight level device is used to control material flow and discharge speed from the VSC. Additional surge capacity can be added by installing inlet extensions.

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**Roept Discharge:**

The rotor discharge is a chain and sprocket driven unit protected by a shear pin hub. Multiple pocket type feeders are chained together to operate with one small, one and one half maximum, horsepower variable speed drive. This true volumetric feeder has been used by many plants to set the production rate for the remainder of the crushing process. The tight tolerance on the rotor plates completely halts the flow of material to ensure a positive shut-off when stopped. The rotors turn at two to three RPM, reducing the wear on the rotors, resulting in a very long lasting, maintenance free discharge.

**Lab VSC:**

At the Crown Laboratory located in Roseville, Minnesota, Crown’s VSC is installed and available for clients and potential clients to test various products. Customers are shown Crown’s VSC by test runs prior to making any final purchasing decisions.  

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Vertical Seed Conditioner

**GENERAL FEATURES**

The Crown’s Vertical Seed Conditioner (VSC) is a combination heater and dryer used on free flowing granular solids such as soybeans and rapeseed. The heater is a stacked design with multiple heating sections using low-pressure (1 Bar or 15 PSI) steam heated oval tubes. Crown’s patented aspiration system draws the seeds by removing the free moisture brought to the surface during heating. A low-power rotary style discharge creates a steady material flow to the plant with minimal electrical load requirements.

In soybean applications, seeds up to 14 percent moisture can be brought to the VSC eliminating the use of grain dryers for processing. The typical retention time in the VSC ranges from 25 to 35 minutes depending on the required results for conditioning, drying and heating.

The VSC can be used for other applications including cans for pre-drying fluid conditioning of soybean seeds prior to planting in conventional drilling systems, corn genetics conditioning, along with sanding with conditioning of many other oil seeds. With five (5) models available, Crown can supply VSCs from a plant capacity as low as 25 MTPD (metric tons per day) to a maximum of 3,500 MTPD. The flanged heating section design gives customers the option to easily expand their plant by adding heating sections.

The Crown VSC provides the greatest efficiency and lowest installation and operating costs of similar conditioning and drying methods currently available. The VSC is also a main component of Crown’s industry leading drilling systems.

**CROWN BRAN HEATER ‘VSC’ FlowSheet**

With multiple soybean preparation systems, beans are received and stored prior to processing. Traditional systems typically utilize a process dryer and a tempering operation which include a high degree of labor, maintenance, handling losses, along with other costs associated with the dryer. These systems also have the bean temperature which could deviate as the beans are handled. The beans are heated once and kept hot, throughout the entire process.

Unlike the traditional system, all of the operations are performed in the preparation plant with a Crown vertical seed conditioner eliminating the need for traditional systems and in some applications. The beans are heated once and kept hot, throughout the entire process.

While soybeans are delivered to the plant from the receiving silos and are cleaned and sanitized. After passing through the cleaner, the beans are delivered to the VSC. The beans are uniformly heated by contact with a series of steam-heated oval tubes extending the width of the VSC. Crown’s patented aspiration system draws the seeds by removing the free moisture brought to the surface during heating. A low-power rotary style discharge creates a steady material flow to the plant with minimal electrical load requirements.

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**VSC PARTS**

**INLET HOPPER:**

The inlet hopper allows for a short-range capacity before beans enter the VSC heating sections. A level of seeds is maintained continuously above the top edge of hoppers to ensure excess tube wear does not occur. A flange is supplied for bolting an ominous level device to the inlet hopper. The volumetric level device is used to control material flow and discharge speed from the VSC. Additional surge capacity can be added by supplying inlet extensions.

**HEATING SECTIONS:**

VSC heating sections are equipped with a steam inlet header on one side and a condenser header on the other. Multiple end 304L stainless steel tubes are welded into a 304L stainless steel sheet. Before sections are supplied on both steam and condenser heating sections allowing full access for maintenance and replacement.

Removable drawers with lever right handers are supplied on two sides to view the seed movement and allow internal access. During insulating sections, sections are stacked and nested to allow for proper mixing of the seeds, avoiding short-circuiting. The end tubes are designed and sized for maximum bean contact as they are traveling through the VSC. This design results in consistent heating and conditioning in all seeds.

**ASPIRATION SECTIONS:**

Each VSC is equipped with a patented Crown aspiration system. This system is designed to remove free moisture carried within the seeds as they enter the heating section. Air inlet and exhaust sections specifically designed to distribute fresh air through the center of the beans is installed between the heating sections.

As the seeds flow down the VSC, the seeds in contact with the tubes heating and also bringing the moisture to the surface of the seeds. During aspiration, the direct air contact pulls the free moisture away. The aspiration system is designed as a complete negative air system. The fan is designed to pull air completely through a fresh air heater, the VSC, the heating and cycling prior to removing the fan. The air enters at various locations, typically around the inlet hopper, the middle and near the bottom of the VSC. The air discharge located near the center of the VSC is controlled by butterfly dampers supplied by Crown.

With drying ability of up to three percent, a processor can receive beans at 14 percent moisture and reduce seed cost or eliminate additional drying prior to processing. In soybean production, the end result is to dry the seeds to approximately 10 percent as VSC discharge.

**RETOUR DISCHARGE:**

The vent discharge is a chain and sprocket driven unit provided by a gear pin half. Multiple pocket type feeders are chained together to operate with one small, one and one half turntable, bow-screw variable speed drive. This roller volumetric feeder has been used by many plants to set the production rate for the remainder of the grinding process. The right tolerance on the shoe plates completely fills the flow of material to ensure optimum flow of seed which stops the sprocket when stopped. The sprocket turns on three 3HP, variable speed motors, resulting in up to a very long lasting, maintenance free discharge.

**CROWN LABORATORY VSC:**

At the Crown Laboratory located in Roseville, Minnesota, a Model 18 VSC is installed and available for clients and potential clients to test various products. Clients can bring Crown to test by a set time prior to making any final purchasing decisions.

**Lab VSC**

**Rotoer Discharge**

Inlet Hopper

Heating Section

Lab VSC
TYPICAL VSC INSTALLATIONS:
The typical VSC is mounted on a steel platform level with a discharge hopper below. A take away conveyor, typically an L-path conveyor, elevates the conditioned beans to the next phase of the process. A VSC can be installed inside the preparations building, or just outside the walls of the preparation building. It is essential to insulate the VSC to maintain temperatures and reduce the risk of moisture build-up inside the unit.

The largest single VSC Crown offers will condition 3,500 MTPD of soybeans. If more production is required multiple units will be offered. Smaller capacity units can be easily expanded by installing additional heating sections and increased drying. When market conditions warrant, the VSC can easily be expanded into a full Crown Hot Dehulling system.

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- Five (5) models available (25 – 3,500 MTPD)
- Stack up to 12 heating sections in one unit
- Easily expandable by adding sections
- FIFO, a true first in first out system
- Oval tubes increase heating surface area
- Low pressure steam (1 BAR or 15 PSI)
- Up to 3% drying with the Crown patented air system
- Low power volumetric rotor discharge (1/2 hp or 1.2 kw maximum)
- Heating sections use 304L SS tubes and tube sheets
- Access to all tubes with removable covers
- Wear protection armor on top row of tubes
- Side inspection covers to watch product flow during operations
- No need for expensive and high maintenance grain dryers
- Optional heat sources include hot water or flash steam
- Proven technology as a canola pre-heater, soybean crack conditioner, and corn germ conditioner
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