

## Coating Machinery Systems (CMS) Continuous Drum Coater

Mfg: Coating Machinery Systems

Model: WH-48-120IN

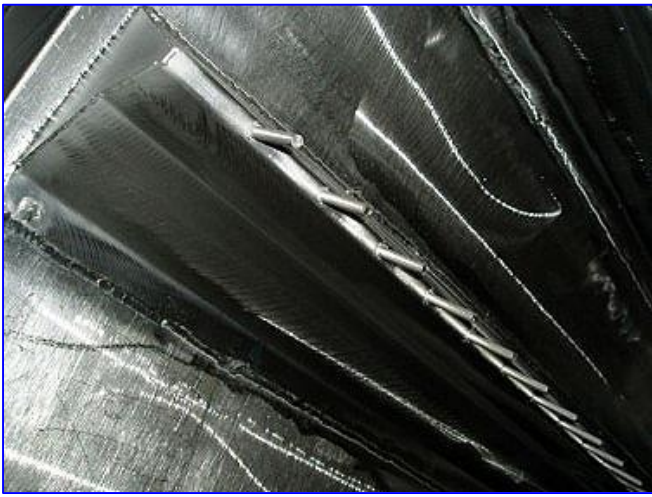
Stock No. SHNZ003.

Serial No. 99005

Coating Machinery Systems (CMS) Continuous Drum Coater. Model WH-48-120IN. S/N 99005. High capacity output with adjustable residence times. Drum dimensions: 46 in. dia. x 11 ft. 6 in. L. Drum contains numerous 1-1/2 in. dia. pegs and extending/retracting spray bars. Previously used for coating cooked pasta. Includes coating drum tilt motor assembly. Inlets: (1) 12 in. W x 10 in. H infeed. Outlets: (1) 2 in. dia. S-line fitting (excess coating), (1) 2 in. dia. threaded fitting, (1) 10 in. L x 6 in. W overflow chute, (1) 20 in. L x 5-1/2 in. W discharge chute. Overall dimensions: 19 ft. 6 in. L x 80 in. W x 10 in. H.







# 1 WORKHORSE SPECIFICATIONS X

MODEL	WH-15-IN	WH-24-IN	WH-36-IN	WH-48-IN	WH-60-IN
COATING CYLINDER DIAMETER	15"	24"	36"	48"	60"
TOTAL CYLINDER DEPTH	120"	120"	120"	120"	120"
MAXIMUM PRODUCT VOLUME (30% FILL)	4 cu ft	10 cu ft	21 cu ft	38 cu ft	59 cu ft
	113 liters	283 liters	595 liters	1076 liters	1670 liters
MAXIMUM QUANTITY OF SPRAY GUNS	10	10	10	15	15
TOTAL DRUM TILT ANGLE	6°	6°	6°	6°	6°

WIDTH	27"	42"	63"	84"	105"
DEPTH	152"	152"	152"	195"	195"
HEIGHT	69"	78"	90"	112"	124"

Refer to the **FUNCTIONAL REQUIREMENT** sheets for additional technical specifications about your coating machine.

Refer to **Electrical Interconnect** drawings for specific voltage, electrical service installation requirements.

*Serial # 99005  
Model WH48IN*

## 2 GENERAL INFORMATION

### 2.1 WORKHORSE INFORMATION

The **WORKHORSE** is a continuous film coating system used for applying liquid based solutions and or dry powders. The process air system is designed for maximum efficiency of process air usage.

This unit is designed to coat product in a continuous application with high throughput rates dependent on bulk density and type of coating. Quick disconnect peripheral components allow for easy cleaning of components in a remote location.

Precision process control is accomplished through an optional PLC (programmable logic controller) control system. During processing, the operator interfaces with a touchscreen monitor located on the front of the main panel to control machine functions and process variables.

### 2.2 AVAILABLE OPTIONS

The **WORKHORSE** has several options available for customizing the machine for optimum efficiency.

#### 2.2.1 PROCESS AIR DEHUMIFICATION

This unit is used for removing moisture from the process air in climates with high atmospheric moistures where process is moisture sensitive. Connection of unit to control panel available for remote start and stop functions.

#### 2.2.2 INLET HEPA FILTER

A 30% efficiency pre-filter is installed in the pre-filter track in the HEPA cabinet and is standard with the equipment. Installing the optional inlet HEPA filter will provide an additional filtration of the inlet process air.

This filter is necessary if the coating process requires air filtration of 99.97% efficiency.

#### 2.2.3 MANUAL CONTROL PANEL FOR CLEANING OF COMPONENTS

Manual control system with NEMA 4X rating. Allows for running pumps, powder applicators, spray guns, and other components required for the cleaning process.

#### 2.2.4 CUSTOM PROCESS CONTROL PROGRAMMING

Gives the customer the ability to tailor the machine to be best suited for their particular process, and allows the customer to specify any plant requirements or codes for the unit to conform to.

#### 2.2.5 PUMPS & CONTROL

The use of any style of pump is dependent on the following:

- **Type of solution being used in the process.**
- **Viscosity of the solution.**
- **Preferred type of pump by customer or plant.**
- **Application rate for throughput of equipment.**
- **These items are defined during testing in CMS pilot plant runs.**

The controlling of any pump is incorporated into the main system control. The actual flow rate or rate of delivery would be displayed on the main control panel.

**CMS** can provide any type of pumping system that is requested or required for the process. This would include but not limited to the following:

- **Gear Pump**  
Solution fluid fills the exposed gear tooth volumes and is transported around the outer diameter of the gear tooth pocket. As the gears mesh together, the fluid is displaced out through the discharge port.
- **Peristaltic Pump**  
Uses a cam or roller to squeeze the the solution tube causing the solution to flow. Nothing but the tube touches the fluid,



eliminating the risk of the pump contaminating the fluid, or the fluid contaminating the pump.

- **Diaphragm Pump**  
Fluid fills the diaphragm cavity and is displaced through the output port when the diaphragm is actuated results in an accurate and controlled volume output.
- **Lobe Pump**  
Similar to the gear pump except with lobe type gears. This pump type allows you keep the pump head heated preventing the solution from solidifying prematurely in the solution lines or in the pump head.
- **Progressive Cavity Pump**  
The pumping action is created by the single helical rotor rolling eccentrically in the double threaded helix of the stator. In its revolution, the rotor forms in conjunction with the stator a series of sealed cavities 180 degrees apart. As the rotor turns, the cavities progress from the suction to the discharge end of the pump. Thus the sum of the two discharges is a constant volume. The result is a pulsation-free, constant volume, positive displacement flow with no valves.

**This range of pumps allows control of delivery of solutions ranging from 1% to 90% solids.**

#### 2.2.6 WEIGH BELT

In-motion scales provide a means of weighing bulk material while being conveyed. This allows accurate rate of flow and totaled weight measurement without interrupting the flow of material in process.

#### 2.2.7 VIBRATORY FEEDER

For high speed feeding of light, bulky materials. They provide greater economy and efficiency in feeding, filling, etc., and are ideal for use in conjunction with many weigh scale and packaging machines.

#### 2.2.8 HOPPER FEEDER

These units work well with most dry, free flowing products for accurate and uniform feed of products and for conventional surge type storage prior to specific processing operations.

#### 2.2.9 FLOW METER

Flow meters measure the volumetric flow of liquid or slurry. The device mounts directly in the pipeline and has no moving parts or obstructions to restrict flow.

#### 2.2.10 AIR SPEED & STATIC PRESSURE PROBES

Insertion type airflow measuring element containing multiple total and static pressure sensors mounts in the ductwork.

#### 2.2.11 HUMIDITY PROBES

Relative humidity probe/transmitters provide accurate, temperature compensated and linearized outputs. They can be mounted in the duct or in any tight location.

#### 2.2.12 MIXERS

Mixers maintain constant mixing speed regardless of torque load or fluid characteristics with repeatable speed settings from run to run for reliable and repeatable mixing.

#### 2.2.13 PRINTER

Printouts of readout screens and parameter settings make it easier to document process and formulation. Available in laserjet, inkjet or dot matrix.

#### 2.2.14 POWER REQUIREMENTS

The workhorse is normally powered with 460VAC, 3 phase power but can be custom built depending upon customer requirements.

### 3 UNLOADING & PLACEMENT

#### 3.1 WH-SS MODEL

1. There should be at least four people present when unloading the machine.
2. A forklift is needed to unload and move the machine.
3. Cut and remove banding on sides (this will free unit from pallet).
4. Check for any damage that may have happened during shipment. If there is damage call and document damages to both the trucking line and CMS.
5. Using the forklift extensions on forks, insert forks under bottom of machine.
6. Forklift should have a minimum capacity of 4000 lbs.. When using forklift, proper safety rules should apply to moving the equipment.
7. Lift machine level and only a minimum for clearance off of the floor.
8. Move machine into location.  
**NOTE:** Driver should have two spotters to watch side and top clearances.
9. Set the machine into place. Check frame for level both directions.
10. Steel shims can be used to assure that the machine is level once set into place.
11. Once machine is set in place see ductwork, pipe, and electrical installation sections and also installation drawings for final hookups.

#### 3.1.1 UNLOADING FROM A LOADING DOCK

1. Attach the fork extensions to the forklift.
2. When moving the machine, the driver should have at least two spotters to check for side and top clearances.
3. Drive the forklift into the semi-truck.
4. Lift the machine and the crate.
5. After the machine is set on the floor, cut the banding.
6. Check the machine for any damage. If there is any damage report it to CMS immediately.  
**CAUTION: When placing the fork extensions to the bottom of the machine be aware of the drain under the machine.**
7. Using fork extension lift the machine by the base and move it to designated area.
8. When moving the machine make certain that the machine remains level.

### 3.3 WH-IN MODEL

1. There should be at least four people present when unloading the machine.
2. Two forklifts are needed to unload and move the machine.
3. Remove top and sides from crate (this will allow access to lift the machine).
4. Check for any damage that may have happened during shipment. If there is damage call and document damages to both the trucking line and **CMS**.
5. Forklifts should have a minimum capacity of 4000 pounds. When using forklift, proper safety rules should apply to moving the equipment.
6. Position one forklift on each end of the machine putting the forks in the marked lifting positions.
7. Lift machine level and only a minimum for clearance off of the floor.
8. Move machine into location.  
**NOTE:** Driver should have two spotters to watch side and top clearances.
9. Set the machine into place. Check frame for level both directions.
10. Use steel shims to assure that the machine is level once set into place.  
Or another option is to break, grind or chisel welds off the telescoping legs and adjust as necessary to keep machine level. Weld continuously around to permanently set them in place.  
[Fig. 3.3]
11. Once machine is set in place see ductwork, pipe and electrical installation sections and also installation drawings for final hookups.

#### 3.3.1 UNLOADING FROM A LOADING DOCK

1. Attach the fork extensions to the forklift.
2. When moving the machine, the driver should have at least two spotters to check for side and top clearances.
3. Drive forklifts into both sides of the double-drop trailer.
4. Lift machine and drive double-drop open trailer out from under the machine.
5. After the machine is set on the floor, remove top and sides of crate.
6. Check the machine for damage. If there is damage report it to **CMS** immediately.
7. Position one forklift on each end of the machine putting the forks in the marked lifting positions.
8. When moving the machine make certain that the machine remains level.

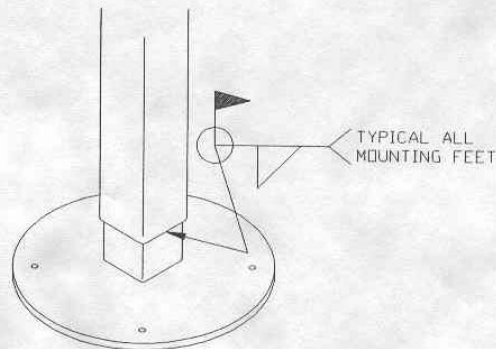


Fig. 3.3 Inline model leveling

### 3.4 INSPECTION

Upon receipt of the shipments please check for shortages or damages to the equipment. Report all damages to the carrier immediately.

Some components of the **WORKHORSE** are shipped in separate cartons, i.e. solution tanks, screen liners, vibratory feeders etc. These cartons should be inspected to ensure all components have arrived.

Initial setup of the **WORKHORSE** requires the installation of components and service connections to the machine. The following paragraphs explain the necessary steps to prepare the **WORKHORSE** for processing.

#### 3.4.1 SERVICE CONNECTIONS

Service connections to air supply, exhaust venting, drainage and electrical supply are required. Refer to **Installation Drawings** section in this manual.

If you have questions or need assistance during initial setup, please contact **Coating Machinery Systems Service Department at 515-597-3390.**

Removal of access covers will be necessary to access the supply connections.

### 3.5 SAFETY PRECAUTIONS

1. **Do not attempt to operate the machinery until this manual has been read and fully understood.**



2. Always wear safety glasses when working on the machine.
3. Maintain a clean and uncluttered work area.
4. Avoid dangerous environments; do not use power tools in wet or damp areas, and keep work area well lit.
5. Personal safety: Be familiar with the equipment and all tools used for servicing functions. Dress appropriately and always use safety glasses.

6. Stay alert to conditions and procedures during installation, operation and servicing.
7. Never operate the machine unless proper maintenance routines have been performed regularly and the machine is known to be in good working condition.
8. Never attempt to repair or perform maintenance on the machine(s) until the main electrical power has been disconnected.
9. When installing pipe fittings always use a pipe sealant. If plastic fittings are installed, do not use or apply heat to copper fittings which may come in contact with them. If Teflon tape is used, do not allow any tape to enter the sealed system components.
10. Do not attempt to open electrical panels or junction boxes unless main power has been disconnected.
11. Stay alert at all times. Know which switch, push button, or control you are about to use and what effect it is going to have.
12. Never leave the machine in an unsafe position.
13. Never continue or begin to operate the equipment if an unusual or excessive noise or vibration occurs.
14. Review the installation instructions carefully. Be sure to have all supplies and tools necessary.
15. Make sure that the machine is firmly bolted into place before operating.



### 3.6 INSTALLATION OF MACHINE

1. Unload machine.
2. Position the machine into place - see installation layout prints for suggestions.
3. Unload outfeed conveyor - if applicable.
4. Unload spray bar cart - if applicable.
5. Unload weigh belt cart - if applicable.
6. Unload dust collector - if applicable.
7. Unload heater - if applicable.
8. Place into position - (see installation layout prints for suggestions).
9. Unload control panel.
10. Unload high voltage panel - if applicable.
11. Place into positions (see installation layout prints for suggestions).
12. Have a compressed air source available.
13. Unload solution tank or have a mixing tank available Refer to installation drawings for recommended location of mixing tank.
14. Have plumbers, electricians, and other contractors available for installation. Please refer to the following sections in this manual:  
**4 DUCTWORK INSTALLATION**  
**5 PIPE INSTALLATION**  
**6 ELECTRICAL INSTALLATION**  
  
**Refer to the following diagrams:**  
**Air/Water Installation Diagram**  
**Electrical Interconnect Diagram**  
**Electrical Schematic Diagram**  
**Piping & Instrumentation Diagram**  
**Pneumatic/Hydraulic Schematic Diagram**  
  
**Also refer to the Parts Support Manual for dehumidifier, chiller, heater, HEPA filter, dust collector or any other optional equipment installation manuals.**
15. Have product available to run through for initial testing.
16. Have coating solution available for use.

### 3.7 PROCESS AIR

Process air enters the **WORKHORSE** from the atmosphere surrounding the inlet blower. To avoid building a negative pressure in the process area **CMS** recommends the inlet blower to be installed outside or run a supply duct to the fan from the outside.

### 3.8 EXHAUST VENTING

The exhaust from the **WORKHORSE** should be connected to a dust collecting system. Connect a customer supplied flexible hose or hard duct to the top of the machine. Any duct work added to the system must be adequately supported - **DO NOT** rely on the unit to support additional duct work.



### WARNING!

**If a flexible hose is used, the hose MUST be resistant to coating solution vapors generated during processing and able to withstand high heat conditions. Otherwise structural failure may occur and may release hazardous fumes into the processing area.**

### 3.9 COMPONENT INSTALLATION

Several components of the machine are shipped separately and require installation before processing can begin. To ensure proper maintenance of the machine, these procedures will have to be performed throughout the lifetime of the machine. Refer to the maintenance and installation instructions in the **Parts Support Manual** specific to the components.

#### 3.9.1 INLET HEPA FILTER

The inlet HEPA filter is shipped separately and must be installed before processing can begin. When unpacking the HEPA filter **DO NOT** touch the surface of the filter.

**Install the filter as follows:**

1. Open the HEPA cabinet by removing the wing nuts and pulling out on the front door.
2. Move the holding bar out of the cabinet.
3. Insert the filter with the sealant edge placed against the flange inside the cabinet.
4. Close the holding bar. This bar keeps the filter in place and forces the seal against the flange.
5. Close the door and reinstall wing nuts.



#### **CAUTION!**

Once the HEPA filter has been installed, **DO NOT** remove again until time of replacement. Premature removal of filter may cause damage to seal or filter surface.

## 5.7 COMPRESSED AIR

### MAIN AIR IN

Air is used within the system for control air and spray air. This air supply must be of instrument grade quality; clean, dry and oil free. The use of a customer supplied coalescent filter and separator filter is recommended.

1. The compressed air connection is made by running the customer supplied air line from the air source to the unit.
2. Air lines should be sized properly to allow the recommended volume (CFM) and pressure (PSI) of air required.
3. Refer to **Air/Water Connections** drawing for additional model specific installation information.



### CAUTION!

**Supply air must be instrument grade quality; clean, dry and oil free.**

**Dirt, oil and moisture in the air supply may cause controls to malfunction. Contamination of the product can also occur through the spray guns.**

## 5.8 DRAINAGE

A drain pan is located directly under the coating machine drums inside the unit. The customer must supply a flexible hose or drain pipe to attach to the drain connection (to collect rinsate water to be used for subsequent run after filtering) or a container can also be placed underneath it.

Some models will have a **drain valve** located on the bottom of the coating machine. The valve handle should be in the inline position (open) when cleaning the machine. The valve handle should be in the perpendicular position (closed) when the machine is operating. Refer to **Air/Water Connections** drawing

**CMS** recommends that water not be allowed to run directly into a drain unless appropriate actions have been taken to comply with local sewer discharge requirements. Drainage system must meet current EPA rules.

**PLEASE NOTE:** *Some solutions should not be directed to the floor drain due to environmental concerns. The customer is ultimately responsible for the proper disposal of all waste.*

## 5.9 WATER

### MAIN WATER IN

Connection should be made to standard water receptacle. De-ionized water or tap water, hot or cold may be used. Water is used by the Auto Wash System or Tank Washer System. A ball valve is supplied with the coating machine to control the flow of water running through the cleaning system bars.

Refer to the **Air/Water Connection** drawing for additional and model specific installation information.



## 7.2 OPERATION SEQUENCE

There must be a mixing tank for the solution. Distance of mixing tank to machine is dependent on the pump type. Refer to pump operations manual in the **Parts Support Manual**.

As an option, the mixing tank may be purchased from Coating Machinery Systems, Inc..

The customer must also have a mixer to mix the polymer and solution (water). This can also be purchased from Coating Machinery Systems, Inc..

In preparation for trial runs it is advised that some scrap product is set aside for the trial runs. Coating solution must be ready for trial testing.

### 1. *Turn ON Control Power*

This function is for starting up the control center and activating everything on the control panel allowing you to start to run the process.

### 2. *Set Drum Angle*

The drum angle is a manual setting. Set the desired angle. The angle can change depending on the product, on how big the product is, the density, and amount to be ran.

### 3. *Turn ON the Solution Flow Pump*

The flow pump can be running throughout the day at any time. However, if there is solution charged in the lines, it should be running.

### 4. *Turn ON the Exhaust Blower*

This is the first phase in a startup. Turn the exhaust blower on (this is the blower that creates the negative pressure on the side vented machine). Usually this blower is remote, however, you have instrumentation on the control panel to show that it is on.

### 5. *Turn ON the Inlet Blower*

The inlet blower is the blower which moves the hot air from the heater box to

the usable source which is the inside of the drum.

### 6. *Turn ON the Air Heater*

The systems can be either equipped with an direct or indirect, gas, steam or electric heater. At this time, once the inlet blower is turned on you would go ahead and turn on the air heater. There is an inter-lock on our system to eliminate the possibility of turning the air heater on without the inlet blower running.

### 7. *Set Temperature for Process*

Different size product require different temperatures. The temperature controller either works on an analog signal or an on/off solenoid, or the setting on the heater. Set the process to run at a specific inlet temperature. By spraying on the product, product temperature can be maintained.

### 8. *Start Drum (Coating Cylinder)*

This is a button that activates the drum to start the coating cylinder, that will move the product inside. This should be started and set at 12 rpm. Again this depends on what size the seed is to determine the maximum speed setting.

### 9. *Start Dust Collector*

The dust collection system is used to collect over spray into a filter. This process causes a pulse air jet to cycle, thereby cleaning the filter as it operates.

### 10. *Load Product to be coated and Set Flow Rate*

The reason you wait until now to load the product to be coated is because you want the heater to come up to temperature, but you don't necessarily want your seed to get that hot. So load your product last. Set your product flow rate with vibratory feeder control.

### 11. *Reach Temperature Set Point*

By using the temperature controller you are able to set your desired temperature as determined by your product. Then wait for the proper set point to show on the digital readout; thereby indicating that the

heater is at it's operating state and is ready for the product.

12. **Set Solution Pump Rate**

This digital readout function is on the front of the Control Panel. Set to proper rate for your product.

13. **Turn ON and Set Product Infeed System**

Start product through system using the preset flow rate.

14. **Turn ON Spray Guns**

These will be from #1 through #5 on Spray 1 and #6 through #10 on Spray 2. The guns are numbered starting with e the gun #1 closest to the inlet chute. The guns are equipped with a pneumatic atomizing feature. This function is powered from the control panel. Control air pulls the needle back and allows the solution to flow out of the nozzle. Observe the product to determine if it is wet or dry and adjust spray rate if need be.

15. **Turn Spray Guns Off**

This is done after we have completed coating the product. The function of pushing the OFF button returns the needle back into the nozzle shutting off the spray.

16. **Shut OFF the Product Infeed System**

Time this with the stage stopping of the spray guns to minimize product tailing loss.

17. **Turn Exhaust OFF**

To shut the exhaust blower push the button.

18. **Turn OFF Inlet Heat and Inlet Blower.**

19. **Turn ON Auto Wash System**

Before starting the Auto Wash System turn off the blowers, drums and spray. Make sure that all of the product has been removed from the machine. Open the drain valve located on the underside of the machine. Turn the Auto Wash System on. The drums should be started and should rotate at about 5 RPM and water will start to run through the inlet tubing

in the roof of the machine. Set the pattern and atomization at about 25 PSI on the spray guns. Start the pumps and pump clean soapy water through the system. Allow the pumps and spray guns to run for approximately 10 minutes depending on coating solution used. The Auto Wash System can be stopped after 15 minutes depending on the coating solution used. After the rinsing cycles is complete the drying cycle begins. At this time, only the inlet blower and heat will need to be started. They should run for 15 minutes. During the clean-in-place cycle the exhaust hose should be removed for inspection of the plenums. Only the exhaust hose needs to be inspected at this time. The exhaust duct/hose, as you face the machine, is typically on the right hand side of the machine.

20. **Check Solution Pump**

Check to see if the solution pump needs to be cleaned or if it should continue to cycle the solution prior to the next batch.

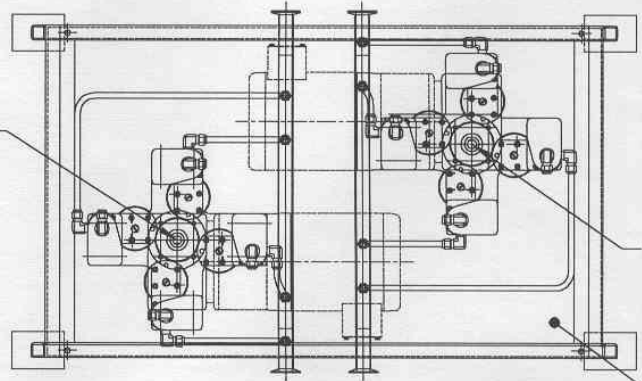


**CAUTION:**

**Do not run the gear pumps dry. If washing, use soap or another type of lubrication with the water. The gear pumps need to be lubricated at all times.**

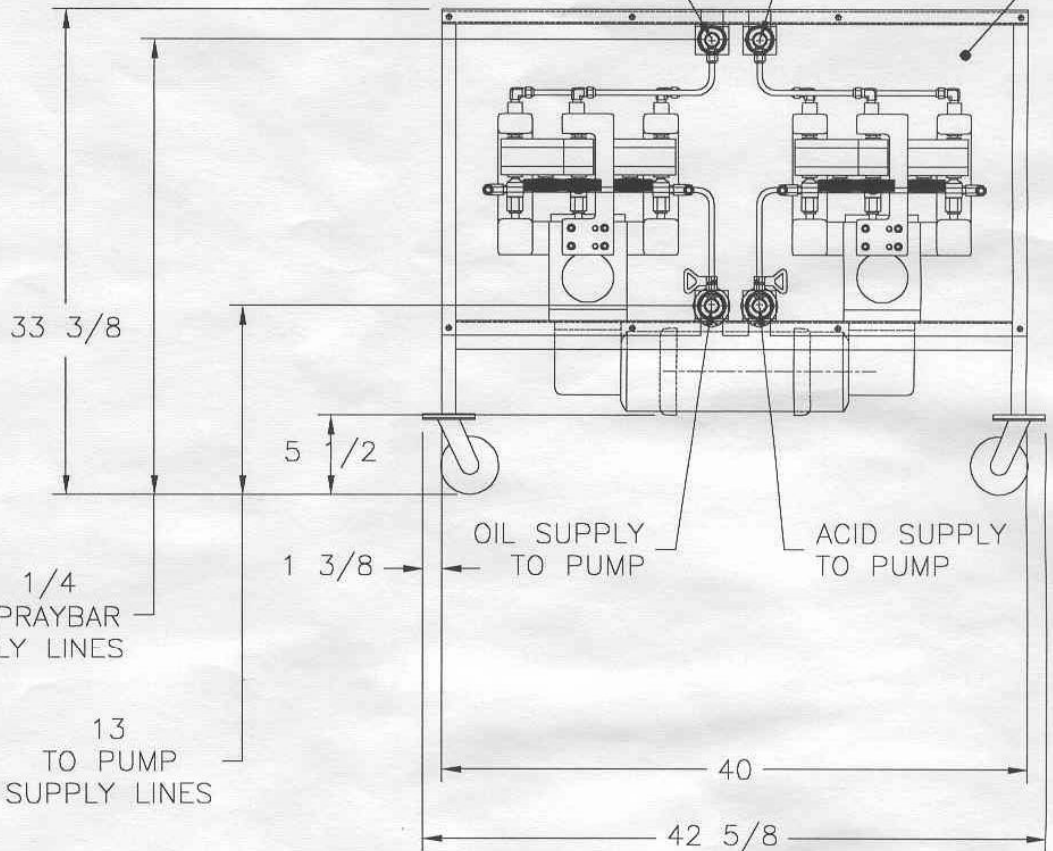
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TO SPRAYBAR

ACID SOLUTION  
TO SPRAYBAR





HEAD PUMP  
OR ACID SOLUTION

TOP AND SIDES  
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COVERED WITH LEXAN  
VIEWING GLASS


1" SANITARY CLAMP  
WITH END CAP  
TYP. 4 PLACES  
SUPPLIED BY CMS

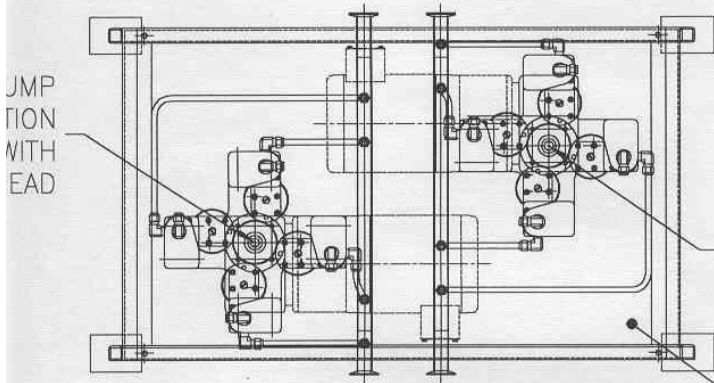
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CUSTOMER WILL SUPPLY  
1" SANITARY GASKET AND  
1" SANITARY CLAMP WITH TUBING  
TO LIQUID SUPPLY AND TO SPRAYBAR

SIDES SHOWN HERE ARE  
COVERED WITH STAINLESS STEEL

3/4"      22 1/2"      24"

1/2 HP, 220-460VAC,  
3 PHASE MOTOR

H				UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE AS FOLLOWS: FRACTIONS ±1/32 ANGLES ±0.5° DECIMALS .XX ±.01 .XXX ±.005 .XXXX ±.0005 BREAK ALL SHARP CORNERS	DRAWN BY <b>BVAN</b>	DATE <b>4/29/1999</b>	 <b>CMS</b> Coating Machinery Systems, Inc. <small>A Division of Taylor Corporation</small> 302 CAMPUS DRIVE HUXLEY, IA 50124 515/597-3390			
G					CHECKED BY 	DATE 		DESCRIPTION <b>FOOT PRINT DRAWING,          PUMP CART W/TWIN PUMPS</b>		
F					MATERIAL <b>AS NOTED</b>	THIS PART IS USED ON MACHINE <b>99005</b>			WEIGHT <b>LBS</b>	
E					FINISH <b>2B0</b>	SCALE <b>NONE</b>				SHEET <b>1 OF 1</b>
D					DO NOT SCALE DRAWING	DWG NO. <b>16430</b>				
C				THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION AND SUCH INFORMATION MAY NOT BE DISCLOSED TO OTHERS FOR ANY PURPOSE NOR USED FOR MANUFACTURING PURPOSES WITHOUT WRITTEN PERMISSION FROM COATING MACHINERY SYSTEMS DESIGN AND DIMENSIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE						
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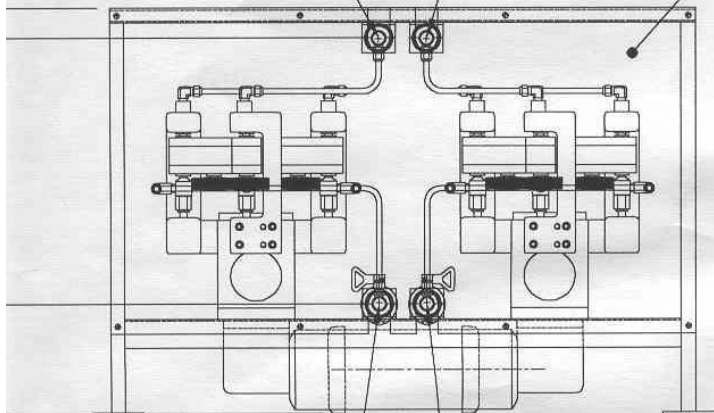
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TO SPRAYBAR

ACID SOLUTION  
TO SPRAYBAR



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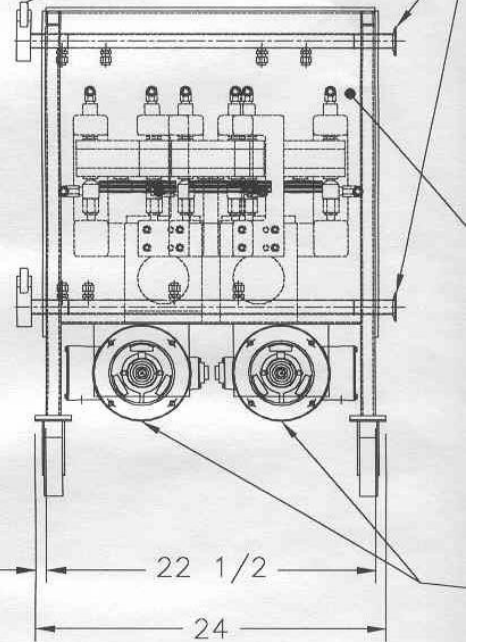
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ACID SUPPLY  
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# VeeJet<sup>®</sup> SPRAY NOZZLES

## STANDARD TYPE

### H-VV

small capacity  
1/8"-1/4" NPT or BSPT (M)



### H-VVL

integral strainer  
1/8"-1/4" NPT or BSPT (M)



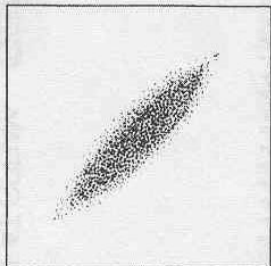
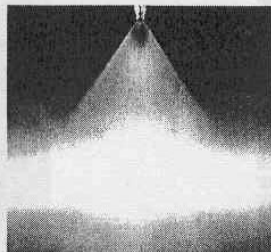
### H-U

medium capacity  
1/8"-3/4" NPT or BSPT (M)



### U

large capacity  
1"-2" NPT or BSPT (M)



### DESIGN FEATURES

Standard VeeJet spray nozzles feature a high impact solid stream or flat spray pattern with spray angles of 0° to 110°.

They produce a uniform distribution of small to medium-sized droplets.

Specially tapered spray pattern edges provide even spray coverage when several nozzles with overlapping patterns are required.

### COMMON APPLICATIONS

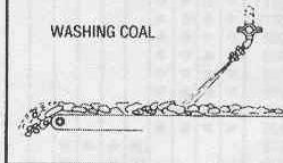
- Cooling and quenching
- Product washing
- Water cooling
- Air and gas washers
- Scrubbers
- Liquor washers
- Dust control
- Fire protection

The H-VV and H-VVL series VeeJet nozzles feature flow rates below 1 gpm at 40 psi (3.9 liters per minute at 3 bar), and male pipe thread connections. They are also available with female pipe connections by using DT in place of VV in the order number. H-VVL series nozzles come equipped with built-in strainers (not available with female pipe connections).

H-U and U series VeeJet spray nozzles feature flow rates of 1 gpm (3.9 liters per minute) and greater at 40 psi (3 bar), and male pipe thread connections.

1/8" and 1/4" H-U series nozzles are available with female pipe connections by using DU in place of U in the order number. See page C43 for materials.

WASHING COAL



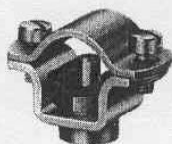
### ACCESSORIES

Other Accessories

- Check Valves
- Swivel Connectors

SEE SECTION G FOR COMPLETE INFORMATION.

Split-Eyelet Connector



Pressure Gauge



Adjustable Ball Fittings



Pressure Relief Valves



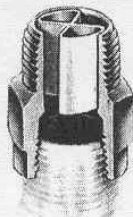
124 Strainer



Control Valves



### JET STABILIZERS



### DESIGN FEATURES

Jet Stabilizers increase spray projection distance and spray impact on flat spray nozzles. When nozzles are mounted in tees, manifolds, or elbows, internal flow turbulence is created when the liquid turns the corner and enters the nozzle. This turbulence can significantly distort spray pattern uniformity. Jet Stabilizers minimize turbulence and increase spray distance and impact by concentrating the spray into a thinner, steadier pattern.

Jet Stabilizer Order No.	Inlet Conn. NPT or BSPT (M)	Conn. for Nozzle NPT or BSPT (F)	Height Inches	Net Weight oz.
11370-1/8 x 1/8	1/8	1/8	3/4	3/4
11370-1/4 x 1/4	1/4	1/4	15/16	1 1/2
11370-3/8 x 3/8	3/8	3/8	1 1/16	1
11370-1/2 x 1/2	1/2	1/2	1 1/4	1 3/4
11370-3/4 x 3/4	3/4	3/4	1 1/2	3 1/2
11370-1 x 1	1	1	1 3/4	6 1/4
11370-1 1/4 x 1 1/4	1 1/4	1 1/4	2 1/4	11 1/4

### ORDERING INFORMATION

JET STABILIZER  
11370-SS - 1/8X1/8

Jet Stabilizer Type      Material Code      Connection Size

C 40

GENERAL PURPOSE

FLAT SPRAY







# VeeJet® SPRAY NOZZLES

## PERFORMANCE DATA

Spray Angle at 40 psi	Capacity Size	VEEJET NOZZLES NOZZLE TYPE/INLET CONNECTION										Equiv. Orifice Diam. Inches	CAPACITY (gallons per minute)										SPRAY ANGLE					
		H-VV		H-VVL		H-U		U		5	10		20	30	40	60	80	100	200	300	500	20	40	80	200			
		1/8	1/4	1/8	1/4	1/8	1/4	3/8	1/2	3/4	1		1-1/4	2	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi
15°	1560												3/16	3.0	4.2	5.2	6.0	7.3	8.5	9.5	13.4	16.4	21	11°	15°	18°	21°	
	1570												1/8	3.5	4.9	6.1	7.0	8.6	9.9	11.1	15.7	19.2	25	11°	15°	18°	21°	
	15100												1/4	3.5	5.0	7.1	8.6	10.0	12.2	14.1	15.8	22	27	35	13°	15°	17°	18°
	15120												1/4	4.2	6.0	8.5	10.4	12.0	14.7	17.0	19.0	27	33	42	13°	15°	17°	18°
	15150												1/4	5.3	7.5	10.6	13.0	15.0	18.4	21	24	34	41	53	14°	15°	17°	18°
	15200												1/2	7.1	10.0	14.1	17.3	20.0	25	28	32	44	55	71	14°	15°	17°	18°
	15250												3/8	8.8	12.5	17.7	22	25	31	35	40	56	68	88	14°	15°	16°	17°
	15500												1/2	17.7	25	35	43	50	61	71	79	112	137	177	14°	15°	16°	17°
151000												1/2	35	50	71	87	100	123	142	158	223	273	353	14°	15°	16°	17°	
0°	0003												.041	10	15	21	26	30	37	42	47	67	82	1.1				
	0004												.047	14	20	28	35	40	49	57	63	89	1.1	1.4				
	0005												.053	18	25	35	43	50	61	71	79	1.1	1.4	1.8				
	0006												.058	21	30	42	52	60	73	85	95	1.3	1.6	2.1				
	0008												.067	28	40	56	69	80	98	1.1	1.3	1.8	2.2	2.8				
	0010												.073	35	50	71	86	1.0	1.2	1.4	1.6	2.2	2.7	3.5				
	0015												.092	53	75	1.1	1.3	1.5	1.8	2.1	2.4	3.4	4.1	5.3				
	0020												.106	71	1.0	1.4	1.7	2.0	2.5	2.8	3.2	4.5	5.5	7.1				
	0030												1/16	1.1	1.5	2.1	2.6	3.0	3.7	4.2	4.7	6.7	8.2	10.6				
	0040												1/8	1.4	2.0	2.8	3.5	4.0	4.9	5.7	6.3	9.0	11.0	14.2				
	0050												1/4	1.8	2.5	3.5	4.3	5.0	6.1	7.1	7.9	11.2	13.7	17.7				
	0060												1/4	2.1	3.0	4.2	5.2	6.0	7.3	8.5	9.5	13.4	16.4	21				
	0070												1/4	2.5	3.5	4.9	6.1	7.0	8.6	9.9	11.1	15.7	19.2	25				
	0080												1/4	2.8	4.0	5.6	6.9	8.0	9.8	11.3	12.6	17.9	22	28				
	00100												1/4	3.5	5.0	7.1	8.6	10.0	12.2	14.1	15.8	22	27	35				
	00120												1/2	4.2	6.0	8.5	10.4	12.0	14.7	17.0	19.0	27	33	42				
	00150												1/2	5.3	7.5	10.6	13.0	15.0	18.4	21	24	34	41	53				
	00200												3/8	7.1	10.0	14.1	17.3	20.0	25	28	32	44	55	71				
	00250												3/8	8.8	12.5	17.7	22	25	31	35	40	56	68	88				
	00350												1/2	12.4	17.5	25	30	35	43	50	55	78	96	124				
00700												1/2	25	35	50	61	70	86	98	111	157	192	247					
001000												3/4	35	50	71	87	100	123	142	158	223	273	353					
001100												3/4	39	55	78	95	110	135	156	174	246	301	389					
001400												1	50	70	99	121	140	171	198	221	313	383	495					
001800												1	64	90	127	156	180	220	254	285	402	493	636					
002000												1 1/4	71	100	142	173	200	245	283	316	447	547	706					
003500												1 1/4	125	175	247	303	350	428	494	553	783	958	1240					

0° SOLID STREAM



## MATERIALS

MATERIAL	MATERIAL CODE	VEEJET®				JET STABILIZERS
		H-VV	H-VVL	H-U	U	11370
BRASS	NONE	•	•	•	•	•
MILD STEEL	1	•	•	•	•	•
303 STAINLESS STEEL	SS	•	•	•	•	•
316 STAINLESS STEEL	316 SS	•	•	•	•	•
Polyvinyl Chloride	PVC	•	•	•	•	•

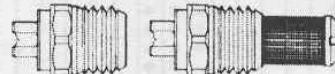
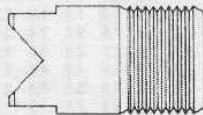
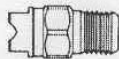
## ORDERING INFORMATION

VEEJET SPRAY NOZZLE  
**H 1/4 VV - SS 11010**

Nozzle Type Prefix (H only)    Inlet Connection Pipe Size    Nozzle Type    Material Code    Capacity Size

## DIMENSIONS & WEIGHTS

Based on largest/heaviest version of each type.



H-U			
Nozzle No.	Hex.	Nozzle Length	Net Weight
H1/8U	1/8"	3/4"	1/2 oz.
H1/4U	3/8"	1"	3/4 oz.
H3/8U	1/2"	1 1/4"	1 1/2 oz.
H1/2U	3/4"	1 3/4"	2 1/4 oz.
H3/4U	1 1/8"	2"	5 oz.

U			
Nozzle No.	Diameter	Nozzle Length	Net Weight
1U	1 1/8"	2 1/2"	9 oz.
1-1/4U	1 1/4"	3 3/4"	1 1/4 lbs.
2U	2 3/8"	5"	4 1/4 lbs.

H-VV			
Nozzle No.	Hex.	Nozzle Length	Net Weight
H1/BVV	1/2"	3/4"	1/2 oz.
H1/BVVL	1/2"	1 1/4"	3/4 oz.
H1/4VV	3/8"	1 3/4"	1 1/2 oz.
H1/4VVL	3/8"	2 1/4"	1 oz.

## DESIGN FEATURES

VeeJet nozzle strainers are available with either brass or 303 stainless steel bodies and come with 304 stainless steel screens. These strainers will fit in any H 1/4 VV or H 3/4 VV VeeJet nozzle. They provide an effective means of straining out particles that are too large to pass through the nozzle orifice.

## VEEJET NOZZLE STRAINER



FOR NOZZLE SERIES	STRAINER ORDER NO.
H 1/4 VV-	12686-**-**
H 3/4 VV-	12687-**-**

\* Material Code  
 no material code = Brass  
 SS = 303 Stainless Steel  
 \*\* Screen Mesh

MESH SELECTION GUIDE	
Equivalent Orifice Diameter	Recommended Screen Mesh
UP THROUGH .018" (.46 mm)	200
.019" (.47 mm) THROUGH .031" (.79 mm)	100
.032" (.80 mm) AND LARGER	50