MODU System
the Modular Conveyor Company www.modu-system.com

INDUSTRY SOLUTION

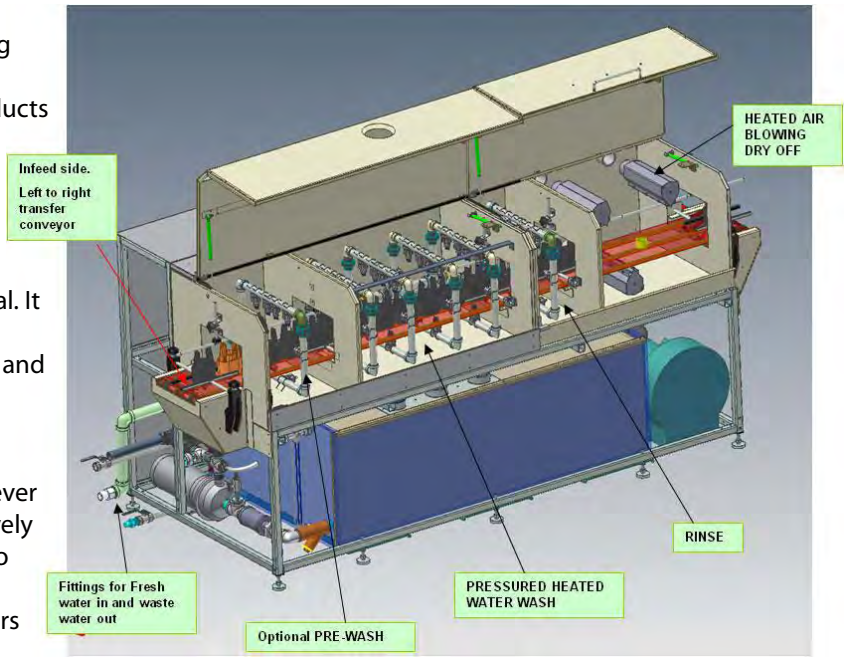
MOODY INTERNATIONAL Reg No : 6382
ISO 9001:2000 Certified

Aqueous Puck Washer

Technical Specification Page

General Overview

Pucks (also referred to carriers) are often used in packaging production lines to stabilize otherwise unstable products and/or to minimize production changeover between products by utilizing a common puck base.



Over time these pucks can become dirty from a combination of spilled liquids and dust. Once pucks become dirty, this can lead to the transfer of dirt to products which will have a negative impact on shelf appeal. It can also lead to rejected product on the productionline as dirty pucks can negatively impact automation equipment and contribute to line downtime.

Often pucks are periodically cleaned by hand. This can be effective if done frequently and thoroughly enough; however this is often not the case. It is best to clean the puck relatively soon after the spill occurs. The longer the spill is allowed to remain on the puck, the more effort is required to clean it. Also considering the repetitive nature of this task, operators often are not thorough enough. Finally, there have been reports of dermatitis by operators has a result of repeated exposure to the plastic and product involved which can present an environmental health and safety issue for the facility.

Definition of Clean and Dry

There are many issues that come into defining how clean is clean and how dry is dry. It can be different with each application. Testing is the best approach, especially when dealing with difficult to clean liquids. As mentioned above, it is helpful to clean the puck relatively soon after the spill occurred, perhaps at the end of every batch run. We can also slow the throughput done (via belt conveyor speed) and adjust the temperature of the water. It is also useful to utilize a "Clean Puck" design which allows water to pass through the puck, eliminating wells where water can accumulate. This also helps in the drying process. When needed, warm air can be introduced to help with water evaporation.

Standard Features

The standard machine incorporates a twelve inch open wire mesh conveyor which conveys the pucks through four zones which can be adapted to a variety of application through installed options.

Zone 1 - Pre-wash - This zone incorporates a pattern of spray nozzles which sprays the puck top, bottom and on both sides. It typically utilizes fresh water directly from customers' utilities which can be hot or cold depending on what is available. Pressure is at live pressure. This zone drains directly to waste. The purpose of this zone is to knock of as much dirt as possible and drain directly to waste so as not to contaminate the water utilized in the cleaning zone.

Zone 2 - Wash - Although zone 2 can also utilize direct customer supplied water it typically incorporates an optional heated tank water supply. The water is pre-filled into the tank and heated to a temperature of 130 degrees by heating elements installed in the tank (optional temperatures up to 180 degrees can be achieved). A filtered pump is used to circulate water from the heated tank to a series of four rows of spray nozzles which also spray the pucks from all four sides. Adjustable nozzles are used to optimize the spray pattern for the pucks being cleaned. The water drain back into the tank, which can be programmed to periodically drain some water off to waste and introduce fresh water.

Zone 3 - Rinse - The rinse zone to again spray the puck with fresh water to rinse of any residual contaminants that may remain on the puck. In some applications a cleaning detergent may be utilized, this zone also allows for any residual detergent to be removed. This zone can be plumbed to drain to waste, or optionally can drain back to the heated tank as a source of fresh water.

Zone 4 - Dry – This zone incorporates a blower which funnels air to three air knifes which direct the air at a high velocity to the top and bottom of the puck to help quickly evaporate the water. Optionally a heated flue can be installed to warm the air facilitating faster evaporation.

Throughput

Pucks per hour through the cleaner is a function of puck size, conveyor speed and number of lanes being utilized. The standard unit incorporates one set of adjustable guide rails. The twelve inch wide conveyor can handle up to three (3) 3.5" wide lanes may be configured with adjustable guide rails to manage puck flow thru the machine. Cleanliness can be somewhat adversely affected by increasing the number of lanes and speed of conveyor operation. Testing is required to determine throughput. For single lane operation rates up to 90 to 100 pucks per minute might be able to be achieved.

Controls

The basic machine controls can be as simple as a manual on/off switch when no heated tank is incorporated and the unit will be manual started and stopped at beginning and end of lot.

When a heated tank with pump is required or more efficient or automated control is desired, an Allen Bradley PLC control package can be incorporated which includes a touch screen interface.This package includes a series of automatic valves which turns zones on and off as needed, and regulates water in the tank and conveyor speed.

Features of the control system include:

Initial setup/tank regulation - this feature runs through a series of steps to assure machine is ready to operate when initially started relative to the heated water tank. On initial start up the tank is filled with fresh water (either cold or warm), and heated to proper operating temperature. Once at temperature, the operator (or via an electronic line interface), is notified that the machine is ready. Other features include the a series of sensors to monitor water level and temperature, a sight glass which gives maintenance a visual cue on water level, a manual overflow failsafe runoff to drain and the ability to utilize the pump to empty the majority of the tank should you be required to move the machine or clean the tank.

Auto standby on/off sensor - This sensor is installed at start of washer conveyor. As pucks pass the sensor, a timer is repeatedly reset which increments to the max time it would take for a single puck to pass through the system. Once a period of inactivity is determined, the pump and conveyor are turned off to conserve energy. Selectively, the temperature setting can be reduced after a longer period of time to further conserve energy.

Product Profiling - This feature allows for individual product profiles to be set up depending on the puck style being cleaned. Parameters which can be varied and stored by product include conveyor speed, water temperature, and auto standby timer (described above). Additionally the regularity and duration in which fresh water is exchanged with contaminated water in the tank can be varied. This can be particularly useful when foaming in the tank may occur. If more is required optionally anti-foaming agents can be introduced.

Technical Specifications

Hot Water Wash

Tank Capacity	180-200 gallons, heated, auto level control and temperature control, general chemical compatible. 1" insulation
Water temp	125°-145 F
Filtration	Yes
Pump	5 HP, stainless steel pump
Pressure	50 PSI
Nozzles Spray	From top, sides and bottom;
Electric Heat	50 KW

Conveyor

Speed	10 - 30 FPM
Belt Width	12" wide
Belt Material	Stainless steel Wire mesh, 3/8" pitch, 70% opening

Blow off drying

Blower	Regenerative blower
Capacity	7 HP, 88-267 SCFM, MAX. PRESSURE 114 IN H2O
Air knife	Two 12 inch S.S. air knife blow from top, one blow from bottom
Electric blow off heat	Optional. 15 KW

Electrical

Control	Allen Bradley PLC
Drive	SEW Eurodrive with Variable Frequency Drive to regulate speed
Horsepower Rating	1/2
Electrical Required	230 VAC, 3 Phase, 60 HZ
Enclosure	NEMA 4
Display	Touch screen

Mechanical

Machine Dimension	Length: 120", Height: about 56"; Depth: 48".
Machine Construction	304 stainless steel
Top of chain to floor	37" +/- 1"
Puck size:	Varies
Tunnel opening size	13" wide, 8" high

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