FINISHING EDUCATION UNIVERSITY

CARLISLE FLUID TECHNOLOGIES

Knowledge is Power

The Brands You Trust

BGK™ products deliver precision-engineered curing capabilities for a full range of coatings including liquid, powder, wax, UV and adhesives.

Binks® products boast innovative spray gun and air cap design along with industry leading pumps and controls.

DeVilbiss® products include low pressure manual and automatic spray guns and related spraying accessories. *DeVilbiss* products are widely acclaimed for ergonomics and innovative spray gun design.

Hosco® products deliver smooth bore, “cavity free” stainless steel fittings and accessories designed for use in paint circulating and application finishing systems.

ms® products include powder coating systems and equipment. ms is recognized throughout the world for quality, efficiency and durability.

Ransburg® manual and automatic electrostatic finishing products offer spray finishing solutions to industrial and automobile manufacturing markets.

Safety in the Paint Kitchen

- Explosive Environment
  - o Prevent a spark
  - o Class 1/Div 1 & ATEX
  - o Methods of protection
- Grounding – prevent sparks
  - o Ground points on pumps, pressure tanks, guns
  - o Conductive hosing
  - o Cardboard/Paper flooring can prevent grounding
- Equipment Safety
  - o Equipment Guards
  - o Prevent contact with spinning agitator blades
  - o Trapped fingers in Elevators
  - o Pressure Tanks ASME
- Protection & Training for Personnel
  - o Eye Protection
  - o Air Fed Masks
  - o Fluid injection

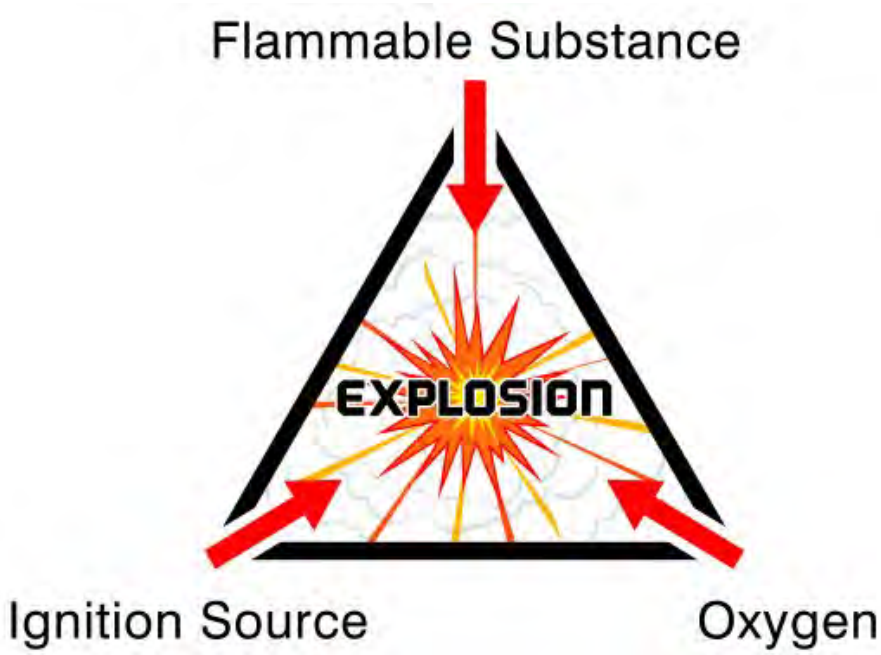
Dominic Martin

Global Product Manager
Circulation & Supply Equipment

Explosive Environments

Why is all this legislation involved with our products; ATEX, NFPA, UL, CE, and CSA Global.

An explosive atmosphere is defined by a mixture of dangerous substances within the air under atmospheric conditions.



Flammable Substance

This needs to be present in a relatively high quantity to produce an explosive mixture (e.g. gas, vapours, mists and dusts).

Oxygen

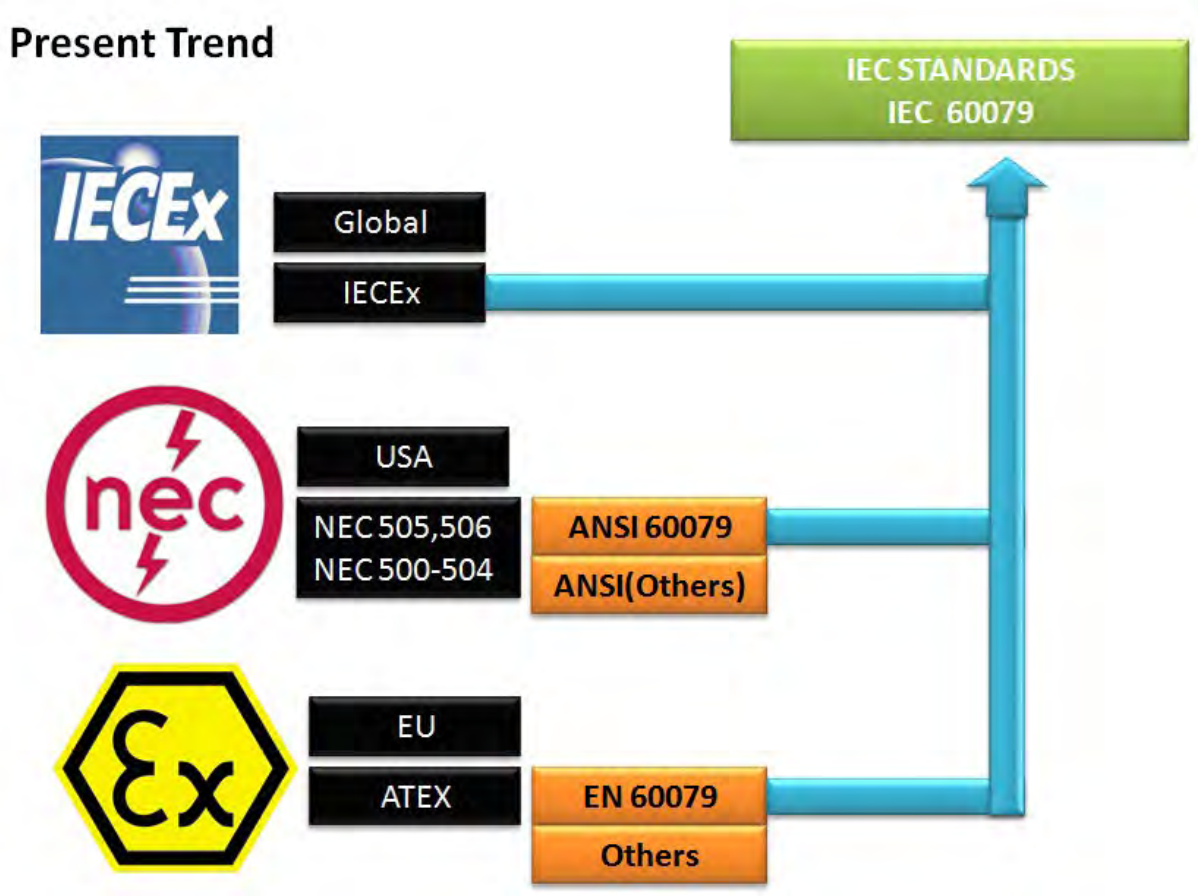
Oxygen is required in high quantities and in combination with the flammable substance to produce an explosive atmosphere.

An Ignition Source

A spark or high heat must also be present.

Global Regulations

NEC = National Electric Code
ATEX = ATEX derives its name from the French title of the 94/9/EC directive: Atmosphères EXplosives.
CE = Conformité Européenne (European health & safety product label)



NFPA (National Fire Protection Association)

- NFPA is a global, nonprofit organization devoted to eliminating death, injury, property and economic loss due to fire, electrical and related hazards.

- The association delivers information and knowledge through more than 300 consensus codes and standards, research, training, education, outreach and advocacy; and by partnering with others who share an interest in furthering the NFPA mission.

- NFPA Committee develops the National Electrical Code (NEC) through their code making panel. The NEC is approved as an American national standard by the American National Standards Institute (ANSI)

Source: http://www.nfpa.org/overview

USA NEC vs EU ATEX

ATEX Environment	NEC Classes
G = Gas	Class 1 = Flammable gas, vapours and liquids
D = Dust	Class 2 = Combustible dusts
	Class 3 = Ignitable fibres and filings

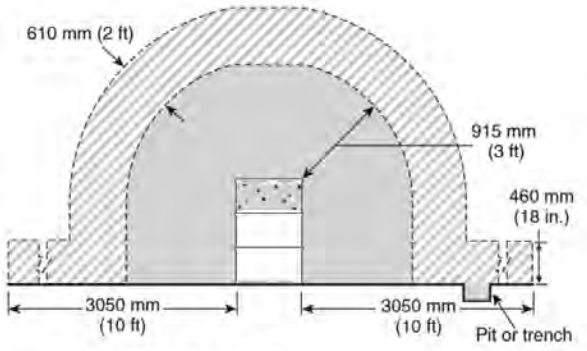
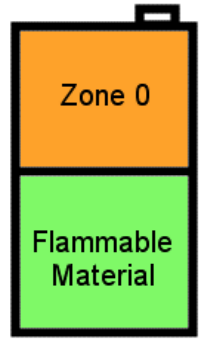
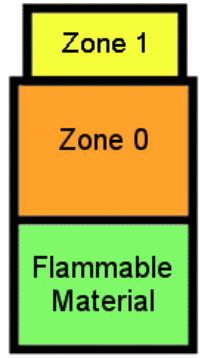


FIGURE 6.5.5.2 Electrical Area Classification for Class I Liquid Operations Around Open Containers, Supply Containers, Waste Containers, Spray Gun Cleaners, and Solvent Distillation Units.

ATEX Zone (for gas)	UL Division	Area Example
0 = Continuously present	Division 1 = Likely or frequent under normal conditions	Inside an open or closed container or mix tank
1 = Intermittently present		Inside a spray-booth or paint mix room (kitchen)
2 = Not likely	Division 2 = Not likely	An open area 2m (ATEX) or 3ft (NEC) beyond Zone 1 area
No Zone (Safe Zone)	*No Division (Safe Zone)*	Office or area not classified as a zone



Closed container



Open container

NFPA (National Fire Protection Association)

Areas of interest for liquid:

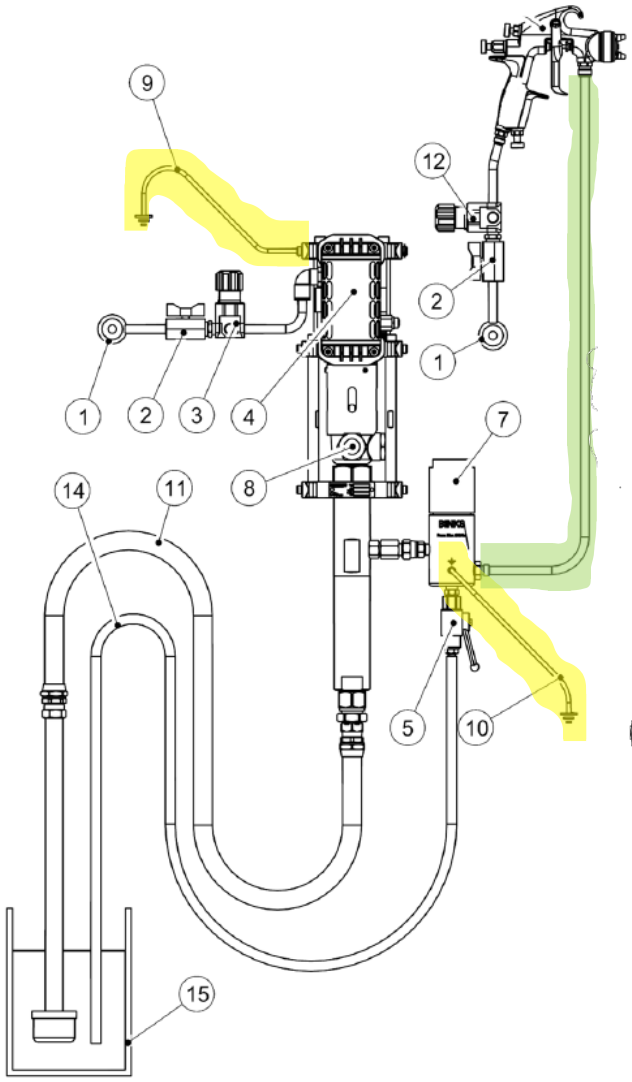
- Chapter 6: Electrical and Other Sources of Ignition
  - 6.2.2 For the purposes of this standard, the Zone system of electrical area classification shall be applied as follows:
    - The inside of open or closed containers or vessels shall be considered a Class I, Zone 0 location.
    - A Class I, Division 1 location shall be permitted to be alternatively classified as a Class I, Zone 1 location.
    - A Class I, Division 2 location shall be permitted to be alternatively classified as a Class I, Zone 2 location.

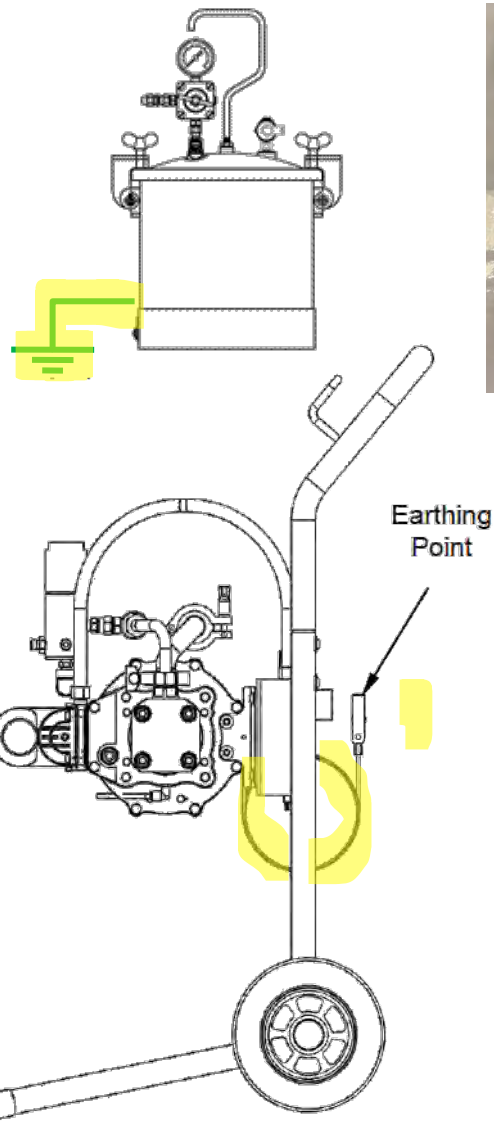
Source: NFPA® 33 Standard for Spray Application Using Flammable or Combustible Materials 2016 Edition

Protection Methods

Zone Protection Method		Zone	Comments
d	Flameproof	1	Similar to explosionproof. Used for motors, junction boxes, electronics
e	Increased Safety	2 or 1	Equipment is very robust and components are made to a high quality
n	Simplified or non-sparking	2	Not common
m	Encapsulation	0 or 1	Equipment components of the equipment are usually encased in a resin type material. Used for electronics with no heat.
p	Pressurized/purged	1 or 2	Equipment is pressurised to a positive pressure relative to the surrounding atmosphere with air or an inert gas
i	Intrinsic safety	0, 1 or 2	Any arcs or sparks in this equipment has insufficient energy (heat) to ignite a vapour
o	Oil Filled	1 or 2	Equipment components are completely submerged in oil
q	Powder filled	1 or 2	Equipment components are completely covered with a layer of Sand, powder or quartz
h	Indicates protection of non-electrical equipment		Only applies to ATEX. Seen on pneumatic pumps

Grounding – Prevent Sparks





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Ground any pails of material

Air, fluid and suction hoses include outer conductive cover. Provides grounding continuity

Grounding – Prevent Sparks

- Grounding mistakes
  - Operators wear gloves insulating them from the gun handle
  - Operators don't wear grounding straps if wearing shoes with insulating soles
  - Covering spray booth floors with cardboard prevents grounding by conductive floors.

			
Adjust-A-Stat	**Ankle-Stat**	**Leg-Stat**	**Palm Stat (with 1Meg resistor)**
Conductive shoe strap with a conductive tongue that tucks into the side of the shoe	Conductively treated rubber pad is worn under arch of shoe and skin contact is made by conductive rubber strip connecting the floor to the strap	Conductive strap which fits over the shoe and under the arch. Skin contact maintained by lightweight metal plate in the strap	Allows operator to wear conventional gloves. PALM-STAT fits over the glove and makes positive contact with the spray gun. There are no cords to ground, thereby eliminating both restrictions on the operator as well as safety hazards.
70289-01	70289-02	70289-03	70289-05

ASME Code Pressure Tanks

Numerous government and insurance bodies (e.g. OSHA, your fire marshal, your insurance underwriter, etc.) use National Fire Protection Association (NFPA) standards. NFPA standards call for the use of ASME-code tanks

- What are code and non-code pressure tanks?
  - o Code tanks are manufactured to rigid standards as specified by the American Society of Mechanical Engineers. (ASME) Each step of manufacture is closely controlled, and welding of the shell is certified.
  - o Code tanks are designed to withstand pressures up to 110 psi. Non-code tanks are normally restricted to 3 gallons in size or less. Due to the type of construction, non-code tanks are rated at 80 psi or less. Regulations may restrict the type of materials and pressures used with a non-code pressure tank.

- What materials are used to construct pressure feed tanks?
  - o The smaller, non-code, light-duty tanks are made of plated steel and have lower inlet pressure restrictions. The heavy-duty, ASME-code tanks are made of galvanized or 300 series stainless steel. They also have plated or stainless steel lids with forged steel clamps. When abrasive or corrosive materials are being sprayed, the tank shell is coated or lined with a special material, or a container insert is used.

5 / 55 Gallon Drum Elevators

A "Plug and Play", turn key elevator system for 25L (5 Gallon) and 205L (55 Gallon) drums

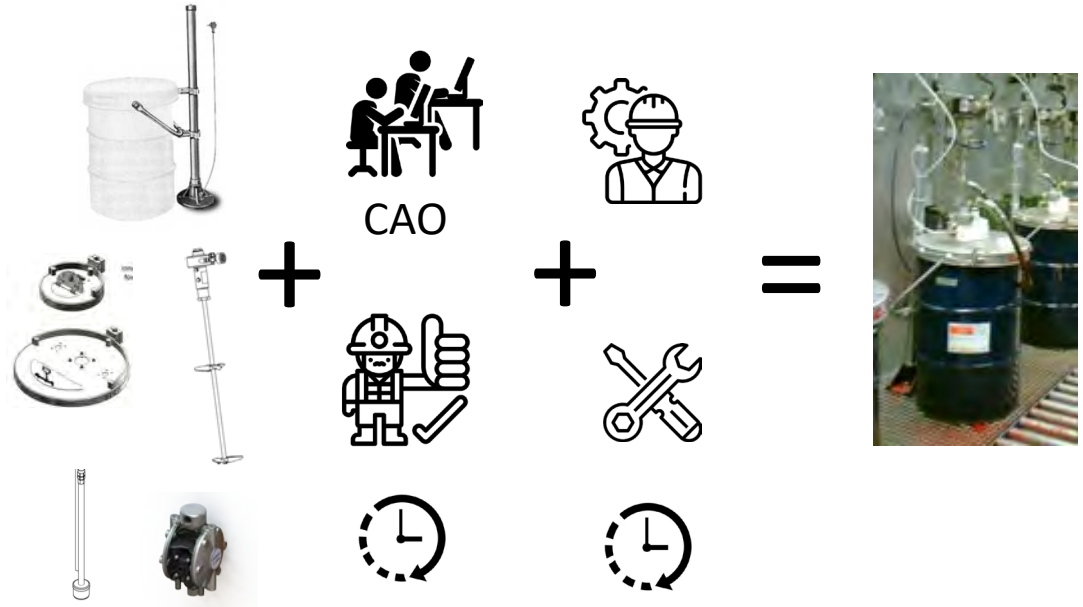
- Save installation and assembly time
- Take the complexity out of procurement for system components
- Mitigate hazards and other operational risks

Hidden Costs Of Elevators

ELEVATOR SYSTEMS:
YOUR BUILD! YOUR WAY!

Barrel elevators are simple products but which require significant integration work including the following tasks:

- *List the needs*
- *Select components*
- *Design the assembly*
- *Certify the assy. for safety*
- *Multiple orders*
- *Reception*
- *Assembly in workshop*
- *Packaging*
- *Set up*

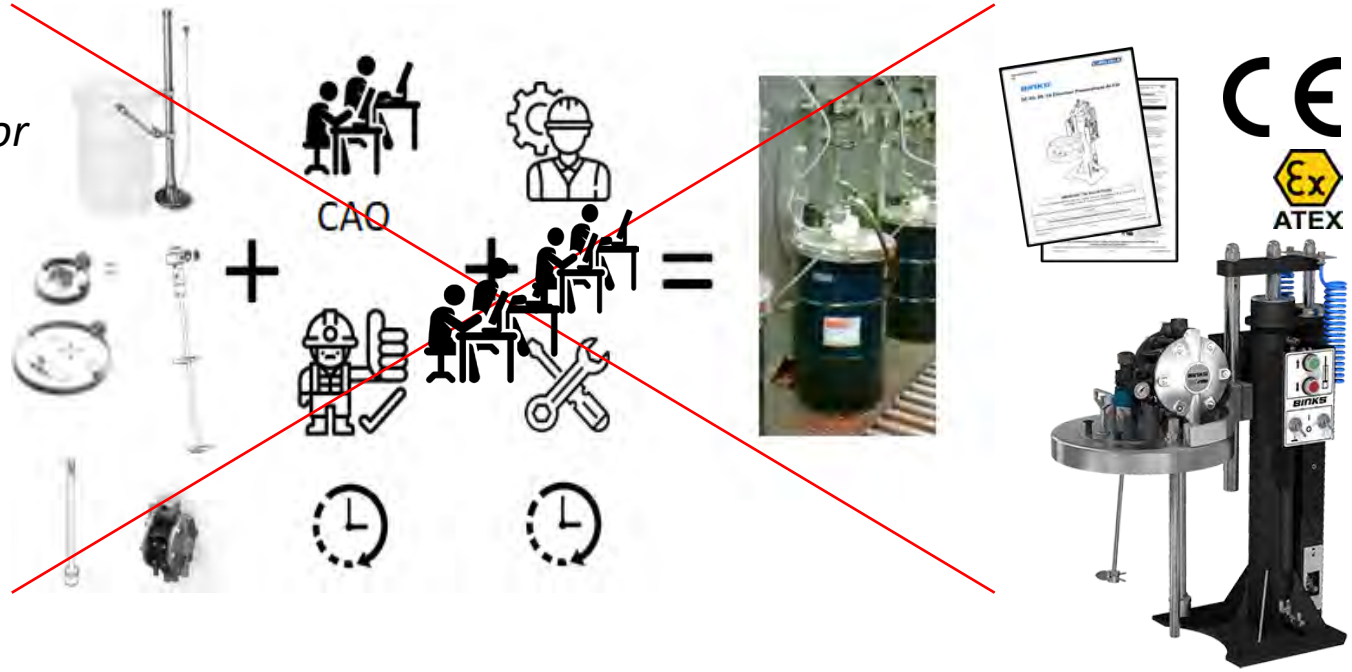


Hidden Costs Of Elevators

ASSEMBLY ELEVATOR BINKS :
YOUR NEEDS! YOUR FINISHED PRODUCT!

Binks barrel elevators are configurable on demand and delivered ready to install.

- *List the needs*
- *Configure your elevator*
- *1 single order*
- *Reception*
- *Set up*



Product delivered finished ready for use, certified and documented

Safety Features: For Operators

- Multiple features make these elevators simple to operate but safe in their use

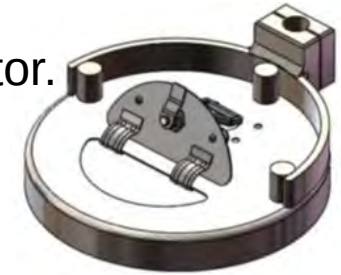
  - ☑ Descent speed is slow and controlled
  - ☑ Weight charge 110lbs 5gal / 165lbs 55gal (See manual)
  - ☑ Drum lid will never move up or down without operator control.
  - ☑ Anti-rotation *and drum positioning (curved base) features mean operators do not need to manually guide drum lid into position*
  - ☑ Sensor detection of drum in option

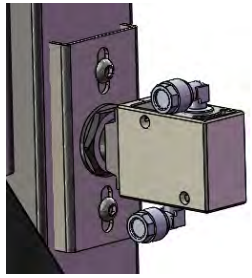
Push buttons:
Security against actions accidental orders

Speed regulator:
Including blocker = no movement without piloting even if there is an air cut

Safety Features: For Operators

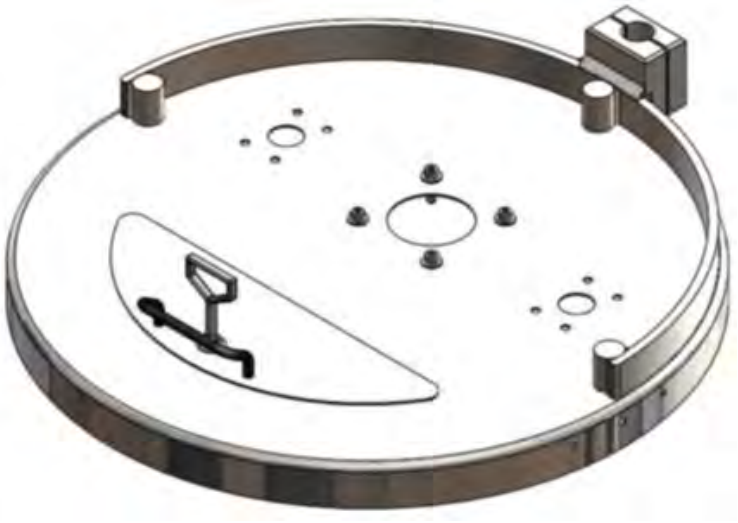
- Safety interlocks automatically stop the agitator as the drum lid is raised.
- Lockable inspection hatch
- Only one box control for operation of the elevator, pump and agitator in one unit
- Drum lids are pre-cut and drilled
- Right or left hand mounted controls of the elevator.





Stirrer lock:
Closed design, no access possible without tools

Keep/Use Protective Guards



Personnel PPE & Training

- Provide coveralls, gloves, spray socks, masks, hair nets, disposable shoe covers, etc. Dirty or worn products can add to additional contamination
- Insure the proper personal protective equipment (PPE) is available – air feed or cartridge respirators, safety glasses steel toe shoes, hearing protection, etc.
  - Vapor exposure risks are of particular concern for workers in confined spaces, such as those spraying inside the cavity of vehicles, ships, aircrafts, or tanks.
  - Sensitizers are chemical substances that can cause sensitization in the lungs (respiratory sensitizers) or to the skin (skin sensitizers) after exposure.
  - Some paints and coatings contain isocyanates, which are powerful sensitizers and irritants that can cause serious health effects due to both dermal and respiratory exposures.
- The operator should be fully trained on the process, equipment, coatings, clean-up and basic maintenance.
  - High-Pressure Fluid Injection Injury
  - Limb threatening injury – paint causes tissue necrosis
  - 7,000psi + will cause 100% amputation

BGK A CARLISLE BRAND

BINKS A CARLISLE BRAND

DEVILBISS A CARLISLE BRAND

HOSCO A CARLISLE BRAND

ms A CARLISLE BRAND

Ransburg A CARLISLE BRAND

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Thank you!

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