AMCOL CORPORATION

3063 BILLET SPRAY SYSTEMS

Technical Description

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Contents

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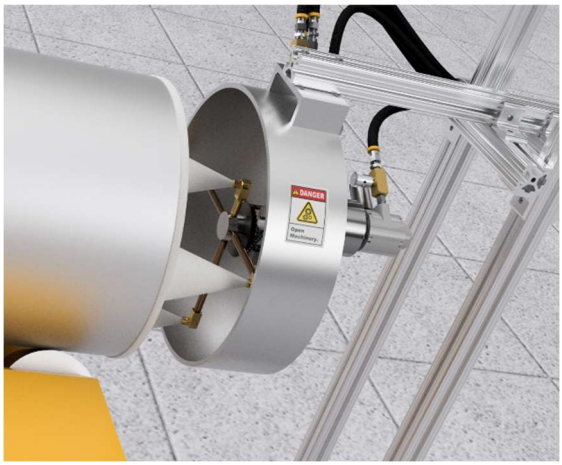
1 Introduction



The AMCOL Model 3063 automatic billet spray systems for use in aluminum extrusion were first introduced in the early 1990s. At the time, hot shearing logs to billets after the press was gaining widespread use. AMCOL was at the forefront of this technology and continues as the world leader.

The AMCOL Model 3063A1 BSR spray system incorporates a rotating spray head made to apply AMCOL 46 ILX EJECTEZE (release agent for non-ferrous extrusion) onto pre-cut hot sheared and hot sawed billet ends before loading into the press.

The 3063A1 BSR is the standard and most popular model in the series. The spray head is typically mounted in a fixed position where the billet is temporarily stopped, and the spray cycle is completed. This system has been successfully used on billets from 5" to 14" in diameter. The spray tips are strategically located to completely coat the end of the billet with a light coating of 46 ILX EJECTEZE.

46ILX EJECTEZE is a water based organic coating that is diluted with 3 parts water to 1-part concentrate. At this dilution and using the 3063A1 BSR spray system, the liquid adheres to the billet end, and a solid film coating is left behind as the water instantly evaporates. For billet spray, the typical consumption on an 8" diameter billet is less than 1.25 gallons of concentrate per 1000 billets.

All systems include a stainless-steel reservoir with an air operated double diaphragm pump to generate pressure and supply liquid to the system. Air and liquid are controlled using 3-way electric operated solenoid valves that include an air blow out function to keep the spray head clean. These systems are designed to provide years of reliable service, as well as for easy maintenance and troubleshooting.

2 System Overview

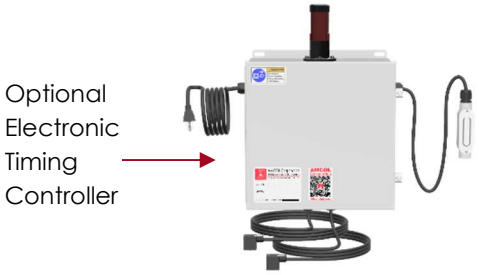
AMCOL Model 3063 Spray Systems are designed to automatically dispense 46 ILX EJECTEZE (a water carried lubricant and release agent) using a rotating nozzle assembly onto hot, round metal objects. The system is primarily used for hot billets and fixed dummy blocks in direct horizontal aluminum extrusion. The system can also be used in indirect extrusion for lubrication of the billet scalper tooling. This universal, scalable system is the result of years of innovations specific to the harsh environments typical of aluminum extrusion.

The 3063 series operates on lightly lubricated filtered plant air and two PLC outputs (110VAC standard) from the press PLC.

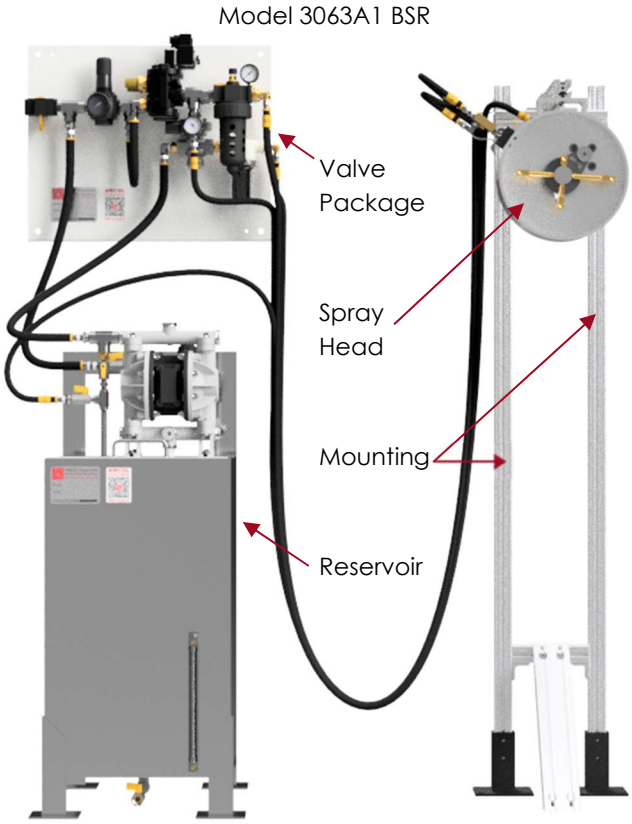
The first PLC output controls the air motor/gear motor, which rotates the spray nozzle assembly while simultaneously operating the dispersing air at the spray tip.

The second PLC output controls air used to open and close an air-piloted spray nozzle, as well as a piloted valve allowing liquid to flow to the nozzle. This design allows for positive on/off of liquid at the spray tip.

Also available is the 3063-ETC Electronic Timing Controller for 3063 Systems. This is a self-contained PLC that is pre-programmed for interface directly with your machine to easily control the system with only one output or control signal. Please see the PS04.3063-ETC.PB Product Bulletin for more information.



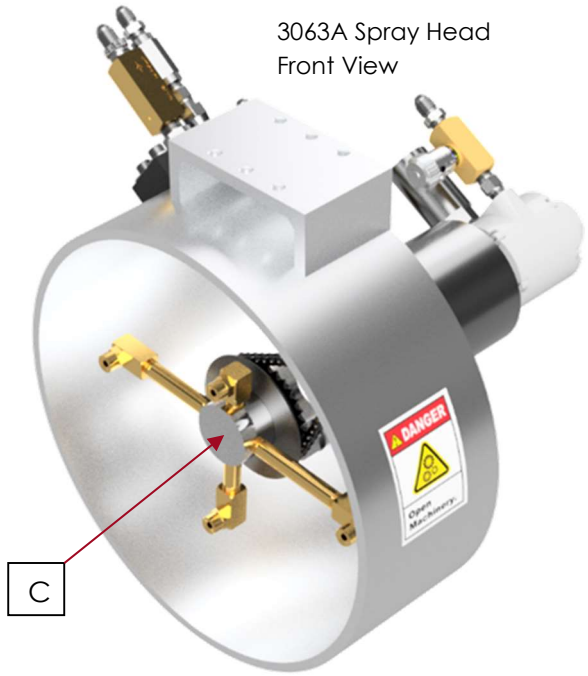
AMCOL 3063 systems are often compared to electrostatic powder systems. The 3063 is often less expensive, easier to install, troubleshoot, and repair. Often, the payback is seen in less than 6 months due to the reduced cost of parts and the efficient use of lubricant. Notably, this system is not affected by small amounts of water in the air source. AMCOL Model 3063 Spray Systems have also replaced acetylene soot and other crudely designed spray systems. ***Simply put, there is no better system on the market!***



3 Description of Components

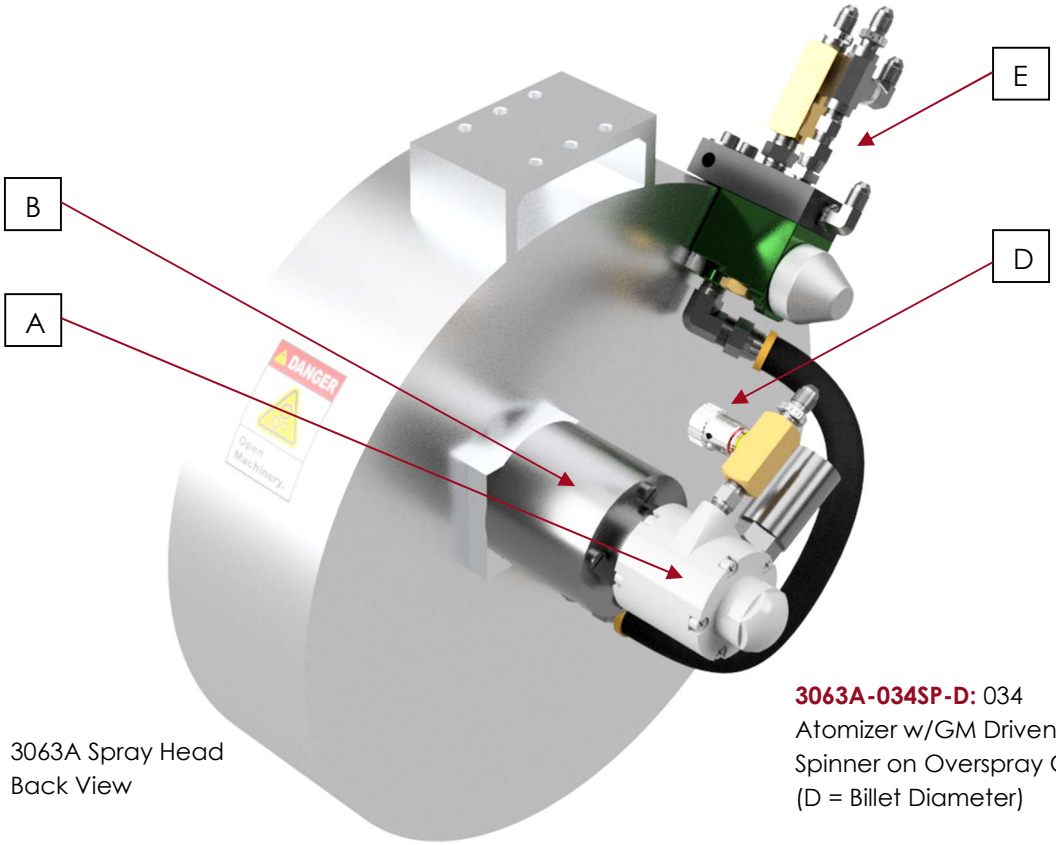
3.1 Spray Head

On standard models, an air motor coupled with a gear reducer is used to rotate the spinner hub through a sprocket and chain assembly. Rotational speed is controlled using an air flow control prior to the air motor. The rotating spray head, in combination with the 034 Atomizer, creates a light, even coating in a circular pattern. All four spray tips can be the same diameter or different diameters, output at each tip will not be affected by variations in diameter.



3063A Spray Head
Front View

A. Air Motor
B. Gear Reducer
C. Spinner Hub
D. Flow Control
E. 034 Atomizer



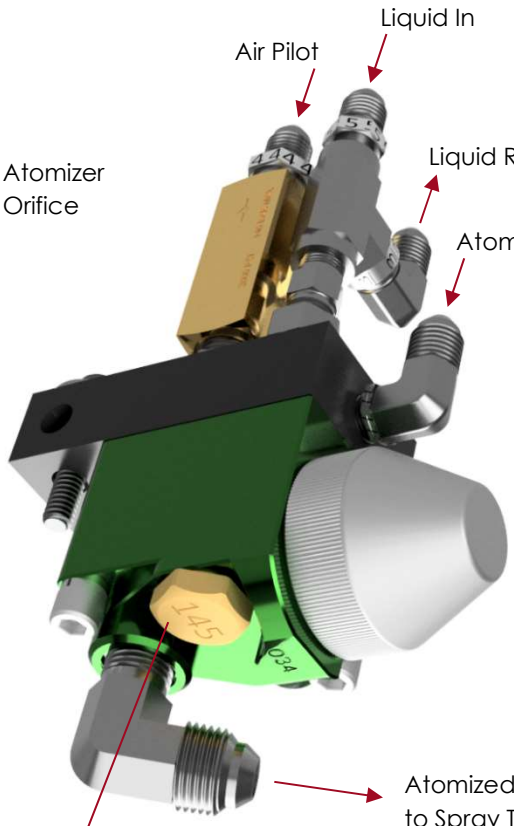
3063A Spray Head
Back View

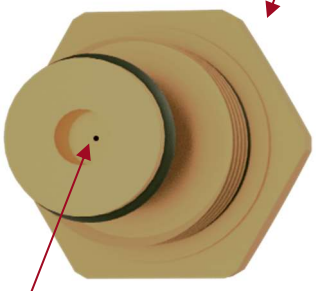
3063A-034SP-D: 034 Atomizer w/GM Driven TS Spinner on Overspray Cover (D = Billet Diameter)

034 Atomizer

An air pilot operated atomizer is at the heart of this system. A nonadjustable flow restrictor is used to meter the liquid output, as well as atomize the liquid and air as it passes through it. When the air piloted piston is opened, liquid is allowed to travel through the flow restrictor and into the air stream. This air/liquid exits the atomizer and continues to the spray tips. When the pilot air is shut off, the piston is spring returned, closing off the liquid to the atomizer. This air pilot operated atomizer also serves as a liquid shutoff at the point of dispensing.

3063A-034C: 034 Atomizer with 0.0145 Fixed Orifice and Fittings





Flow Restrictor (Fixed Orifice)

Liquid flow rate is controlled in the atomizer by a flow restrictor. The flow restrictor is a fixed orifice micro port that is so small that the liquid is atomized as it is forced through the hole. As fluid exits the flow restrictor, it enters the air stream from the air cycle output. These small particles adhere better to hot surfaces, and the volume of fluid output is strictly controlled. This results in a light, even coating of the billet or dummy block. (part number A3031801-AC0145 shown)

3.2 Valve Package

The valve package is operated through the press PLC to control the air and liquid timing sequence relative to the press cycle. Only two PLC outputs (110VAC standard), are required; all other valves and regulators are integrated for controlling the complete spray cycle. A clean, reasonably dry, and lightly lubricated air source is also required. An air purge is standard, allowing for the circulation of liquid from the reservoir to the spray head and back. (part number 3063A-MVO-V shown)

3.3 Liquid Reservoir

The liquid is supplied from a stainless-steel reservoir using an air operated double diaphragm pump. Liquid pressure is set using an air regulator located prior to the pump. A ball valve on the liquid output opens a liquid bypass directly back into the reservoir. This keeps the pump in motion between spray cycles. (part number 3063A-NP30 shown)

3.4 Spray Head Mounting

There are a variety of spray head mounting options available. The most common is a fixed assembly for billet end spray using a universal and adaptable frame. The spray head dimension for a given billet diameter is engineered to have the spray head edge at a distance of 4" from the face. (part number 13-FPOCM1 shown)

3.5 Hose Assemblies

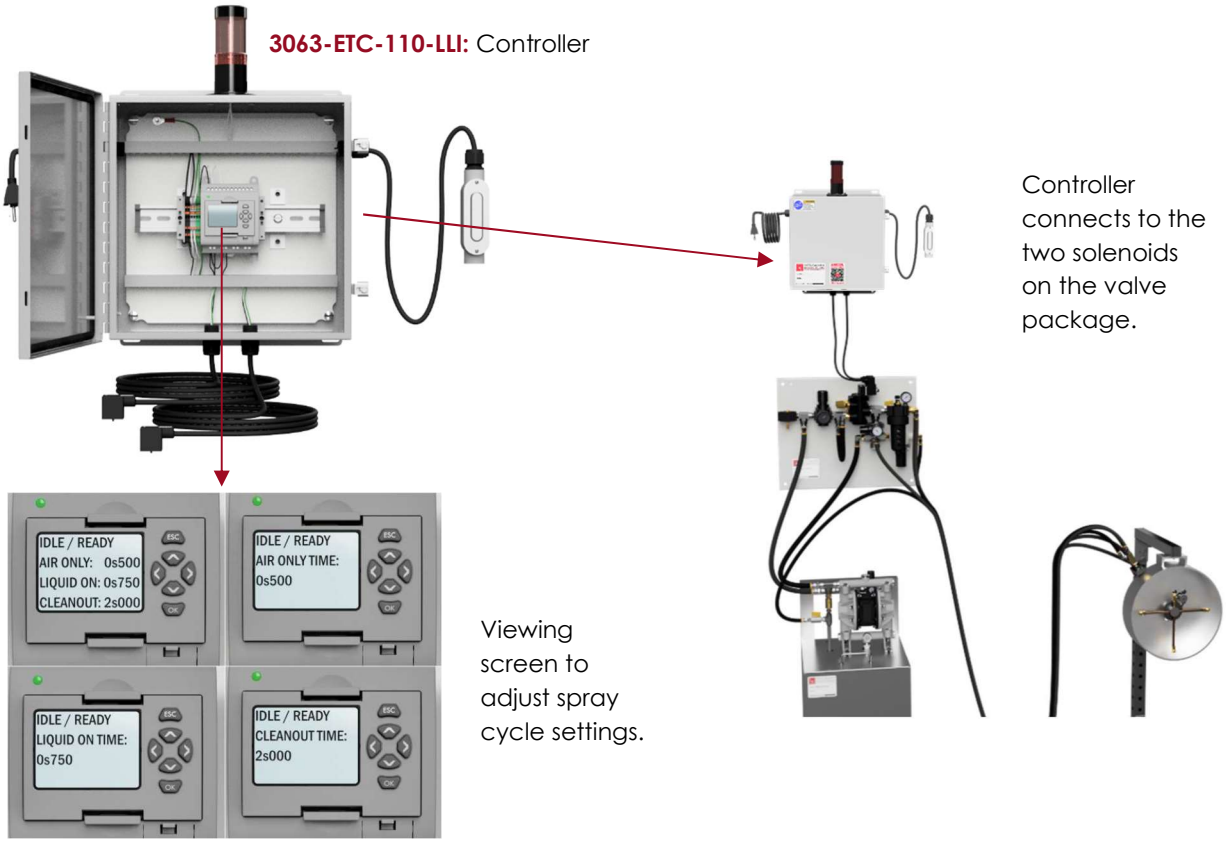
Fire resistant hose with union and JIC fittings are included to connect the spray head, liquid reservoir, and valve package. Standard hose lengths for a billet sprayer are 5 feet from the reservoir to the valve package and 10 feet from the valve package to the spray head. Longer hose lengths and extensions are also available.

3.6 Spray Wand

An optional handheld spray wand fed from the reservoir is often purchased as a method to manually lubricate the die ring and container ring. (part number 020-01048-AC shown)

3.7 Optional Electronic Timing Controller

The 3063-ETC is a self-contained PLC that is preprogrammed to interface directly with your machine to easily control a 3063 Spray System with only 1 machine output or control signal. Using this controller, you will no longer need to reprogram or modify your current PLC programming to operate a 3063 Spray System. 3063-ETC's can be ordered with a low-level indicator light that interfaces with the 10- or 30-gallon reservoir of the 3063 Spray System.



4 System Features

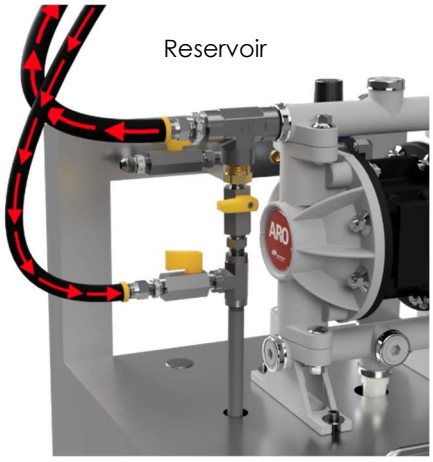
AMCOL 3063 systems include several design features to improve the reliability, longevity, and effectiveness of the system.

Reservoir Circulation

The use of a diaphragm pump allows for consistent pressure at the spray points, as well as the ability to mix and dilute the billet coating fluid inside the reservoir. Using the fluid recirculation valve on the reservoir, flow to the reservoir and pressure at the spray head can be adjusted. By keeping the valve slightly open, fluid can be constantly recirculated back to the reservoir while still maintaining a consistent pressure at the spray head.

Liquid Air Purge

Consistent and uninterrupted fluid flow is crucial to the operation of 3063 systems and their ability to provide a thin coating on the billet or dummy block. If an air pocket builds inside any of the liquid lines and is allowed to travel to the spray points, the flow could be momentarily interrupted. Since 3063 systems use low volumes of fluid, this could severely impact the system's ability to operate consistently. To combat this, a liquid air purge has been built into the system. Liquid is manually cycled from the reservoir, through the valve package, to the atomizer, and then back to the reservoir. This operation allows for the complete removal of any air in the liquid lines of the system.



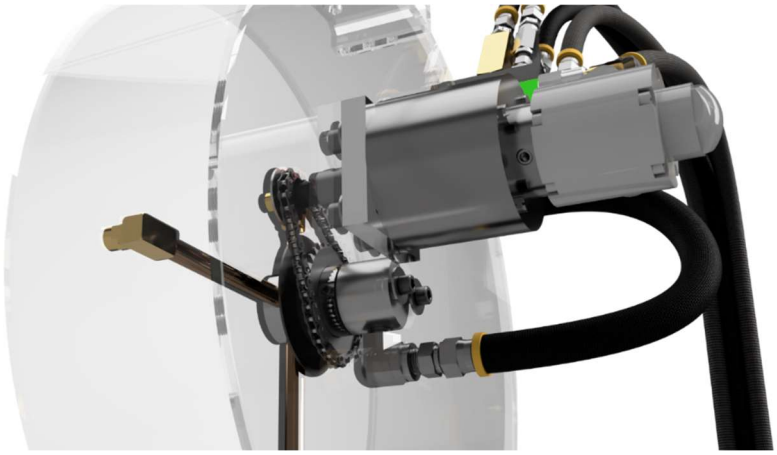

Valve Package

System Longevity

The moving components in 3063 spray heads have been designed with longevity and durability in mind, reducing the downtime required for replacing broken or worn-out parts.

The spinner bodies are made of stainless steel to improve chemical resistance and are precision machined to ensure that each spinner functions exactly as it should. They utilize sealed bearings to remove the need for relubrication and to keep debris out of the bearings. This keeps the assembly spinning smoothly without worry of failure. They are also completely leak free, as each spinner has a triple seal preventing any leaks.

The spinner assembly is driven using a sprocket and chain assembly that is connected to an air motor coupled to a gear reducer. The air motor is driven at a high speed, since air motors generally operate more consistently and reliably at a higher speed. The sprocket and chain assembly are used to decrease the rotational speed of the spray assembly, which allows the spinner to rotate slower for a more consistent and effective coating.



5 Recommended Fluid

For optimal performance, AMCOL Recommends:

46 ILX EJECTEZE

Release Agent for Non-ferrous Extrusion

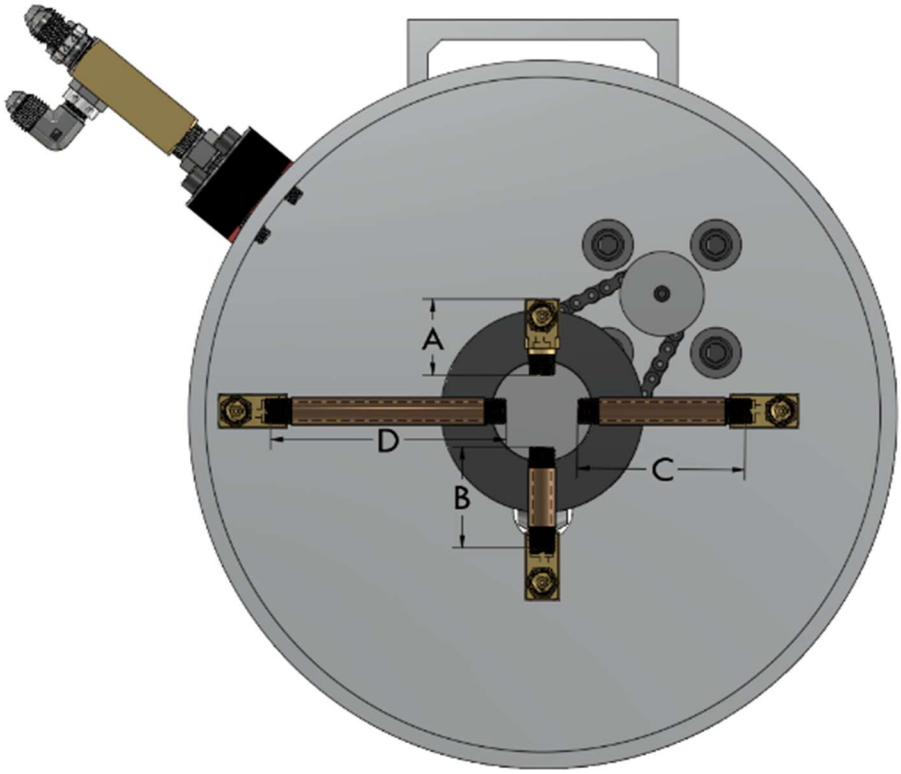
Proven technology, refined over decades.

6 Recommended Spray Head Sizing

Billet Sprayer

Billet Diameter	A	B	C	D	Overspray Cover ID
5" *	MALE	MALE	1"	1"	10"
6" *	MALE	1"	1.5"	1.5"	10"
7"	MALE	1"	1.5"	2"	10"
8"	MALE	1.5"	2"	2.5"	10"
9"	MALE	1.5"	2.5"	3"	10"
10" (shown)	MALE	1.5"	2.5"	3.5"	10"
11"	MALE	2.25"	3.25"	4"	12"
12"	1.5"	2.5"	3.5"	4.5"	12"

* Fixed Spray Head (3063B BSF) available for billets <6"



7 How to Order

3063A1 BSR – Billet Sprayer with Rotating Head

Specify Billet Diameter, Control Voltage, and Billet Height

- Billet Diameter: See table above for recommended sizing.
- Voltage: 110VAC, 220VAC, or 24VDC
- Billet Height: Distance from floor (or mounting surface) to center of billet

8 Additional Information

For more information regarding installation, operation, system settings, and maintenance of 3063 systems, please refer to the AMCOL 3063 Billet and Dummy Block Spray Systems Operator's Manual.

AMCOL Corporation

3063 Support

AMCOL Corporation

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