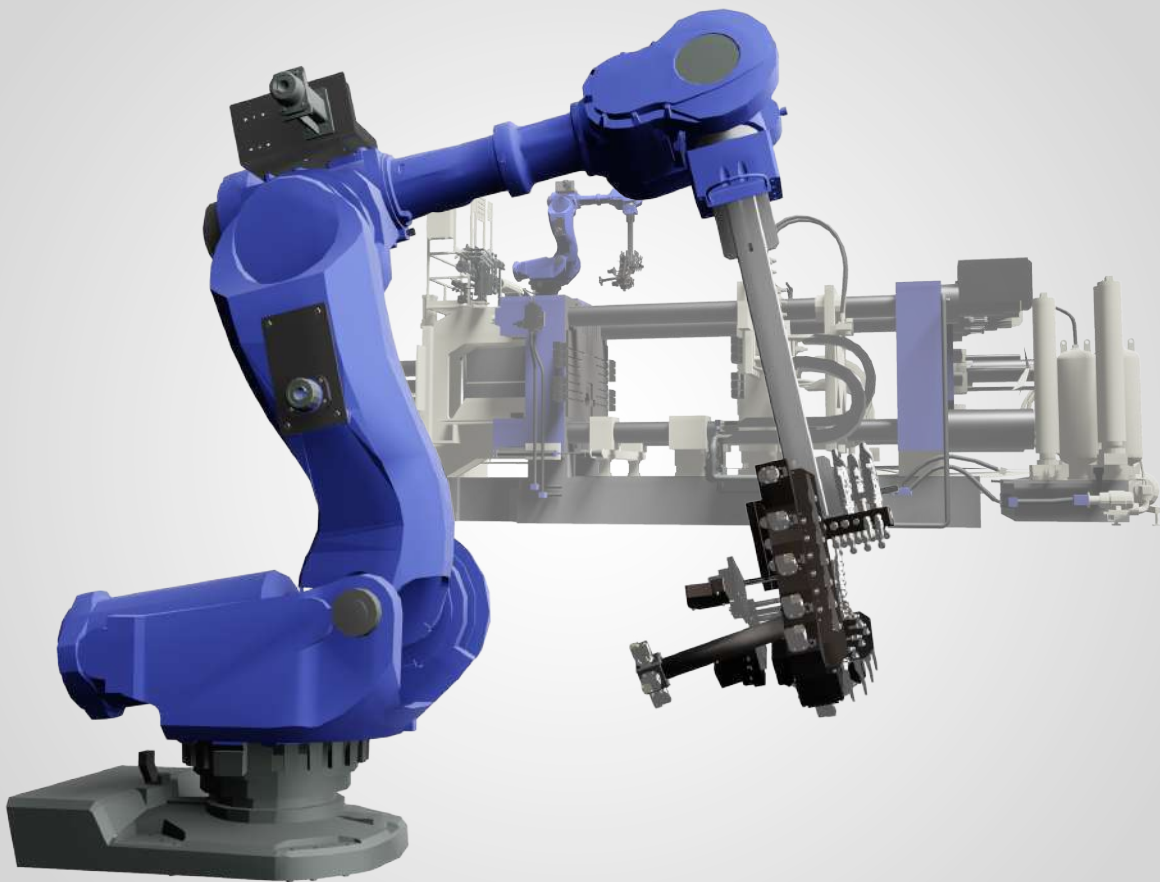


EcoShot™

by **RYOEI**



Optimize Your Die Lubrication Process

- Reduce cycle time
- Increase casting quality
- Decrease airborne lubricant
- Optimize lubricant film thickness
- Enhance cooling and target hot spots

Benefit Overview

What you can expect with EcoShot™ spray



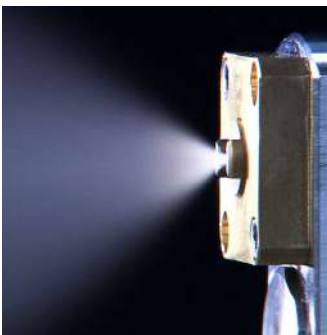
Reduced Spray Volume

Precision spray application with nozzle response time 50x faster than competing systems allows better lubricant adhesion with less volume.



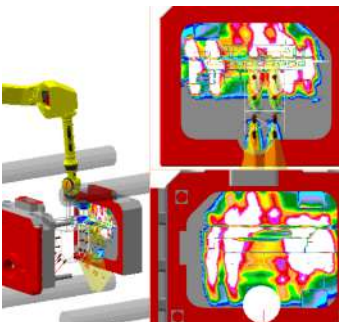
Longer Die Life and Better Quality

Break through the Leidenfrost effect with rapid pulse spray to improve control of die cooling and extend die life. Target hot spots with spray simulation.



Less Airborne Lubricant

Reduce or eliminate need for air hoods and expensive ventilation systems, and maintain a safe workplace environment.



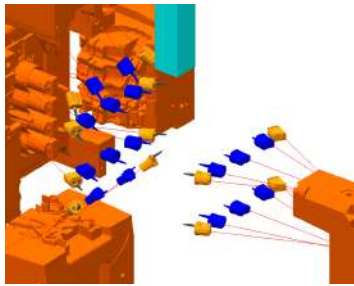
Optimized Spray Process with RYOEI Simulation

Minimize cycle time and robot crashes. Eliminate on-site nozzle adjustment during setup. Easily update spray and robot programs to address hot spots.

Advanced Simulation

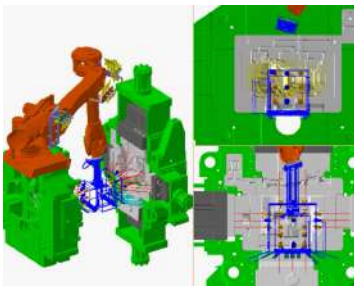
Fine-tune film thickness and improve cycle time

EcoShot™ Simulation offers you unprecedented control over your spray process. Eliminate the need for nozzle adjustment during installation to minimize downtime with EcoShot™ Simulation and laser correction.



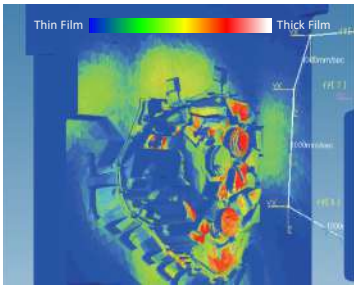
Optimized Nozzle Placement

EcoShot™ Simulation ensures optimal nozzle placement to achieve the desired lubricant thickness on each area of the die.



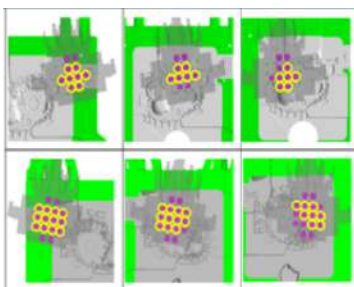
Streamlined Robotic Movement

Cycle time can be predicted and adjusted through verifying the time required for spraying and robot movement. Adjustments are made to reach your cycle time objectives.



Controlled Lubricant Film Thickness

Simulates nozzle quantity and placement, spray pattern volume, angles, and spray film thickness. Control how much lubricant you are applying to each area of the die.

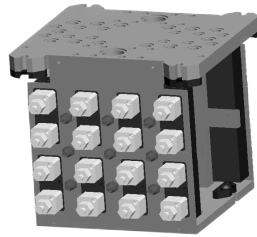


Refined Spray Pattern

Experience total control over your die lubricant application. Know exactly when each of your nozzles is spraying, for how long, in what quantity, and over what area of the die.

Experience the EcoShot™ Difference

Break through Leidenfrost effect for enhanced cooling



Category	Before EcoShot™ (Competitor)	After EcoShot™	Description
Lubricant Quantity per cycle	5000 cc (169 oz)	23 cc (0.7 oz)	Reduce lubricant usage for a cleaner workplace and reduced waste.
Air Blow Time	18.5 sec.	6 sec.	67% reduction in air blow time due to eliminated need for lubricant spreading.
Total Cycle Time	92 sec.	85 sec.	8% reduction in total cycle time.
Nozzle Response Time	Over 500 milliseconds	10 milliseconds	50x faster nozzle response time for targeted lubricant application and mitigating Leidenfrost effect.
Nozzle Dripping	Nozzles leak before and after spray cycle	No dripping, no leaking	Eliminate dripping and leakage with EcoShot™ Nozzles.
Nozzle Maintenance	Nozzles clog easily	Self-cleaning nozzles require minimal maintenance	Minimize downtime and experience optimal performance.
Airborne Lubricant	Significant airborne lubricant; requires air hood. Facility is dirty and air quality is poor.	Virtually no airborne lubricant. No air hood required. Employees can work in a safer and cleaner environment.	Improved health and safety for employees.

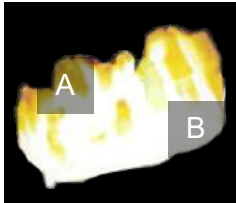
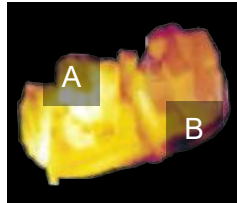
*Results based on a customer case study

Optimized Cooling

Break through Leidenfrost effect for enhanced cooling

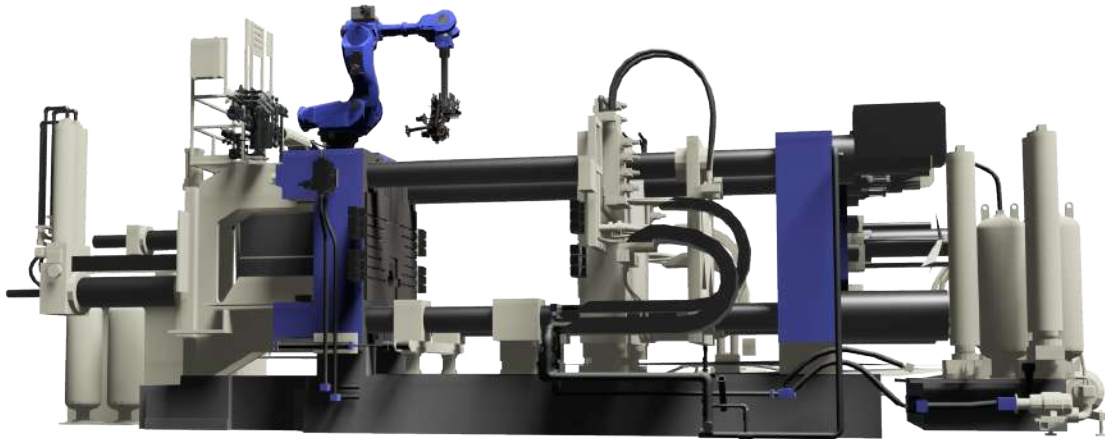
With typical spray systems, water-based lubricants evaporate upon contact with the high-temperature die, forming a gas barrier. This barrier of evaporated water prevents lubricant adhesion and is known as the Leidenfrost effect. Significant quantities of water-based lubricant are used to cool the die before finally forming lubricant film, resulting in a large quantity of waste.

With unmatched nozzle response time, EcoShot™ allows water to fully evaporate while applying lubricant. This prevents barrier formation and improves lubricant adhesion, even at higher die temperatures. External die cooling is more effective and requires less die lubricant.

	Before Spraying	Typical Spray	EcoShot Spray
			
Temperature	A. 309.88 °C (589.78 °F) B. 311.29 °C (592.32 °F)	A. 253.34 °C (488.01 °F) B. 273.73 °C (524.71 °F)	A. 232.23 °C (450.01 °F) B. 253.93 °C (489.07 °F)
Spray Time		3.5 sec.	3.5 sec.
Spray Pattern		Continuous	0.25 sec. on 0.25 sec. off
Lubricant Quantity		42 cc (1.4 oz)	21 cc (0.7 oz)
Observations		Significant dripping and wastewater, poor adhesion due to Leidenfrost effect.	Improved adhesion and no wastewater. Significantly improved cooling.

Case Studies

Experience actual results with industry-leading spray technology



Case: ROI with EcoShot™

Actual Customer Experience (engine block / 3500T)

Our customer's optimized cycle time with EcoShot™ resulted in fewer machines required for the same production volume. This customer went from using 6 die casting machines (DCM) to 4 DCMs, with 2 DCMs being re-purposed for other work. With fewer DCMs needed to maintain the same production volume, per unit labor cost decreased (reduced labor costs of 3 people).

ROI was achieved just 6 months after installation

EcoShot™ is applicable to DCMs ranging in size from 350 ton to 9,000 ton or larger. Contact us to see what EcoShot™ can do to optimize your casting process.

Lubricant Compatibility

Flexible hardware for any lubricant type

EcoShot™ allows you to switch your lubricant type without investing in a new spray head, allowing the flexibility to innovate with minimal capital expenditure. Realize more savings by switching lubricant types with EcoShot™.



Water-based Lubricant

EcoShot™ + Water-based Lubricant:

Up to 50% cut in Air Blow Time

Up to 50% decrease in Lube Volume

Up to 5% cut in Total Spray Cycle



Hybrid Lubricant

EcoShot™ + Switch to Hybrid Lubricant:

Up to 80% cut in Air Blow Time

Up to 95% decrease in Lube Volume



Water-free or Oil-based Lubricant

EcoShot™ + Water-free or Oil-based Lubricant:

Up to 90% cut in Air Blow Time

Up to 95% decrease in Lube Volume

Die modifications may be required

Our Customer-Centric Approach



Consult and Plan
Define your requirements
Align our technology to your needs and processes



Design and Build
Adhere to strict design and manufacturing standards
Provide cost-effective, customized solutions



Deliver and Integrate
Install the spray system
Oversee quality checks
Provide in-depth instruction on equipment operations

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