

ISV SPRAY SYSTEM

COOLANT SPRAYS FOR MILL THERMAL CONTROL

The ISV is one of the metal industry's leading spray valves, having been supplied to the rolling industry worldwide for over 25 years.

Proven extensively in both the ferrous and non-ferrous industries, the ISV (Integral Solenoid Valve) is suitable for all mill types, from hot mills through to aluminium foil mills.

The ISV Spray System is designed to apply zone cooling and lubrication to the work rolls. The system addresses residual flatness errors and controls the bulk temperature of the mill during the rolling process. Temperature control is achieved by modulating the coolant through individual ISV valves thereby controlling the thermal profile of the work rolls. Nozzle configurations are specifically designed, using advanced thermal modelling, by optimising the spray patterns and coolant flow rates to suit the requirements of the process. By this means, the optimal thermal performance may be achieved for each and every application regardless of the rolling duty or individual pass schedules.

Level control is achieved by Pulse Width Modulation (PWM) enabling 10 levels of cooling from a single valve. This is particularly important for today's universal rolling mills or on a mill where a wide range of products are rolled.

OPERATING PRINCIPLE

Each ISV valve supplies coolant via a process optimized nozzle plate to the mill rolls. Compressed air applied via the electrical solenoid deflects the diaphragm blocking the coolant flow through the valve. When this air pressure is vented the diaphragm relaxes and again allows coolant to flow through the ISV. Each ISV valve has its own 24V DC driven solenoid mounted within each valve body, which in turn is controlled by signals from the mill flatness control system.

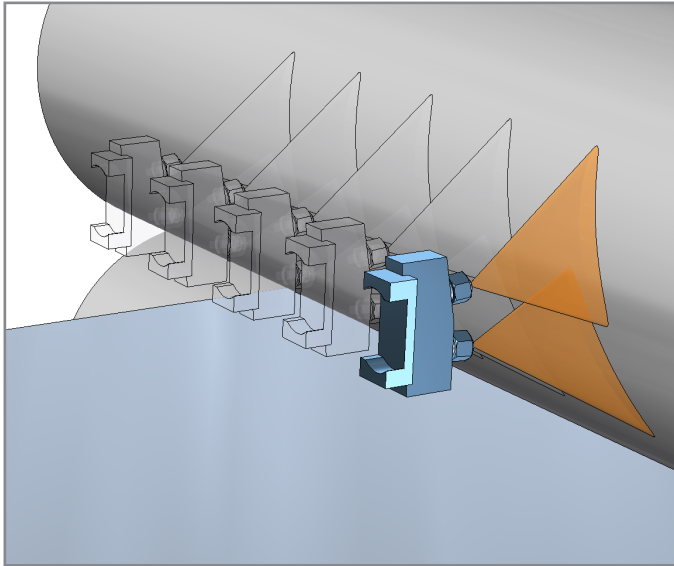
REFERENCES

With over 350 references worldwide, the ISV Spray System is one of the most proven and effective roll coolant spray systems available for ferrous and non-ferrous rolling mills.

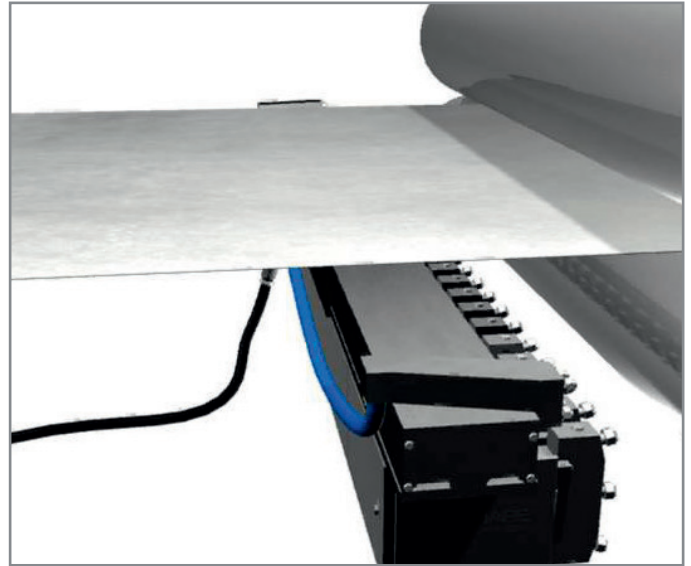
CONSTRUCTION

The spray valves are mounted in spray headers which are available in extruded aluminium or stainless steel sections depending on application. Although designed to interface with AFC systems, the system may also be used via a manual spray control panel from which an operator may select individual spray levels or predetermined spray patterns. Each spray system is modelled specifically for each mill application and its specific product range.

As a complement to the ISV Spray System and to minimise shape errors at the strip edge, Primetals Technologies also offer an integrated Hot Edge Spray System to spray hot coolant outboard of the strip edge to reduce work roll thermal gradients.



Spray pattern thermal modelling



Hot edge spray actuator

OPTIONS

- Stainless steel spray headers
- Hot Edge Sprays
- Manual spray control system
- Coolant pressure and temperature monitoring

FEATURES

The ISV Spray System by Primetals Technologies, provides the user with the following feature and benefits:

- Suitable for hot and cold mills
- ISV valve all stainless steel construction
- No sliding seals
- Pulse width modulated, providing 10:1 flow level turndown ratio
- Low pressure drop through valve
- Quickly detachable signal cable with mill duty electrical connectors
- ISV valve removable from the front face of the spray header - for easy maintenance
- Use of standard proprietary spray nozzles
- Easy to maintain
- Very high tolerance to coolant contaminants

MAIN BENEFITS

- Easy maintenance
- Universal valve for all mill types
- Robust design
- Small installation envelope
- High reliability
- Advanced thermal modelling
- Low power solenoid

SPECIFICATIONS

Valve material	Stainless steel
Diaphragm material	Fabric reinforced Viton
Diaphragm life	>20 million cycles
Flow rate (max)	67 litre/min at 5 bar
Solenoid switching time	approx 12 ms
Solenoid power	24V DC 2W, 0.083A
Coolant temperature	75 °C maximum
Coolant pressure	2 to 12 bar
Electrical contacts	Gold plated for ultimate protection
Valve pitch	25mm minimum
Coolant medium	Mineral oils and water based coolants

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