PROTECTING ROBOTS IN HIGH-HEAT METAL FORMING ENVIRONMENTS

Situation:

A Canadian manufacturing facility specializing in advanced metal forming automation experienced recurring robot performance issues in a high-heat press environment. The automation cell was exposed to intense radiant heat, along with dielube, punchlube, graphite, and oil mist. These contaminants infiltrated critical robot components — overheating servo motors, restricting movement, and accelerating wear on exposed joints and cabling.

Over time, the harsh environment led to frequent cleanings, unplanned shutdowns, and rising maintenance costs, highlighting the need for robust robot arm protection designed for extreme thermal conditions.

Challenge:

The team required robot protective covers for harsh environments capable of withstanding sustained high temperatures while resisting lubrication chemicals, graphite buildup, and airborne particulates. Overall, the robot jackets needed to:

- Shield servo motors and joints from overheating and contamination
- Maintain full articulation without restricting motion
- Prevent unexpected downtimes due to overheating
- Protect long-term performance and capital equipment

Any solution had to deliver reliable robot covers without interrupting production or compromising precision.

Solution:

Roboworld engineered and delivered five custom Robosuits®, also referred to as robot jackets, designed specifically for high-heat metal-forming applications. Each robot protective suit was fabricated using high-temperature NorFab material and tailored to provide complete arm articulation while protecting vulnerable joints, cables, and servo housings from heat and chemical exposure.

To further enhance reliability, each robot was outfitted with a pressurized, cooled-air system inside the Robosuit, creating a protective barrier to prevent heat soak and over-temperature faults.
Together, the integrated solution delivered durable robot arm protection engineered to perform in extreme thermal and contaminant-heavy conditions.

Results:

Following installation, the facility achieved:

- Significantly reduced unplanned maintenance and contamination-related downtime
- Reliable temperature control, eliminating servo over-temperature shutdowns
- Extended robot and component life through improved environmental protection

This integrated thermal and contamination-control solution enabled the manufacturer to maintain consistent throughput, protect its automation investment, and eliminate costly service interruptions—unlocking higher productivity and long-term operational stability in a harsh environment.