

A Revolutionary Solution to Corrosion Under Pipe Supports (CUPS): The RedLineIPS SmartPad System

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Industrial piping systems, the backbone of countless industries such as petrochemical, oil and gas, and power generation, are constantly exposed to environmental and operational challenges. One of the most insidious threats to these systems is **Corrosion Under Pipe Supports (CUPS)**. This phenomenon, though localized, can lead to catastrophic failures, costly downtime, and safety hazards if left unchecked. The **RedLineIPS SmartPad System**, developed by Cogbill in Texas, U.S.A., offers a groundbreaking, patent-pending solution that not only addresses CUPS but also redefines the standards for pipe support technology.



An image showing an old metallic pipe sitting directly on a metal beam and corroding badly, while another section of it is protected by the SmartPad System from Cogbill Constructing.

What is CUPS Corrosion?

Corrosion Under Pipe Supports (CUPS) is a type of corrosion that occurs at the contact points where pipes rest on their supporting structures, such as beams or saddles. This corrosion arises due to a combination of mechanical and environmental factors:

1. Friction and Coating Erosion:

Piping systems experience constant movement and vibration due to fluid flow, thermal expansion, and rotating machinery. Over time, this motion erodes the protective paint coating at pipe-support contact points, leaving the underlying metal exposed.

2. Moisture Retention:

The restricted airflow between the pipe and its support creates a micro-environment that traps moisture. This leads to crevice corrosion, as water molecules accumulate and initiate rust formation.

3. Metal-to-Metal Contact:

When metallic pipes rest directly on metallic supports, galvanic corrosion occurs, where one metal corrodes faster due to electrochemical reactions.

Effects of CUPS on Piping Systems

The impact of CUPS extends beyond surface damage:

- **Structural Weakening:** Corrosion reduces the thickness and strength of pipes, making them vulnerable to mechanical failure.
- **Leaks and Contamination:** Compromised pipes can leak hazardous materials, posing environmental and safety risks.
- **Costly Maintenance:** Addressing CUPS typically requires expensive inspections, repairs, or even complete replacements.
- **Operational Downtime:** Unplanned line shutdowns disrupt operations and lead to significant financial losses.
- **Catastrophic Failures:** In extreme cases, CUPS can cause sudden pipe failures, jeopardizing lives and assets.

Given these challenges, preventing CUPS is critical for maintaining the integrity and efficiency of piping systems.

The SmartPad System: A Revolutionary Solution

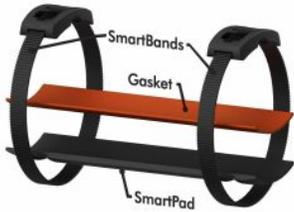
The RedLineIPS SmartPad System is a patent-pending, all-composite solution designed to tackle the root causes of CUPS. By eliminating friction, moisture retention, and metal-to-metal contact, it offers a comprehensive and long-lasting defense against corrosion. Its innovative design combines *tried-and-tested* materials with modern engineering to create a product that outperforms traditional alternatives.

SmartPad System Components

The SmartPad System integrates several components to provide a robust and efficient solution:

1. **SmartPads:** These fiber-reinforced plastic (FRP) wear pads feature recessed grooves for anchoring straps and sloped edges to accommodate pipe movement. They isolate the pipe from its support structure, preventing friction and galvanic corrosion.
2. **Hydroseal Gasket:** A pre-installed, closed-cell gasket compresses under tension to create a watertight NEMA-4 seal, blocking moisture and eliminating crevice corrosion.

1. **SmartBands:** Non-metallic, fiber-reinforced straps secure the SmartPads to the pipe. They maintain tension over time and are designed for easy installation and removal.
1. **SmartTool:** This specialized tool applies precise tension to the straps, ensuring a secure fit and reliable seal. Its integrated cutting mechanism trims excess banding for a clean finish.
1. **Optional PTFE Strips:** For environments with aggressive chemicals, PTFE strips offer additional protection against corrosion.



How the SmartPad System Works

The **SmartPad System** operates through a combination of durable materials and innovative design to isolate pipes from their supports and prevent corrosion. The **SmartPad**, made of fiber-reinforced plastic (FRP), is placed under the pipe at the support point, eliminating metal-to-metal contact and protecting the pipe's coating from friction. Each SmartPad features a pre-installed **Hydroseal Gasket**, which compresses under the pipe's weight and the system's tensioning to create a watertight NEMA-4 seal, preventing moisture ingress and crevice corrosion.

The system is secured using **SmartBands**, heavy-duty composite straps that loop around the pad and pipe and are tensioned using the **SmartTool**. This ensures a firm fit while compressing the gasket for a reliable seal. The installation process is fast, requiring no adhesives, welding, or hot work permits. The pads are easy to remove and reinstall, enabling quick visual inspections and making the system both efficient and cost-effective.

Advantages of SmartPads Over Alternatives

The SmartPad System offers clear benefits compared to existing solutions:

Welded Metallic Plates

- **Issues:** Require welding permits, line shutdowns, and specialized labor. They trap moisture, promoting hidden corrosion.
- **SmartPad Advantage:** Eliminates the need for welding, reducing costs and installation time. Its watertight seal prevents moisture accumulation.
- **Epoxyed FRP Wear Pads**

- **Issues:** Time-consuming installation with long curing times. Risk of improper application, which can trap moisture.
- **SmartPad Advantage:** Epoxy-free design allows for rapid installation without curing delays or workmanship errors.

Thermoplastic Half Rods

- **Issues:** Cause point loading, increasing stress on pipes. Under heavy loads, they are prone to breaking.
- **SmartPad Advantage:** SmartPad's saddle shape distributes loads evenly, avoiding point loading and ensuring long-term stability.

Wraps, Liners, and Sheets

- **Issues:** Often tear or slide off due to friction forces, leaving pipes exposed.
- **SmartPad Advantage:** Made from durable composite materials, SmartPads remain securely in place even under harsh conditions.

SmartPad System in Action

Since its introduction in 2018, the SmartPad System has been adopted by major industrial players, including Chevron, Nutrien, and Formosa, on-shore and off-shore. These organizations have implemented SmartPads in facilities near the Gulf of Mexico, a region known for its harsh, corrosive environments. Pilot programs have demonstrated:



- **Reduced Installation Time:** SmartPads can be installed in under two minutes, compared to 30+ minutes for traditional methods.
- **Lower Maintenance Costs:** The system's durability minimizes the need for frequent repairs or replacements.
- **Improved Safety:** Weld-free, epoxy-free installation reduces the risks associated with hot work permits and chemical adhesives.

Benefits of the SmartPad System

The SmartPad System delivers unparalleled performance and value:

- **Reduced Cost of Ownership:** Long-lasting materials and reusable components lower overall expenses.
- **Eliminates Metal-to-Metal Contact:** Prevents galvanic corrosion.
- **Epoxy-Less and Weld-Less:** Simplifies installation and reduces environmental impact.
- **No Welding Permits or Shutdowns:** Avoids costly operational disruptions.
- **Quick Visual Inspections:** Allows inspection in seconds without removing the pads.
- **Installs on Live Lines:** Saves time and minimizes downtime.
- **Removable and Reusable:** A cost-effective and sustainable solution.
- **Corrosion Resistance:** Optional chemical-resistant materials for harsh environments.
- **Wide Temperature Range:** Operates effectively from -60°F to 400°F (-51°C to 204°C).
- **Long Service Life:** Materials rated for 20–30 years or more.
- **Vibration and Noise Dampening:** Enhances stability and operational efficiency.



The **RedLineIPS SmartPad System** is a game-changer in industrial piping technology, providing a superior solution to the pervasive problem of CUPS. Its innovative design, ease of installation, and unmatched durability make it the ideal choice for industries seeking to enhance safety, reduce costs, and extend the life of their piping systems.

By addressing the root causes of corrosion, the SmartPad System not only prevents failures but also ensures long-term operational efficiency, positioning itself as the future of pipe support technology.

For more information, visit SmartPadSystem.com or contact Sales@SmartPadSystem.com.



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