



Penetration seals may be exposed to high cycling frequency. They may be exposed to high temperatures, up to 1150 Fahrenheit in some cases. Tight Clearances between multiple penetration seals and also between penetration seals and existing support structural steel.

### THE HUSKY PENSEAL SOLUTION

The Senior Flexonics Pathway Husky Penseal utilizes our Rhinohide gas seal. This high performance, patented, belt material allows for easier installation than conventional composite fabric expansion joint belts, while providing infinite cycle life.

The Husky Penseal utilizes exclusive, proprietary thermal protection features which address the two primary sources of heat, heat from the pipe and heat from the exhaust gas, independently.

Size matters and every feature is designed to be as slim as possible to fit in areas with minimal clearance. Another feature with the Husky Penseal is installation is accomplished with 100% of the work performed outside, entirely from underneath the HRSG, requiring no inside work permits or hole watch.

The carbon steel frame is provided in two pieces and welded together around the pipe. The frame is located concentric to the pipe and may require the hole in the bottom of the HRSG to be enlarged. The lower frame half can be welded to the existing poison pad or directly to the pipe.

### THE PROBLEM

Many HRSG's originally utilized metal bellows penetration seals which are susceptible to flex-fatigue failure in cycling applications. They can be replaced with metal bellows installed as clamshells (a bellows that is cut into 180 degree sections) requiring highly skilled welders or they can be replaced with one piece bellows. If installed as clamshells, typically a thicker bellows is required resulting in a higher spring rate and reduced cycle life. If installed as one piece bellows, the penetration pipe must be cut and temporarily removed and generally requires a code pipe weld and heat treatment.

### THE CHALLENGES

Penetration seals may need to accommodate significant axial extension, up to 6.5" in some cases. This is the opposite movement direction for most expansion joints so the excess material must be installed in the cold position, extremely difficult for many, common design, fabric expansion joints.



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