



# PENFLEX

## FLEXIBLE METAL HOSES FOR PAPER DRYER ROTARY JOINTS

As important as water is to the paper making process, it is just as important that it's all gone by the end of it. Metal hoses, attached to the rotary joints on each drying can, play a critical role in achieving this outcome.

They flex, absorb vibration and operate at the temperatures required to deliver steam to and drain condensate from the cans. When needed, their corrosion resistance prolongs service life. While it's a seemingly straightforward application, don't be deceived.

### COMMON CAUSES OF HOSE FAILURE

In paper mills, hoses fail prematurely and require frequent maintenance for several reasons, most of which can be linked to oversights in design or in assembly installation.

A drying machine may require dozens of metal hoses for dozens of identical dryers and rotary joints, but it's rarely the case that all those metal hoses will be the same. The distance, turns, and geometry of the piping system determine the design of a metal hose assembly and these variables can change with each can.

Similarly, we've also seen great variation in the magnitude of vibrations experienced by rotary joints on the same machine due to the varying lengths of adjacent pipes and other process variables such as steam temperature and pressure. To combat vibration, engineers might consider adding braid layers, using heavier wall hose or increasing flexibility.

In short, each metal hose assembly may require a unique design.

### At a glance

**Penflex offers the widest range of metal hose and braid products in the industry, including bronze hose and braid for Pulp and Paper applications.**

Nominal I.D. ranges from 1/4" to 24".

Custom-pitch options for required flexibility

On-call engineering support for hose products and assembly quoting

ASME IX certified welders and on-site Certified Welding Instructor and Non-Destructive Examiner ensures highest quality fabrication.

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Penflex hoses are sold through a worldwide distribution network.

Once in service, rotary joint hoses are subject to random motion which—when combined with the constant cycling and vibrations—creates a likely scenario for “out-of-plane” flexing. If one end moves out of plane while bending is taking place, torsion and fatigue stress are likely outcomes. Both will reduce effective service life.

While additional design measures can be taken to reduce the probability of out-of-plane flexing, proper installation is critical. Always install a rotary joint hose assembly so that flexing occurs in only one plane, that being the plane in which bending occurs.

## **HARDWORKING FLEXIBLE METAL HOSES**

Beyond making hoses for paper dryer rotary joints, Penflex designs and manufactures hoses for a range of pulp and paper applications. These include general steam production applications as well as those involving black liquor and other corrosive or hazardous media.

To ensure a longer life in service, Penflex hoses incorporate these characteristics.

- **Heavy wall.** Our line of heavy wall hoses can better withstand the wear and tear brought on by random motion, constant cycling and—where applicable—corrosive media.
- **Double braid.** In addition to increasing the working pressure of a hose, the second braid layer can help combat vibration.
- **Purging of welds.** Argon purging of welds ensures clean, contamination-free welds. With the numerous chemicals involved in pulp and paper operations—including chlorides found in some steams—this approach delays corrosion.

Paper mills run 24/7 and metal hoses need to keep pace with the speed of operations. Penflex’s wide range of hose and braid options ensure you’ll have what you need and our extensive network of fabricating distributors can custom design any assembly and provide recommendations for your unique application.