

Longwall Hydraulic Hazards Workshop

“Improving Hose and Fitting Reliability”

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1. Improving Hose and Fitting Reliability

Ensure that all suppliers have type tested assemblies as a matched system for maximum reliability and safety that are endorsed by international authorities



2. Selecting the type of hose construction for application

Wire Braid Construction

One wire construction.
Generally for Low/Med pressure



Two wire construction. Generally
for Med/High pressure

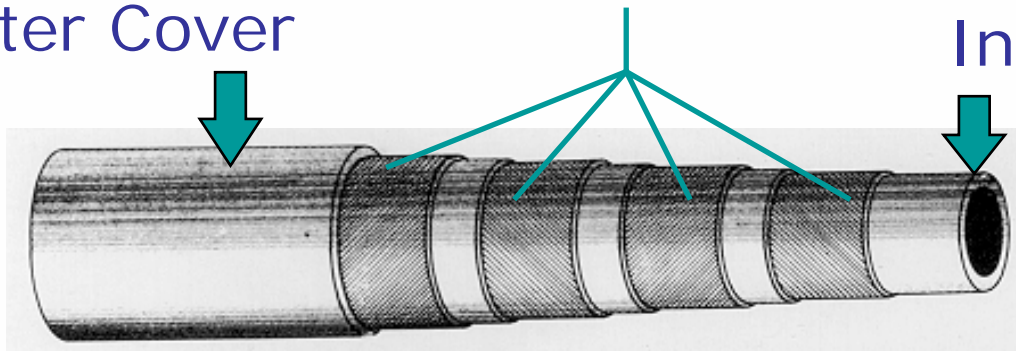


Multi-Spiral Construction

Alternating Spirals of Wire (4 or 6
spirals). High pressure & impulse

Outer Cover

Inner Tube



2. Selecting the type of hose construction for application

The outer cover is there to protect the wire from corrosion and breaking.

Hence there are different types of abrasion resistant covers for specific applications.



2.1 Selecting the type of hose construction and cover for application

Standard ISO6805 states when a force of 50N is applied in the test apparatus on the hose test piece for 2000 cycles

Standard Hose = 1.0 gram loss

Abrasive Resistant Hose < 0.1 gram loss

“Special” UHWMPE cover < 0.1 gram loss
After 1 000 000 cycles



3. Respecting the hose

Standard SAE J 1273 – 2004 states that stored hose and assemblies should be capped at both ends.



3. Respecting the hose



4. Protecting the hose and assembly

For arduous conditions use **FRAS** spiral guard

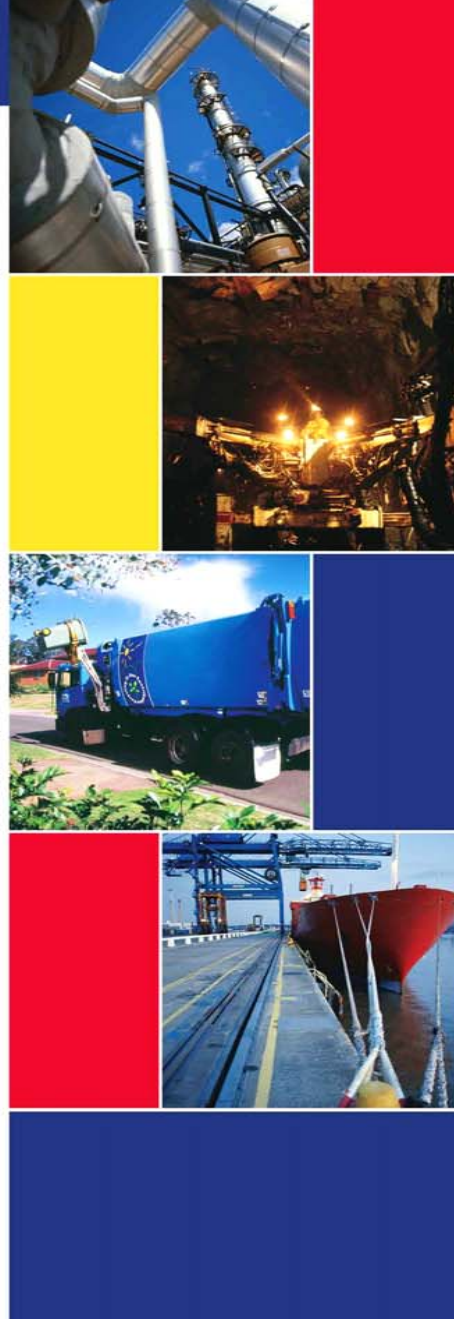


4. Protecting the hose and assembly

Other applications may require the need of a Diffusion Abrasion Sleeve.



This is not a burst suppression device



4. Protecting the hose and assembly

Where possible, avoid hoses rubbing side by side, as this too will contribute to outer cover wear.

General Note:

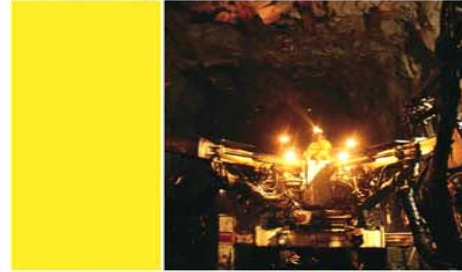
External damage accounts for approximately 80% of early failures. The outer cover must be kept in tact.



4. Protecting the hose and assembly

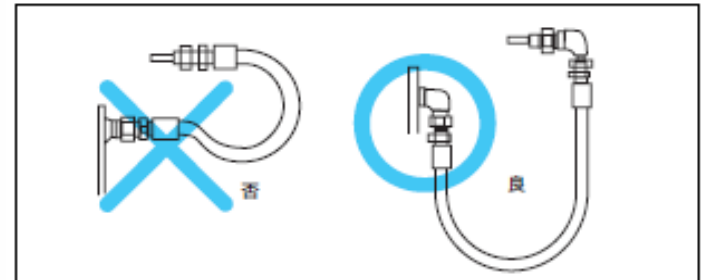
In underground mining, hose and fittings are continuously exposed to a wet and corrosive environment.

Sufficient drainage should be considered (eg if hoses are in a channel) or use of stainless steel fittings may be required with regular periodical inspections conducted.

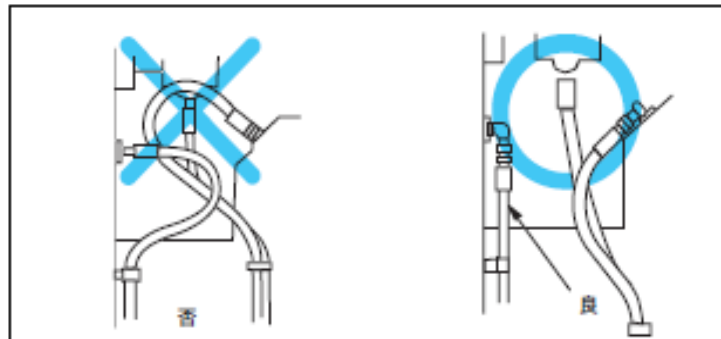


5. Hose Routing

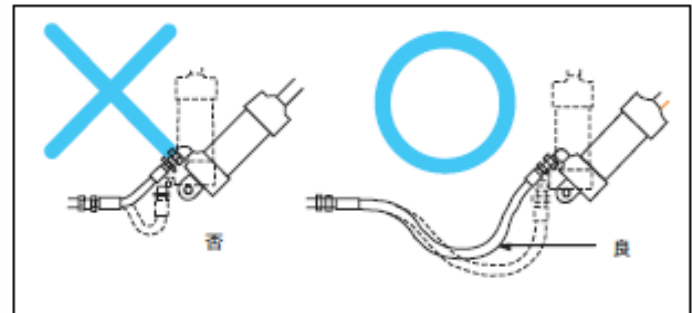
Exceeding the minimum bend radius or kinking may cause premature failure of hose assembly.



Where the radius falls below the required minimum, an angle adaptor should be used as shown above to avoid sharp bends in the hose.

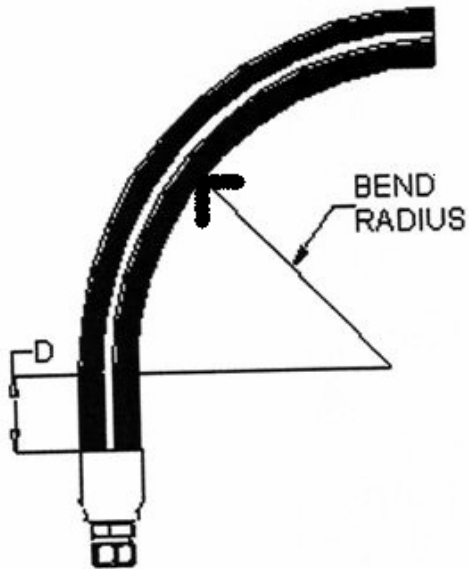


Obtain direct routing of hose through use of adaptors and couplings. Improve appearance by avoiding excessive hose length.



Adequate hose length is most important to distribute movement on flexing applications and to avoid abrasion.

5.1 Hose Routing-Bend Radius



CORRECT

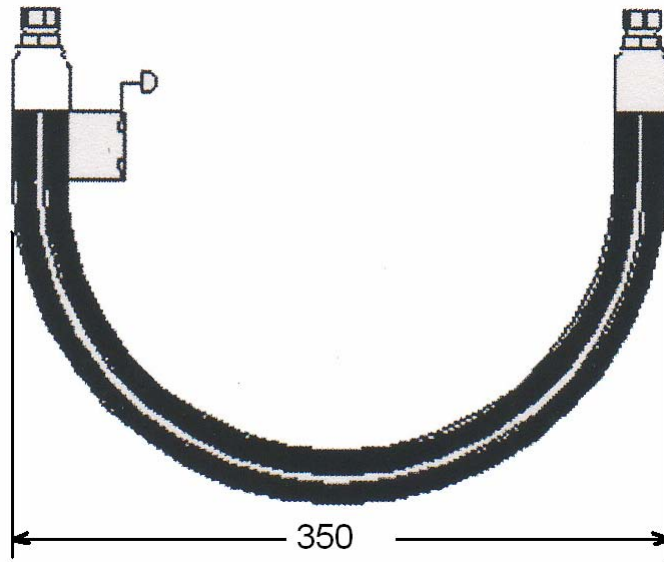
Clarification of the bend radius

To prolong the life of a hose and improve reliability, the bend radius must be adhered to

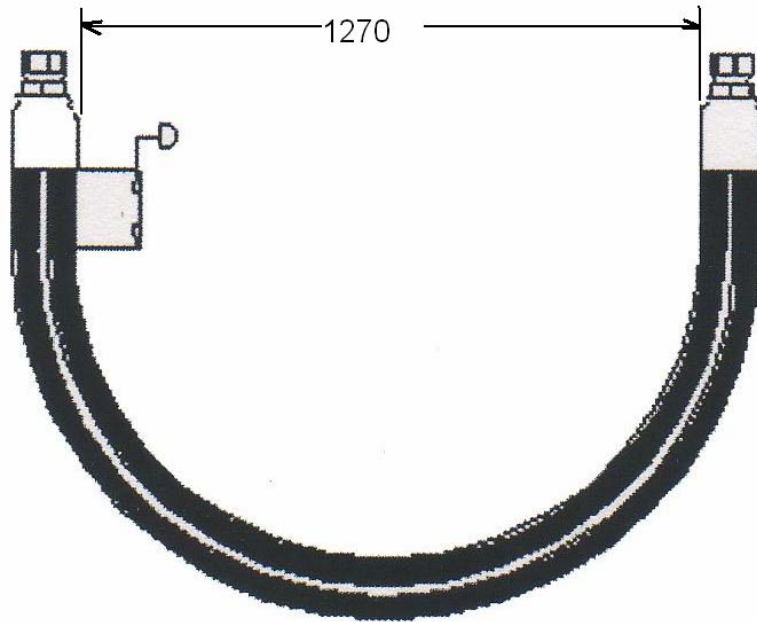


5.1 Routing - Bend Radius

Practical Example as witnessed in service:
For a Shearer Water hose on a Shearer Bretby, the "OD to OD extent dimension" was 350mm as per drawing below.



5.1 Routing - Bend Radius



Specified bend radius of that particular hose is 635mm (which equates to an ID to ID $\text{\O}1270\text{mm}$)



5.1 Routing - Bend Radius

Will the hose work if the bend radius is exceeded ?

The answer: Yes, however it does reduce its effective working life considerably



5.1 Routing - Bend Radius at end fitting

Avoid exceeding the minimum bend radius when exiting the fitting



5.1 Routing - Bend Radius at end fitting



*leakage / weeping near the coupling apparent



*inner liner is cut in line with the last barb of the tail and ferrule combination

This type of result can be found when hoses with a sharp bend near the coupling are under pressure.