Air needs

General air needs

Pneumatic splicers are operated by compressed air, so the air supply must be appropriate.

- Splicers generally operate at a pressure between 3 and 8 bar, according to application
- Pressure must be as uniform as possible.
- The air supply should be reasonably dry and clean
- There must be the lowest possible flow resistance.

Because the time taken to make a splice is short, transient pressure drops associated with other demands in the mill may become important. When the splicer is operated, If there are restrictions in the line, air will not be replenished, so that the pressure drop will be greater; weak splices may result. Compressed air installations should therefore be designed so that the pressure at the splicer should be as consistent as possible when the splicer is working.

Adequate static air pressure in the supply line is not sufficient to ensure adequate performance. When working, the splicer uses a lot of air (typically 3 litres/sec), and line pressure at the splicer head normally drops by about 1 bar. Even when static pressure appears to be suitable, pipe friction may be high, so that the air is not replenished, and pressure drops, ruining splicing performance. So the air supply should have as little resistance and pipe-friction as possible; never use narrow-bore supply tube.

Main feed-pipes should be fairly large (maybe 25 mm). Flexible hose feeding the splicer should not be small-bore, and not too long. Six metres of flexible hose between air main and splicer represents a good compromise between the requirement for a long reach and the need to minimise pipe losses. A large creel, for example, will be best served if it is provided with a number of air supply connectors of the quick-release type, so that the splicer may be carried from place to place and simply plugged in.

When there is doubt about the quality of the air supply system, a pressure gauge should be fitted - temporarily - as near as possible to the splicer, so that static pressure and pressure drop can be monitored. This is particularly desirable in an installation which uses long lengths of coiled hose; losses in such hoses tend to be significant, and may adversely affect splicing performance.

Sometimes, static line pressure is known to be adequate, but there are insurmountable problems with transient pressure fluctuations. In these circumstances, if it is impossible to maintain a good supply of air, it may be necessary to provide a reservoir of perhaps 20 litres capacity, near to the splicer. The reservoir will assure adequate air supply to the splicer while it is being used. The reservoir pressure will fall a little during splicing, but it will be replenished once the splicer is switched off.

What should be the quality of the air supply; should it be dry and filtered?

Under normal circumstances, splicers should be supplied with clean, dry air. For most applications, provision should be made for modest standards of filters and water traps. Dirty air should NEVER be supplied. It is certain to give a poor-quality splice, and over a prolonged period is likely to damage the splicer itself.

Do not fit lubricators in the line very near to the splicer; an excess of oil on the yarn may weaken the splice.

Under special circumstances, however, and with appropriate designs of splicer, it may be appropriate to supply moist air, in order to splice yarns which splice more efficiently when damp. Such a step should be taken only after consultation with the supplier, however, as special rust-proof splicer components may be needed.

Can splicers be fitted with portable air bottles instead of air lines?

In certain very special circumstances, it may be expedient to run a splicer by using air supplied from an air cylinder. This may be seen as having some advantages - notably that a complex and expensive plumbing system need not be installed all round the factory.

However, bottle-driven splicers are very rare, because of the profound disadvantages:

- to ensure an adequate pressure, a heavy-duty bottle is required; such bottles are usually heavyweight, as well as heavy duty.
- to ensure an adequate service life for the contents of the supply cylinder, the bottle will need to be large, unless splicer use is very infrequent. This requirement adds to the problem of bottle size and weight.
- regulators will be needed; on occasion, users have connected splicers direct to bottles, with the result that splicers were operating outside their design limits, creating a distinct health and safety hazard. Moreover, when operated under these conditions, the free expansion of the bottled gas has led to some marked Joule-Kelvin cooling, which has frozen some components of the splicer.

Overall, if a special situation can be found where a positive case for a bottled supply can be made, and the operating conditions optimised, there is no reason why a bottled supply should not be used. The usual solution in these circumstances is a trolley of sack-truck form, which bears the weight of the bottle. The whole assembly is then wheeled to where it is needed, and after use is parked up awaiting the next call for the splicer.