



# Technical Bulletins

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## Low Temperature Seals

This bulletin will address the issue of Original Line cylinder life expectancy as well as some of the factors which have a direct impact on cylinder life.

This bulletin will address the issue of when to specify special low temperature seals and lubrication. Currently our catalog reads, "Buna N seals with a temperature range of -20 degrees Fahrenheit to 200 degrees Fahrenheit are standard in all BIMBA air cylinders. If cylinders are operated at temperatures below zero degrees Fahrenheit for extended time periods special modifications may be required."

Seal manufacturers issue a temperature range when rating their different elastomers. This temperature range varies for the different elastomers based on the different physical properties of each. The high and low limit of this range is the point at which the internal physical properties of the seal undergo a drastic change. This point is crucial to understanding the nature of a seal rating because the rating is independent of the seal geometry or of the actual application for which the seal is being specified. Thus it becomes obvious that it is left to the individual to determine a proper temperature operating range for each particular application.

Bimba Manufacturing Company has done leak testing of cylinders operated at low temperatures. This test data as well as extensive field experience has allowed us to make some general determinations with regard to low temperature applications. The test was conducted at an off-site testing laboratory. An environmental chamber was used to simulate low temperature conditions. The chamber was kept at zero degrees to minus ten degrees Fahrenheit for at least fifteen hours prior to the test, allowing the cylinders to chill to the ambient temperature. Both our standard and low temperature seals were tested. The standard seals were found to leak and it was theorized that the seals became too stiff at the test temperature to function properly. The low temperature seals were then tested and their performance was acceptable at the test temperature.

The results show that the standard seals do not perform adequately in temperatures consistently below zero. This fact coupled with extensive field experience for our other product lines show that for any application with sustained ambient temperatures at or below zero special low temperature seals should be specified. Applications most susceptible to these temperature extremes will be located in the northern United States and Canada. Examples of specific industries at risk would be mobile applications in the agricultural and transportation industries.

The information presented is in Bimba's best engineering opinion and should be used for reference only. Recommendations derived should be verified under actual operating conditions. Bimba reserves the right to change specifications without prior notice.

Date: 12/4/08

Rev Level: 0