

# HIGH PERFORMANCE SOLUTION FOR VENTILATION

INNOVATION IN VENTILATION

**Norvent Mine & Tunnel Ventilation** is dedicated to providing quality products to the mining and tunnelling industries.

Through continued research and development we have introduced innovative improvements to the manufacturing process for our **Filament Wound Rigid Pipe**.

We take pride in announcing the precedent setting **K Factor** and **Air Loss** results as the best in our industry.

## **K Factor**

- 9.5 H  $10^{-10}$  lbXmin<sup>2</sup>/ft<sup>4</sup> imperial
- 21% improvement in K-Factor
- Energy Efficient

## **Air Loss Factor**

- 0.0009 to 0.0019m<sup>3</sup>/s (1.9 to 4 cfm)
- Bell and spigot joints can move 5° right/left and up/down
- Internal rubber gaskets prevent air loss and reduce resistance

## **Filament Wound Ducting**

- Withstands high positive and negative pressures.
- Low cost due to quick installation.
- Ducting springs back into shape when subject to loading or impact and can tolerate blast damage.
- Round and oval configurations available.
- Variety of lengths up to 20 feet.
- Manufactured in Ontario for over 50 years.

K FACTOR & AIR LOSS TESTING



**Norvent**  
MINE & TUNNEL VENTILATION

# Breathe easier one duct at a time

## IMPROVED K FACTOR



### **K Factor Qualified Third Party Testing**

Testing was arranged to allow the measurement of frictional pressure loss over 9 contiguous sections at different fan speeds/air delivery rates. This surface condition could be considered as representative to an ideal installation.

The test was designed such that high velocity flows would incur frictional pressure losses that could be confidently measured over a relatively short length of duct system, so permitting multiple independent measurements along the installation length.

Measurements also included temperature and humidity, to determine the air density, and the distances between measurement points to calculate the frictional resistance of the duct to airflow.

The test was successful in generating consistent and repeatable results.

### **Old Style K Factor**

Old style ducting had a k factor resistance  $0.00225 \pm 0.00008 \text{ kg/m}^3$  ( $12.1 \text{ H } 10^{-10} \text{ lbXmin}^2/\text{ft}^4$  imperial)

### **New Style K Factor**

The new style manufactured had decreased the resistance by 21% to a k factor  $0.00177 \pm 0.00006 \text{ kg/m}^3$  ( $9.5 \text{ H } 10^{-10} \text{ lbXmin}^2/\text{ft}^4$  imperial)

All K Factor test results excerpted from CanmetMINING Report Dated November 2015

## PREVENT AIR LOSS



### **Air Loss Qualified Third Party Testing**

Testing was conducted to assess the air loss at the joints between ducting segments that could be confidently measured.

Various gauge pressure values were used up to 7 kPa (28" w.g.)

### **Redesigned Gasket**

The leakage from the joint was reduced by an average of 57%.

A patch installed on the gasket where most of the leakage occurred resulted in reducing the leakage by roughly 90%, to an average of  $0.0002 \text{ m}^3/\text{s}$  (0.4 cfm) per joint.

### **Five Degree Installation**

Although leakage increased in the 5° installation compared to the test with the segments aligned straight, the impact was minimal.

Ducting was tested with multiple joints. The leakage per joint did not increase with pressure in a linear manner.

The seal at the joints between the duct and the gasket improved as the pressure increased.

### **Testing Conclusion**

Leakage testing was conducted on 0.6m (24 inch) diameter, fiberglass ducting with bell and spigot joints whereby it was determined that the leakage per joint was  $0.0009$  to  $0.0019 \text{ m}^3/\text{s}$  (1.9 to 4 cfm) for pressures ranging from 0.5 to 5 kPa (2 to 20" w.g.)

All Air Loss test results excerpted from CanmetMINING Report Dated March 2016



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