Blowers; Application & Maintenance Overview
Application

- Sized correctly;
- too big or too small
- Speed;
- too slow or too fast
- High pressure
- High temperature
Pneumatic Conveying

- Match the blower to the job
- elevation
- product
- line size & lengths
- elbows
- airlock
- diverters
Pneumatic Conveying Data Sheet

Company Name
Contact
Phone (____) ____ - ______
Fax (____) ____ - ______
City
Province
Elevation
Average Ambient Temperature ______ °F
Type of System
Pressure
Vacuum
Product to be Conveyed
Weight, lb/ft³
Particle size
Flow Rate
or lbs/min
or kg/min
Conveying line size O/D
I/D
Total Conveying line in feet
Horizontal
Vertical
Total number of long sweep elbows
90°
45°
Specify other i.e. Hammertek, short radius etc.
Total number of diverters
Flap
Tunnel
Number of air locks
Size and manufacture of air locks
Terminal of conveying line
□ Bin □ Cyclone □ Tanker □ Other
Please specify any other info i.e. flex hose, switching station, multi product line, etc.
Size of line from blower to air lock
Total Length in feet
Horizontal
Vertical
Number of elbows
90°
45°
Outside installation □ Inside installation
Blower room □ Mill floor □ Other
Plenum air intake (outside air) □ Blower room / mill intake (inside air)
Motor frame TEFC □ Explosion proof
Flour, 36 lbs/ft³
28,000 lbs/hr
300’ horizontal
60’ vertical
10 – LR 90’s
3 – diverters
3.8”ID conveying line, 4”OD
3600 FPM
52 cfm lock loss
Blower Selection

- TL70
- 528icfm (includes 52cfm lock loss)
- 2600rpm
- 12psig
- 38 brake hp
TL70 528 icfm
12 psig
2600 rpm, 68% 155F delta t
68F Ambient = 223F outlet temp!

(Curve Data Based on the Following)

Gas handled: Air
Inlet pressure: 14.7 PSIA
Inlet temp.: 68°F

Job number
Customer
Location
V-Belt Drive Design

Minimum sheave diameters
- Blower
- Motor

Correct # of belts to handle the hp
X belts = more hp/belt

Keep sheaves close to blower & motor
Align sheaves
Proper Tension
### Table IV: Minimum sheave diameter [inches / mm]

<table>
<thead>
<tr>
<th>TL</th>
<th>3</th>
<th>20.7</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>34.5</th>
<th>6</th>
<th>41.4</th>
<th>7</th>
<th>48.3</th>
<th>8</th>
<th>55.2</th>
<th>10</th>
<th>68.9</th>
<th>12</th>
<th>82.7</th>
<th>13</th>
<th>89.6</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>TL10</td>
<td>3.20</td>
<td>80</td>
<td>3.20</td>
<td>80</td>
<td>3.20</td>
<td>80</td>
<td>3.20</td>
<td>80</td>
<td>3.20</td>
<td>80</td>
<td>3.20</td>
<td>80</td>
<td>3.20</td>
<td>80</td>
<td>3.20</td>
<td>80</td>
<td>3.20</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>TL20</td>
<td>3.20</td>
<td>80</td>
<td>3.20</td>
<td>80</td>
<td>3.20</td>
<td>80</td>
<td>3.20</td>
<td>80</td>
<td>3.20</td>
<td>80</td>
<td>3.20</td>
<td>80</td>
<td>3.20</td>
<td>80</td>
<td>3.20</td>
<td>80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TL30</td>
<td>4.00</td>
<td>100</td>
<td>4.00</td>
<td>100</td>
<td>4.00</td>
<td>100</td>
<td>4.00</td>
<td>100</td>
<td>4.00</td>
<td>112</td>
<td>4.40</td>
<td>112</td>
<td>4.40</td>
<td>112</td>
<td>4.40</td>
<td>112</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TL40</td>
<td>4.00</td>
<td>100</td>
<td>4.00</td>
<td>100</td>
<td>4.00</td>
<td>100</td>
<td>4.00</td>
<td>100</td>
<td>4.40</td>
<td>112</td>
<td>4.40</td>
<td>112</td>
<td>4.40</td>
<td>112</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TL41</td>
<td>4.00</td>
<td>100</td>
<td>4.00</td>
<td>100</td>
<td>4.00</td>
<td>100</td>
<td>4.00</td>
<td>100</td>
<td>4.40</td>
<td>112</td>
<td>4.40</td>
<td>112</td>
<td>4.40</td>
<td>112</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TL50</td>
<td>4.70</td>
<td>118</td>
<td>4.70</td>
<td>118</td>
<td>4.70</td>
<td>118</td>
<td>5.20</td>
<td>132</td>
<td>5.20</td>
<td>132</td>
<td>5.50</td>
<td>140</td>
<td>5.50</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TL60</td>
<td>5.20</td>
<td>132</td>
<td>5.20</td>
<td>132</td>
<td>5.20</td>
<td>132</td>
<td>5.20</td>
<td>132</td>
<td>5.50</td>
<td>140</td>
<td>5.50</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TL61</td>
<td>5.20</td>
<td>132</td>
<td>5.20</td>
<td>132</td>
<td>5.50</td>
<td>140</td>
<td>5.50</td>
<td>140</td>
<td>5.90</td>
<td>150</td>
<td>5.90</td>
<td>150</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TL70</td>
<td>5.50</td>
<td>140</td>
<td>5.50</td>
<td>140</td>
<td>5.90</td>
<td>150</td>
<td>5.90</td>
<td>150</td>
<td>6.30</td>
<td>160</td>
<td>6.30</td>
<td>160</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TL80</td>
<td>5.50</td>
<td>140</td>
<td>5.50</td>
<td>140</td>
<td>5.90</td>
<td>150</td>
<td>6.30</td>
<td>160</td>
<td>6.30</td>
<td>160</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TL81</td>
<td>6.00</td>
<td>160</td>
<td>6.00</td>
<td>160</td>
<td>6.70</td>
<td>170</td>
<td>6.70</td>
<td>170</td>
<td>7.10</td>
<td>180</td>
<td>7.10</td>
<td>180</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TL90</td>
<td>7.90</td>
<td>200</td>
<td>7.90</td>
<td>200</td>
<td>7.90</td>
<td>200</td>
<td>7.90</td>
<td>200</td>
<td>9.00</td>
<td>225</td>
<td>9.00</td>
<td>225</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TL10</td>
<td>7.90</td>
<td>200</td>
<td>7.90</td>
<td>200</td>
<td>7.90</td>
<td>200</td>
<td>9.00</td>
<td>225</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TL101</td>
<td>7.90</td>
<td>200</td>
<td>7.90</td>
<td>200</td>
<td>9.00</td>
<td>225</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TL110</td>
<td>7.90</td>
<td>200</td>
<td>7.90</td>
<td>200</td>
<td>9.00</td>
<td>225</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TL120</td>
<td>7.90</td>
<td>200</td>
<td>9.00</td>
<td>225</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TL600</td>
<td>9.30</td>
<td>236</td>
<td>9.30</td>
<td>236</td>
<td>9.30</td>
<td>236</td>
<td>9.90</td>
<td>250</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TL900</td>
<td>9.30</td>
<td>236</td>
<td>9.30</td>
<td>236</td>
<td>9.90</td>
<td>250</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Check pressure rating for all blowers.
# Motor Sheave Diameter

Table 3-3 Recommended Minimum Sheave Diameters, Belt Type, Number of Belts and Deflected Force

<table>
<thead>
<tr>
<th>Motor Hp</th>
<th>Min Sheave Dia (in)</th>
<th>Belt Type</th>
<th>Max # of Belts</th>
<th>Avg. Deflected Force (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.75</td>
<td>2.2</td>
<td>3VX</td>
<td>1</td>
<td>3.4</td>
</tr>
<tr>
<td>1</td>
<td>2.4</td>
<td>3VX</td>
<td>1</td>
<td>4.0</td>
</tr>
<tr>
<td>1.5</td>
<td>2.4</td>
<td>3VX</td>
<td>2</td>
<td>3.1</td>
</tr>
<tr>
<td>2</td>
<td>2.4</td>
<td>3VX</td>
<td>3</td>
<td>2.8</td>
</tr>
<tr>
<td>3</td>
<td>3.0</td>
<td>3VX</td>
<td>2</td>
<td>3.3</td>
</tr>
<tr>
<td>5</td>
<td>3.0</td>
<td>3VX</td>
<td>3</td>
<td>4.0</td>
</tr>
<tr>
<td>7.5</td>
<td>3.8</td>
<td>3VX</td>
<td>4</td>
<td>4.7</td>
</tr>
<tr>
<td>10</td>
<td>4.4</td>
<td>3VX</td>
<td>4</td>
<td>5.4</td>
</tr>
<tr>
<td>15</td>
<td>4.4</td>
<td>3VX</td>
<td>5</td>
<td>5.4</td>
</tr>
<tr>
<td>20</td>
<td>5.2</td>
<td>3VX</td>
<td>6</td>
<td>6.0</td>
</tr>
<tr>
<td>25</td>
<td>6.0</td>
<td>3VX</td>
<td>7</td>
<td>5.6</td>
</tr>
<tr>
<td>30</td>
<td>6.8</td>
<td>3VX</td>
<td>7</td>
<td>5.9</td>
</tr>
<tr>
<td>40</td>
<td>6.8</td>
<td>5VX</td>
<td>4</td>
<td>11.6</td>
</tr>
<tr>
<td>50</td>
<td>8.2</td>
<td>5VX</td>
<td>4</td>
<td>14.6</td>
</tr>
<tr>
<td>60</td>
<td>8.2</td>
<td>5VX</td>
<td>5</td>
<td>14.1</td>
</tr>
<tr>
<td>75</td>
<td>10.0</td>
<td>5VX</td>
<td>5</td>
<td>14.5</td>
</tr>
<tr>
<td>100</td>
<td>10.0</td>
<td>5VX</td>
<td>6</td>
<td>16.0</td>
</tr>
<tr>
<td>125</td>
<td>12.0</td>
<td>5V</td>
<td>7</td>
<td>14.1</td>
</tr>
<tr>
<td>150</td>
<td>13.2</td>
<td>5V</td>
<td>7</td>
<td>15.4</td>
</tr>
<tr>
<td>200</td>
<td>15.0</td>
<td>5V</td>
<td>8</td>
<td>16.0</td>
</tr>
<tr>
<td>250</td>
<td>15.0</td>
<td>8V</td>
<td>6</td>
<td>27.6</td>
</tr>
<tr>
<td>300</td>
<td>16.0</td>
<td>8V</td>
<td>7</td>
<td>27.1</td>
</tr>
<tr>
<td>350</td>
<td>16.5</td>
<td>8V</td>
<td>7</td>
<td>30.3</td>
</tr>
<tr>
<td>400</td>
<td>17.5</td>
<td>8V</td>
<td>8</td>
<td>29.1</td>
</tr>
<tr>
<td>450</td>
<td>18.0</td>
<td>8V</td>
<td>8</td>
<td>31.6</td>
</tr>
<tr>
<td>500</td>
<td>18.5</td>
<td>8V</td>
<td>9</td>
<td>30.7</td>
</tr>
<tr>
<td>600</td>
<td>17.5</td>
<td>8V</td>
<td>11</td>
<td>26.3</td>
</tr>
<tr>
<td>700</td>
<td>19.0</td>
<td>8V</td>
<td>12</td>
<td>27.3</td>
</tr>
<tr>
<td>800</td>
<td>20.0</td>
<td>8V</td>
<td>13</td>
<td>28.2</td>
</tr>
</tbody>
</table>

Notes:
1. Horsepower is the nameplate motor horsepower, and RPM is the motor (driver) speed.
Blower Speed

- Too fast;
  - shortened bearing life

- Too slow;
  - higher temperature
  - oil degradation
  - shortened bearing life
For every 1 psig pressure rise, the discharge temperature will increase by approximately 13°F plus ambient.
Ex. 10psig x 13°F + 70°F = 200°F

Hotter Ambient
Ex. 10psig x 16°F + 100°F = 260°F
Application Summary

- Good blower speed
- Proper product speed, FPM
- Acceptable pressure
- Properly sized V-Belt drive
- Airlock sized correctly
- All accessories are accounted for;
- sifters, infestation destroyers, diverters etc.
Lubrication

- Oil changes
- Proper grade and type
- Non detergent
- Anti foam
- Rust inhibitors
- Anti wear
- Hydrolytic stability
## 10.3 Recommended oils

<table>
<thead>
<tr>
<th>Make</th>
<th>Type</th>
<th>ISO VG - 150</th>
<th>Pour point</th>
<th>ISO VG - 220</th>
<th>Pour point</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>°F</td>
<td>°C</td>
<td>°F</td>
</tr>
<tr>
<td>Mobil</td>
<td>Nuto</td>
<td>150</td>
<td>0</td>
<td>-18</td>
<td>n/a</td>
</tr>
<tr>
<td>Petro-Canada</td>
<td>Compro</td>
<td>150</td>
<td>-11</td>
<td>-24</td>
<td>n/a</td>
</tr>
<tr>
<td>Mobil</td>
<td>Synthetic</td>
<td>SHC630</td>
<td>-49</td>
<td>-45</td>
<td>SHC630</td>
</tr>
</tbody>
</table>
Oil Fill Ports
Oil Level sight glasses
Synthetic Oil
Mineral Oil
Food Grade Gaskets
Filter Changes
Filter with weather hood

Blower Engineering

Tri-Lobe
Open filter for indoor use, up to 3025 cfm
Open filter for indoor use, up to 480 cfm
Filter
Restriction
Indicator

Easy to read
Simple
Re-useable
Re-set button
Dirty Filter

Blower Engineering

Change filter when red
**Cost of a dirty filter**

BHP = RPM x CFR x P x 0.00474

With clean filter:
BHP = 2040 x 10 x 0.28 x .00474
= 27.074

With dirty filter:
BHP = 2040 x 10.9 x 0.28 x .00474
= 29.51 (BHP differential = 2.43)

P = 25” WC (equals 0.9 psig differential)

Extra Cost:
= 2.43 x 16hrs x 300 days x $0.1 = $1166.40/year
Pressure Relief Valve
Blower will over heat in about 5 minutes
Rotors expand causing tip to housing contact
- increased clearance
- loss of efficiency
- wasted hp
- higher operating temperatures
Blower will seize up

Over Pressure
Check Valve
Product in Air Box
Compact/Silencer package
Oil Drain Hoses
Oil Drain Hoses
Filter Restriction Indicator
Double adjusting slide base
Summarize

- Change oil
- Change filter
- Pressure Relief Valve
- Check Valve
- V-Belt drive-aligned & tensioned
Thank you

Blower Engineering

Bill Byrnes
bill@blowerengineering.com

40 Industrial Parkway North
Aurora, ON Canada L4G 4C2

Toll Free: 844-898-1980
Office: 905-841-2215
Cell: 289-221-2414

www.BlowerEngineering.ca