Correct Air Ducting from a Cleaner

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CORRECT AIR DUCTING FROM A CLEANER

James Henderson

Improper air trunking installations from the cleaner and into the dust house or collector causes up to 90% of the difficulties our salesmen have had in conjunction with improper air movements. Sharp turns, improper junctions, poor connections and poor collection equipment will all contribute to air deficiency in a cleaner. Improper air clearance also results in a very dirty, dusty plant operation. The following are a few of the common errors found in various plants and how each can be avoided or corrected:

A single fan cleaner having only the variable speed bottom blast fan must have a booster fan between it and a cyclone dust collector if a cyclone is to be used. These single fan cleaners are generally installed with the fan discharge near an outside wall so the fan can discharge out into the open air. In some cases, it is necessary to blow the dust so that it is run into a large expansion chamber that will permit dust and light chaff to settle while permitting the air to continue on through and be discharged relatively clean.

The dustless cleaners with top suction fans and the bottom blast fan develops sufficient velocity that cyclone type collectors or dust houses can be used to settle the dust and chaff from those air streams without a booster. Usually the dustless model cleaners have two top suction fans discharging side by side. Some larger models have as many as three fans, in which case the third fan must be handled separately. Separate collectors, one for each fan, are the ideal set up. However, unless too much air volume is to be handled, it is cheaper to bring them together by means of a junction with a divider valve installed into a single air pipe.

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and use a single air collector or single dust house. When such a junction is made, the approach angle should be held to a minimum and, I repeat, the junction divider is very important (Figure 1). If the pipes are brought together too abruptly or if the divider is not installed, back pressures are created which impede the proper flow of air. In fact, as the two air streams converge one opposes the other and it is found that when air adjustment is made on one fan it will affect the separation that is being made with the other fan.

Figure 1

<table>
<thead>
<tr>
<th>Width Cleaner</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>7&quot;</td>
<td>18&quot;</td>
<td>36&quot;</td>
</tr>
<tr>
<td>9&quot; and 3&quot;</td>
<td>24&quot;</td>
<td>48&quot;</td>
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This shows the HORIZONTAL MINIMUM (across the floor) LENGTH ONLY and doesn't cover actual length of ducting if extra elevation "up and away" is necessary.

Refrain from installing elbows which have a sharp change of direction. Back pressures are created at such points and in most cases light chaff will be dropped into the pipe and finally plug the entire run. A rule of thumb used at our plant is that the inside radius of the elbow should be at least two times the diameter of the pipe.
The final source of trouble is in the cyclone or dust house itself. If it is either too large or too small or isn't designed properly or has a cap over the pipe discharging from the top of it or in some other way causes back pressure or pressure drop or turbulence that interferes with the cycloning action of the air inside of the collector, the installation will cause real trouble.

Many seedsmen build their own dust houses. If a house is properly designed and is large enough, it will serve the purpose very well. Space does not permit detailed explanations of the following eight basic rules governing good dust house construction:

1. The dust house should be deep.
2. The entry duct should be horizontal.
3. The entry duct should be below the pitch of the roof.
4. The entry duct should enter along one side.
5. The exhaust opening should be greater than the entry area.
6. The exhaust pipe should extend below the entry duct.
7. The exhaust pipe cover should not restrict the opening of the exhaust pipe.
8. The clean-out opening should be as large as possible.

A common mistake is the use of a single dust house to handle the air from two separate cleaners. If the individual air streams from each cleaner were adjusted exactly the same, it is possible that a single dust house or cyclone would be satisfactory, however, so many times the plant will be cleaning large seed on one cleaner and small seed on the other and the air streams from the fans will seldom be identical. If one cleaner is operating and the other is idle, there will probably be a blow back into the air ducting of the inoperative machine. This will either plug that cleaner's piping with dust or cause the dust to be blown back into the work room. It is impossible to adjust one cleaner in this situation without affecting the standing adjustment of the other cleaner.