

# Sources of Combustion Gas Leaks in Bulk Curing Barns

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1. Use a bright flashlight to inspect all exhaust flue-pipe joints (elbows, etc.), if applicable, that are located inside the barn and could be sources of leaking exhaust gases. Especially flue-pipe joints that are simply connected with sheet metal screws and/or some type of compression or clamp style fittings. Some of these connections are located directly in the return air stream, which typically is the low-pressure side of the fan. Also the floor style heat exchanger systems that use multiple pipes spanning the length of the barn should be checked for connection leaks.
2. A high temperature sealant (Exhaust sealant - for temperatures up to 2300°F) may be needed in addition to these mechanical fasteners to properly seal the connection from leaking exhaust gases. The best solution would be to minimize or eliminate the flue-pipe connections located inside the barn.
3. Using a bright flashlight closely inspect the heat exchanger for cracks. The firebox area or combustion chamber, which typically will be the hottest part on the heat exchanger, may be the first location on the heat exchanger to develop cracks. Also closely inspect all weld joints. Look at the heat exchanger welds, this may take crawling under the floor and looking down over the furnace area. It will be very hard to examine all of the welds. Lastly, pull the heat exchanger out and examine every weld with a bright flash light.
4. Although the CO<sub>2</sub> test is not used to determine if the stack exhaust gases are being pulled back into the barn when the fan fresh air intake vents are open, growers should be aware of the stack height relative to the top of the barn. It is possible that exhaust gases could be pulled back into the barn when the vents are open. Intake of stack exhaust could result in elevated TSNAs, even if the heat exchanger and other sources mentioned above are not leaking combustion gases. This is especially the case during the curing schedule when the outside air ventilation is at a maximum. The stack height should meet the minimum recommended height of 24 inches above the highest point of the barn roof.

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