WOOD ROUTING APPLICATION GUIDE

Oil Carryover (Router specific)

Oil is used to maintain the temperature of these machines.

Oil is considered a consumable however, it is not used up, it should be replaced with new oil. Never add oil to the machine, unless doing an oil change. If there is not oil on the floor or oil coming out of the discharge, then it is somewhere in the machine.

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Vacuum is used to circulate the oil in the machine and, at the same time, to create the vacuum. Similar to the operation of a compressor which relies on positive pressure, the vacuum pressure must be strong enough to pull the oil through the system. This occurs most efficiently deeper than 19" HgV on Vmax systems. Between 15" HgV - 28" HgV is the recommended vacuum level for long-term operation. If the system is not regularly maintaining 19" HgV or deeper, run the system at a deep vacuum level as often as possible.

At lunch or break time, leave the system running with the valve to the router table closed for at least 30 minutes every day. This is called dead-heading the machine. It helps to recirculate the oil and allows the separator element to clear. In between cutting cycles, when removing pieces from the table and positioning the next work piece, have the vacuum isolation valve to the table closed to allow the vacuum system to run at a deeper level. This will allow the system time to recover the oil in between cycles, and there should be far less oil carryover.

When the machine does not pull a deep vacuum level or the machine is left open to atmosphere, oil will be carried through the system. The oil is carried to the outer shell of the separator. Here, oil either settles as a liquid, or accumulates in the separator filter element. Oversaturation of the element will cause back pressure to increase in the separator. The end result is a reduction in the system's ability to pull a deep vacuum. Backpressure of 1 psig can result in about 2" HgV of vacuum loss.

Excessive oil carryover will typically be indicated by a white, oily mist being exhausted by the system. In some rare cases, liquid oil droplets can be ejected from the discharge. The oil that settles as a liquid in the outer shell of the separator tank will eventually be recovered by the small plastic tubing that runs from the underside of the tank back to the pump. This line is only intended to recirculate a minor amount of recovered oil. Excessive oil carryover, indicated by a drop in the sight glass, may require that the oil be drained from the outer shell of the separator tank and manually added back into the oil fill of the separator.

Overheating

When a system overheats, it is designed to shut down. The high temperature is most likely caused by poor oil circulation. Ensure the manual isolation valve, located in line with the y-strainer, is in the open position to allow the oil to flow. Remember to regularly check the inlet filter, y-strainer, and spin on oil filter (if system is so equipped) for foreign particulate or restrictions. It is common in routing applications for these items to become clogged due to the high amount of particles and debris that can be ingested by the vacuum system. Never clean filters with compressed air.

Less frequent, but a potential cause of high temperature issues is a clogged heat exchanger. Ensure the exterior of the heat exchanger is free of dust and debris. Using an infrared temperature gun, measure the temperature of the "hot oil in" side of the heat exchanger (i.e. separator to cooler). Take the reading on the metal lip of the heat exchanger where the hose is

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connected. Do the same thing on the "cold oil out" side of the heat exchanger (i.e. cooler to pump). If the temperature differential is greater than 35°F, the heat exchanger will likely need to be replaced. If the system shuts down on high temperature within only minutes of starting, it is likely that the cooler is significantly clogged and inhibiting the flow of oil.

Oil Level

Every Vmax system that ships from DEKKER is run tested for at least 2 hours to ensure that it performs properly, is free of leaks, and within acceptable vibration levels. For this testing, the machine is filled to its nominal capacity with oil. The Vmax system will ship to the customer with this oil. Sometimes, during the vacuum testing, the Vmax will be operated at a shallow vacuum. As previously discussed, running at shallow vacuum can carry the oil through the separator tank and into the outer shell. This can give the appearance of a drop in the oil sight glass because the sight glass only reads from the inner shell of the separator tank. The sight glass can be low, but oil is still in the system.
If the Vmax system is delivered with low oil in the sight glass, do not add more oil to the system. Simply install the unit and make the electrical connections as planned. With the suction inlet 90% closed and all tagged valves open, start the machine and allow it to run for 15-20 minutes. Oil will be pulled through the scavenge lines and the sight glass will return to an acceptable level.

Oil level may also drop slightly at vacuum levels deeper than 27" HgV. This is because the demand of the pump for oil is greater at deeper vacuum levels.

Vacuum Capacity

Several factors can contribute to loss in vacuum capacity on a Vmax system. As previously discussed, oversaturation of the separator element will cause backpressure and can reduce vacuum capacity by 2" HgV per 1 psi of backpressure. Check the following points to potentially achieve a deeper vacuum level:

- Density of the fiberboard. Less porous material can result in a deeper vacuum level at the pump.
- Thickness of fiberboard. Thicker fiberboard can result in a deeper vacuum level at the pump.
- Optimize patterns to minimize open table space.
- Turn off any unused zones.
- Condition of gasket material at the router table.
- Quality of piping connections from the table to the vacuum pump.
- Proper operation of the table in tandem with Vmax system.

When a fresh workpiece is placed on the table, the system will see its deepest vacuum levels for that setup. Vacuum level will naturally become shallower with each cut, depending on the length, width, and depth of each cut. It is best to cover any cutouts or holes with gaskets or other pieces of board in order to maintain deep vacuum, if possible.