COMPRESSORS FOR FOSSIL PREPARATION

Determine the appropriate compressor size for a fossil prep lab should first start with an audit of all tools and the amount of air they require. There are two parts to this equation.

1. The volume of air in CFM (cubic feet per minute)
2. The minimum pressure in PSI (pounds per square inch) that the tools need to operate correctly

If you are working in metric, you will find the volume in LPM (liters per minute) and pressure in Bar (1 Bar =14.5 PSI or 100 PSI = 6.9 Bar).

Next, determine how many tools may need to be working at the same time. Think about future staffing and tool needs as well.

Air compressors are sized in several ways. Compressor specifications normally list a volume at a given pressure; the higher the pressure, the lower the volume that a compressor can produce. It also must be recognized that compressors normally have a 'duty cycle'. This is the amount of time they can run, versus the amount of time they need to cool off. A good compressor will have about an 80% duty cycle, meaning that it can run for eight out of ten minutes, but it will require two minutes to cool down, otherwise, it will trip the thermal overload requiring the unit to cool before it can be reset. Compressors with a 100% duty cycle are available, but they are expensive and oversized for the rated pressure/volume so that they can run constantly. As a result, when sizing a compressor for the lab, it may be necessary to exceed the pressures from the tool audit to ensure that compressor will not have to run constantly.

Another consideration is the compressors pressure tank (or reservoir). This tank does two things:

1. It smoothes out the pulses from the compressor providing an even stream of air to the connected tools.
2. It allows the compressor to shut off and cool down while you run the tools from the air in the reservoir.

The tanks are usually measured in 'gallons'. The amount of horsepower required to run a compressor can be calculated by a rule of thumb: 3 CFM of air can be compressed to 125 PSI for each one unit of horsepower. Many of the pressure switches are adjustable for both the high-pressure shutoff as well as the minimum or restart pressure. The maximum pressure setting may be fixed by the factory so you can't exceed it. If necessary, a a pressure-reducing valve can be installed to regulate for constant pressure helping ensure constant air pressure that makes tools run consistently.

> *Example A - if you need 10 CFM of air at a minimum of 100 PSI, you would should look for a compressor that was capable of producing 15 CFM at some pressure greater than 100 PSI and with a reservoir of 60-100 galls. Since 100 PSI is your minimum pressure, you need to check to see that the compressor will restart before it gets down to 100 PSI.*
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> *Example B - To size a system for the following three tools :*
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> 1. *ME-9100 (2 CFM and 110 PSI for proper functioning)*
> 2. *a PaleoAro (1 CFM and 80-90 PSI)*
> 3. *Micro-Jack (0.6 CFM and 100 PSI)*
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> *In total these require a consumption of just less than 4 CFM. However, the ME-9100 requires 110 PSI for proper functioning, the PaleoAro can work down to 80-90 PSI and the Micro-Jack needs 100 PSI. Together these tools require a compressor that will put out a minimum of six or seven CRFM at 110 PSI. As a result, a compressor with at least a 30 gallon reservoir and probably a unit of around two horsepower would be appropriate.*