

Controlling Noise in Industry

Many plants are unnecessarily noisy because the most basic elements of noise control are not applied. The table gives a brief summary of some common noise sources and applicable noise control techniques, materials or devices. Although these measures may reduce noise from the sources treated, remember, to obtain an overall **measurable** noise reduction requires the noise source to be the dominant source in the area.

All new equipment should be purchased to be quiet. In general, encourage buyers to specify that sound levels should meet 80 dBA at 1m. It is unlikely that purchasing equipment meeting 85 dBA at 1m will give plant sound levels under 85 dBA when multiple items are installed.

If you have purchased noisy equipment, the following table can help

Noise Source	Approach	Principle
Air Exhaust	Air Exhaust Muffler	Spreads air exhaust over many small holes to reduce velocity.
Air Jet	Air Thrust Nozzle (for cooling, cleaning, drying or moving)	Entrain air to primary jet to increase airflow at a slower speed, i.e. quieter but with increased thrust.
Fan	Inlet or Outlet Silencer	Absorbs sound in baffles lined with fiberglass or mineral wool. Specification requires some expertise.
New Electric Motor (most often required for 3600 rpm and higher)	Quiet Line Motor	Available in most sizes and speeds. Usually higher efficiency than conventional noisy motor. Much better option than quieting after purchase.
Existing electric motor	Motor silencer/motor mute	Silences motor cooling fan, usually the major noise source. Must be sized not to overheat motor. Better to buy a quiet motor in the first place.
"Singing" motor	Filter electric power supply	Power supplies producing DC or current for variable speed motors often produce audible harmonics in the regular plant power system.
New flow valves	Buy to meet noise specification.	Most valve selection programs will help select quiet valves. These are premium price, but often worth the extra cost.
Existing loud valves (usually high pressure drop)	Quiet trim valve	Quiet trim can be retrofit in existing valves in some situations to make them considerably quieter.
Existing loud valves (usually high pressure drop)	Orifice plate	Introduce an orifice plate across the pipe to reduce pressure drop across the noisy valve.
Flow noise in pipes	Repair leaks and insulate pipes	Acoustical insulation can reduce noise from piping, but in some cases must extend a considerable distance from a noisy valve.

Flow noise in pipes	Wrap acoustical lagging around pipes	Wrap pipes in a composite of mineral wool blanket covered with metal jacket or loaded vinyl
Pump rooms and other similar small equipment rooms	Line with sound absorbing material.	Small industrial rooms can be highly reverberant, increasing sound levels inside.
	Separate different circuits	Allows shut down circuit to be worked on under quiet conditions while other circuit continues to operate.
Isolated, noisy, automatic equipment	Noise enclosure with heavy (steel) outer shell and sound absorbing lining (fiberglass)	Must be designed to provide inspection, light, access, maintenance and adequate cooling.
Hydraulic equipment	Isolate from drip trays and tanks, insulate hoses and enclose pump if necessary	Can often be specified quiet
Ventilation openings	Acoustical louvres	Provide about 10 dB attenuation with 50% free area

Buying quiet equipment is always better than quieting noisy equipment that is already installed. Applying the above should help this to happen.

If noise control has already been implemented and is unsatisfactory:

Control Feature	Approach	Principle
Operator Booth	Acoustical leaks developed	Check for poor door & window seals, holed or cracked panels, interior absorbent walls & ceiling treatment damaged or removed, booth in mechanical contact with mill.
Machine enclosure	Acoustical leaks developed	Check for poor door & window seals, holed or cracked panels, interior absorbent walls & ceiling treatment damaged or removed, infeed/outfeed tunnels without cover flaps, machine in mechanical contact with enclosure wall.
Noisy mobile equipment	Acoustical leaks developed	Muffler missing, damaged, rusted or incorrectly sized.

If you have trouble identifying what is producing the noise or if the noise control will be costly, getting specialist help is cost effective. Identifying the correct sources to silence, knowing how much is required and specifying noise control that is low cost and functional can save considerable expense.