NOISE CONTROL MEASURES

The following is a listing of noise control methods that have been applied with good results in various types of workplaces. Many noise sources produce airborne sound and sound from vibrating surfaces at the same time, so in many cases several noise control measures must be applied.

Planning for noise control

Noise control should be taken into account from the beginning of the planning process for a new building:

- The frame, floor, and machine bases should be selected so that all sources of disturbance can be provided with effective vibration isolation. Heavy equipment requires rigid, heavy bases. It is also possible to prevent the machine bases from making direct contact with the rest of the building frame.
- Important noise sources may be surrounded with constructions which supply sound isolation. Special attention should be paid to portholes, observation windows, and other building parts which involve a risk of sound leakage.
- Noisy areas where the workers must spend time should be provided with ceiling coverings (and wall coverings as well in the case of very high ceilings) to absorb incoming sound. The sound absorption ability varies greatly for various materials, so the materials must be selected in relation to the type of noise. Good sound absorption properties can often be combined with good thermal insulation.
- Office areas should be separated by means of a joint from building areas where vibration - producing equipment is installed.
- Wall and floor constructions as well as windows, doors, etc., should be constructed to provide the necessary sound TL.
- Fastening of noisy equipment to light separate structures should always be avoided because vibration isolation requires a rigid base to be effective.
- For office areas and storerooms where there are many functions in the same area, ceiling surfaces which provide good sound absorption and floors covered with soft textile material may be needed.

Material handling. Existing workplaces may be changed to prevent impact and collision during manual and mechanical materials handling.

- Reduce the dropping height of goods being collected in bins and boxes.
- Increase the rigidity of containers receiving impact from goods, or damp them with damping materials.
- Use soft rubber or plastic to receive hard impacts.

If new transportation equipment is being purchased, consideration should be given to creating a system for quiet materials handling.

The following may be considered:
• Selecting belt conveyors, which generally are quieter than roller conveyors.
• regulating the conveyors or other transportation systems so that their speed is adjusted to the required amount of material. In this way, it is possible to avoid some noise produced by vibrations and colliding objects.

Enclosing Equipment. If it is not possible to prevent noise, it may be necessary to enclose the machines.
• Use a dense material, such as sheet metal or plasterboard, on the outside.
• Use a sound absorbent material on the inside. A single hood of this type can reduce the sound level by 15-20 dB(A).
• Install mufflers on cooling air openings during enclosure of electric motors, etc.
• Install easily opened doors as required for machine adjustment and service.

Plates dropping from a great height off of a roller belt onto a staking platform produce loud noise. By using a board whose height can be raised and lowered, the drop can be reduced and the noise decreased.

Enclosure of a hydraulic system requires muffled ventilation openings. Electric motors release both sound and heat, as do the pump and the oil tank.

Control of noise from vibrating surfaces. Vibration in machines often results from slippage or loosened bolts. In such cases, the disturbance can be reduced by repair or replacement.
• Isolate the floor from machine vibrations.
- Place large and heavy machines which will not be vibration isolated on separate bases. They may be put on a separate piece of ground without contact with the remainder of the building.
- Provide vibration isolation of machine surfaces to reduce sound emission. Fasten plates to the machine face by flexible means in order to reduce the vibrations of the surfaces. Plates with special damping design may be used. In the case of heavily vibrating machines, a separate machine base may be used as well as a separating joint to prevent the spread of sound. Here, two joints are used for separation.

After pouring, clean or burn out the joints, Seal the joint with a piece of rubber tubing, etc., inspect, and re-clean if necessary. Which is No pieces of stone or the like surface should be present in the joints.

**Damping with absorbents.** In a workplace with hard materials on the ceiling, walls, and floor, almost all the sound that strikes the surfaces is reflected. The sound level goes down at first as you move away from the machine, but after a
certain point it remains practically unchanged. A better sound environment can be obtained by coating the ceilings and walls with effective sound-absorbing material.

How sound levels vary at different distances from a sound source before and after application of absorbent materials to the entire ceiling surface.

**Sound insulating separate rooms.** With automation of machines and processes, remote control from a separate room may become desirable. Some control measures may include:

- constructing the control rooms with materials having adequate TL.
- providing good sealing around doors and windows
- providing openings for ventilation with passages for cables and piping equipped with good seals. The control room will need adequate ventilation and possibly air conditioning in hot working areas. Otherwise, there is a risk that the doors will be opened for ventilation, which would spoil the effectiveness of the room in reducing the noise level.
Sound disturbances in an operating room or shop office may be caused by direct transmission (leakage through the door opening, etc.) from the machine or by radiation from the common floor.

**Maintenance**
In some cases, a noise hazard will be created or made worse by a lack of maintenance. Parts may become loose, creating more noise because of improper operation or scraping against other parts. Grinding noises may also occur as the result of inadequate lubrication.
It is especially important to provide proper maintenance of noise control devices that are added or built into machinery. If a muffler becomes loose or worn out, for example, it should be fixed or replaced as soon as possible.