Noise Control in Food and Drink Manufacturing

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Basic Noise Control

• Noise exposure is a combination of noise level and the time that an individual is exposed to that noise.

• A 3dB reduction in noise level will result in a halving of exposure if the exposure time remains constant.
  – A 3dB change is barely noticeable
Basic Noise Control

• Source
  – Usually the most effective

• Path
  – Can be ‘open to abuse’ and is often retrofitted at significant cost.

• Receiver
  – NOT Hearing protection
Role of Hearing Protection

• As an interim measure while noise control is being implemented.

• Where noise exposure is as low as reasonably practicable but still above the Upper Exposure Action Value (UEAV).
  – UEAV is an $L_{EP,d}$ of 85 dB(A).
Some Typical Noise Sources

- Food prep machinery (esp. peelers, slicers, cutters)
- Conveyor belt noise (conveyors, products on conveyors, containers on conveyors)
- Use of compressed air (for cleaning, drying, moving etc.)
- Use of injected steam for heating
- Impact noise (products on sheet steel, chutes and containers)
- Panel resonances
- Pressure washing
Examples of Controlling Noise at Source

• Impact Noise
• ‘Sound-deadened’ Steel
• Compressed Air Use
• Maintenance
• ‘Buying Quiet’
**Source - Impacts**

- Boiled sweets impacting on metal trays. Replace metal with plastic. 4-5 dB reduction in noise levels.
Source - Impacts

• Damping material in hoppers and chutes in a multi-head weigher. 8 dB reduction in noise levels.
Source – Reduce Drop Heights

- Lower drop height, lower noise levels from the resulting impact.
Source – Sheet Stainless Steel

• Damping material on stainless steel or ‘sandwich’ construction.

unconstrained layer of damping material

• damping material

• sheet metal

• damping material deforms only near bends

• damping material made to shear over whole area
Source – Compressed Air

• Compressed air used to clean conveyor belt.

• ‘Quiet nozzles’ reduced noise level by approximately 10 dB.
Source – Compressed Air

- Hand-held Air-Lines

- 10 dB reduction in noise levels
Source – Compressed Air

• Air exhausts can be fitted with silencers to reduce noise. A wide variety of silencers are available.

• Leaking air lines can produce significant noise levels unnecessarily.
  – A total waste of compressed air and money.
Source - Maintenance

- Fruit juice pump producing noise of 103 dB(A).
- Maintenance performed on pump including replacing bearings.
- 27 dB reduction in noise levels
Source – Buy Quiet

• Have a low-noise equipment purchasing and hire policy.
  – Avoid the need for retrofitting noise controls.

• Have a noise specification for tendering suppliers to meet.

• See HSE Buy Quiet Webpages:
Examples of Controlling the Noise Path

- Potential Noise Transmission Routes
- Enclosures
- ‘Plastic Strip Curtains’
- Isolation
- Reverberant Noise
Path – Potential Routes
Path - Enclosures

- Inspection window
- Suitably attenuated cooling air supply/discharge
- Demountable panel to be sealed to form airtight seal for occasional access
- Work entry/delivery via treated feed ducts
- Sign warning that hearing protection is needed inside
- Personnel door (if necessary)
- Routine access (hinged panel)
- Inner lining of sound absorbing material and outer skin of insulating material
Path – Enclosure/Segregation

• Plastic strip curtains
Path – Isolation

- Isolation from the building and other structures.
Path – Reverberant Noise

- Incorporate noise absorbing materials into walls and ceilings.
Examples of Controlling Noise at the Receiver

• Remote Working
• Controlling the Exposure Duration
• Distance
Receiver – Remote Working

- Workers monitor and operate machinery from a noise refuge. 30 dB reduction in noise levels from outside to inside.
Receiver – Other Tactics

• Limit the time spent in noisy areas.
• Ensure commonly used walkways are outside noisy areas.
• Increase the distance between workers and noisy machinery.
Sources of Advice

- Search ‘top 10 noise’ on the HSE Internet Site (www.hse.gov.uk)
- HSG 232 – Sound Solutions for the Food and Drink Industries
- Other case studies on HSE Noise website (www.hse.gov.uk/noise)
Any Questions?

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