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Wall Scrubbing Equipment

Meat & Livestock Australia Technology Transfer Kits

This Technology Transfer Kit is one in a series of Do-It-Yourself (DIY) resources prepared for the Australian meat industry to encourage the development of project engineering skills at meat processing sites while implementing simple but useful items of technology. This kit is designed to provide the essential information to allow processors to carry out suitable modifications and installations at their own sites to improve some aspects of their processing performance. As each processing site has unique design and construction features the information in this kit should be used as a guide only. Some modifications from this kit, to ensure the successful application at individual sites, are likely. No warranty is given on the outcome of the use of this kit or the information it contains.

DIY Kit # 10 – Wall Scrubbing Equipment

Many walls in abattoirs become soiled with blood, fat and pieces of meat tissue with those particularly close to the slaughterline heavily soiled. Current wall cleaning procedures include:

- Hosing with cold water to loosen blood
- Hosing with hot water to melt fat
- Applying cleaning chemical via a foam applicator to emulsify soils
- Scrubbing the walls with a scourer pad to loosen soils
- Hosing down with cold water

While generally effective, areas of wall above about 2 metres from the floor can not be easily reached, and effectively scrubbed by hand, unless a ladder or scaffolding is used. This is not desirable due to the Occupational Health and Safety risks associated with working in an elevated position above a wet and greasy floor. An alternative is to mount the scourer pad on an aluminium pole to extend the operator's reach while standing on the floor.

The effectiveness of cleaning difficult-to-clean areas using a fixed scourer with an extended reach is poor. Areas such as the grout in between stainless steel tiles or the joint beading in foam sandwich walls tends to retain a build up of residue if cleaned in this way.

Trials have been conducted in an export abattoir on a powered scrubbing device with an extended handle to give stronger scrubbing action with adequate extended access from floor level. The equipment has proven reasonably effective and easy to use.

Description

The powered wall scrubber consists of scrubbing disks made from 3M brand non-abrasive scourer pads mounted on rotary heads. These heads are mounted via a hinged link onto hollow aluminium tube handle approximately two metres long. An air drill drives the heads.

The air drill chosen for the prototype is an Ingersoll-Rand 6LR3, 500-rpm straight-drill with a lever throttle. Drive from the drill to the heads is via a small diameter aluminium tube inside the hollow handle. A flexible drive coupling at the hinged link rotates the disks via a rubber "O" ring drive. This arrangement can be seen in Diagram 1 and Photograph 1.

A two-metre extension has proven to be a useful length for general applications although is insufficient to reach the highest wall areas on a slaughterfloor. The fitting of quick release connections from the drill to both the handle and the drive shaft would allow for further extensions to be added for extra high cleaning.

The "O" ring drive system has limited drive for two scrubbing disks. This is adequate for high level cleaning where soils are lighter and application pressures are low. It has been found that a more direct coupling to a single disk is more effective for applications where significant pressure is required to loosen heavy soils. This is normally encountered lower to the ground where the daily build up of soil is likely to occur.

A short handled system, or one with the scourer attached directly to the drill via a flexible coupling, gives positive drive and very effective cleaning. The flexible coupling used

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should be able to be angled up to 30°. The use of the direct drive single head unit is shown in Photograph 2.

The cleaning schedule may need to be modified to incorporate the use of a powered scrubber. The best utilisation of this equipment is obtained with small cleaning teams where a few cleaners each scrub a large area, rather than with a large team of cleaners with each scrubbing a small area.

Benefits

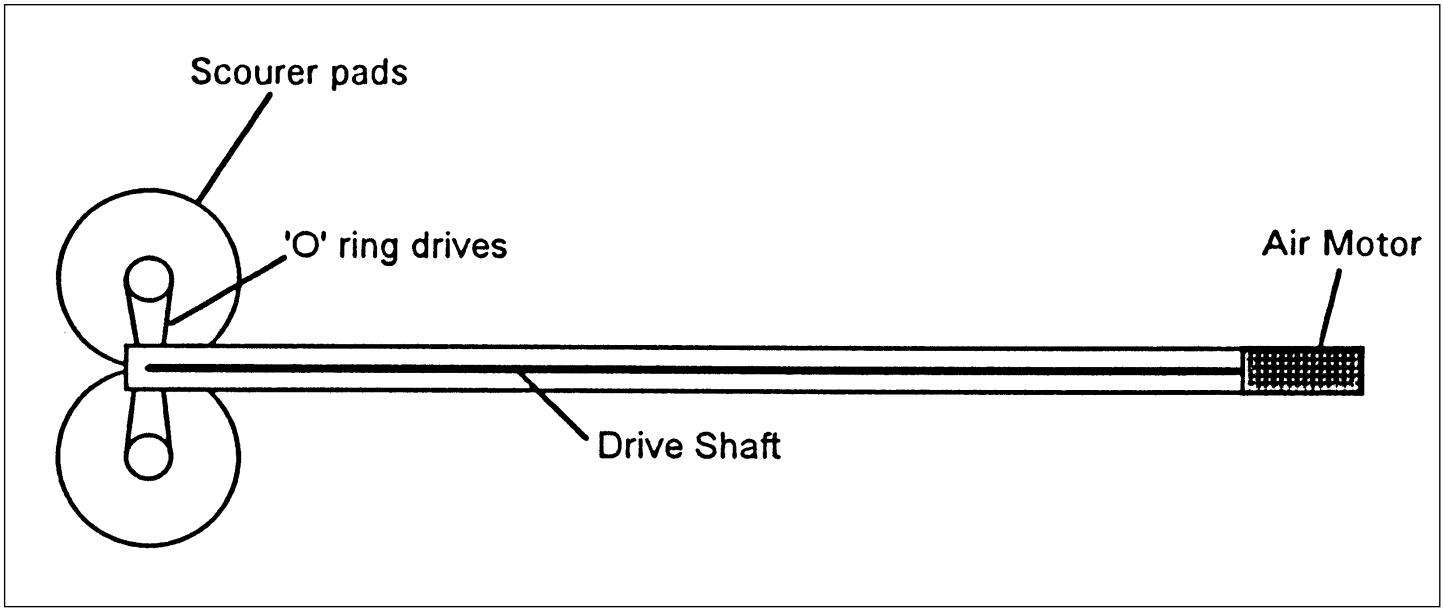
The prototype powered scrubbers have been shown to effectively and easily remove stains and build-up of soil that has previously been left due to the high labour costs and inherent OH&S risks associated with an extensive over head cleaning operation.

The use of these scrubbing devices has been to remove build-up and stains on walls that should normally be removed during daily clean up. In this situation a direct labour savings is hard to identify. The advantage is in cleaner walls. Where additional cleaning is carried out to remove stains and build-up, then the cost of this cleaning can be quickly recovered by the use of a powered scrubber during daily cleaning.

The cost of the long-handled prototype using an air drill is approximately $700 with the major cost being the air drill at $580. Some pistol grip air drills have been identified at a cost of as little as $200. This will significantly reduce the cost to around $350.

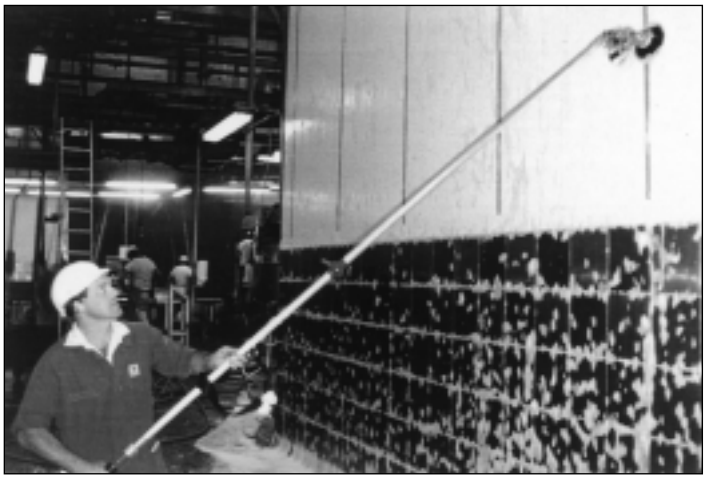
Diagrams

Diagram 1. Schematic arrangement of twin disk wall scrubber



Photographs

Photograph 1. 2 metre long powered scrubber with twin disks in use on a wall.



Photograph 2. A single powered scrubbing disk attached directly to the air drill.

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Equipment design, development and assessment

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