Working safely and productively with silica

While silicosis mortality has declined over time, the continuing occurrence of silicosis deaths in young adults underscores the need for strengthening efforts to limit workplace exposure to respirable crystalline silica.

Here in Australia, we should look to the United States as providing a judicial template as a future warning for potential more local class action activity.

Silica, which is in sand and rocks, is released during industrial processes that involve cutting and blasting and cleaning silica-containing materials, such as concrete, tile and brick. Well-known examples of occupations with known high silica exposure include: mining, quarrying, sandblasting, rock drilling, road construction, pottery making, stone masonry, tunnelling operations and hydraulic fracturing.

NIOSH (the United States National Institute of Occupational Safety and Health) has identified seven primary sources of silica dust exposure during hydraulic fracturing operations. These include dust ejected from access ports on top of the sand movers during refilling operations while the machines are running; ejected and pulsed through open side fill ports on the sand movers during refilling operations; generated by on-site vehicle traffic; released from the transfer belt under the sand movers; created as sand drops into, or is agitated in, the blender hopper and on transfer belts; released from operations of transfer belts between the sand mover and the blender; and released from the top of the end of the sand transfer belt on sand movers.

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Material conveying processes can produce unwanted dust.

Prevention of silica health hazards

From an engineering controls perspective, tools causing dust such as grinders, and saws etc., should be fitted with dust extraction devices. Where possible, dusty processes should be fully enclosed and have an exhaust hood attached; and establish a local ventilation system with hoses as close as possible to the head of cutting tools.

Using tools fitted with a water attachment to suppress dust e.g. on power saws, jackhammers and scabbing picks is also recommended. As well as spraying with water in processes such as grinding or drilling can reduce the amount of dust by as much as 75%. An American study of foundries showed that over-exposure to silica dust was the result of poorly designed and/or poorly maintained ventilation systems.

For good housekeeping, regular vacuuming and wet sweeping of floors, machinery etc. to remove settled dust, is particularly important to stop dust being

kicked back into the air. Under no circumstances should dry sweeping take place in areas where silica dust could be present.

Productivity improvements

The discipline of forming healthy work habits is a life or death reality in the context of silicosis prevention and continuous dust management. The maintenance of equipment should not be undertaken on a one-off basis; it should be a daily, ongoing part of any bulk materials handling operation. In most cases employees can conduct maintenance work on-site, provided they are wearing the correct safety protective clothing and are adequately trained in correct dust disposal procedures (i.e. considering ideal environmental conditions such as wind direction).

"Some clean-up work may require the expertise of plant providers for more technical maintenance schedules," said Neil Kinder, CEO at Kinder Australia, "which is why we have developed a new section to our website under 'productivity improvements'; and we have one section in relation to the effective management of dust emissions.

"It gives expertise and information to self-diagnose any problems being experienced on site, and then we suggest a list of conveyor hardware componentry that would help resolve these issues including wind-guards, conveyor covers, belt support, and engineered skirt seals to suit even the harshest of transfer point locations."

One example is Kinder Australia's specifically designed dust control skirt - K-Snap-Loc Dust Seal System. K-Snap-Loc is an engineered polyurethane skirting product that has been used successfully to control dust, avoid belt damage and conveyor roller malfunction. It is suitable to use in wood chip environments and grain facilities where the bulk material is conveyed at high speed, as well as high impact transfer points in quarries and surface mining operations. When used in combination with K-Containment Seal and K-Sure Belt Support, each Kinder product in-turn improves the overall conveyor performance further, as well as reduce dust particle transmission to meet OHS safety standards and also site maintenance cleaning targets.

One of Kinder's wood-chip customers installed K-Snap-Loc at the beginning of the year, was able to confirm immediate financial savings: "Since the installation on the 18 of January, the site has not had to re-visit or clean the area up. So in just six weeks already the company has saved more than $12,000. The tower is still looking clean and won't need any attention for some time".

A proactive approach to site maintenance over the life of the site will reduce the time and money spent on resources allocated to clean-up unplanned spillage situations as well as general tidying in periods when the plant may be shut down or non-operational.

Contact: www.kinder.com.au

K-Containment Seal

The critical component in any conveyor transfer point is an effective sealing system. The seal should be located where the material is being loaded and continue to where it becomes stable. This is the last position to practically control spillage and dust. To enhance the success of the outer seal or skirting, the loading area should be properly supported.

K-Containment Seal and K-Sure Belt Support System.

Engineered Polyurethane for best results

Kinder Australia's K-Containment Seal is a high performance, low friction engineered polyurethane system that provides exceptional resistance to wear. The slotted arrangement allows for installation adjustment to ensure that material cannot be entrapped leading to premature belt damage.

In many cases the outer flexible seal is ineffective in controlling spillage. An unsupported belt trying to contain the full weight of material load would be inadequate. Instead, to effectively contain bulk material the lightweight K-Containment Seal should be installed inside the chute to handle high internal chute pressure and therefore reduce the load on the skirting seal.

The steel-backed polyurethane seal can be supplied bevelled or straight edged.