

# A guide to conveyor belt cleaning solutions

When it comes to conveyors, cleanliness is not just next to godliness, it's imperative for a profitable, productive and continuous operation.

## THERE IS AN INCREASING NEED FOR

owners and operators of conveyor belt systems to have a clear understanding of the different types of cleaning equipment available, the features and benefits of different cleaning techniques, as well as where the cleaners should be located for optimum results.

### The head culprit – carryback

Material transported on a conveyor belt is discharged at the head pulley. However, a small percentage of this conveyed material will not be discharged with the bulk of the load stream – it will stick to the belt surface. Carryback (or carryover) is the term used for this residual material. It causes spillage along the return strand of the conveyor

which, if left unchecked, will quickly build up and drop off causing a variety of increasingly expensive and extremely serious problems.

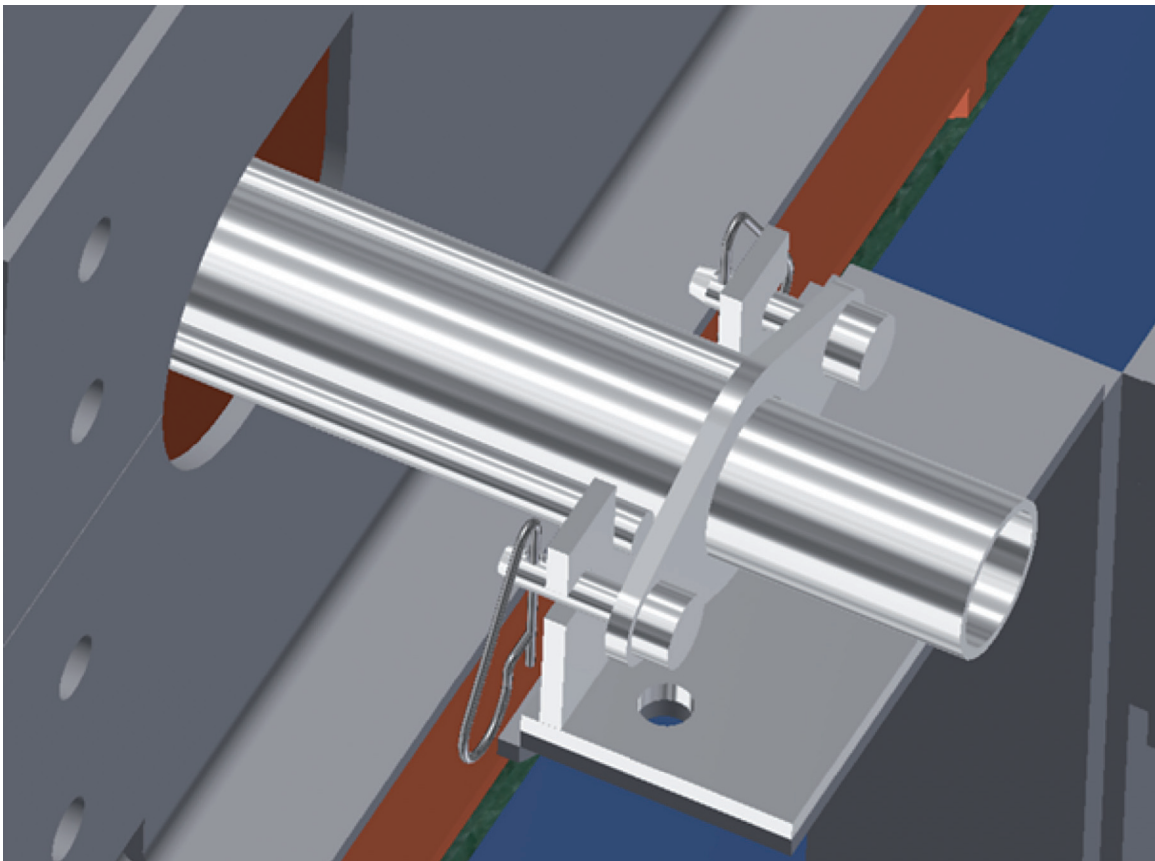
This is why you need up to date and efficient belt cleaning equipment properly fitted and constantly operating on all of your conveyor systems.

The amount of carryback on a return conveyor can be affected by:

- The consistency of the material – whether it is dry or wet
- The characteristics of the material – whether the product comprises large lumps or fine dust
- The mechanical design of the conveyor – e.g. the belt speed and pulley diameter



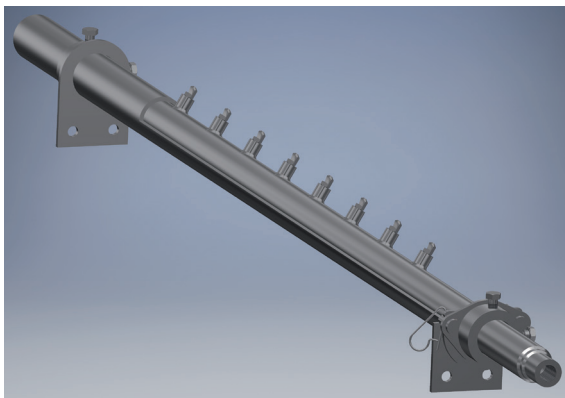
*In this regular column, experts from specialist bulk materials engineering firm DYNA Engineering solve some common issues associated with materials handling. In this edition, the firm's senior project and sales engineer Reddy Emmadi, provides helpful information about one of the more common areas of concern – choosing the optimum conveyor belt cleaning equipment. He can be contacted on 0400 022 928 or +61 (0)8 9473 4304, or at email: reddy@dynaeng.com.au.*



**LEFT:** DYNAFastFit Spray Bars are a unique design that employs a fully retractable spray bar mounted in a stationary shaft to form a two-part assembly.

**RIGHT:**

A spray bar is a pipe arrangement with several evenly spaced spray nozzles fitted.



### Range of cleaning equipment

Most belt cleaning techniques are aimed at removing the greatest possible percentage of carryback at the source, that is at the head/discharge pulley. A very comprehensive range of conveyor belt cleaning equipment is available, broadly broken down into contact cleaners and non-contact cleaners. The most common contact cleaners are:

- Primary, secondary and tertiary scrapers
- Brush cleaners
- V-Plows or Return Ploughs.

Non-contact cleaners used most often are:

- Air knives
- Spray bars.

### Focus on spray bars

A spray bar is a pipe arrangement with several evenly spaced spray nozzles fitted.

The spray nozzles are used to disperse a liquid, usually water, in a desired pattern over an area, to increase the liquid's surface area, or to create an impact force on a surface.

Water is distributed across the belt surface to clump materials together within the water, creating a mud or sludge, so it can be more effectively scraped from the surface. Or the water is used to impact the surface to dislodge particles from the belt surface and flow away with the water during the scraping process.

Depending on the characteristics of the materials being conveyed and the intended application, spray pressure and pattern play an important role to achieve your best outcome.

### Usual location of the spray bar

Normally located between the primary and secondary scraper, a spray bar is designed to position the spray nozzles in the most effective position in relation to the conveyor belt surface. Both distance and angle to the belt surface need to be optimised for the highest cleaning efficiency.

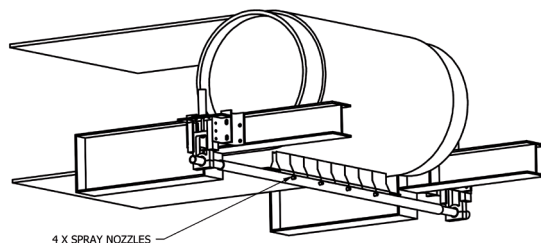
After the primary scraper has performed its initial cleaning function, some material may still be present.

To further decrease carryback, water is sprayed

onto the belt surface. The water is used to soften the carryback and wash away particles into the chute to be re-combined with the material flow. In this configuration, the secondary scraper, located after the spray bar, finishes the cleaning of the conveyor belt and also removes any remaining water from the conveyor belt.

Spray bars can be configured in many ways depending on the application, space and surrounding structure. Some common examples include using the secondary scraper shaft as the spray bar or mounting a separate spray bar between the scrapers.

Another common configuration is to install spray bars between the secondary and tertiary scraper. This adds an additional level of cleaning that will result in the best possible clean for the conveyor belt.



### Dust suppression assistance

Spray bars can also be used in dust suppression applications. When dust forming materials are aerated or exposed to moving air streams, particles can be separated and carried away in the air. In the case of materials being conveyed, the belt velocity or even a gust of wind can result in dust generation. In these cases, simply wetting the surface material can be an effective counter measure.

Another main dust generating location is where the material is disturbed. Well known locations can include loading points, chutes, crushers and screens.

Spray bars can be effective in many of these locations to reduce the amount of dust that is allowed to escape into the surrounding environment. In this case, the liquid is atomised into the air as mist, forming water droplets that are used to capture dust particles. The droplets are either sprayed toward the source of the dust or redirected with a fan towards the dust generating location. Dust will be captured by the droplets and carried towards the ground by gravity. **B**



### Benefits of DYNAFastFit Spray Bars

DYNAFastFit Spray Bars from DYNA Engineering are a unique design that employs a fully retractable spray bar mounted in a stationary shaft to form a two-part assembly.

With the stationary shaft remaining in its location, the spray bar can be removed simply and safely by disconnecting from the water supply and removing two clips. Then the spray bar can be retracted from the stationary shaft in a matter of seconds. No need for stoppages. No need for highly skilled labour.

There are no tools required to remove the spray bar. No need to remove guards, and the opening left when the spray bar is removed complies with AS 4024 Safety of Machinery.

DYNAFastFit Spray Bars can be designed for a vast range of applications, flow rates and supply pressures. Configured to suit almost any application, they are made from stainless steel for a long-lasting solution. They will not rust or corrode and are suitable for non-potable water sources including high salinity water, recycled process water.

### Safer maintenance

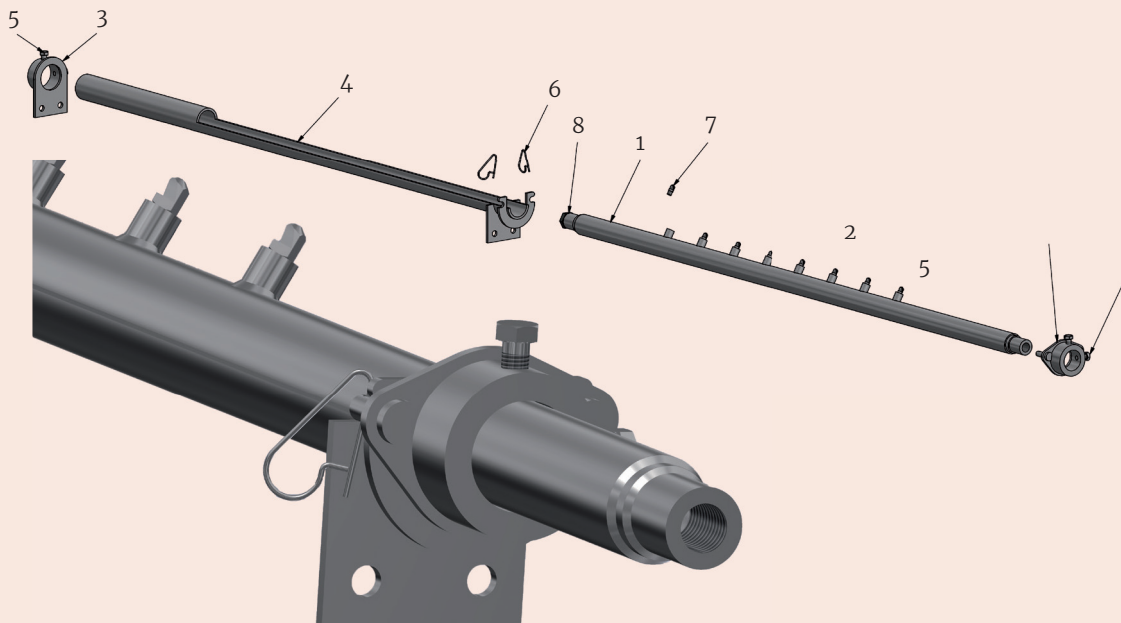
When the spray bar is removed from the stationary shaft, maintenance can be performed in a safe and ergonomic location. This allows maintenance personnel to quickly remove any sediment build up from the pipe and unblock any clogged nozzles from outside of the chute.

Blockages are a common point of failure when using water sourced from recycled process water or dam water. The spray bar can then be simply returned to its original position, water supply connected and returned to operation.

Because this can be done safely while the conveyor is running, there is no need to wait for the next shutdown. This ensures cleaning efficiency is maintained and carryback is kept to a minimum throughout the production cycle.

*DYNA Engineering is an Australian owned and operated company with its head office and factory located in Perth. The company specialises in the design, manufacture and supply of conveyor equipment and related services which can be tailored to an extensive range of applications, operations and operating conditions. These designs incorporate common components and assemblies which allow easy modification from one design to another on short notice. As an example, its DYNAFastFit range of belt cleaners and adjusters can be converted from polyurethane to carbide blades without major modifications or replacement. Products are of robust construction that allows them to withstand extremely harsh operating environments. DYNA Engineering thoroughly test its products in both workshop and onsite situations to ensure they work as intended and to industry safety standards.*

**RIGHT:**  
Parts of the DYNAFastFit retractable spray bar: 1. Retractable spray bar; 2. Positioning collar; 3. Far side mounting collar; 4. Stationary shaft; 5. M12x25 bolt; 6. SS R clip; 7. High impact nozzle; and 8. 1" HEX plug.



For more information contact DYNA Engineering on  
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# Totally Australian made

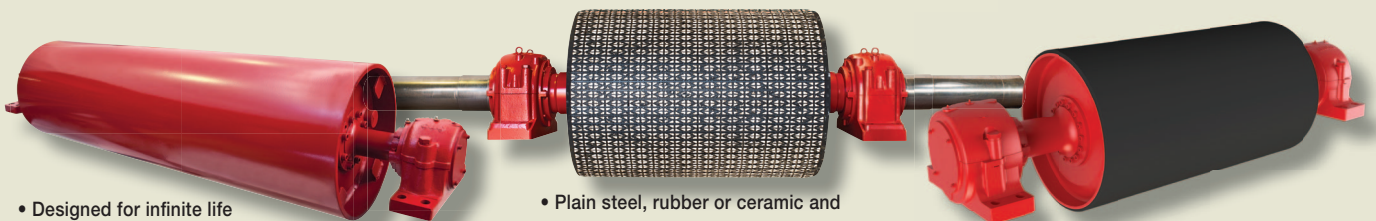
We believe pulleys with 100% local content have an important role in the bulk materials conveying sector. Our locally-manufactured pulleys offer key benefits:

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- Designed to suit Australian conditions
- Pulley reconditioning service available

Our pulleys are manufactured to the highest engineering standards for long, reliable, fatigue-resistant service life.

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One more thing... we deliver when we say we will.



- Designed for infinite life
- Full penetration welding

- Plain steel, rubber or ceramic and direct bond ceramic lagging
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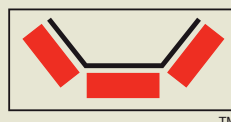
- Keyless locking assemblies
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