

Fast and Dust-free Delivery

Dust Control at Buxton Cement's Rail Depots

G. Bishop, United Kingdom

To reduce the environmental impact of its cement transport operations, Buxton Cement has transferred regular load from road to rail. Dust abatement systems installed at silos and road tanker loading facilities keep environment pollution to a minimum.



Pictures: Dantherm Filtration

The environmental impact of bulk material transport can be considerably reduced by transferring regular loads from road to rail. Regional distribution depots supplied by rail eliminate the need for long distance road haulage, limiting road transport to short journeys.

Tarmac Buxton Cement, formally BLI Cement, are firmly committed to this environmentally sound policy for their UK operations with rail depots in the South, Midlands and North of England. These depots supply bulk cement customers throughout the country. BLI Cement received full support for this as everyone who travels by road in UK knows that many routes are not merely congested, but actually full. With annual worldwide production of more than 12 million tonnes of bulk material, cost and environmentally efficient distribution are key factors for the international success of the parent Group, whose diverse interests also include gold, diamonds and paper.

More than 300 000 tonnes of cement are moved by rail from producer to regional depot, but delivery from the depots in Wallsall, Leeds and most recently London involves only short journeys to customers. The Buxton production centre railhead has also been developed to accommodate state-of-the-art cement handling and distribution equipment, adding to its present roadstone and lime function. Dantherm Filtration has played a significant part providing dust control throughout.

Intake and Storage

Intake and discharge operations at the three transfer stations are fully automated requiring minimal operational staff to unload the trains (Fig. 1), with all road tanker loading performed by the vehicle driver alone. The distribution depots are almost identical in operation, so the Cross Green, Leeds site photos shown in the figures of this article are typical.

The two high capacity storage silos at each site are filled directly from the rail wagons by a high pressure lean phase blowing system. Up to six rail wagons may be discharged simultaneously, requiring

up to 19 000 m³/h of filtered ventilation for each silo, with auto silo level controls to ensure even distribution.

It's Tough at the Top

The silos are very prominent features in the local landscape so their visual effect had to be minimised. Clean lines, minimal height and suitable colours were prerequisites to achieve this. BLI also required that maintenance at the silo tops (Fig. 2) should be possible in all weathers, summer and winter.

Specially adapted high capacity Dantherm Filtration MJB reverse jet filters were fitted to the top of each silo. To minimise height, low profile clean air chambers were fitted, together with horizontal air outlet manifolds. Dantherm engineers used every effective means to reduce the height of these units, employing the wide range of standard components available, plus some ingenuity, to provide a customised solution to a big silo venting challenge.

Maintenance access was limited to one side of each filter unit, which was enclosed in a weatherproof walk-in enclosure large enough for complete bag changes to be made under cover, via big access doors in the filter body. To further reduce the visual impact, each filter was served by a compact high efficiency Dantherm Combifab radial fan, belt driven by a 22 kW motor.

Noiseless and Dust-free

Although the installations are situated a considerable distance from residential areas, nuisance noise could become an issue under certain quiet weather conditions, particularly early morning or evening with a humid atmosphere. So the fan outlets were fitted with efficient air silencers to reduce airborne noise to below 75 dBA at one metre. The cowled horizontal air outlets were also directed away from the site



Fig. 1: The rail wagons are connected to the silo inlet pipelines.



Fig. 2: Filter installation at the silo top, Combifab fan in foreground.



Fig. 3: Silo discharge chute and Dantherm dust control unit.

boundary and the neighbours. Each silo has an automated drive-through road tanker loading bay. Designed to be dust free in operation, each employs a recirculating Dantherm filter mounted directly above the retractable loading bellows.

Fig. 3 shows the silo outlet and cement discharge chute that feeds the material directly into the filter hopper and back into the vehicle loading bellows. This has an annular aspiration ring with two duct connections. Dust laden air displaced by the filling operation is drawn continuously via these two connections back into the filter hopper then returned through the bellows back into the vehicle. So, the operation is dust-free and nothing is wasted. This return air connection can be also seen in the picture, between the top of the bellows and the filter hopper.

Severe headroom restrictions in the area directly underneath the silo dictated the discharge filter unit design. Horizontal 16 m² bag units with access from the clean air side were chosen to handle the air volume displaced by the vehicle loading process. They were fitted with integral 2.2 kW fans and air silencers to reduce the noise level to 75 dB(A) at 1 metre from the outlet. The Dantherm controls were linked to the customer's integrated loading control

systems, which for economic use of energy allow the intake and discharge filter units to run on demand only.

Operating Experience

Since the recent commissioning of the final transfer station near London, the whole English distribution network for BLI has now settled into normal operation. As originally anticipated a delivery rate of approximately 300 000 tonnes of cement per year is now being achieved efficiently by rail with minimal environmental impact – indeed requiring up to 120 000 fewer long distance journeys by road. ■

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