



Case Study

“Clean” Recycling - Concrete & Asphalt Recycler utilizes Atomized Dust Suppression

Edited by on 16. Apr. 2020

[Published in bulk solids handling, Vol. 35 \(2015\) No. 1](#)

Reducing the need to landfill huge amounts of reusable debris from road repair includes the processing of these materials during which a great amount of dust is produced. A California company solved its dust problems with an special water mist generator.

(From the archive of "[bulk solids handling](#)", article published in Vol. 35 (2015) No. 1 , ©2015 bulk-online.com)



RAI needed a dust suppression system to minimize leverage on neighboring enterprises. (Picture ©: BossTek)

A leading west coast recycler of asphalt and concrete material from large demolition and road projects has successfully employed an atomized mist dust suppression system to control air quality in and around its Chula Vista plant. Reclaimed Aggregates Inc. (RAI) occupies 5 acres in Southern California, operating one of the largest pavement salvage and reclaimed asphalt pavement

(RAP) production facilities in the region. By upgrading the dust suppression from a sprinkler system to a DustBoss DB-45, operators report a substantial air quality improvement in the material receiving area. RAI was formed as a subsidiary of Pavement Recycling Systems (PRS) in 2005, with its first two locations in Colton and Lancaster. In 2009, the company's Chula Vista facility was added and acts as its largest processing location, receiving and processing concrete and asphalt recovered from multiple road and construction demolition projects. Since opening, the business has expanded its scope to service hundreds of contractors and companies, as well as local and state government projects.

Dusty Business

Dozens of dump trucks per day deliver recovered pavement from projects all over the San Diego area to the Chula Vista site. Material is offloaded onto a 200'x200' dry earth receiving area and immediately moved by front loader to the crusher or into storage piles. "The offloading process creates a tremendous amount of dust, and that was causing issues for our neighbors who run large vehicle salvage lots," said facilities manager Robert Erautt. "At first, we tried to reduce the amount of dust with a sprinkler system. But that just saturated the material, creating a lot of mud, whereas the dust still remained an issue."



The Dustboss atomizer needs 11.3 GPM at 100 PSI to generate a dust catching mist.

Company officials reviewed the options and during their investigation discovered the DustBoss series of suppression equipment from BossTek (Peoria, IL, USA - formerly known as Dust Control Technology). They chose the DB-45 based on its range, which is well suited to the size of the area requiring dust management. The unit is able to throw its atomized plume 150 feet (45 m) to deliver effective dust control over a 12,000 square foot (1,115 m²) area. When equipped with optional 359° oscillation, the design can cover as much as 74,000 square feet (16,875 m²) from a single location. The mist is created by a stainless steel manifold with 18 brass atomizing nozzles delivering 80+ PSI (5.52 BAR) of

pressure, propelling millions of droplets with an 18,000 CFM (8.5 m³/sec), 15 HP industrial fan. The DB-45 delivers a dense curtain of water droplets atomized to a 50-200 micron size range, which creates the greatest attraction to most dust particles.



After turning on the atomizer, you can see the mist pull out the dust.

“The size range is critical to avoid the ‘slipstream’ effect that large droplets from sprinklers have on airborne dust particles,” explained BossTek President Laura Stiverson. “In most applications, fugitive particles are generally around 50-100 microns in size, but water droplets from a sprinkler are much larger, often 2000 to 6000 microns,” she said. “The velocity of the large sprinkler droplet affects the airflow, and when an airborne particle approaches it, the flow often deflects the particle without a collision between dust and droplet.” In contrast, the atomized mist system creates droplets that are much closer in size to the dust particles, which encourages the necessary contact to bring dust particles to the ground. The sheer number of these miniscule droplets also increases the surface area available to contact airborne particles, without over-saturating the debris. While large sprinklers can apply 500 gallons per minute or more, the DB-45 puts out just 11.3 GPM at 100 PSI inlet pressure, helping RAI prevent mud and minimize runoff. “The Dustboss made an immediate impact,” Erautt continued. “On hot dry days — which we get a lot of around here — a little breeze can carry dust a long way. We just turn on the atomizer and you can see the mist pull the dust out of the air.”

Sustainable Road Production

Prior to material recycling, California roads were constructed with aggregate and sand pulled from local quarries. To replace these roads, thousands of tons of existing asphalt, concrete and base were removed and transported to landfills, while virgin material was trucked in. Reclaimed Aggregates has made it possible to minimize the use of new materials by recycling road and construction debris into its Class II base CMB (crushed miscellaneous base), meeting CalTrans specifications. RAI primarily produces a recycled class II base, as well as various products and materials for use in pavement preservation using 100% recycled asphalt. In addition to cold milling, pavement preservation and soil stabilization, PRS also provides cold in-place recycling (CIR or CIPR). The process involves a “train” of several different machines, which together handle the milling of existing asphalt pavement. It is then removed from the roadbed and added to a crusher with its own integrated dust suppression, which reduces the material to a 1-inch minus aggregate. The aggregate is transferred to a machine that mixes the cold milled material with an asphalt-based emulsified recycling agents in an engineered mix design. The cold recycled asphalt is installed, compacted to specific depths and then overlaid with a thin section of virgin asphalt. “A road project can involve thousands of truck loads carrying asphalt out and bringing material in, causing a lot of dust and traffic,” Erautt pointed out. “The CIR process only requires the engineered emulsion to be shipped in, reducing truck traffic

40:1 and lowering the carbon footprint of most projects by about 70%-80%. In addition, the work is done faster, the cost of the process plummets and the finished product is just as good.” Erautt calls it an engineered approach using sustainable solutions. The push for greener, more environmentally sound construction methods is not just a trend; it has become a key component of lean and efficient business models for companies across the country. Erautt comments “Recycling material is just good business, but it shouldn’t come at the expense of air quality. At our processing centers or out on a project site, a clean and efficient operation including dust control keeps the community and clients happy. It’s good for everyone in the end.” BossTek is a global leader in dust and odor control solutions for ports and shipping, slag handling, material recycling, coal, petcoke and demolition. The company specializes in atomized mist technology, with its entire focus on customized equipment for dust suppression and odor control. Its staff helps customers analyze particle sizes, working environments and other factors to ensure effective performance under real-world conditions.

About the Author

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