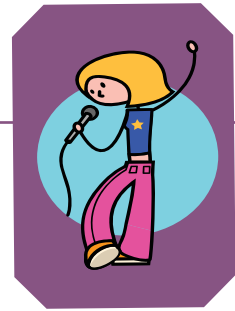


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An Introduction to the Asphalt Release Agent



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Colorado Asphalt Pavement Association *The Asphalt RAP*



Today's HMA mix designs include extremely sticky asphalt modifiers that include materials such as rubber and plastic.

The purpose of this essay is to act as an introduction to the Asphalt Release Agent Industry; highlighting both its role in today's greener, environmentally friendly asphalt operations and as a guide to evaluate products in today's crowded marketplace.

Asphalt Release Agents can be broadly defined as a family of products designed to replace diesel and other petrochemical solvents in asphalt operations as mandated by numerous legislative and regulatory actions. The products can vary greatly in type, application methods and cost. The operational and financial benefits associated with the different types of products also will vary greatly and must be measured along with the environmentally friendly aspects.

Background:

We all know asphalt is sticky. It is the sticky bond of the oil used as a binder in the Hot Mix Asphalt (HMA) that makes asphalt such a great paving material. Consequently, asphalt has a tendency to stick to every working surface that it comes in contact with as it is manufactured, transported, and installed. Contractors and government agencies are forced to use some type of product to keep their machines clean when working with HMA.

For years, the release agent product of choice was diesel fuel. Diesel was fairly cheap and already being used as fuel in the machines involved with the job. Diesel also dissolves asphalt very easily and can be sprayed wherever needed using an easy to find hand sprayer – similar to the sprayers used to apply garden chemicals. Diesel use in asphalt operations does have problems. Diesel creates a byproduct, or sludge, when it mixes with the asphalt oil (tar) melted from the HMA material.

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The sludge is classified as a hazardous waste material by the Oil Pollution Act and is dangerous to surface water runoff. Diesel also weakens the HMA by diluting the binder that holds the material together, and in cases of overuse, has led to premature pavement failure. The industry has tried to improve their operations and continues to urge environmental compliance and higher quality practices through the use of environmentally friendly asphalt release agents. Today's HMA mix designs include extremely sticky asphalt modifiers that include materials such as rubber and plastic. The polymer additives make the pavement last longer and provide a better return for the customer, but contractors are forced to use something that is an effective release agent, or face difficulties keeping their operations going.

There are 3 main areas where diesel and other solvents are used during paving operations:

First, Clean truck beds.

Asphalt will stick to the truck bed if it is loaded into an untreated bed. Spraying a product in the bed prior to loading allows the load to slide out. Early products were soaps that formed a slippery layer between HMA and the steel bed surface. These products are limited in that they only work under optimal conditions and on non-modified HMA. Many contractors tested various products but returned to what they knew would work against any mix under any conditions – diesel. Within the last 10 years, a new generation of



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products has come to market that work very well. There are now truly environmentally friendly agents that are economical and actually work well against the very sticky HMA being used today. Some of the new products are being applied using advanced spray systems saving valuable time and increasing productivity.

Second, Clean Equipment.

Solvents are used to clean equipment from HMA buildup. At the conclusion of each day's work, a paving machine needs to be cleaned by its crew. Many pavers use a citrus solvent to melt the asphalt off the metal



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The Release agent solvents are used to clean drag slat conveyors at the plant

Keeping equipment clean is important for the operation of the paving process



surfaces. While these solvents work on the material and are more environmentally friendly than diesel, they still create dangerous sludge that has to be contained and disposed of by the contractor/government agency. There are some products available that do not melt the asphalt, but most contractors still prefer the cleaning action of the solvents. The most significant problems with citrus and other non-petroleum based solvents are their high cost, low flash points and hazardous rating for the crews. Most solvent products can cost as much as three times more per gallon and are rated as “slightly” or “moderately” hazardous materials. Many are only environmentally friendly because they are non-petroleum based products in their virgin state.

Third, Clean Slat Conveyors.

Solvents are used to clean drag slat conveyors at the plant. These conveyors face buildup as a result of their normal daily operation and without treatment will eventually fail. Producers are forced to clean the slats at the conclusion of production each day and the product of choice for years has been diesel. While diesel does a good job cleaning slat systems, there are two main problems with diesel use on the slat; diesel tanks and area residue creating storm water runoff liability, and flash explosion danger which can seriously damage equipment and hurt plant personnel. Although citrus and other non-petroleum solvents can be used on slat systems, they typically do not perform as well as diesel because they fail to lubricate and if

sprayed on hot metal carry a flash risk. The vapors created are also as bad as or worse than diesel fumes.

Product Evaluation

Now that we have discussed the challenges facing release agents, let’s talk about product evaluation and the factors that separate many of the products available today.

All release agents should be examined, first, based on the respective product’s Material Safety Data Sheet (MSDS) provided by the manufacturer. The MSDS will have ratings that inform the potential customer if a product is hazardous or flammable. Any agent that is hazardous or flammable should be seriously evaluated against its potential for harm. There are products on the market that do not carry any hazardous or flammable liability and are competitively priced, but they are few and may be a challenge to locate. Many products claim in their marketing that they are “environmentally friendly”, but on the MSDS, actual contents of a product are disclosed which may pose a health or environmental risk. Most major manufactures have their MSDS information published on their website and we recommend checking out the MSDS before requesting samples, demonstrations and/or pricing of any release agent product.

- There are 3 main areas where solvents are used during paving operations:
- Clean Truck Beds
- Clean Equipment
- Clean Slat Conveyors

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After finding a suitable MSDS on a release agent, it then needs to work. Performance is crucial to any purchase and all potential products should be evaluated prior to any major investments. Evaluations should consider a products effectiveness, ease of use and impact on the bottom line. Effectiveness can be evaluated on a visual basis; i.e., does it work as advertised? Products should be tested in actual paving operations preferably with a manufacturer providing any necessary assistance and support. The tests should last until all members of the crew/staff are convinced the agent works. Ease of use is also a consideration during testing, since application systems, methods and requirements vary tremendously between products. There are many applications systems on the market today that must be evaluated as closely as the asphalt release agent itself. These systems range from the manual spray systems all the way to highly efficient automatic spray systems. Each product's application system needs to be evaluated as well for durability and ease of repair. Some manufactures will warranty systems as long as their product is being used, which eliminates most problems associated with application system breakdown. The most ideal application systems are easy to install, use and maintain, and apply the product in a manner that increases operational productivity and ensures release agent performance.

Finally, you have identified a product that is compliant and actually works, but now comes the most important part – cost. Release agent cost is commonly miscalculated because many customers do not consider all aspects of a product's program. The most common factor used to compare release agents is cost per gallon. This is a good place to start, but more information needs to be gathered in order to make an informed decision. Since there is so much variety in application systems and methods, particular attention should be paid to product cost per application. A common choice is, "What is the best deal if one system sprays less of a more expensive product and gets better results than a system that sprays more of a cheaper product?" Other factors that should be considered are time taken for product application and overall impact on operational safety and efficiency. Some manufactures have engineered systems to enhance productivity and actually generate profit for paving operations. A typical choice may be, "Does an expensive automatic system allow us to lay more asphalt per paving day?" Or, "Is there needless storm water runoff and workers comp liability associated with our current practices and facilities?" Most importantly, gather as much data during testing as possible to make a true assessment of a program's total costs to your operations before making any major release agent investments.

Modern environmental and quality control requirements are forcing government agencies and asphalt paving companies to pursue comprehensive release agent programs. Picking the right alternative products can be challenging and confusing. We hope the above has shed light on the asphalt release agent industry and proves useful in purchasing decisions.

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