

Product Datasheet

Release: 14.06.2015, Wetbond-S Nano.

WETBOND-S[®]**Anti-stripping Agent for Bitumen**

Description : "Wetbond-S" is next generation Nano-technology Silicon based Anti-stripping Additive for Asphalt. This product is a low dose and extremely thermal resistive additive for use in Hot-mix and Warm-mix road constructions. This product is specially suitable for aggregates having very high and tough to control stripping profile.

Chemical Nature: Proprietary Fatty polyaminosilane.

Physical Properties : "Wetbond-S" is brownish clear liquid at room temperature with characteristic citrus odour. This product is non-miscible with water and miscible with polar & hydrocarbon solvents. The thermal stability of this product in hot bitumen (at 160°C) is over 15 days and no additional dose addition/adjustment is required on prolonged storage in hot bitumen in normal course of Hot-mix and Warm-mix pavement constructions. As this product is used in a very low dose, it does not have any effect on physical properties of paving bitumen of any grade including VG-10, VG-30, VG-40, CRMB or PMB (Elastomeric & Plastomeric types) towards Penetration, Softening Point, Ductility etc. However the chemical properties are changed tremendously as the bitumen becomes more receptive to aggregates and bonding between aggregates and treated bitumen becomes highly resistant to stripping even under extreme atmospheric conditions. This ensures long term pavement durability without affecting the quality of work. This product is suitable for production of Refinery-treated non-stripping bitumen, Hot-mix pavement constructions, Warm-mix constructions and for industrial bituminous coatings.

Mode of Action : "Wetbond-S" is based on silicon molecular chemistry (nano-technology). This product assists in formation of a non-reversible covalent bond between bitumen and silica present in road aggregates. Since this bonding is at molecular level, it is one of the toughest in present day chemistry, which is resistant to the action of higher temperatures or water.

When this product is mixed with bitumen, the polyamino groups react with organic acids present in bitumen and form complex silicon bridge intermediates. This also imparts a slightly basic nature to the bitumen which is favorable for aggregate coating properties.

When "Wetbond-S" treated bitumen is mixed with common road aggregates, the active silicon bridge intermediates in bitumen readily form covalent bond with nearest silicon molecules on aggregate surface. This bond is physically and chemically resistant so it does not allow ingress of water between bitumen-aggregate interface.

Since the active silicon bridge formation takes place at molecular (Nano) level, a very small dose of "Wetbond-S" is enough to achieve complete protection from water damage.

Chemical Properties:**Typical Data (Testing conditions @ 30°C)**

Results may differ based on statistical variations depending upon test procedure, testing equipment, ambient test temperature, relative humidity, uniformity of associated bituminous and mineral materials, application methods, actual site conditions, handling of test materials, weighing accuracy, site conditions.

Chemical Name	: Fatty polyaminosilane.
Specific Gravity	: 0.86 - 0.95
Amine Value	: > 200
Active Nitrogen	: > 7.00
Water Content	: < 1.0%
Flash Point	: > 100°C
Active content	: 100%
Shelf Life	: 2 Years from the date of production in sealed containers.
Storage	: Store in a cool, dry place away from heat at ambient temperature. Protect from freezing.
Colour	: Brownish clear liquid.
Odour	: Characteristic Citrous.
Dose	: 0.02 to 0.06% by weight of Bitumen.
Compatibility	: All grades of Road and Industrial Bitumens.



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Advantages

“Wetbond-S” is oily liquid product for premixing or direct injection in Bitumen. This product has several advantages over conventional Anti-stripping Agents:

- Very low dose product, no effect on bitumen properties.
- No degradation when stored in hot bitumen, saves money.
- Nano active silicon based, works on molecular level.
- High amine value for active bridge formation between Bitumen and aggregates.
- High Nitrogen content gives excellent performance even with moist aggregates.
- Readily soluble in hot bitumen, so fit even for direct dosing in HMP.
- Non Hazardous product for safe handling and storage.
- Economical as compared to conventional products in dose dependent comparison.

Typical Doses:

For Hot-mix Asphalt use: **0.02 to 0.06%** w/w of Bitumen. (0.2 to 0.6 Kg/MT of Bitumen)

For Warm-mix Asphalt use: 0.10 to 0.30% w/w of Bitumen.

Procedure for Mixing:

“Wetbond-S” can be conveniently mixed with hot bitumen by following methods:

(1) Direct injection in hot bitumen stream in hot-mix plant. This is done using an automatic precise dosing devise (to be pre-installed in hot-mix plant). The hot-mix plant manufacturer must be consulted before altering the plant for this arrangement.

(2) Co-addition in hot bitumen storage tank. In this method, the required quantity of “Wetbond-S” is placed in empty bitumen storage tank before unloading hot bitumen from truck tankers. After unloading of hot bitumen, it is stirred for 10 minutes.

(3) Post addition in hot bitumen stored in bulk bitumen tank. In this method, the required quantity of “Wetbond-S” is added to stored hot bitumen from the open manhole of the tank and then hot bitumen is stirred or re-circulated for 30 minutes using appropriate arrangement.

After any method of addition, the treated bitumen can be used as normal.

Packing:

“Wetbond-S” is available in 200 Kgs / 100 Kgs HDPE Drums and 20 Kgs HDPE Cans.

Storage and Handling:

“Wetbond-S” can be stored in HDPE or MS drums / tanks at a cool and dry place at ambient temperature. Heating above 50°C and freezing should be avoided. Minimum exposure to air is the key for long shelf life for this product. This product contains organic silicon derivatives which can cause mild irritation to skin, eyes and lungs. Protective gloves and goggles must be worn during handling and use. Avoid inhalation.

- **KEEP CONTAINER TIGHTLY CLOSED**
- **KEEP OUT OF REACH OF CHILDREN**
- **NOT FOR INTERNAL CONSUMPTION**
- **FOR INDUSTRIAL USE ONLY**

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