

VUMOS

**ENVIRONMENTAL
MANAGEMENT**

**DUST – CONTROL &
SOIL STABILIZATION**

VUMOS

INDUSTRIAL SOLUTIONS

Vumos Corporation is your one-stop-solution partner offering industrial services, rental machines & manpower and material handling together with products for environmental management for industry, mining companies and municipalities since 2008.

VUMOS CORPORATION

✉ Valtalanniementie 268
88270 Vuolijoki - Finland

🏠 Varastokatu 5
87100 Kajaani - Finland

☎ +358 20 734 98 40

📱 +358 44 493 22 65

🌐 info@vumos.fi
vumos.fi | myvumos.com



European Key Distributor for:

 **CYPHER
ENVIRONMENTAL**
www.cypherenvironmental.com

A photograph of several vibrant green leaves with prominent veins, positioned on the left side of the page.

VUMOS



ENVIRONMENTAL MANAGEMENT

Clean air and fresh water are often taken for granted but our resources are limited. Therefore it is essential to integrate sustainable methods in our everyday operations ensuring that these resources will be available to the next generation, too.

One positive effect in changing the way we operate today, is the reduce of our own carbon footprint — and this effect has a global impact on the lives of all of us. That is why having good sustainable choices, which can help us save our valuable resources, are so important.

In this brochure we will show you, how establishing and maintaining of roads in various areas can help us save not only water, but also improve the air quality, reducing the rolling resistance and our fuel consumption at the same time, too.

We can also help you minimize the loss of material and reduce the risk of contamination by using a suitable and sustainable erosion control on your material piles stored outdoors.

Using products that really are made of natural ingredients can significantly improve the overall sustainability in our everyday activities and if you have any questions in regard to the technique or practical use, please do not hesitate to contact your nearest Vumos distributor or our technical team!

VUMOS



SUSTAINABLE ROAD MANAGEMENT

Sustainable and environmentally friendly dust control on all unpaved roads and areas is easy to make with **Dust/Blokr® Sugar Blend**. It works with various materials as long as there are enough fines to bind all the other aggregates.

If soil, which contains clay, is available, it can help us save on overall material costs because some 25-30% of this soil can be mixed together with the sand-gravel mixture when using **Road//Stabilizr®** together with Dust/Blokr® Sugar Blend.

You can even create the mixture beforehand and add the liquid concentrate diluted with water already in the mixing phase, before spreading the moist mixture onto the area or old road surface, as a new layer.

Depending on various factors such as climate, traffic type and volume as well as the sublayer and road quality, a well mixed and properly compacted layer with 20 cm thickness using both Dust/Blokr® SB and Road//Stabilizr® will carry all standard vehicles without any problems.

For heavy loaded trucks and haul roads in general a minimum of 30 cm layer is recommended.

Improved & dust-free
Roads with Dust/Blokr®SB



VUMOS

DUST CONTROL

Benefits of DUST/BLOKR® SB

Access roads, country roads, dirt roads...

are all part of our modern infrastructure, but their reputation and quality could be much better than what they are currently.

Every dust cloud is carrying a part of your road material away and every rain shower washes the fines leaving only a desert of pebbles and stones. But with Dust/Blokr® SB the maintenance of all these roads can be easier & cost efficient than ever before.

Binding the road aggregate together and creating a protective shield on the road, Dust/Blokr® Sugar Blend helps you keep your road surface in a good shape with less maintenance.

- ✔ captures > 90% of the fugitive dust generated by traffic
- ✔ Improves the quality of road surface
- ✔ Reduces rolling resistance & fuel consumption and
- ✔ Overall road maintenance costs
- ✔ Rejuvenates with moisture = long lasting effect!
- ✔ Safe to use in sensitive areas
- ✔ Made of sustainable & natural ingredients

before — after

VUMOS

5

Typical DB-SB ratios vary depending on the climate, traffic type & volume and the road material from 500ml up to 2000ml/m². The topical sealing is usually done with 100-200ml DB-SB with 1-1,5 Ltr water / m². Maintenance treatment depending on above mentioned factors with 50—100ml DB-SB with 1-1,5 Ltr water / m² every 4-12 weeks or on as-needed-basis (surface rejuvenites with moisture).

MIXED-IN APPLICATION

Use grader to remove all imperfections and potholes off of the road surface. Keep the erased material on the road.

If the road surface is no longer in good shape and lacking fines, you may have to add a new sand-gravel layer on it.

Spread DBSB-liquid: Use water truck to spread the Dust/Blokr® Sugar Blend diluted in water onto the loose material on the road. This can be done in several runs to avoid over-saturation and run-offs while giving the liquid some time to get absorbed by the mineralic material.

Material mixing: Use the grader to mix the material on the road with the liquid throughly.

If the temperature is high and the material starts to dry too early, you may sprinkle some water on it to keep it moist until to the next step.

Forming the road: Use grader to form the shoulders and the crown for the road.

An angle of 3—5 degrees is necessary to enable the rainwater to run off of the road surface. Insufficient angles and missing drainage cause potholes and rutting in the surface.

Start the compaction. Make sure to start at the sides going to the middle towards end and please reserve enough time for this step as it is one of the essential ones, use vibration first at the end - this pushes the coarse material deeper and brings the fines to the top.

Final finishing should be done by using a rubber wheel compactor.

Topical sealing: Use water truck for topical sealing with the Dust/ Blokr® Sugar Blend. Dilute some 100—200ml DB-SB in 1-1,5 L water per square meter and spray it onto the compacted road surface.

Let the road dry one day before use.



DUST/BLOKR®

DUST/BLOKR® Sugar Blend

was specially developed with the most important environmental aspects in mind and is a non-corrosive & environmentally friendly alternative to road salt such as magnesium or potassium chloride on unpaved roads, and gives very good results in dust control. The effect is based on the cooperation of special sugars and starches.

Due to its many positive properties, DUST/BLOKR® is very competitive in price with road salt because it also very effectively eliminates dust coming from surrounding, untreated surfaces and improves the overall quality of the road surface reducing the road maintenance costs.

Perfect areas of applications are unpaved:

- Roads & paths in the construction, industrial, mining, municipalities and agriculture
- Exercise & sport areas and parking lots
- Cycling and hiking trails also in
- Sensitive nature conservation areas, parks & forests
- Airport runways and helipads

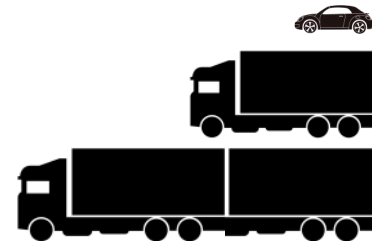
DUST/BLOKR® Sugar Blend:

- Delivery in 1.000 Ltr IBC tote with 1390 Kg weight
- Optionally EXW Canada or EXW EU-Warehousing
- freeze-thaw stable formula
- Storage at -60C—+25C (keep away from direct sunlight)
- Shelflife minimum 24 months



Good for the environment!

Dust/Blokr® SB was awarded in 2021 by the American Environmental Protection Agency EPA with the *Safer Choice certificate*



DB-SB / m ²	DB-SB / Km (width 7m)
500-650 ml + 100ml TS	~ 5.300 Ltr MI + TS 700 Ltr MT
700-800 ml + 100ml TS	~ 6.300 Ltr MI + TS 700 Ltr MT
850-1500ml+ 100ml TS	~ 11.200 Ltr MI + TS 700 Ltr MT

MI = Mixed-In application TS = Topical sealing MT = Maintenance treatment

VUMOS

SUSTAINABLE SOIL STABILIZATION

We love roads!

Functioning roads have been the lifeblood of all communities around the world dating back to the Roman Empire, but that doesn't mean we have to still build them in the same old-fashioned way!

We have the product

We offer all road owners and those responsible for the maintenance, easy-to-use products designed to successfully solve common and costly road and infrastructure challenges, such as dustyness and low load-bearing ratio, with zero impact on the environment. Our products are developed and manufactured in Canada and they work in all climate zones and always come along with all the technical information necessary for your success.

We are one & everywhere

Together with our manufacturer, colleagues and partners from all over the world we share the latest knowledge and experience of a wide network of companies, distributors and a vast number of projects in more than 50+ countries!

Technology transfer

In addition, our team is always ready to guide you through your very first project, showing you all the details and helping you out anywhere in our market area.



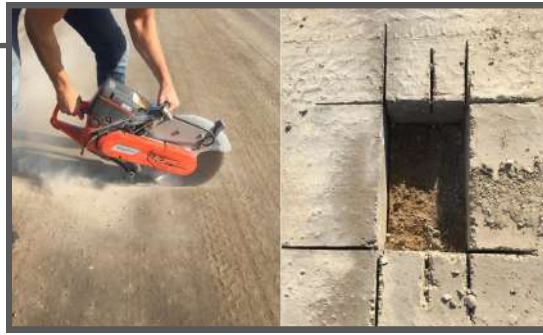
VUMOS

Birimbo rural road in Kigali, Rwanda
Taking samples for material testing with
Road//Stabilizr® in May 2022

CURRIES LANDING ROAD

Rural Municipality of Cornwallis, Manitoba Canada
Since Road//Stabilizr construction 2015-2017:

- Significant reduction in maintenance requirements (grader hours, aggregate, water) equal to approx. \$100,000/year in savings
- Previous grading requirements of 2-3 times per week has been reduced to once per year, if needed
- Previous water treatments of 2-3 times per day, that equated to approximately \$50,000/season, has been eliminated
- Zero additional aggregate materials required after 5 years
- Running surface is completely bound and safer to travel on
- Dust production is significantly reduced
- Significant reduction in machine hours results in fuel savings and reduction in green house gas emissions



ZIMBABWE RURAL ROAD

Road leading to Harare cemetery

- Significant improvement in strength and durability
- with reduced maintenance costs
- complete just prior to the rains
- since then in 6 months more than 1200ml rain received

LOAD-BEARING ROADS

Need some 20—30 cm of compacted layer *sand-gravel with clay soil*, treated with Road//Stabilizr® and if dust control is required, together with Dust/Blokr® Sugar Blend

Depending on *climate, traffic and sub-layer material*, additional layer of some 20- 80 cm with solid gravel-stone mixture may be necessary.

Regions with heavy frosty periods may need some 80 -100 cm of stony material under the stabilized road surface layer



VUMOS



Road//Stabilizr®

Spray diluted in water evenly on the scarified surface in several passes. If additional stabilizing is required, you can also use Dust/Blokr® Sugar Blend at the same time.

Mix the materials

with the liquids well using a tow-behind crusher or scarifier. On dirt roads even a grader can be used for this.

It is important to make sure that as much of clay containing soil particles get in touch with the liquid.

After mixing and forming

of the area you can start with **compaction**. If the material sticks to the drum, it is too moist and you should wait some 30 minutes.

Do not use the vibration in the very beginning, but later. This will push all bigger particles down and bring the fines more up.

Apply topical sealing

using some Dust/Blokr Sugar Blend. Typical ratios vary from 100—200ml DB-SB with some 1-1,5 Ltr of water per square meter.

Leave the compacted and sealed surface dry until next day before use.



VUMOS





Road//Stabilizr® needs a minimum of **20% clay** by weight in the soil mixture — should you have too much clay, it is advisable to add some mineralic material for more strength and durability!

Add the sand-gravel mixture or small stones and pebbles on the soil before mixing it together with the liquids.

Remember to check the optimum moisture content (**OMC**) on regular basis and keep it at **10-12%**. If the material is too moist, it will stick to the drum of the compactor.



VUMOS



+300%
ROAD MATERIAL
STRENGTH

61%
REDUCTION
IN WHEEL
ROLLING RESISTANCE

17,4%
REDUCTION
IN HAUL TRUCK
FUEL CONSUMPTION

+12%
COST
REDUCTION OF
BUILDING
ROADS

**ENABLING
THE USE OF
CHEAPER**
ROAD-BUILDING MATERIALS

ROAD//STABILIZR®

Its effectiveness is based on enzymes, electrolytes and tencides and it doesn't contain any corrosive ingredients harmful to the environment, such as salt.

It reacts together with the clay section of the soil, permanently altering its properties.

After the treatment, the clay loses its ability to bind water, which causes the road bed to condense much better and also helps it maintain good driving properties in changing humidity conditions.

The product is liquid and easily soluble in water, so no special equipment is needed for its application.

The processing pays off for itself through the longevity and ease of care of the road. The roads established ® Road//Stabilizr are very long-lasting and very resistant to heavy traffic.

Road//Stabilizr® is a long term solution — no repeated treatment is required!

1L
33M³
ROADSTABILIZR
IS HIGHLY
CONCENTRATED
1L WILL TREAT 33M³
OF SOIL VOLUME

Road//Stabilizr® is a truly environmentally friendly and highly cost effective road and soil stabilizer.

1 liter of concentrate is enough to treat 33 m³ of soil volume. Depending on the processing depth you need with:

15 cm depth 5 ml / m²
20 cm depth 6 ml / m²
30 cm depth 9 ml / m²

VUMOS



Road//Stabilizer®
needs a minimum of 20% of clay
by weight

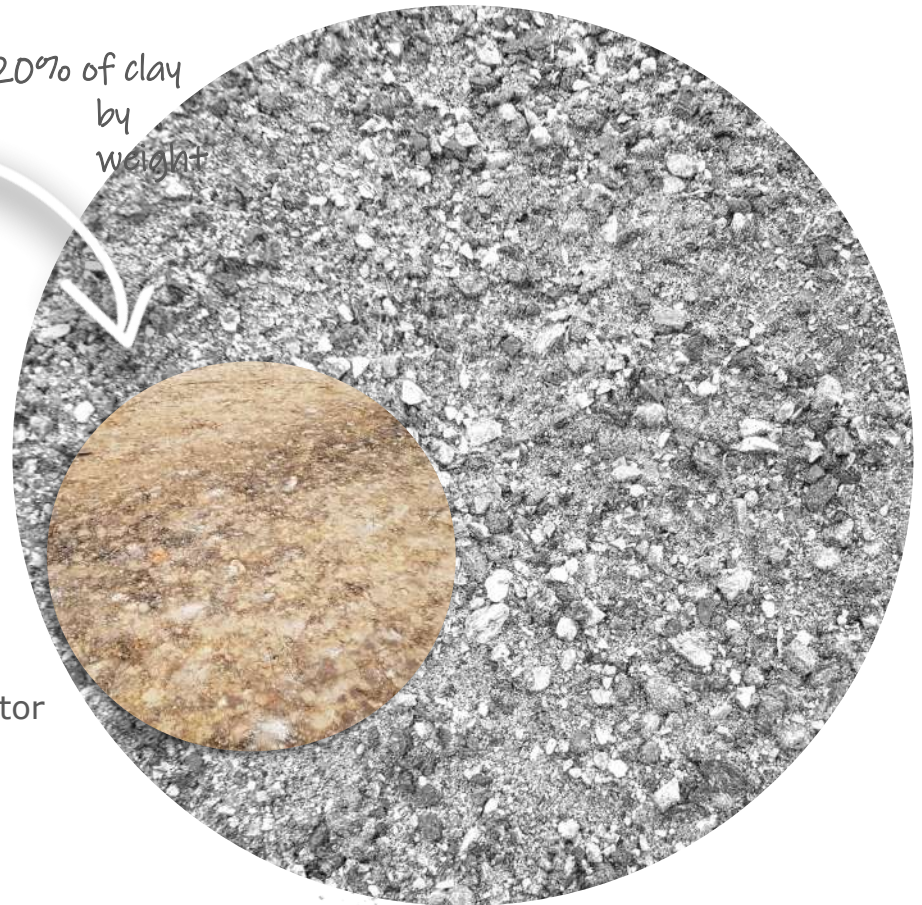
Road//Stabilizer®:

- Is highly concentrated
- available in 20 liter canister with 27 Kg weight
- Delivery EXW Canada or EXW EU-Warehouse
- Comes with a freeze-thaw stable formula
- Shelf-life properly stored minimum 24 months
- Developed and manufactured in Canada

Soil identification

As R//S is effective on the clay fraction of the soil it is important that the quantity & quality of clay present is being assessed. This is achieved using the following standard engineering tests:

- A) Dry Density/Moisture Content Relation Proctor Test ASTM D698-07
- B) Liquid Limit, Plastic Limit and Plastic Index Test (Atterberg Limits) ASTM D4318-10
- C) Particle Size Distribution ASTM D6913-04
- D) Hydrometer Analysis ASTM D1140-00



VUMOS

SUSTAINABLE EROSION CONTROL

Protecting your materials against erosion caused by wind and rain is a wise decision and helps also our environment because you not only reduce material loss in your stock piles and maintain the quality, but also reduce the dust concentration in the air and the risk of contamination in the near surroundings with any hazardous particles.

The whole process can be easy with our liquid concentrates and you need only standard equipment such as pump, hose and a matching nozzle — that's all! Sprayed in 2-3 layers it only takes a while until the protective effect appears.

Depending on your material and the duration of protection needed, for example for any by-products until further processing or transport, we can help you choose the right product.

Perfect erosion control for:

- raw material piles stored outdoors
- Coal piles in steel industry
- Tailings ponds



Coal piles in North-Italy



Beach area of a tailings pond in North-Finland



Rain test with DB-PB and various materials at the University of Applied Sciences in Kajaani, Finland

VUMOS



DUST/BLOKR[®]

SUGAR BLEND

- Based on natural ingredients such as sugars, starches and minerals
- Watersoluble liquid concentrate
- Available in 1.000 Ltr IBC tote - weight 1390 Kg
- Easy application with standard pumps and hoses
- Choose nozzle according to the material requirements
- Once dried, only semi-soluble in water
- Works on many stock pile materials outdoors
- Sprayed in 2-3 thin layers it gives good protection against erosion caused by wind and rain, but
- treatment should be repeated depending on dilution ratio used and the climatic conditions as well as the protection duration required:
- 0.300 L/m² - 2-3 months
0.400 L/m² - 3-4 months
0.600 L/m² - 5-6 months
0.800 L/m² - 8-10 months
Product should be diluted into about 1 L/m² of water depending on how wet the material is.
- Semi-soluble in water—does normally not affect further industrial material processing
- Ideal for various mineralic material piles stored outdoors in industry and mining, short-term dust issues of tailings ponds and their beach areas, by-product piles, industrial waste areas without traffic, good especially for sensitive areas such as nature conservation & parks



DUST/BLOKR[®]

POLYMER BLEND

- Based on vinyl acrylic (polymeremulsion)
- Watersoluble liquid concentrate
- Available in 1.000 Ltr IBC tote - weight 1150 Kg
- Easy application with standard pumps and hoses
- Choose nozzle according to the material requirements
- Once dried, creates water resistant surface on materials
- Works on many stock pile materials outdoors, especially good on hydrophobic materials such as coal (coke)
- Sprayed in 2-3 thin layers it gives good protection against erosion caused by wind and rain
- Polymer product: UV-radiation affects the protection, may require repeated treatment depending on the climate and material treated
- Depending on ratio used, one treatment can hold up to a year:
0.050-0.100 L/m² - 1-3 months
0.150-0.200 L/m² - 4—6 months
0.250-0.300 L/m² - 7—12 months
- may sometimes have light impact on further industrial material processing depending on ratios used (foaming process)
- Material compatibility test recommended before using in big scale
- Ideal for coal piles in steel industry, dust issues of tailings ponds, by-product piles of industrial and mining companies and for various mineralic and organic raw materials stored outdoors

AREAS OF APPLICATIONS



SCAN ME

For more information about our products and applications contact your nearest local distributor or our team at Vumos:

info@vumos.fi

Visit also our websites:

vumos.fi | myvumos.com



VUMOS