1984 ORZEŁ

ORZEŁ S.A.

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ZAKŁAD PRODUKCJI GRANULATU GUMOWEGO
TIRE RECYCLING PLANT

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About the product

DroGum is an asphalt modifier (enriched rubber powder) used to improve the parameters of bituminous mixtures. It includes quality Orzeł Powder obtained from recycled tires with an added improver and a cross-linking agent. It can be added to all kinds of hot-mix asphalt mixtures (HMA).

This solution has been supported and refined through numerous laboratory and industrial tests. The tests proved that a mix of asphalt with standard binder with additives (50/70, 70/100 or 35/50) has much better performance than the same mix modified only with polymers.

Properties

Thanks to the use of the DroGum modifier, the asphalt mixture reveals better resistance properties to significant load deformation.

Thanks to the homogeneous mixture and the size of the granulate, the modifier can be added not only by gravity feed systems, but also by pneumatic system, which is often used in industrial production.

Orzeł S.A. is an experienced producer of rubber powder used in rubber and construction industries. The rubber powder, used in DroGum, maintains the same high standards throughout the year, which are also monitored at every stage of in the production process.

DROGUM

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Benefits

- Improved resistance to permanent deformation,
- Improved resistance to low temperatures,
- Noise reduction,
- Reduction of production costs of SMA, AC WMS, and other mm-a made of modified bitumen,
- Significant extention of the service life of asphalt surfaces,
- Production of SMA without expensive stabilizers,
- Elimination of hydrogen sulfide emissions.

DroGum, in a dry method, is added directly to the mixer during production at the mixing plant using existing feeders (e.g. for cellulose fibers) or by modifying an asphalt binder, i.e. wet method. Due to modifier dosing option, appropriate proportions can be set so that the mixture acquires desired properties. The Society for Research on Roads and Road Traffic in Germany (FGSV - Forschungsgesellschaft fur Strassen und Verkehrswesen), already in 2012, issued "Recommendations on bitumen modified with rubber and asphalt" (E GmBA - Empfehlungen zu Gummimodifizierten Bitumen und Asphalten), which, as an equivalent solution to modification of asphalt binders with polymers, indicate adding activated rubber powder directly to the aggregate mixer, without the need for additional installations in the bitumen mass plant.

Application

Thanks to the use of DroGum, bitumen distribution at lower temperatures is facilitated. The bituminous surface with the addition of the modifier allows for longer work in hard-to-reach places, such as roundabouts, bicycle paths, flyovers, etc

Application of DroGum as a modifier:

- SMA including SMA LA,
- BBTM asphalt concrete for very thin layers,
- PA porous asphalt,
- ACWMS asphalt concrete with a high stiffness modulus,
- MA cast asphalt,
- SAMI,
- AF elastic anti-fatigue layer.

Recommended storage conditions

Big-Bag sacks should be stored in a ventilated warehouse. Avoid direct sunlight, which may cause material caking. Store in a dry place.
Permissible storage period: One year from the date of production

DROGUM

Transportation

No special transportation required.

Guidelines for use

For the production of asphalt mixtures with DroGum, existing feeders for cellulose fibers can be used. However, it should be taken into account that the density and loose structure of DroGum requires a system with a high volume throughput and a greater thrust in the installation than pellet fibers. In order to ensure homogeneity of the mixture, DroGum is added to the mixer together with the aggregate, and before the asphalt binder. To ensure homogeneity of the mixture with the additive, mix it for about 10 seconds with the aggregate, before adding the binder, and then for about 25 seconds.

The finished mineral-rubber asphalt mix can be stored in a tank for up to 3-5 hours. Before laying the asphalt mixture with DroGum, leave the mixture for about 30 to 60 minutes. Usually, the transport time between mixing at the WMA and laying at the destination is sufficient. This time is necessary for the asphalt to react with the rubber, which improves its properties. The use of rubber granules without adequate enrichment may, however, cause the surface to behave elastically during compaction. This results in loosening the mix structure and inappropriate surface compaction.

Designing asphalt mixtures

The recommended amount of enriched fine-grained DroGum rubber for blends with discontinuous graining (SMA, BBTM, PA) is 15% in relation to the amount of added asphalt binder. Adding DroGum should be done by replacing a part of the bituminous binder that was to be used - usually the binder dosage should be reduced by 0.1-0.2 percent. For the extraction of mineral-asphalt mixtures with the addition of DroGum using ultrasonic devices, it is recommended to use baskets with a sieve size of 0.075 mm, and to set the devices for the maximum number of rinses. For the recommended 15% share of the additive, the concentration temperature of Marshall samples or in the gyratory press is 145-150°C. The temperature of the finished asphalt mixture in the coating plant mixer is <185°C.

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