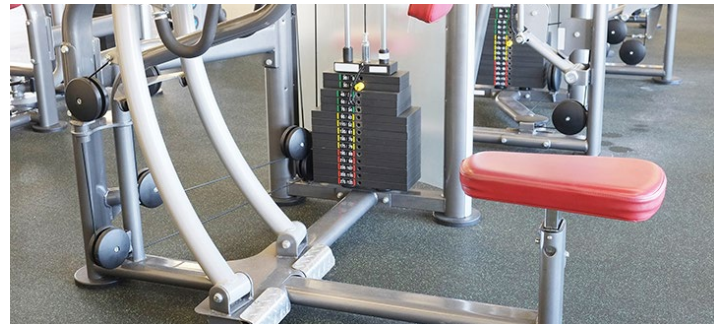


VORAMER™ Polyurethane Binders

for sports, safety and landscape surfaces



Dow's VORAMER™ binders are a safe and durable choice of products for recycling various materials including rubber, EVA, cork, gravel and wood mulch. The binders and resulting composites offer excellent properties such as:

- Adhesion to particles
- Flexibility
- Shock absorption
- Abrasion resistance
- Tailored permeability
- Hydrolytic stability
- Weatherability

This makes them useful for a wide range of products such as playground surfaces, resilient flooring, safety tiles, running tracks and other applications. VORAMER™ Binder products are all solvent free and environmentally friendly.

Playground applications

VORAMER™ MR Binders for playground surfaces are specifically designed with requisite viscosity, tensile strength and elongation properties to achieve easy processing and durability. Dow VORAMER™ binders cater to various climate conditions, including extreme conditions. Advantages of specific VORAMER™ MR binders include negligible bubble formation during the moisture cure process. VORAMER™ MR Prepolymers in conjunction with rubber granules provide the necessary resiliency to help prevent injuries. All VORAMER™ binders for playground applications meet the performance requirements for impact attenuation as specified in ASTM F1292-18. The VORAMER™ binder portfolio also includes UV stable aliphatic binders that enable improved color fastness.

Running track applications

Dow's VORAMER™ Polyurethane Binder Solutions for running tracks and sports fields can enhance an athlete's performance, while helping reduce the risk of serious injuries. Dow VORAMER™ binders are free of volatile solvent, toxins and hazardous additives. In addition, they provide durability and potentially reduce renovation costs.

Landscape applications

VORAMER™ binders for landscaping are used to bind together and stabilize loose gravel, pebbles and other kinds of aggregate. The one component moisture-cured binders hold the aggregate together without affecting the porosity of the surface. Depending upon the application, the low viscosity prepolymers can be poured or sprayed on with ease.

Molded tiles & articles

Molded rubber tiles and articles are used in a wide range of indoor and outdoor applications. Molded tiles and mats provide cushioning and better traction for playgrounds, gyms, patios, etc., and can also be used for ground protection. Other applications include traffic stops, landscape edging and decorations. Dow's VORAMER™ MR binders provide a range

of reaction profiles for specific open times as well as demolding times. Dow's polyurethane binders have low shrinkage and consistent dimensional stability during temperature and climate fluctuations. This allows a level of highly uniform composite quality, ensuring the best result in the final application.

Molded cylinders

The molded cylinder application finds its major use in the manufacturing of flooring mats such as underlay mats and sound or vibration-dampening mats. VORAMER™ polyurethane binders are specifically designed to create molded cylinders using recycled rubber granules. The binders have excellent processability, high flexibility, and superior adhesion to rubber. Through careful selection of isocyanates and polyols, Dow produces prepolymers tailored to customer's specific demands such as longer working times or fast cycle times.



Playground applications

Product	%NCO	Viscosity (cps)*	Recommended use temperature	Description
MR 1160	10	4000	40 - 60°F	Cool weather binder
MR 1165	10	3500	60 - 80°F	Standard spring/summer binder
MR 1220	9.8	4600	60 - 80°F	Base layer binder with fast reactivity for quicker return to service
MR 1196	10.3	4500	60 - 90°F	Suitable for hot and humid climates
MR 1105	9.5	5200	80 - 100°F	Standard desert binder for hot and arid climates
MR 1217	9.8	4600	80 - 100°F	Desert base layer binder - faster curing for quicker return to service
MR 1195 Aliphatic	6.7	5700	80 - 100°F	UV stable aliphatic binder for hot and arid climates
MR 1240 Aliphatic	8.2	3000	60 - 80°F	UV stable aliphatic binder for cooler climates

Landscape applications

Product	%NCO	Viscosity (cps)*	Specific gravity*	Description
MR 1181	16.3	2200	1.14	Binder for combinations of rubber, polymer granulate and rock
MR 1232	15.4	1150	1.10	Low viscosity binder - can be poured or sprayed

Molded tile & article applications

Product	%NCO	Viscosity (cps)*	Specific gravity*	Description
MR 1141	14.1	1385	1.14	High reactivity binder for fast demold times
MR 1194	12.1	2600	1.10	Standard binder with medium cure speed
MR 1253	10.1	1600	1.10	Slower curing binder for longer working time

Molded cylinder applications

Product	%NCO	Viscosity (cps)*	Specific gravity*	Description
MR 1215	10.3	3125	1.10	Clear, flexible binder ideal for molded cylinder applications
MR 1250	9.8	1900	1.10	High elongation binder with excellent processability
MR 1201	10	1900	1.10	Binder with an extended working time
MR 1212	12	1600	1.10	Slower curing binder

*Measured at 25°C

Recommended usage levels

Molded cylinder applications – 5 - 6 wt% of rubber crumbs

Molded Tiles/Products - Up to 10 wt% of rubber crumbs

Playground applications – 15 wt% of base buffing rubber; 20 wt % of top layer EPDM/TPV rubber

The Dow Chemical Company

US

dow.com

Global Dow Center 2211
H.H. Dow Way Midland, MI 48674

Toll Free

800 441 4DOW
989 832 1542

Images: AdobeStock_213727774, AdobeStock_33130693, AdobeStock_119954823, AdobeStock_83381328, dow_57957621781

NOTICE: No freedom from infringement of any patent owned by Dow or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other government enactments. The product shown in this literature may not be available for sale and/or available in all geographies where Dow is represented. The claims made may not have been approved for use in all countries. Dow assumes no obligation or liability for the information in this document. References to "Dow" or the "Company" mean the Dow legal entity selling the products to Customer unless otherwise expressly noted. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.

®™ Trademark of The Dow Chemical Company ("Dow") or an affiliated company of Dow

© 2023 The Dow Chemical Company. All rights reserved.

2000024564-6424

Form No. 756-271-01-0923 S2D