



MOR-FREE™ 403 A/ MOR-FREE™ C-132-2

Description MOR-FREE™ 403 A/ MOR-FREE™ C-132-2 is a solventless, two component, polyurethane adhesive system which is applied at low temperature. MOR-FREE™ 403 A/ MOR-FREE™ C-132-2 is suitable for laminating nylon, aluminum, polyester, polyethylene, and other packaging substrates, unprinted or reverse printed.

MOR-FREE™ 403 A/ MOR-FREE™ C-132-2 is designed to reduce or eliminate ink smearing when laminated to reverse printed films, but the actual performance must be evaluated before large scale use in production.

MOR-FREE™ 403 A/ MOR-FREE™ C-132-2 has good heat and chemical resistance for most packaging applications.

Typical Applications

Films should be printed with suitable ink for lamination.
 Lamination of metal oxide deposited films.
 Lamination of metallized and aluminium foil structures with and without sandwich print.
 Lamination of PETP, PA, PP, PE (including EVA-types) structures.
 Lamination of transparent films, SiOx deposited films, metallized and aluminum foil containing structures with and without sandwich printing.
 Metallized snack food packaging.
 Other application uses are possible, subject to performance trials and testing.

Suggested Substrates

Aluminium foil, converter grade.
 Cellulosic film (cellophane).
 Nylon or polyamide (PA).
 Polyester (PET).
 Substrates should be printed with suitable inks for lamination.
 Treated polyethylene (PE), (minimum 38 dyne/cm).
 Treated polypropylene (PP), (minimum 38 dyne/cm).
 Other types of laminates are possible and should be tested.

Typical Physical Properties	Adhesive	Coreactant	Unit
Component Type	NCO	OH	
Solids Content	100	100	%
Viscosity (25°C)	1700	5000	mPa·s
Weight/Gallon	9.80	8.15	lb
Mix Ratio by Weight (PBW)	100	100	
Mix Ratio by Volume (PBV)	100	120	
Wet Appearance	<ul style="list-style-type: none"> • Clear to Hazy • Colourless to Slightly Yellow • Liquid 	<ul style="list-style-type: none"> • Colourless to Slightly Yellow • Liquid 	

Recommended Processing Guidelines

This system has to be used with a laminating machine designed for solventless lamination, equipped with a suitable adhesive application unit and a tension control system suitable for winding laminated films with low initial tack.

For trial runs it is recommended to prepare no more adhesive than can be used within 15-30 minutes. The mixing of the two components must be done in such way as to obtain a homogeneous mix.

For regular production, it is indispensable to use a mixing and dosing device or pump, which continuously mixes the adhesive in the chosen mix ratio, controls the feeding to the application unit, and stops automatically in case of machine standstills.

When processing the adhesive, the precautionary measures normally applied to work with isocyanate have to be observed.

MOR-FREE™ Adhesive typically contains >2% monomeric MDI, as indicated in the MSDS / Safety Data Sheet and on the container label.

General Comments

Dow's Technical Service is ready to supply assistance in regards to the correct use of our products.

Interaction may occur with other components of the structure. Inks, retained solvents from any source, substrates, additives, coatings and the packed product are some of the components that may cause a property change of the total structure.

Before regular production, the end user is responsible to verify the suitability and performance properties of the total construction for the intended end use application, including the suitability of the process, construction and components.

If used in conjunction with high slip films (COF <0.2), it is strongly recommended to verify that potential film property changes, due to the lamination process and materials, are acceptable for the end use performance requirements.

The Coreactant or Catalyst must be used at the recommended mix ratio to achieve the desired properties.

Especially unfavorable substrate circumstances and combinations are: laminates containing polyamide (PA) film; of PA to high EVA content PE; white pigmented PE or combination of both; sealing films with excess slip, antifogging or antistatic additives.

Alcohol and similar materials containing active hydrogen can react with this adhesive causing inadequate cure and unexpected performance.

This product is sensitive to moisture and should be stored under and transferred with dry nitrogen.

The adhesive layer must be separated from the food product by a functional barrier. Consult your Dow Technical Sales representative for suggestions and further information.

Other Coreactant or Catalysts are available for special uses. Consult your Dow Technical Sales representative for suggestions and further information.

Like all MDI-monomer containing adhesives, a potential monomer migration risk may interfere with the sealing properties of the sealant film.

Recommended Application Weight

Apply 1.3 to 2.0 g/m² dry, depending on substrate, printing and application.

Nip Temperature

The adhesive can bond with room temperature pressure nip rollers; however heating the rollers up to 49 to 71°C would be recommended for most applications.

The rubber roll in the nip with hardness of 85 Shore A or greater is recommended.

Slitting / Rewind Time

Slitting and rewind is possible after 6.0 to 24.0 hr at 21°C (70°F).

Curing Time

Converters should verify appropriate cure times and conditions for their individual application.

It is necessary to wait until complete curing has taken place before the laminate is fit for use.

The curing process is normally completed 7.0 day after lamination at 24°C and may be influenced by the type of film used, applied weight and by the storage conditions.

Suggested Application and Operating Guidelines

Adhesive Unit

Application Temperature

38 to 60 °C

Suggested Cleanup Guidelines

A proper cleaning procedure should be implemented and practiced as part of the machine operation.

If the machine is stopped for more than 30 minutes, the mixing device and the application rolls should be cleaned before the adhesive becomes insoluble due to progressive curing.

Ethyl acetate is a suitable solvent for cleaning. Other solvents such as MEK or Acetone may also be used.

If the adhesive has become cured on the application rolls, a suitable chemical cleaner may need to be used to remove the residue.

Storage and Shelf Life Guidelines

The expiry date of each product is the date reported on the label of the package.

The product may be stored up to stated expiry date provided that the product is stored in a dry and cool, well ventilated place between 5 - 35°C (41 - 95°F) unopened in the original shipping container.

Opened containers should be used as quickly as possible.

Opened shipping containers, especially those of NCO-containing products, should be fitted with desiccant drier tubes to minimize moisture contamination.

FDA and/or European Food Contact Compliance

Due to the evolving nature of European and FDA food contact compliances, please contact Dow's Customer Information Group for the most up to date food contact compliance information. Call 800-258-2436 or use the web form at Dow.com for complete FDA and European food contact statements available.

Notes

These are typical properties only and are not to be construed as specifications. Users should confirm results by their own tests.

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