



MOR-FREE™ 225/MOR-FREE C-33 Solventless Laminating Adhesive

Description

Mor-Free 225/Mor-Free C-33 is a solventless, two component, polyurethane adhesive system which is applied at low temperature. This adhesive system is used for film/film retort applications. This adhesive has shown good adhesion to a wide variety of clear barrier films.

Typical Properties*

	(Polyester) Mor-Free 225	(Isocyanate) Mor-Free C-33
Solids	100%	100%
Viscosity 77° F	3500 cps	1800 - 4000 cps
Weight/Gallon	9.85 lb	9.75 lb
Appearance	Clear, Yellow	Clear
Odor	----- Practically none-----	
Mixing Ratio	100 pbw	100.0 pbw
	100 pbv	100.0 pbv
Shelf Life (unopened containers)	360 days	360 days

*These items are provided for general information only. They are approximate values and are not considered part of a product specification.

Mor-Free 225/Mor-Free C-33 may react or interact with other components of laminations. Retained volatiles (solvents or water), slip additives, antiblock agents and inks are some of the components that may cause property changes of the laminated structure. If Mor-Free 225/Mor-Free C-33 is used on high slip films (COF < 0.2) or with high slip LDPE/LDPE laminations, then the user must verify that potential film property changes due to the lamination process and materials are acceptable for the end use performance requirements.

Processing

Mor-Free 225/Mor-Free C-33 must be used on machines which have been specially designed for solventless laminations. Such equipment allows the adhesive to be fed through a meter/mix/dispense device and provides web tension controls designed for adhesives with low initial tack.

Mor-Free 225/Mor-Free C-33 cures sufficiently for further processing in 5 - 7 days @ 25°C. Avoid hot room cure for first 48 hours. Allow 14 days cure @ 25°C before retorting.

Preheating the adhesive and coreactant is not required under normal use to lower the viscosity. The application rolls should be heated to approximately 110° - 130°F or higher depending on line speed.

When processing Mor-Free 225/Mor-Free C-33, the safety rules for working with isocyanates must be observed.

For short trial runs the adhesive can be batch mixed. We recommend preparation of no more adhesive than can be used within 5-10 minutes. However, the use of a meter/mix/dispense device which continuously mixes the adhesive at the chosen ratio, controls the feeding of the application unit, and stops production automatically in case of machine failures, is indispensable for extended trials and normal production.

Cleaning

Depending on the design of the meter/mix/dispense unit, it should be cleaned before the adhesive becomes insoluble by progressive curing, if the machine stops for more than 15 minutes. Methylene chloride can be used to flush the mixing and metering units where a non-flammable solvent is required. Consult the Material Safety Data Sheet from the methylene chloride supplier for safe handling.

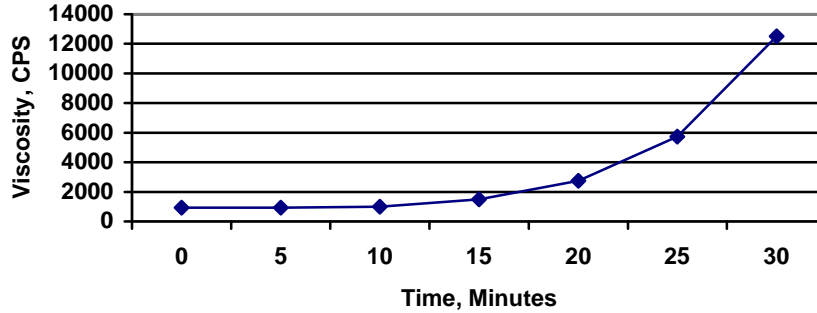
If the application unit and mixing device are combustion proof, they may be cleaned with esters or ketones such as ethyl acetate and MEK.

Several commercially available solvents are safe and effective for flushing and cleaning Mor-Free adhesive residues from solventless laminators and meter/mix/dispensing equipment that do not have combustion proof ratings. We recommend contacting either Dynaloy, Inc. (800-669-5709; www.dynaloy.com) or Danko Industries (630-761-3188) for cleaning solvent recommendations. Always consult the solvent supplier's MSD for safety information before use.

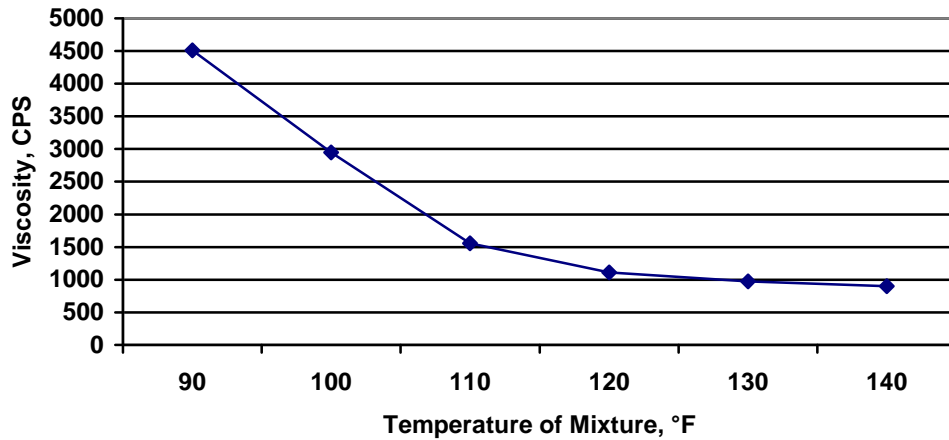
Safety, Handling and Storage

- Mor-Free 225 and its coreactant can be stored for 12 months in airtight, closed, original containers in dry rooms at temperatures of 70°F±15°F. Opened containers should be used as quickly as possible.
- Store in a well ventilated area away from heat and ignition sources.
- Follow good manufacturing and handling practices.
- Wash thoroughly after handling. Wash contaminated goggles, face shield, and gloves. Professionally launder contaminated clothing before re-use.
- ATTENTION! Container can be hazardous when empty. Follow label warnings even after container is empty. Do not reuse empty container without professional cleaning.
- Refer to Material Safety Data Sheet for more information.

**Pot Life Curve @ 130°F (54.4°C)
Mor-Free 225 + C-33 (100:100 pbw)**



**Temperature vs. Viscosity Curve
Mor-Free 225 + C-33 (100:100 pbw)**



Mor-Free is a registered trademark of Rohm and Haas Company.

These suggestions and data are based on information we believe to be reliable. They are offered in good faith, but without guarantee, as conditions and method of use of our products are beyond our control. We recommend that the prospective user determine the suitability of our materials and suggestions before adopting them on a commercial scale.

Suggestions for uses of our products or the inclusion of descriptive material from patents and the citation of specific patents in this publication should not be understood as recommending the use of our products in violation of any patent or as permission or license to use any patents of the Rohm and Haas Company.

Visit us at <http://www.rohmhaas.com/AdhesivesSealants>

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Rohm and Haas Food and Drug Opinion

Name: MOR-FREE (TM) 225

Regulation	Complies	Opinion Date	Limitations
21CFR175.105	Y	02/02/2006	
21CFR177.1390	A	02/02/2006	▪ The combination of MOR-FREE (TM) 225/Mor-Free C-33 may be used as an adhesive layer in multilaminate food packaging materials with all food types and with no limitations as to the type of food-contact layer used in compliance with the Federal Food, Drug, and Cosmetic Act.
21CFR177.1395	A	02/02/2006	▪ In accordance with the limitations as described under 21CFR177.1390 above.

Legend:

- L Yes, this product is cleared with limitations noted
- N No, this product is not cleared
- Y Yes, this product is cleared.
- A Affirmed as compliant based on migration studies.

Regulations:

- 21CFR175.105 Adhesives
- 21CFR177.1390 Laminate structures for use at temperatures of 250F and above
- 21CFR177.1395 Laminate structures for use at temperatures between 120F and 250F

Disclaimer:

This information relates specifically to this product. We believe this information to be accurate and reliable as of this date.

We recommend that our customers make their own determination on the suitability of this product for their particular application.

We cannot guarantee that the indirect food additives/food-contact status of this product will remain unchanged indefinitely; therefore we recommend that you periodically verify its status.

Rohm and Haas Food and Drug Opinion

Name: MOR-FREE (TM) C-33

Regulation	Complies	Opinion Date	Limitations
21CFR175.105	L	09/24/2001	<ul style="list-style-type: none"> ▪ FOR USE ONLY IN THE PREPARATION OF POLYURETHANE RESINS.
21CFR177.1390	A	02/02/2006	<ul style="list-style-type: none"> ▪ A = AFFIRMED AS COMPLIANT BASED UPON MIGRATION STUDIES. THE COMBINATION OF MOR-FREE 225/MOR-FREE C-33 MAY BE USED AS AN ADHESIVE LAYER IN MULTILAMINATE FOOD PACKAGING MATERIALS WITH ALL FOOD TYPES AND WITH NO LIMITATIONS AS TO THE TYPE OF FOOD-CONTACT LAYER USED IN COMPLIANCE WITH THE FEDERAL FOOD, DRUG, AND COSMETIC ACT. ▪ A = AFFIRMED AS COMPLIANT BASED UPON MIGRATION STUDIES. THE COMBINATION OF MOR-FREE1390A/MOR-FREE C-33 MAY BE USED AS AN ADHESIVE LAYER IN MULTILAMINATE FOOD PACKAGING MATERIALS WITH ALL FOOD TYPES AND WITH NO LIMITATIONS AS TO THE TYPE OF FOOD-CONTACT LAYER USED IN COMPLIANCE WITH THE FEDERAL FOOD, DRUG, AND COSMETIC ACT. ▪ The combination of Mor-Free L75X154/Mor-Free C-33 may be used as an adhesive layer in multilaminare food packaging materials with all food types and with no limitations as to the type of food-contact layer used in compliance with the Federal Food, Drug, and Cosmetic Act.
21CFR177.1395	A	02/02/2006	<ul style="list-style-type: none"> ▪ In accordance with the limitations as described under 21CFR177.1390 above.
21CFR177.1680	L	09/24/2001	<ul style="list-style-type: none"> ▪ FOR USE ONLY IN THE PREPARATION OF POLYURETHANE RESINS.

Legend:

- L **Yes, this product is cleared with limitations noted**
- N **No, this product is not cleared**
- Y **Yes, this product is cleared.**
- A **Affirmed as compliant based on migration studies.**

Regulations:

- 21CFR175.105 **Adhesives**
- 21CFR177.1390 **Laminate structures for use at temperatures of 250F and above**
- 21CFR177.1395 **Laminate structures for use at temperatures between 120F and 250F**
- 21CFR177.1680 **Polyurethane resins**

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