

SunBar™ 1.1 Two Part Oxygen Barrier Coating (non retort)

1. Description

SunBar™ 1.1 Oxygen Barrier Coating is a water reducible, two parts blendable coating designed to replace or enhance current oxygen barrier technologies used with a range of flexible packaging films. The coating is intended for use in non-retort laminate structures. It can be applied by flexo, gravure or roller coat processes. This product provides good barrier performance and bond strength at up to 75% external relative humidity and up to 100% internal relative humidity, depending on the barrier of the secondary substrate used.

2. Product Features¹

SunBar™ 1.1 O2 barrier coating benefits:

- Chlorine-free.
- Highly transparent.
- Resistance to flex cracking.
- Suitable for a broad range of films.
- Demonstrates stable film and barrier properties immediately after application.
- Suitable for lamination using appropriate adhesives¹.
- Suitable for in-line gravure and out-of-line flexo printing applications.
- Suitable for multi ply non-retort laminate applications.
- Blendable two part coating, stable for 12 hours after mixing.

3. Product Suitability²

3.1 Applications

SunBar™ 1.1 O2 barrier coating:

- Provides oxygen barrier on PET substrates (from as low as 0.1cm³/m²/day at 23°C/73°F, up to 5cm³/m²/day at 23°C/73°F and 75% Relative Humidity (RH) depending on substrate and applied film weight).
- Enhances the performance of SiOx and AlOx deposited and Al metallized PET.
- Suitable for use with solvent based and solvent-less lamination adhesives¹.
- For high temperature and humidity conditions, the coating has to be qualified for the application.

SunBar™ 1.1 O2 barrier coating is not formulated for:

- Retort or pasteurization packaging applications.
- Requirements that have a water immersion specification
- Direct food contact.
- Surface print applications without the use of a protective overprint varnish.

Always consult your Sun Chemical representative for further advice regarding applications.

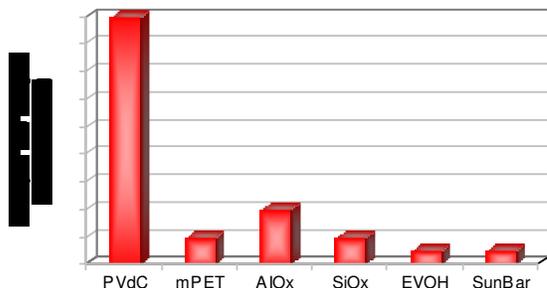
¹ Specific application performance data, where available, can be provided by your local Sun Chemical representative.

² Please refer to your local SunChemical representative for specific details.

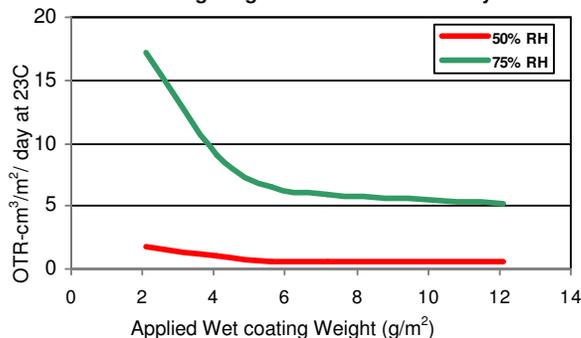
working for you.



Comparison of SunBar™ O2 barrier coating with other barriers on PET



Oxygen barrier performance on PET at different coating weights and relative humidity



3.2 Substrates

SunBar™ 1.1 O2 barrier coating has been successfully used with the following laminate structure combinations. New applications are continually being developed – refer to your Sun Chemical representative for specific details.

Primary web	Secondary web
Polyester (PET)	Cast Polypropylene
	Oriented Polypropylene
	Polyethylene
SiOx or AlOx deposited PET	Various ³
Metallised PET	Polyethylene
PolyPropylene(PP)	Polyethylene
	Cast Polypropylene

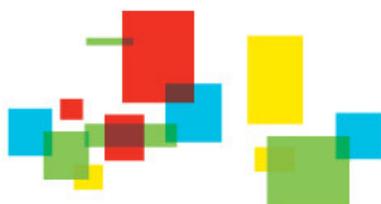
- PET/PP/Nylon base films must be in line Corona treated.
- PP films may need a primer
- Metallized and Ceramic films are easily damaged; care should be taken when handling these substrates as it will impact on barrier performance.
- Metallized and Ceramic film shelf life is limited and the customer is advised to establish the quality and condition of the film before use.

³[N.B. Information given here is for indication of potential uses only. Detailed information related to specific structures can be provided in a Customer Technical Information File]

3.3 Adhesives

SunBar™ 1.1 O2 barrier coating, when applied to films, may be laminated using a number of suitable solvent based and solvent-less adhesives. The actual bond strength achieved will largely depend on the choice of substrate, adhesive and applied film weights of both coating and adhesive. It is recommended that rigorous tests are carried out before commencing any commercial trials.

Sun Chemical can provide assistance to confirm suitability. However, it is recommended that all coating / substrate specifications are tested against appropriate standards and validated test methods.



4. Inks

Sun Chemical supplies a range of inks suitable for flexo and gravure lamination applications. The coating should be applied first down, prior to printing

Please refer to your local Sun Chemical representative for specific details.

5. General Handling

Safe Handling Procedure

Most SunBar Oxygen Barrier products are both flammable and corrosive to standard metal containers. This combination of properties makes it necessary to package SunBar products either in plastic pails or metal pails with plastic liners. When transferring material from either of these containers, care must be taken to avoid the generation of static charges that can ignite flammable vapors. The following procedure must be carefully followed to avoid the possibility of static generation:

1. The mixing of Parts A & B must be carried out in a grounded metal pail.
2. Ground any metal parts on both the receiving and dispensing containers.
3. When pouring flammable material from a plastic or plastic lined container insert a grounded wire or dip tube in the liquid that reaches the bottom of the container.
4. Dispensing rate should be controlled (less than 2 gallons (10 litres)/minute) and the free fall minimized.

Prior to handling any SunBar products personnel should refer to the MSDS for detailed information including the recommended Personal Protective Equipment.

5.1 Storage

SunBar™ 1.1 O2 barrier coating is flammable. Suitable precautions should be observed to avoid sources of ignition.

Temperature of storage: Above 10 °C / 50 °F and below 30 °C / 85 °F.

Shelf life: 4 months for part A and 12 months for part B, from date of manufacture and under above storage conditions. Please observe the manufactured date on the label of each container and refer to your local Sun Chemical representative for specific details.

5.2 Waste Disposal

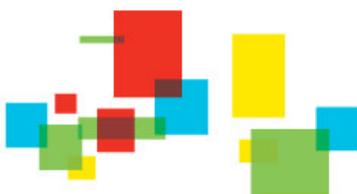
Sun Chemical always recommends responsible disposal. Care should be exercised in the disposal of coating waste. This should be carried out in accordance with good industrial practice, observing all the appropriate regulations and guidelines.

Please refer to SDS or MSDS for the appropriate product code.

6. Printing Conditions

6.1 Printing Viscosities

SunBar™ 1.1 Oxygen Barrier Coating consists of two components, Part A and Part B. Each coating component needs to be thoroughly mixed separately prior to mixing Part A and B together. The viscosity of Part A should be Zahn (Signature) #2/18-30". The viscosity of Part B should be Zahn #3/20-30". **Continue mixing each part individually until you reach the desired viscosities. The mix ratio is Part A: Part B 1:2 by weight. Part A should be added to the mixing vessel first. Then with gentle stirring, slowly**



add Part B. Continue mixing until completely homogenous and the viscosity has reached Z#2/20-30" Once mixed, the coating has a pot life of 12 hours; however, fresh coating can be added.

6.2 Reducing solvents

Product is press ready after mixing parts A and B together.

6.3 Wash Up solvents

Tap water or water/alcohol mixture.

6.4 Cylinders / Aniloxes / Plates

There are no restrictions on the types of cylinders or aniloxes used. However it is important to ensure that the correct wet film weight is applied without defects which will reduce the barrier obtained. Please refer to your local Sun Chemical representative for specific recommendations. We recommend using stainless steel press equipment

6.5 Drying Considerations

Applied film weights will be determined by substrate and O2 barrier requirements. It is important to ensure that adequate drying capacity exists on the coating unit to be used.

7. End-Use Safety / Assumptions

Acceptable technical performance of **SunBar™ 1.1 O2 barrier coating** is dependent on:

- Control of film weight (coating and adhesive).
- Adequate drying on press (to ensure that the print is dry before conversion).
- Use of blended coating within the 12 hour pot life period.
- Control of any migratable substances within the print, film or adhesive.
- Suitable adhesive used in accordance with supplier recommendations.

Choice and control of film weight, drying, substrate and adhesive are printer technical requirements for which the Sun Chemical technical team can provide assistance in the form of suggestions or direct support.

Food Packaging: It is the ultimate responsibility of the food packaging supply chain to ensure packaged food is safe. With regard to potential migration of substances into food from the printed packaging, it is the responsibility of the converter and food packager to ensure that no migration occurs beyond permitted regulatory levels.

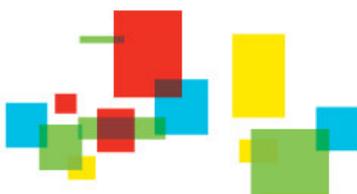
To fulfill its responsibility within the supply chain, Sun Chemical will provide details to the customer of potential migratable components, where present in its inks and coatings, upon request.

8. Disclaimers

The list of applications, substrates and processes provided in this document is not exhaustive. Please contact your local Sun Chemical representative for full technical evaluation of your application or process. The performance of the product and its suitability for the customers' purposes depend on the particular conditions of use and materials being printed. Therefore, any statement provided in this document should not be construed as providing a guarantee of performance in a specific application area. Sun Chemical always recommends that customers carry out a full evaluation of performance and safety-in-use prior to using our products in commercial applications.

9. Technical Assistance / Contacts

For further information, please contact your local Sun Chemical team or visit the Sun Chemical Website at www.sunchemical.com.



10. Appendix Provisional Technical Data

Property	Test Method ⁴	Test Conditions	Units	Typical Values
Environmental & Supply				
Regulatory / Legislation Compliance	Meets current EuPIA, TSCA requirements when applied to non food contact surfaces			
Stability	Sun Chemical Test	Closed container 20C	months	Parts A 4 max, B 12
	Mixed on press		hours	12 max
Manufacturing Availability	Trial quantities or commercial supply			
Physical				
Appearance	Visual mass			Semi opaque
Specific Gravity	Part A / Part B			0.97
pH	Part A / Part B/Blended A&B			2-5/7-8/4-5
Non Volatile Content	Parts A & B Blended		%	6
Supply Viscosity	Part A (after stirring)		Seconds Zahn #2 (23°C / 73°F)	18-30
Supply Viscosity	Part B (after stirring)		Seconds Zahn #3 (23°C / 73°F)	20-30
Supply Viscosity	Blended 1 Part A & 2 Part B		Seconds Zahn #2 (23°C / 73°F)	20-30
Application				
Film Weight, Dry	Sun Chemical Test	Tested on PET	g/m ² (lbs/ream)	0.18-0.36 (0.11-0.22)
Film Weight, Wet	Sun Chemical Test	Tested on PET	g/m ² (lbs/ream)	3-6 (1.8-3.7)
Printability	Sun Chemical Test	Tested on PET	Visual	As control
Thinners	None required			
Solvent retention	Sun Chemical Test	Tested on PET	mg/m ²	Less than 5
End Use				
O2 Transmission	Mocon (ASTM F1927)	Tested on PET	cm ³ / m ² / day ⁶ cm ³ /100 inch ² / day	0.4-0.8 0.025-0.050
O2 Transmission	Mocon (ASTM F1927)	Tested on met-PET	cm ³ / m ² / day ⁶ cm ³ /100 inch ² / day	0.1-0.2 0.006-0.013
Odor	Sun Chemical Test	Tested on OPP	Panel	As control
Taint	Sun Chemical Test	Tested on OPP	Panel	As control
Tape Adhesion	Sun Chemical Test	Tested on PET		100%
Heat Resistance	Sun Chemical Test	Tested on PET, heat-seal, 220°C (428°F) 1 sec		No Change
Blocking Resistance	Sun Chemical Test	Tested on PET, 64 Kg / cm ² (900 lb / sq inch) / 24 hrs		None
Flexibility	Gelbo Flexes	20 Coated Monoweb	cm ³ /m ² /day @ 50% RH	Within 2 of control
Optical-haze	ASTM D 1003-61	Ambient Temperature Haze Guard (PET)	%	<1 ⁷
Elongation	Sun Chemical Test	Tensiometer 5% stretch	%	No change
Lamination bond strengths	Sun Chemical Test	PET:PE with solvent and solvent-less adhesives	g / 15mm @ 75% RH g / inch @ 75 % RH	>150 >250
Handling Advice				
Composition and Mix Ratios	SunBar™ 1.1 O2 barrier coating is provided as 2 components. The mix ratio by weight is 1:2, part A to part B respectively. Ensure thorough mixing of parts A + B to achieve correct application viscosity			
Storage	Store in a safe, dry environment 10-30°C			
Wash Up	Water or water / alcohol mixture			
Disposal	Hazardous Waste. See Material Safety Data Sheet (MSDS or SDS)			

⁴ Test methods available via Sun Chemical

⁵ NR = Not reported

⁶ Tested at 23°C (73°F), 50% RH

⁷ Depending on haze value of primary and secondary substrates

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Our Products are intended for sale to professional users. The information herein is general information designed to assist customers whether our products are suitable for their applications. All recommendations are made without guarantee, since the application and conditions of use are beyond our control. We recommend that customers satisfy themselves that each product meets their requirements in all respects before commencing a print run. There is no implied warranty of merchantability or fitness for purpose of the product or products described herein. In no event shall Sun Chemical be liable for damages of any nature arising out of the use or reliance upon this information. Modifications of the product for reasons of improvements might be made without further notice.

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