Coatings and Compounds for Small Diameter Metal Closures

Darex®

Henkel

Introduction

Henkel supplies a complete range of PVC and non-PVC sealants to meet the sealing requirements of the closure industry. The main purpose of PVC and non-PVC sealants is to provide a sealing gasket for crowns, twist-off crowns, ROPP or plastic caps and to seal a bottle or jar for beverage applications; beer, champagne, carbonated soft drinks, fruit juice, mineral water. The specific closure, sealant application method or type of beverage requires the selection of a specific sealant. Your Henkel representative can help you select the most appropriate material for your needs from our product portfolio.

Closure Compound Portfolio

Product name	General purpose	Barrier	Scavenger	PVC FREE	PVC plastisol	Phthalate NI	Returnable glass	White	Clear	Blue	Grey	Observation
Metal Crown for Pry Off Applications												
DARAFORM 6411MF	●			●		●	●	●	●	●		
DARAFORM 6435	●			●		●	●	●	●			Mineral oil NI
DARAFORM 6475P			●	●		●	●	●	●			
DARAFORM 6492		●		●		●		●				Passive barrier
DARAFORM 6492MG		●		●		●						Passive barrier, green color
DARAFORM 6405		●		●		●		●				Champagne
DARAFORM 6407		●		●		●		●				Champagne
CELOX 290		●	●	●		●		●				Barrier & oxygen scavenger
Metal Crown for Twist Off Applications												
DARAFORM 4000				●		●	●	●	●			
CELOX 410			●	●		●	●	●	●			
RO/ROPP Applications												
DARAFORM 2000				●		●			●	●		Taste sensitive
DARAFORM 2200	●			●		●	●	●				
SINCERA 500B				●		●	●			●		Taste sensitive - Erucamide NI
DARAFORM 6601			●	●		●				●	●	
DARASEAL RO PA30W	●				●		●	●				
DARASEAL RO PA80W					●	●	●	●				EU approved
DARASEAL RO PA85W					●	●	●	●				

Additional properties and handling information can be found in corresponding PI (Product Information Sheets) and SDS (Safety Data Sheets).

Oxygen Scavenger Technology

Oxygen ingress into sealed beverage containers causes widespread problems in the industry. Although most of the packages have oxygen barriers, oxygen can permeate into the package via micro-pores, holes and inconsistent sealing, among other issues.

Oxygen ingress into the packaging causes reduction of shelf life and may result in product spoilage as flavor deterioration, color change, haze formation and nutrient depletion.

Our Oxygen Scavenging Technology (OST) provides a solution to problems of oxygen ingress during the filling process and oxygen ingress over time. This technology can be used in several applications including lined crowns, aluminium RO/ROPP or in the center panel within plastic caps. In addition, an OST masterbatch has been developed to be incorporated in linerless in linerless plastic caps or other packaging type.

In our Material Technology R&D centers, equipment has been designed to support a wide range of new customer applications. Simulated pack tests can be performed with controlled oxygen levels in a closed environment. All types of packages can be tested, including glass/PET jars and bottles. The package is then pasteurized in accordance with the customer's specifications.

Oxygen measurements are performed on shaken samples using a non-invasive method, OXYSENSE. This analyzer system utilizes an optical methodology that determines the oxygen concentration within a sealed package (in liquid or headspace phases). This new technique allows evaluating the performance of our products in scavenging oxygen in time within a given package.

SINCERA – The Erucamide Free Liners

SINCERA, a family of products offered exclusively by Henkel, is a new approach to beverage packaging lubricants. This approach enables brand owners and packaging manufacturers to solve previously insurmountable problems. Based upon a patented mixture of three components, the SINCERA family of products works within a polymer matrix to reduce friction. With SINCERA products, beverages taste cleaner and caps are easier to remove and manufacturing productivity is improved.

Unsaturated amides, like erucamide and oleamide, currently perform the majority of the lubrication in the beverage industry. One of today's challenges, however, is that in the presence of heat, UV and ozone, unsaturated amides will break down to form a strong off-taste. In addition, if exposed to too much heat, the amide migration can be so high that some will fall into the beverage, or foul the manufacturing process. Erucamide has benefits, but off-taste and migration are forcing the beverage industry to reconsider the type of lubricant used. The potential for off-taste has forced many brands to place restrictions on the use of unsaturated amides. This has forced manufacturers to use saturated amides such as behenamide, with marginal results. The results with SINCERA are impressive, with low removal torques, no off-taste issues, and less wax build-up during manufacturing.

All current lubricants were found to have a minimal effect on the opening force, or a detrimental effect on taste and odor. Only SINCERA technology has been able to overcome both challenges.

DAREX Non-BPA Closure Coatings, PVC Free Sealants

For more than 80 years, we have built a world-class reputation of total customer focus and innovative packaging solutions. As a major global supplier to the packaged food and beverage industry, Henkel Materials Technologies has always been an expert on changes in the dynamic food packaging industry.

Henkel is one of the few suppliers of coatings and sealants for the closures industry, focused on the needs of the beverage, food and personal care packaging industries. Our regulatory and food law experts throughout the world have authoritative knowledge on diverse laws and regulations applicable to coatings and closure sealants in every geographic region. As a leading supplier of can and closure sealants, Henkel has a holistic perspective of the regulatory issues that food and beverage customers face. It is this strong regulatory support and intimate market knowledge that allows Henkel to anticipate some of the changes the industry faces today. In response, our Materials Technologies has built a robust portfolio of non-BPA closure coatings (compatible with PVC free and PVC based sealants), and PVC free sealants which are available today, providing our customers with total flexibility in the choice of raw materials. This brochure includes a compilation of innovative DAREX closure coatings, and DARAFORM closure sealants, formulated without raw materials containing BPA, BADGE and/or BFDGE.

System Recommendations

Many of the non-BPA coatings listed in the preceding table can be used as a single layer and can also be combined into double-coat systems. Henkel is always available for advice on product usage, as many permutations are possible to fit the many packaging needs.

Detailed product information, such as standard product combinations, recommended dry film weights and curing temperatures, can be found in the PI. Please contact a Henkel representative to obtain this information.

We recommend all closure manufacturers to test performance with their own pack tests, including flavor tests.

The Use of Solvents, Prevention of Contamination

Our non-BPA family of products has been formulated with high performance polyester and/or PVC organosol resins. These materials are highly sensitive to the solvent used to adjust viscosity and/or to flush previously used materials from the coating system. Henkel strongly recommends using the solvents listed in the PI for each specific coating. Using non-recommended thinners may result in severe incompatibilities that affect application performance and the process resistance of the coatings.

For more information about these products, handling and application guidelines, please refer to the Henkel Technical Information Sheet titled APPERTA non-BPA Can Coatings for Interior Use. Any Henkel sales representative would be happy to provide this document for your information.

Best practice recommendations for preventing cross-contamination of Non-BPA based systems, are also available. These include equipment clean outs, dedication of piping and sequence of coating.

Storage, Handling, Cautions & Limitations

SDS provide specific details regarding the storage and handling of solvent-based materials.

Materials should be treated and handled using standard manufacturing practices. Store all products in cool and dry conditions, between 5°C (40°F) and 30°C (86°F) for a period no longer than six months from the date of manufacture. Pack conditions vary greatly. We recommend a full process test, and/or pack test when applicable, before commercialization. This testing confirms the suitability of the coating or coating system for specific end uses.

Europe

Product name	Functionality	Chemistry	BPA-NI non-BADGE	Non-PVC	Non-melamine benzoguanamine	Color	Total solids (%)	Application
BPA-NI Products								
DAREX OV 1597-07	Overprint varnish	Polyester	●	●		Clear	40 ± 1	External
DAREX SE 1474-02	Stamping enamel	Polyester	●	●	●	White	65 ± 1	External
DAREX PR 1159-26	External primer	Polyester	●	●		Clear	42 ± 2	External
DAREX PR 1159-13	Primer	Polyester		●		Gold	41 ± 2	External
DAREX AL 2002-05	Adhesion lacquer	Polyester	●	●	●	Aluminized	40 ± 1	Internal
DAREX AL 2002-07	Adhesion lacquer	Polyester	●	●		Gold	50 ± 2	Internal
DAREX SE 1169-101	Stamping enamel	Polyester	●	●	●	White	62 ± 1	External
DAREX OV 4002-01	Overpaint varnish	Polyester	●	●		Clear	45 ± 2	Internal
Conventional Products								
APPERTA 1019-34	Protection lacquer	Epoxy phenol		●		Clear	38 ± 1	External
DAREX PL 1014-16	Protection lacquer	Epoxy phenol		●		Gold	38 ± 1	External
DAREX OV 1092-01	Overprint varnish	Epoxy ester		●		Clear	38 ± 1	External
DAREX PR 1154-15	Primer	Epoxy phenol		●	●	Clear	27 ± 1	External
DAREX SE 1169-98	Stamping enamel	Polyester		●	●	White	62 ± 2	External
DAREX CV 1334-01	Coloured varnish	Polyester		●		Gold	38 ± 1	External
Adhesion Lacquer PVC for Crowns and ROPP								
DAREX AL 1108-15	Adhesion lacquer	PVC	●			Gold	61 ± 2	Internal
Adhesion Lacquer Non-PVC (Internal)								
DAREX AL 1700-04	Adhesion lacquer	Epoxy phenol		●	●	Gold	37 ± 2	Internal
DAREX AL 1724-03	Adhesion lacquer	Epoxy phenol		●	●	Aluminized	38 ± 2	Internal

North and Latin America

Product name	Functionality	Chemistry	BPA-NI non-BADGE	Non-PVC	Non-melamine benzoguanamine	Color	Total solids (%)	Application
Conventional Coatings, Overprint Varnish for Crowns (External)								
DAREX OV 1655-01	Overprint varnish	Acrylic		●	●	Clear		External
DAREX OV 1655-06	Overprint varnish	Acrylic		●	●	Clear		External
DAREX OV 1655-11	Overprint varnish	Acrylic		●	●	Clear		External
DAREX OV 1655-14	Overprint varnish	Acrylic		●	●	Clear		External
DAREX OV 1129-10	Overprint varnish	Epoxy ester		●		Matt		External
DAREX OV 1964-02	Overprint varnish	Polyester	●	●		Clear		External
Primers								
DAREX PR 1154-18	Primer	Epoxy phenolic		●		Clear		External
DAREX PR 1254-19	Primer	Epoxy phenolic		●		Aluminized		External
DAREX PR 1159-32	Primer	Polyester				Clear		External
DAREX PR 1159-36	Primer	Polyester				Aluminized		External
DAREX PR 1631-06	Primer	Vinyl				Aluminized		External
Stamping Enamel for Crowns (External)								
DAREX SE 1169-97	Stamping enamel	Polyester		●		White		External
DAREX SE 1639-05	Stamping enamel	Polyester		●		White		External
DAREX SE 1639-06	Stamping enamel	Polyester		●		White		External
DAREX SE 1639-106	Stamping enamel	Polyester	●	●		White		External
DAREX SE 1169-107	Stamping enamel	Polyester	●	●		White		External
DAREX SE 1169-108	Stamping enamel	Polyester	●	●		White		External
Adhesion Lacquers, Organosols for Crowns and ROPP (Internal)								
DAREX AL 1103-05	Adhesion lacquer	PVC				Gold		Internal
DAREX AL 1103-26	Adhesion lacquer	PVC				Gold		Internal
DAREX AL 1621-02	Adhesion lacquer	PVC			●	Gold		Internal
DAREX AL 1694-02	Adhesion lacquer	PVC	●		●	Gold		Internal
DAREX AL 1694-04	Adhesion lacquer	PVC			●	Aluminized		Internal
DAREX AL 1694-20	Adhesion lacquer	PVC			●	Gold		Internal
DAREX AL 1621-15	Adhesion lacquer	PVC	●			Gold		Internal
DAREX AL 1694-24	Adhesion lacquer	PVC	●			Gold		Internal
Adhesion Lacquers, Non-PVC (Internal)								
DAREX AL 1700-05	Adhesion lacquer	Epoxy phenol		●		Gold		Internal
DAREX AL 1724-03	Adhesion lacquer	Epoxy phenol		●		Aluminized		Internal

Asia

Product name	Functionality	Chemistry	BPA-NI non-BADGE	Non-PVC	Non-melamine benzoguanamine	Color	Total solids (%)	Application
Overprint Varnish (External)								
DAREX OV 1655-02	Overprint varnish	Acrylic		●	●	Clear	40 ± 2	External crown
DAREX OV 1655-06	Overprint varnish	Acrylic		●	●	Clear	40 ± 2	External crown
DAREX OV 1091-03	Overprint varnish	Epoxy ester		●		Clear	37 ± 1.5	External crown
DAREX OV 1574-06	Overprint varnish	Polyester		●		Clear	41 ± 2	External ROPP
Primers								
DAREX PR 1254-16	Primer	Epoxy phenolic		●	●	Aluminized	37 ± 2	Internal/external crown
DAREX PR 1254-23*	Primer	Epoxy modified		●		Aluminized	35 ± 1.5	External crown
Adhesion Lacquers, Organosol (Internal)								
DAREX AL 1103-09	Adhesion lacquer	PVC			●	Aluminized grey	49 ± 2	Internal crown
DAREX AL 1103-15	Adhesion lacquer	PVC			●	Aluminized gold	49 ± 2	Internal crown
DAREX AL 1103-21	Adhesion lacquer	PVC			●	Dark gold	47 ± 2	Internal crown
Adhesion Lacquers, Non-PVC (Internal)								
DAREX AL 1064-05	Adhesion lacquer	Epoxy phenolic		●	●	Aluminized grey	37 ± 1.5	Internal crown
DAREX AL 1064-11	Adhesion lacquer	Epoxy phenolic		●	●	Gold	37 ± 1.5	Internal crown

*Especially used when light silver shade for external design is required

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