WACKER

CREATING TOMORROW'S SOLUTIONS

DEHESIVE®

PAPER & FILM I RELEASE COATINGS

LET'S MAKE THE PERFECT COMBINATION

Optimize Your Products and Processes with DEHESIVE® Solutions

LET’S MAKE THE PERFECT COMBINATION

What do release coatings and partnerships have in common? They are the outcome of a perfect combination. Behind DEHESIVE® release systems, you have a partner that optimizes your products and processes at every stage and ranks among the world's leading suppliers. As both a regional service provider and a global company, we can ensure the exact same quality – everywhere. When you choose DEHESIVE®, you have the perfect combination, because we are there wherever you need us.

Cost-efficient, rapid processing, film coating, graduated release values, high-speed coating and flexible formulations all call for a release coating that can do something out of the ordinary. And that is precisely where DEHESIVE® release systems give you the competitive edge.

Clear Advantages

Release coatings consist of silicone components developed specially by WACKER for the production of silicone release liners and release films. Their chemical structure makes them exceptionally good at releasing tacky substances. Substrates coated with DEHESIVE® release systems will therefore separate form the adhesive every time. Furthermore, DEHESIVE® silicones also exhibit excellent leveling during processing, and rapid curing.

Three Product Groups

DEHESIVE® release systems come in three product groups: solventless systems, solvent-based systems and emulsion systems. You can rely on obtaining excellent performance, high functionality and ease of processing from all three groups. DEHESIVE® release systems undergo either platinum-catalyzed addition curing or tin-catalyzed condensation curing to yield flexible release layers.

Flexible System

The DEHESIVE® product range is designed for flexibility of formulation and can therefore be tailored to the coating process and the end application. The four basic system components – polymer, crosslinker, catalyst and controlled release additive – can be varied to create custom release forces for all kinds of applications. The system's reactivity can be adjusted to the desired curing temperature and production speed.

Contents

EXPECT MORE THAN THE ORDINARY

What do you think of when you want your products to meet the most rigorous of demands? At WACKER, we think of outstanding release values and very good processing properties, along with easy handling and tests performed on different paper and film grades. With our DEHESIVE® release systems, we offer products that are extremely reliable and versatile, and meet the toughest of demands.


LET'S
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DEHESIVE® RELEASE SYSTEMS ARE AS VARIED AS YOUR APPLICATIONS

Whether self-adhesive labels, graphics applications or specialty medical products, silicones provide the release liners with the precise level of release and processing properties. And allow for maximum production speeds.

High Speed for Release Liners

Increased output, increased cost effectiveness. WACKER's high-speed DEHESIVE® release systems offer you custom formulations for coating release liners at production speeds of 1,000 m/min or more, along with reliability and high efficiency. A very small quantity of an anti-mist additive helps to minimize misting.

Applications	
Paper High-density papers, such as glassine and calandered kraft paper, make up the bulk of applications and are the preferred basis for label rolls and adhesive tapes. Coated kraft paper is used mainly in label sheets and in graphics applications.	**PCK** Polyolefin coated kraft (PCK) is used for applications requiring outstanding dimensional stability, moisture resistance, smooth surfaces and high tear strength. One or both sides may be coated as required by the application, with polyethylene being the most common coating. This PCK release liner is employed predominantly in industrial products, tapes, graphics applications and the medical sector.
Demands on the DEHESIVE® Release System	
Paper • Rapid curing at 130 to 140 °C web temperature for minimal rewetting and consistent good flatness • Outstanding anchorage in combination with rapid crosslinkers for minimal catalyst consumption • Good leveling and flow properties for good coverage combined with low coat weight	**PCK** • Rapid curing at 105 °C web exit temperature • Outstanding anchorage even to PCK which has not been corona treated

Polypropylene (PP) films These generally serve as release films due to their mechanical strength and barrier properties and because they are slightly more rigid and heat-resistant than polyethylene films. PP release film is used mainly in labels and adhesive tapes.	**Polyester films** Polyester (PET) films generally serve as release films, because they have excellent mechanical and barrier properties, and because they are smoother, more rigid and more heat-resistant than PE and PP films. PET release films are used mainly in labels, adhesive tapes and medical applications.	**Polyethylene (PE) films** Polyethylene films are used typically for release films on the basis of their relatively low cost and their physical properties. Additionally, they are available in low, medium and high gauges to meet various requirements on temperature resistance and shape conformity. PE films are used primarily in sanitary products, in the construction sector and for insulation.
Polypropylene (PP) films • Rapid curing at a dryer temperature of 105 °C • Outstanding silicone anchorage, even to PP films which have not been corona treated	**Polyester films** • Rapid curing at a dryer temperature of 135 °C • Outstanding silicone anchorage, even to unprimed polyester films	**Polyethylene (PE) films** • Rapid curing at a dryer temperature of 100 °C • Outstanding silicone anchorage

By virtue of their diverse chemical and physical properties, DEHESIVE® release systems are able to meet all kinds of specifications for coating release liners. WACKER continues to further expand their large range of applications through its ongoing research and development.

Excellent Anchorage on Filmic Substrates

Film coating offers enormous market potential. The no-label look of printed clear film labels, for example, is a cost-effective alternative to direct printing on packaging. Films vary in the demands they impose on silicone adhesion and curing temperature. For the right degree of anchorage to PET film, special adhesion promoters have been developed that can be combined with the DEHESIVE® release system. Special DEHESIVE® release systems have been developed for rapid curing and good adhesion to polypropylene film.

PRESSURE-SENSITIVE-ADHESIVE LABELS – THE MOST COMMON TYPE OF APPLICATION

Applications

Applications for Labels

- Product labels for foodstuffs, beverages, hygiene, cosmetics, and domestic appliances
- Price labels
- Graphic labels for advertising
- Bar code labels for product identification
- Security labels
- Labels for traffic signs
- Decorative labels for the automotive and toy industries
- Smart labels

PSA Tapes

- Carpet fixing & floor edge trims
- Acoustic and anti-vibration tapes
- Flying splices
- Fixing of point-of-sale materials
- Closure systems for envelopes
- Tapes for display screens and other electronic parts

By virtue of their diverse chemical and physical properties, DEHESIVE® release coatings are able to meet all kinds of specifications for coating release liners and films. WACKER continues to further expand its large range of applications through its ongoing research and development.

PSA Labels – High Demands, Total Versatility

The requirements imposed on PSA labels vary considerably with the intended application and the production method. The different sizes and shapes of the labels, along with the different pressure-sensitive-adhesives applied directly to the silicone surface, call for a highly flexible system. Consequently, the demands on the silicone release coating are high.

Silicone Release Coating: The Properties

- Good coverage of the substrate's surface
- Minimal silicone consumption
- No matrix breaks at high die-cutting speeds
- Smooth, pin-hole free surfaces
- Good curing
- No silicone migration
- Custom controlled-release
- Can be easily modified to suit the PSA
- Reproducible release force
- Release values that do not change during storage
- Ease of processing under widely various production temperatures and speeds
- Application and adhesion to different kinds of substrates

High speed and versatility: production of product labels, adhesive tapes and bar code labels.

PSA Tapes – Custom Release Values

There are adhesive tapes to suit every application. The most popular is single-sided, easy-to-tear packaging tape. Additionally, major applications include strong, heat-resistant tape, electrically insulating tape, and double-sided PSA tapes. The properties expected of silicone release coatings are many and varied.

The Properties

- Adjustable release
- Heat resistance
- Easy unwinding of the tape as needed
- Different release force for each side of double-sided tapes

OFTEN INVISIBLE, BUT INDISPENSABLE IN OUR DAILY LIVES

Release coatings used in baby diapers and adhesive bandages

Whether it's adhesive bandages or baby diapers – many areas of our daily lives depend on silicone release coatings: Without them, many everyday applications simply would not work.

Solutions for Medical and Hygiene Applications

There are no limits on the different types of applications in the medical and hygiene sectors. Wherever self-adhesive technology is used, release liners and films are required, such as: Closures for baby and adult diapers, sanitary napkins for feminine hygiene, treatment of wounds (wound closures), adhesive bandages and other surgical and clinical products. Coatings based on DEHESIVE® release systems are FDA and BfR compliant and exhibit excellent release properties.

Indispensable to the Industry

Silicone release liners and films are highly effective wherever self-adhesive heat-insulation or sound and vibration-dampening materials are used to make work easier and faster.

They offer good release properties and the coating is also resistant to environmental influences and large temperature fluctuations. Due to their non-migrating properties, a perfect finish is typically achieved in automotive coating applications.

Peel-and-stick systems save time and work, especially in roofing. They are easy to apply and the adhesive is not dependent upon weather conditions or a specific drying time.

Solutions for Fiber Composites

DEHESIVE® release systems also play an important role in aerospace, automotive construction and wind turbines. The main function of the release liner is as process paper or film, because it delivers absolute product stability even under large temperature fluctuations and prevents the material from sticking during impregnation.

Most double-coated silicone release liners are exposed to extreme processing conditions when used for decorative laminates, for furniture, kitchens and the ski industry. DEHESIVE® release systems offer multiple benefits:

- High heat resistance and constant release action for melamine, epoxy and polyester resins
- Resistance to monomers
- Good leveling properties
- Pore-free surface
- No effect on finishes

Aerospace and wind turbines impose special demands on release systems.

DEHESIVE® RELEASE SYSTEMS – APPLICATIONS AND BENEFITS

Applications			
Labels	**Adhesive tapes**	**Hygiene**	**Foodstuff and Packaging**
• Product labels • Food labels • Price labels • Security labels • Transparent labels • Smart labels	• Packaging • Mounting and bonding • Carpet fixing • Flying splice	• Self-adhesive closures for diapers, sanitary napkins for feminine hygiene, panty inserts • Release coating for adhesive bandages/nonwovens, depilation plasters	• Baking paper • Disposable baking trays • Release coating for packaging adhesive raw materials in cardboard and metal containers • Impregnation of cardboard containers

Benefits			
Labels	**Adhesive tapes**	**Hygiene**	**Foodstuff and Packaging**
• Release values that do not change during storage • Very good controlled release • Full cure at high speeds • Straightforward printing • Excellent leveling properties • Good adhesion • Good slip • Stable release values during matrix stripping • FDA and BfR compliant	• Good release values • High heat resistance • Adjustable release values • Different release force for each side of double-coated tapes	• Excellent release stability • Good release properties for aggressive adhesives • FDA and BfR compliant	• High release power • Baking/waterproof • High shear stability for emulsions • Excellent anchorage • Good wetting • FDA and BfR compliant

Industrial Applications	Graphics Applications	Medicine	Envelopes
• Roof coverings • Pipe and thermal insulation • Vapor barriers • Acoustic, vibrational dampening • PVC/PUR synthetic leather • Printing of delicate textiles, leather and synthetic resin laminates • Fiber composites for wind turbines, leisure industry and aerospace industry	• Advertising films • Advertising on vehicles • Traffic and safety	• Electrodes • Tear-open bags • Surgical covers • Wound dressing	• Envelopes • PSA stamps • Envelope flaps

Industrial Applications	Graphics Applications	Medicine	Envelopes
• High release force for aggressive adhesives • Resistant to environmental influences • No blocking of double-sided coating • No migration • High heat resistance • Impermeable to water vapor • Very good release action • High elasticity • High-definition printing • Resistance to monomers • Good leveling properties • Pin-hole free surface	• Release values that do not change during storage • Reproducible laminating • Reliable laminating, even of large areas • High elasticity	• Excellent release stability • Good release properties for aggressive adhesives • FDA and BfR compliant	• High heat resistance • Good release force • Pin-hole free surface

WHEN EVERYTHING IS POSSIBLE, DEMAND MORE

If a system provides a solution to nearly every demand, how can it be improved? At WACKER, we are working to further optimize costs and processes and to explore new applications. WACKER is studying the performance of solventless systems and studying ways to achieve excellent results with low levels of silicone. Additionally, we combine excellent handling with increasing ecological processing for effective economic and responsible stewardship of resources.


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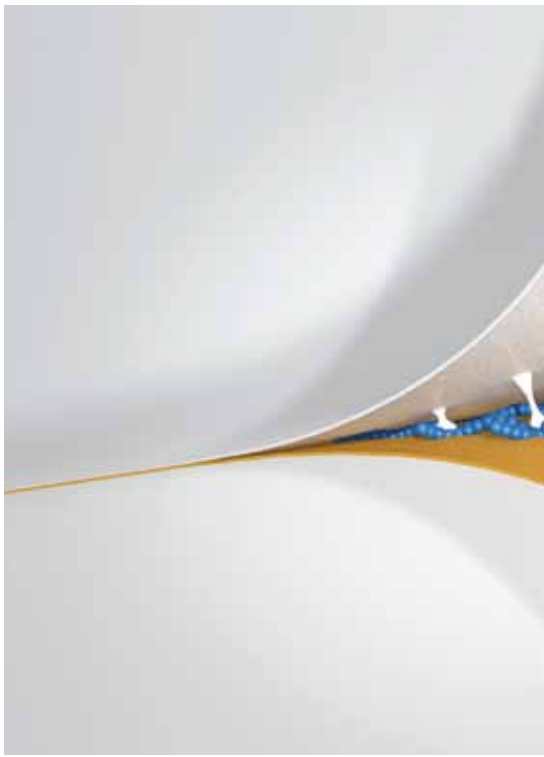
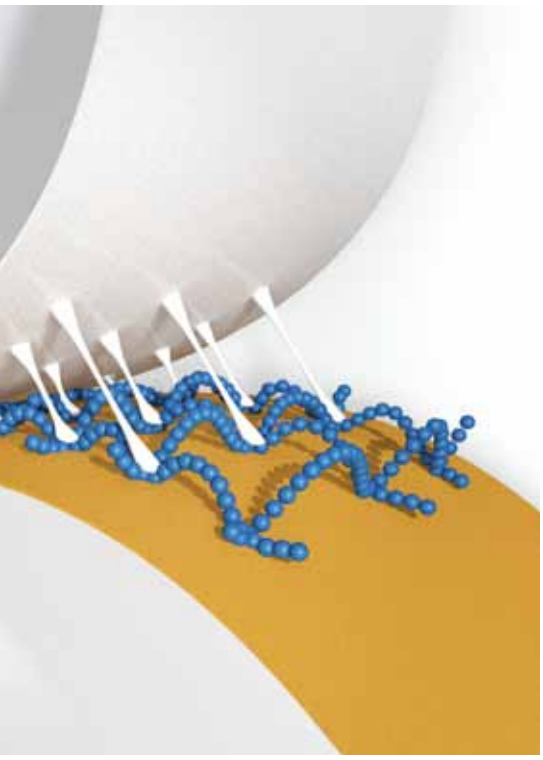
BINATION

DEHESIVE® RELEASE SYSTEMS: FOUR COMPONENTS, THREE PRODUCT GROUPS AND EVERY POSSIBILITY



DEHESIVE® release systems consist of four basic components: polymer, crosslinker, catalyst and controlled-release additive. These components can be combined in a variety of ways to offer customized solutions that meet your needs. This applies to solvent-based and solventless systems as well as emulsions.



Mechanism for removing the adhesive from the silicone release coating – basis of tailor-made solutions.

Polymers

Reactive silicone polymers form the basis of the DEHESIVE® release system. With addition-curing systems, vinyl DEHESIVE® polymers impart the best release properties and rapid curing. Chain length, structure and the number of reactive groups are critical parameters for the properties of the resultant network and thus the release effect and release-force profile. A tight network leads to a lower dependence of release force on the peel-off speed and thus to a flat release force profile.

Crosslinker

Silicone hydride siloxanes serve as crosslinkers, reacting with the DEHESIVE® polymer and the CRA® during curing to yield the release coating. The type and quantity of the crosslinker have a crucial influence on the system's reaction rate, anchorage of the coating to the substrate and the interaction with the adhesive. Consequently, the crosslinker is a key determinant of cost-efficiency in the production and long-term stability of the laminate.

Catalysts

Platinum catalysts are used to increase the reaction rate. WACKER catalysts are highly active platinum complexes which ensure that the DEHESIVE® polymer and crosslinker cure rapidly even at processing temperatures as low as 85 °C. The key to a cost-efficient coating is to match the quantity of platinum to the specified curing conditions.

Release Force Booster – The CRA®

CRA® controlled release additives play a crucial role in the formulation of the four basic components: they determine the specific release force.
You can find out how on the next page.

CONTROL RELEASE VALUES THE WAY YOU WANT – WITH CRA® MODIFIERS

Perfect peeling every time – custom release values add up to even more value.

Certain applications and adhesive systems require higher release forces. With CRA® modifiers, you can tailor every DEHESIVE® system to any requirement.

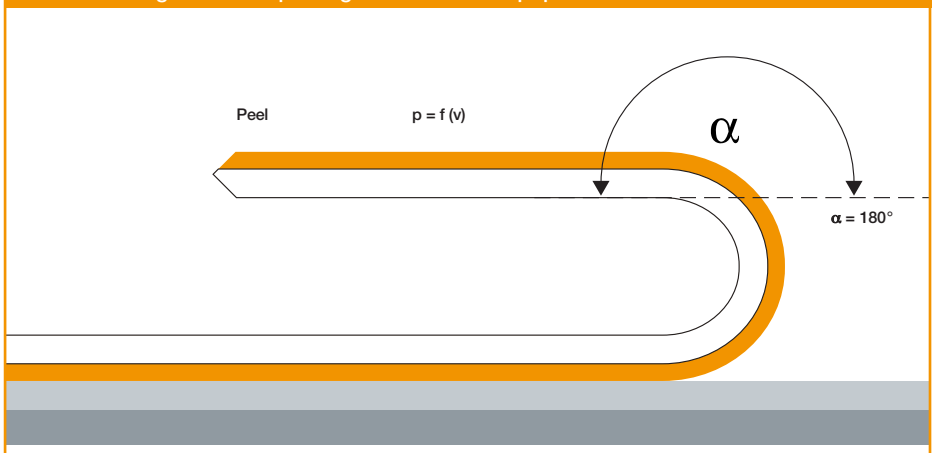
High Release Forces

When it comes to producing adhesive tapes and transfer papers, CRA® modifiers are indispensable. They incorporate specialty silicone resins into the chemical structure of the coating system, where they reduce the flexibility of the silicone chains and thus selectively raise the level of the release force. The desired level of release force is determined by the CRA® grade and its use level. CRA® controlled release additives are particularly adept at raising the release force during slow peeling, but also influence high-speed peeling. High-speed peeling behavior is important for labeling, matrix stripping or rewinding of double-sided adhesive tapes.

Tested Effect

For precise control over the release properties and peel rates, it is essential to test how the CRA® affects the DEHESIVE® system employed. This is because the release behavior of the release liner changes necessarily with the peel rate. At low peel rates, ranging from 0.3 to 3 m/min, the controlled release effect is governed primarily by the type and quantity of added CRA® controlled-release additive and the quantity of crosslinker employed. As the peel rate increases, the network density of the silicone coating and the mechanical properties (hardness, extensibility and modulus of elasticity) of the adhesive increasingly come into play.

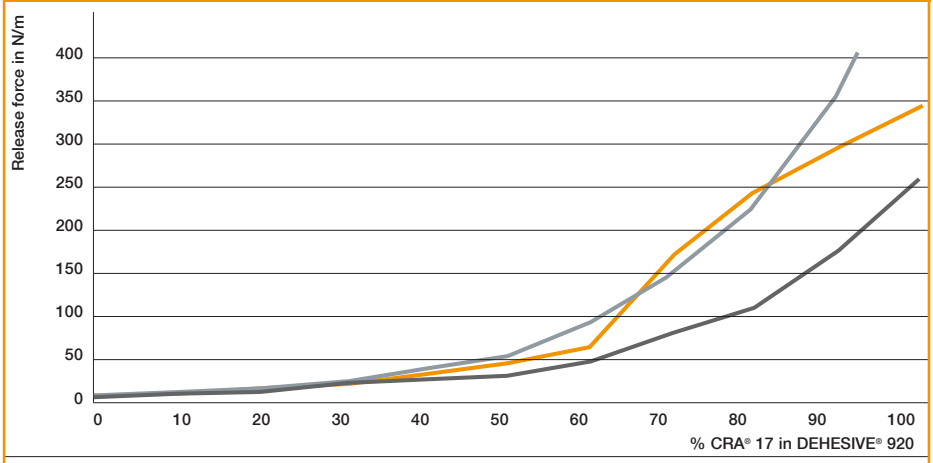
Schematic diagram of the peeling of a siliconized paper from an adhesive



CRA® Modifiers

- Targeted release force gradation
- Very high release values possible
- Release value stable in the long term
- Reproducible release force
- Long pot life
- For all DEHESIVE® systems

Release effect of CRA® 17 in combination with 3 test adhesives blended with DEHESIVE® 920



CRA® 17 with Tesa 7475 CRA® 17 with Tesa 7476 CRA® 17 with Tesa 4154

Peel rate 0.3 m/min Peeling angle 180°

SOLVENTLESS DEHESIVE® SILICONE RELEASE SYSTEMS ARE ECOLOGICALLY AND ECONOMICALLY ADVANTAGEOUS

Outstanding controlled release combined with low volatile organic compounds (VOCs), a low order of toxicity and economical processes are the properties that make solventless systems compelling in many applications over many years.

Better for Mankind and the Environment

And fewer problems with maintenance, ventilation and transport. Processing solventless DEHESIVE® release systems is not only better for minimizing the potential impact on human health and the environment but it is also more economical. Solvent recovery units and treatment equipment are eliminated, thereby providing energy cost savings.

Efficient Processing

Solventless DEHESIVE® release systems not only have the shortest curing time of all heat-curing silicones, they also offer trouble-free processing. The use of CRA® modifiers enables their release values to be matched to all kinds of PSAs. The products' viscosities adapt well to the processing conditions. Low-viscosity products are ideal for high-speed applications. Their good leveling properties are conducive to consistent coverage at low coat weights and to providing low release values. AMA® anti-misting additives ensure that the environment remains clean where high-speed machines are running. Solventless products should preferably, be used in multi-roll application systems or offset-gravure systems.

Solventless DEHESIVE® Silicones	Suitable Substrates
• Ecologically sound	• Paper
• Lower energy costs	• PE-laminated paper
• Economical	• PP paper
• Addition-curing	• BOPP, HDPE, PP, LDPE films
• Extremely fast curing	• Polyester films
• Very good controlled release	
• Excellent anchorage	
• For in-line and off-line processing	

Product labels on foodstuffs must be ecologically sound.

SOLVENT-BASED DEHESIVE® RELEASE SYSTEMS ARE ECONOMICAL

There are many applications in which solvent-based systems are simply irreplaceable, due to their ease of handling, excellent leveling and first-class coating results with low use levels of silicone.

Rapid Addition Curing

Platinum catalysts are used to accelerate the reaction of addition-curing DEHESIVE® systems which can boost curing at temperatures starting at 85 °C. Generally, addition systems cure faster than condensation systems. Good reactivity at low temperatures is particularly important for the processing of films. The coated substrates exhibit a particularly low coefficient of friction. WACKER SILICONES also offers specialty DEHESIVE® products tailored to the requirements of film coating.

Economical Condensation Curing

Since condensation-curing DEHESIVE® silicones will even cure slowly at room temperatures, coating machines can be operated at temperatures as low as 80 °C. Furthermore, they post-cure at room temperature, requiring some time to attain their ultimate release values. Thanks to an anchorage additive, these silicones adhere extremely well to plastic film. The coated substrates exhibit a particularly low coefficient of friction. In general, condensation-curing systems are inert toward catalyst poisons, since the tin catalysts are much more stable than platinum catalysts.

Solventless DEHESIVE® Silicones

Addition-Curing

- Long pot life
- No blocking of double-sided coating
- Glossy surface on films
- Very good results with low silicone consumption
- Coated substrates have low coefficient of friction

Condensation-Curing

- Good anchorage to paper and films
- Robust system
- Coated substrates very low coefficient of friction

Suitable Substrates

- PCK
- PE, PP, PET films
- Metal foils
- PEK film
- Paper

Solvent-based systems are used on films to yield very smooth, glossy surfaces.

DEHESIVE® EMULSIONS ARE UNIQUELY MULTI-FUNCTIONAL

Look – no crumbs: baking papers coated with DEHESIVE® emulsions.

With their specific properties, DEHESIVE® emulsions open up new applications for silicone coating. And switching to this product range is easy.

Compelling Benefits

DEHESIVE® emulsions are processed as addition-curing, two-component or three-component systems. They are ideal for coating open-pored papers or for producing low coat weights. Further advantages include long pot lives, good shear stability, outstanding wetting properties and excellent anchorage to a diverse range of substrates.

Simple Switchover

DEHESIVE® emulsions offer another key advantage: equipment used for solvent-based systems can be easily switched over to emulsion coating.

Concentrated or Diluted

Emulsions can be processed in a highly concentrated form (e.g., 50%) or as a dilution with deionized water. The dilute formulation usually has a silicone content of between 10% and 20%. Since emulsions contain water, they need to be protected against freezing and excessively high storage temperatures. It is recommended to mix thoroughly prior to use. This recommendation is especially pertinent to crosslinking emulsions. Suitable processing systems include simple multi-roll coaters, airbrushes, gravure rolls or size presses in-line with the paper machine and a drying section of adequate length.

DEHESIVE® Emulsions
• Solventless
• Ready-to-use concentration
• May be used in a dilute form
• Rapid curing
• Long pot life
• Good shear stability
• Very good wetting properties
• Excellent anchorage
Suitable Substrates
• Smooth machine papers (baking papers)
• Glassine papers
• Kraft papers
• Polyester films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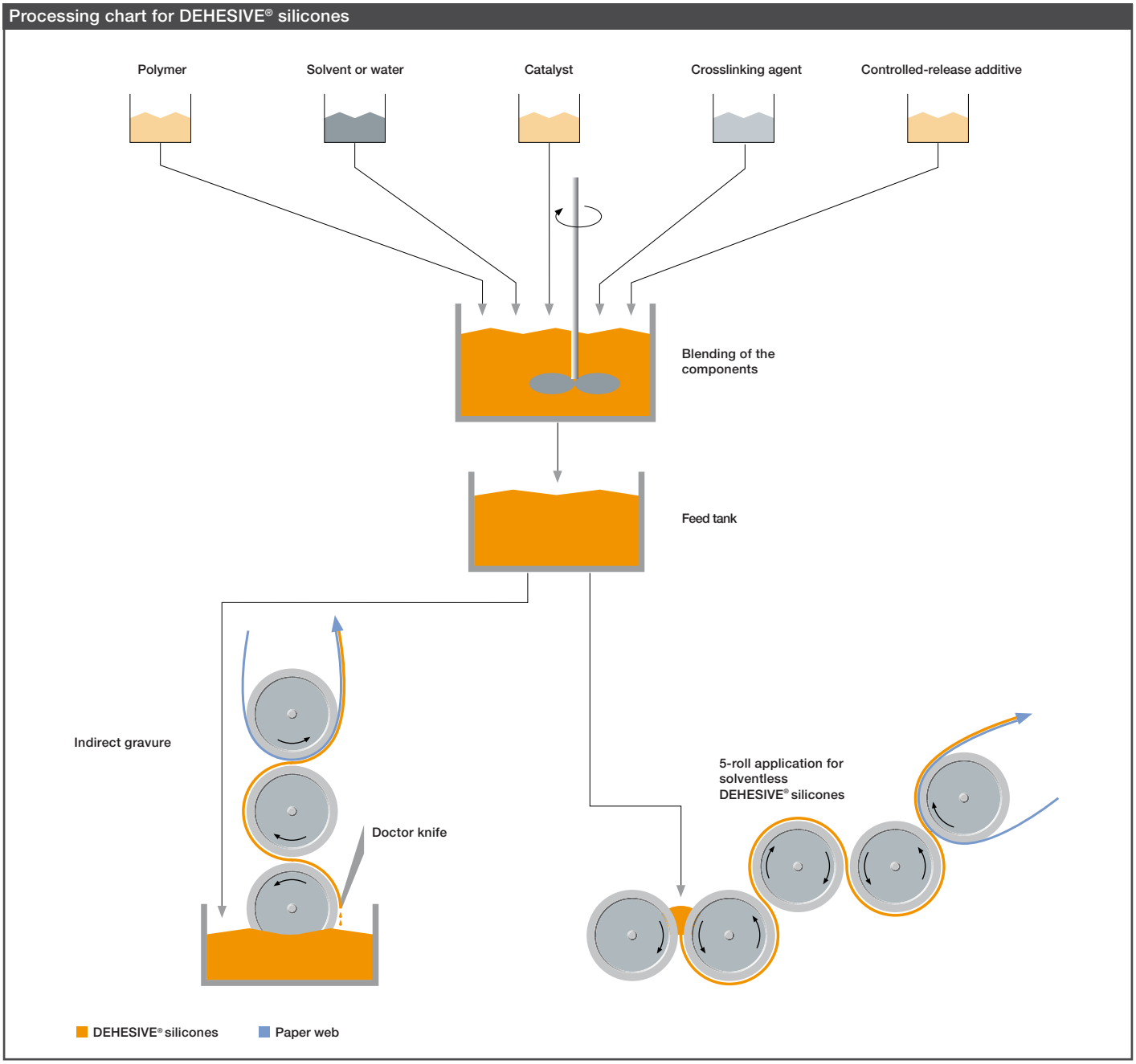
WE ENSURE THAT ONE WHEEL MESHES WITH ANOTHER

Why are WACKER release coatings top performers? Is it based on choosing the right product and adding the right amount of components? Is it the perfect coverage with clean processing? Yes, all these – and much more – are important. With more than 30 years of experience, we pay attention to every step, from the recipe to processing, from product development to how you optimize your machines and equipment in production.

THE EFFECTIVENESS OF A RELEASE COATING ALSO DEPENDS ON THE PROCESS

Processing chart for DEHESIVE® silicones



Whether paper, film or other material – DEHESIVE® silicones will coat a wide range of substrates under a variety of coating methods. Optimum performance at every stage in the process, from selection of the various components through correct dosing and blending, right through to the appropriate choice of coating method, will culminate in excellent results.

Perfect Coverage

The coat weight and thus coverage is a key determinant as to whether the release coating functions properly. The correct coat weight varies with the DEHESIVE® product group, the nature of the substrate and its surface, as well as the coating technology. The following coat weights are generally recommended:

- Solvent-based coating on relatively dense paper surfaces: 0.4–1.0 g/m^2
- Solventless and emulsion coating on relatively dense paper surfaces: 0.8-1.2 g/m^2
- Solvent-based coating on films: 0.3-0.4 g/m^2
- Solventless coating on films: > 0.6 g/m^2

Clean Processing

Certain auxiliaries that might be in paper and film surfaces can interfere with processing and inhibit the platinum catalyst in addition-curing. These auxiliaries need only be present in very small quantities. In such cases, perfect crosslinking of the silicone release layer cannot be guaranteed. WACKER can assist you in the selection of suitable substrates.

The adjacent processing chart for DEHESIVE® release coatings illustrates two types of application:

- 5-roll application
- Indirect gravure

The right rolls help to ensure ideal processing.

Important processing factors

- Choice of product grades
- Metering of the components
- Order of blending
- Careful mixing
- Observing the pot life
- Correct curing temperature
- Application method appropriate to the DEHESIVE® system

WE TEST YOUR PRODUCT UNDER REAL CONDITIONS

Every release coating requires its own solution. Using our pilot coater, we create real conditions to test your products in order to find the perfect solution. We offer a pilot coater service at our sites in Burghausen, Germany and Adrian, Michigan, USA. This service is our way of enabling you to discover which silicone formulation best meets your requirements.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CUSTOM SERVICE. THIS IS WHAT WACKER MEANS BY A ONE-STOP SHOP

Whether you want more efficient processes, innovative coating solutions or higher machine speeds, WACKER SILICONES believes in taking an integrated approach. As a result, our service commitment is to be your valued partner, from idea to selection to product implementation to production workflows, right through to the end product.

Personal Service

Despite the diverse range of applications for paper and film coating available today, the list continues to grow. New product ideas, new functions and new technologies offer fresh challenges to all those involved in the supply chain – from paper, film and machine producers to siliconizers and converters to end customers. When we add in the growing competition caused by increasing globalization, benchmarking becomes essential. WACKER SILICONES acts as a problem-solver for its customers and thus is a valued partner in all phases of complex production processes. We advise you on technical and chemical issues, develop formulations for your specific needs and tailor them to your production conditions. Just as much consideration is given to available coating technology as to further processing as far as the end product. Moreover, we seek to optimize the economics along with the above offerings.

What We Do

Our goal is to provide the best solution for each and every order. We achieve this first of all by becoming better acquainted with your needs and your equipment. This involves looking at the technology being used for coating, studying the substrate and factoring in ecological and health aspects. After these steps, we determine the appropriate DEHESIVE® components and formulate the initial recipe. We do this by identifying the desired release property, the adhesive to be used and the way in which the release liner or film is processed. Important considerations are the peel or dispensing speed in labeling applications or the rewinding speed of double-coated adhesive tapes.

Desired release force? Fully cured? In our laboratories, we attach the same importance to every step of the production process. The pilot coater (picture on the right) coats products under real conditions.

The Pilot Coater

The final adjustments to the formulation are made on our pilot coater. We have the option of coating the substrate with a 5-roll or a gravure system using a selection of optimized recipes. All this is done using your processing conditions, such as coat weight, temperature, speed and time in the oven. We then test the cure, anchorage and coverage of the release liners or films. We provide you with the release force data for the adhesives which you supplied. The release force is determined at pre-defined peel rates and its long-term stability is monitored. You receive a recommendation, based on a scientific data, on how you can use and process the optimized DEHESIVE® release system on your coating equipment.

Technical Support

The more thoroughly a new formulation has been tested for a process, the more smoothly production will take place under operating conditions. WACKER has therefore established numerous technical centers worldwide to offer timely and practical support. Production sites in Burghausen, Germany, and Adrian, Michigan, USA, have up-to-date pilot coater for testing tailored, customer-specific carrier materials. This capability gives you the security of knowing that the coating and substrate will be perfectly matched. Moreover, our technical support extends to all issues including application, processing technology, packaging, inventory and logistics.

EXPERTISE AND SERVICE NETWORK ON FIVE CONTINENTS

• Sales and production sites, plus 20 technical centers, ensure you a local presence worldwide.

WACKER is one of the world's leading and most research-intensive chemical companies, with total sales of €4.63 billion. Products range from silicones, binders and polymer additives for diverse industrial sectors to bio-engineered pharmaceutical actives and hyperpure silicon for semiconductor and solar applications. As a technology leader focusing on sustainability, WACKER promotes products and ideas that offer a high value-added potential to ensure that current and future generations enjoy a better quality of life based on energy efficiency and protection of the climate and environment. Spanning the globe with five business divisions, operating 24 production sites, WACKER is currently active in over 100 countries. The Group maintains subsidiaries and sales offices in 29 countries across Europe, the Americas and Asia – including a solidly established presence in China. With a workforce of 16,300, WACKER sees itself as a reliable innovation partner that develops trailblazing solutions for, and in collaboration with, its customers. WACKER also helps them boost their own success. Our technical centers employ local

specialists who assist customers worldwide in the development of products tailored to regional demands, supporting them during every stage of their complex production processes, if required. WACKER e-solutions are online services provided via our customer portal and as integrated process solutions. Our customers and business partners thus benefit from comprehensive information and reliable service to enable projects and orders to be handled fast, reliably and highly efficiently.

Visit us anywhere, anytime around the world at: **www.wacker.com**

All figures are based on fiscal 2012.

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6188e/05.13 supersedes 6188e/10.07