



**WACKER**

**SILICONES**

**DEHESIVE<sup>®</sup>**

PAPER AND FILM COATING  
DISCOVER A FEW EXTRAORDINARY TALENTS

CREATING TOMORROW'S SOLUTIONS



SPEED, PRECISION AND RELIABILITY  
ARE A CINCH WITH US

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**Success means quick response to customer needs. We are geared to do precisely that. DEHESIVE® silicones optimize the complex processes of coating paper and film. Through innovative coating solutions, flexible service and logistics, we take action. Worldwide.**

### Transparent Interaction

Speed, precision and reliability are recognized benchmarks for measuring coating processes. It is vital these components interact transparently and in harmony. This is precisely where WACKER SILICONES makes a difference. Because we have linked our unique range of DEHESIVE® silicones to process-focused service and support, we can offer you integrated solutions with an optimum combination of quality and economy.

DEHESIVE® silicones feature excellent release properties, outstanding leveling properties, extremely fast curing and especially easy handling. Furthermore, they are designed for flexible formulation so they can be integrated smoothly into

even the most complex coating processes. Whether your application involves high-speed coating, film coating or low-platinum systems – DEHESIVE® silicones are precisely the right solution for enhancing your production efficiency.

### In-Depth Expertise

WACKER SILICONES has developed silicone-based coating systems for more than 30 years. Through its innovative research and comprehensive applied expertise during that time, it has evolved into a global technology leader.

We know the markets, the goals and the technical facilities of our customers, which is why we firmly believe in developing integrated and efficient solutions through the highest levels of partnership, customer service and support.

### Application areas for DEHESIVE® silicones

Release liners for:

- Adhesive labels and pressure-sensitive adhesive tapes
- Food industry
- Medicine and hygiene
- Industrial products
- Automotive industry
- Office requisites
- Construction sector

# IF IT'S INTEGRATED SOLUTIONS YOU WANT, OUR SERVICE SETS THE PACE



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

#### Personal Service

Despite the extremely varied applications for paper and film coating already available today, the list continues to grow. New product ideas, new functions and new technologies keep posing fresh challenges to all those involved in the supply chain - from makers of paper, film and machines 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 is therefore 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. Consideration is given to machine availability, to further processing and right through to the end product. What's more, throughout all this, we seek to optimize the economics.

#### Technical Support

The more thoroughly a solution 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, have ultra-modern pilot coaters for testing tailored, customer-specific carrier solutions. This 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.

#### Global Service and Support

- Personal on-site advice
- Individual formulations
- Optimization of the production processes
- Test runs on pilot coaters
- Appropriate packaging
- High availability
- Short lead times
- Logistics advice
- E-commerce

WHAT MAKES WACKER SILICONES  
SPECIAL IS THEIR COMBINATION OF  
EXCELLENT PROPERTIES



**High-speed coating, all kinds of film coatings, and demanding performance requirements call for release coat formulations that are beyond the ordinary. And that is precisely where DEHESIVE® silicones give you the decisive edge.**

#### **Clear Advantages**

DEHESIVE® silicones are organosilicon compounds that WACKER SILICONES has developed specifically for the production of silicone release liners and release films. Their chemical structure makes them exceptionally good at releasing tacky substances. Substrates properly coated with DEHESIVE® will therefore peel off from the adhesive every time. Furthermore, DEHESIVE® silicones also exhibit excellent leveling during processing, and have the quickest curing available.

#### **Three Product Groups**

DEHESIVE® silicones come in three product groups: solventless systems, solvent-based systems and emulsions. You can rely on obtaining similar performance, high functionality and ease of processing from all three groups. The type of crosslinking mechanism determines whether the systems cure by condensation of hydroxyl groups or by addition of alkenyl groups.

#### **Flexible System**

The DEHESIVE® product range is designed for flexibility of formulation and can therefore be integrated smoothly into even the most complex coating processes. 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. For greater ease of handling, two-component systems are also available. You can adjust the reactivity, crosslinking temperature and production speed to suit your requirements. A critical role is played by the CRA® controlled release additive, which is used for fine-tuning the release value.

#### **DEHESIVE® Product groups**

- Solventless silicones
- Silicone emulsions
- Solvent-based silicones

#### **Benefits**

- Outstanding release properties
- Stable, reproducible release values
- Excellent leveling
- Extremely short crosslinking times
- Flexibility of formulation
- Simple handling

# THE RANGE OF APPLICATIONS CONTINUES TO EXPAND



**DEHESIVE®** silicone systems have the robustness to fill a wide range of release liner coating applications. WACKER continues to expand the large range of commercial applications through its ongoing research and development.

#### **Full-Speed Ahead for Release liners**

Increased output can lead to increased profitability. Our high-speed DEHESIVE® silicones allow custom formulations for coating release liners at production speeds of 1,000 m/min and more, reliably and efficiently. WACKER has the technology to keep mist generated at these high coating speeds to a minimum for increased cleanliness and reduced silicone contamination.

#### **Permanent Anchorage of Film Coats**

Film coating promises enormous market potential. The no-label look of printed clear film labels, for example, presents a cost-effective alternative to direct printing on packaging. DEHESIVE® silicones that have been specially developed for films ensure the right degree of anchorage to PET film, and rapid curing and good adhesion on polypropylene film. The flexibility of this system enables you to adjust the formulation exactly as wished, whether for a low-temperature-curing release coating for heat-sensitive films or for extremely smooth backing materials.

### Flexibility for PSA Labels

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. They include:

- Total ease of processing under a wide range of production temperatures and speeds
- Application and adhesion to different kinds of substrates
- Can be easily modified to suit the PSA
- Custom-controlled release
- Good curing
- Good coverage of the substrate's surface
- Minimal silicone consumption
- No skeleton tearing at high punching speeds
- Smooth, pinhole-free surfaces
- No silicone migration
- Reproducible release force
- Release values that do not change in storage

### Applications

#### Labels

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

#### PSA Tapes

- Carpet-laying
- Installation of acoustic and thermal insulation mats
- Flying splices
- Installation of advertising material
- Bonding of envelopes
- Installation of television tubes and other electronic parts

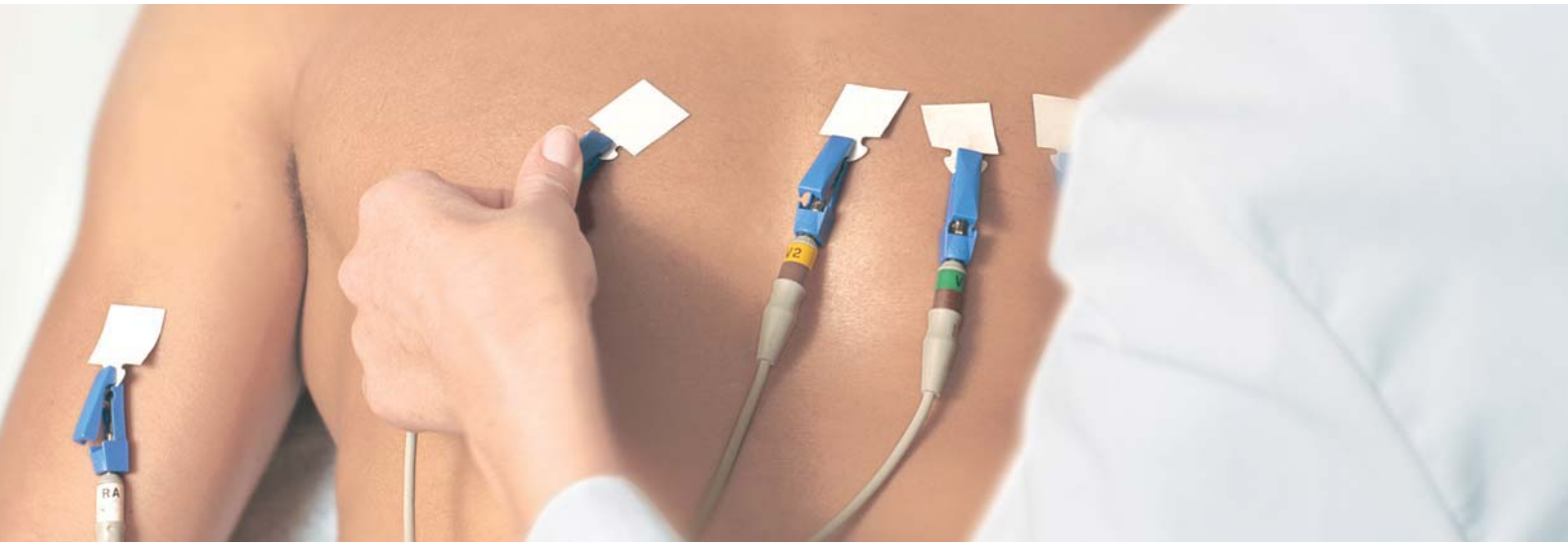
### Custom Release Values for PSA Tapes

The largest PSA tape applications are single-sided, easy-to-tear packaging tape; broad, strong, heat-resistant tape; electrically insulating tape and double-sided tapes. Properties required of the silicone release coatings are:

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

The PSA can be applied to a nonwoven substrate, a fabric or an appropriate film without the need for a support. Substrates commercially coated with silicone include glassine, PE-laminated paper, paper with a dense surface, polyester and polypropylene film.

# OFTEN INVISIBLE, BUT NEVER INDISPENSABLE



**A silicone release coating cannot be seen in baking paper, self-adhesive envelopes or baby diapers, but it is indispensable. Without it, many everyday applications simply would not work.**

## **Convenience for Foodstuffs**

Release coatings containing DEHESIVE® silicones offer many advantages for convenient packaging or preparation of foodstuffs:

- Nonstick properties for baking paper
- Easy release for double-coated wrapping paper for products containing sugar and proteins
- Grease and water resistance for disposable baking trays
- Formulations compliant with BfR and suitable for FDA Food Contact

## **Self-Adhesive Consumer Articles**

Self-adhesive closures are increasingly replacing traditional gum adhesives in applications such as envelopes and backing film. The silicone release liner allows use of adhesives that impart greater bonding power and permit repeated opening and resealing.

Self-adhesive backing film offers protection against wear and damage, corrosion, and mechanical influences and can have decorative functions. The properties expected of the release coating depend upon the application area:

- Reliable bonding, even in the case of large areas
- Good release properties
- Stable release values during a long shelf life
- Easy stretching

## **Simple Handling for Medical and Hygiene Applications**

Self-adhesive products speed up and simplify many medical and hygiene applications. The silicone release liners, PE and PP release films, and nonwovens employed have to be totally reliable, clean and precise. Moreover, the coating must also show variable release properties and excellent release stability with respect to aggressive adhesives, as well as being BfR and FDA compliant.

## Applications

### Consumer Articles

- Envelopes
- PSA stamps
- Jackets
- Backing film
- Decorative film

### Medicine and Hygiene

- Self-adhesive closures for diapers, sanitary towels, panty inserts, incontinence inserts
- Sticking plaster, adhesive soft fleeces and transdermal plasters
- Depilation plasters
- Self-adhesive electrodes for ECG and EEG
- Hermetically sealed tear-open bags for sterile instruments
- Self-adhesive surgical covers

### Insulation

- Vehicle bodywork covers, trunk liners
- Pipe and thermal insulation
- Roof covers
- Vapor barriers

### Cardboard and Metal Containers

The coating employed for packaging adhesive raw materials, such as rubber sheeting and resins, must ensure good release action. Moreover, packaging for adhesives such as bitumen and hot-melts, which are filled at temperatures in excess of 150 °C, must be pore-free and heat resistant. Not only do they offer good release properties, even toward aggressive adhesives such as bitumen, but the coating is also resistant to environmental influences. Some DEHESIVE systems may be sprayed to impart desired release action, e.g. for large container construction.

### Rapid Acoustic and Thermal Insulation

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

### Interleaving Paper for PVC and PUR Synthetic Leather

Since PVC fuses at 180 - 220 °C, the silicone coating of the interleaving paper must have very high heat resistance and be impervious to water vapor so the synthetic leather will not suffer from blistering. The long contact times in the case of PUR synthetic leather call for very good solvent resistance and release action. Since the release liner is usually embossed after siliconization, the silicone film has to be highly elastic and adhere firmly.

### Thermal Transfer Printing Paper

This is used for printing on delicate leather and textiles, is usually absorbent and is only slightly siliconized in order to ensure that the print is of high definition. Even when applied in thin layers, DEHESIVE® silicones meet these requirements.

### Release Coating for Synthetic Resin Laminates

Most double-coated silicone release liners used for decorative laminates for furniture, kitchens and the ski industry are exposed to extreme processing conditions.

DEHESIVE® silicones offer more in every respect:

- 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

# DEHESIVE® SILICONES AND THEIR APPLICATIONS

## Applications

### PSA Labels

- Product labels
- Food labels
- Price labels
- Security labels
- Graphic labels for advertising
- Transparent labels
- Smart labels
- EDP labels

### PSA Tapes

- Packaging
- Mounting
- Carpet bonding
- Flying splice
- Envelopes

### Foodstuffs

- Silicone release liners
- Baking paper
- Disposable baking trays
- Polyester films

### Medicine and Hygiene

- Self-adhesive closures for diapers, sanitary towels, panty inserts, incontinence inserts
- Release coating for: adhesive plasters/ nonwovens, depilation plasters, electrodes, tear-open bags, surgical covers

## Benefits

- Release values that do not change in storage
- Very good controlled release
- Full cure at high speeds
- Straightforward printing
- Excellent leveling properties
- Good adhesion
- Good slip
- Stable release values during matrix peeling
- FDA suitable, BfR compliant

- Good release values
- High heat resistance
- Adjustable release values
- Different release action for each side of double-coated tapes

- High release power
- Baking/waterproof
- High shear stability in the case of emulsions
- Excellent anchorage
- Good wetting
- FDA suitable, BfR compliant

- Excellent release stability
- Good release properties for aggressive adhesives
- FDA suitable, BfR compliant

## Applications

### Construction Sector, Automotive, Industrial Products

- Roof covers
- Pipe and thermal insulation
- Vapor barriers
- Bodywork protection
- Acoustic, vibrational damping
- Insulation

### Consumer Articles

- PSA stamps
- Envelope flaps
- Cover films, book jackets, decorative films

### Release Liners, Thermal Transfer Printing Paper, Synthetic Resin Laminates

- PVC/PUR synthetic leather
- Printing of delicate textiles, leather and synthetic resin laminates
- Decorative release liners (kitchens, furniture, sports equipment)

### Packaging

- Release coating for packaging adhesive raw materials in cardboard and metal containers
- Impregnation of cardboard containers

## Benefits

- High release action for aggressive adhesives
- Resistant to environmental influences
- No blocking of double-sided coatings
- No migration

- Stable release values
- Reproducible bonding
- Reliable bonding, even in the case of large areas
- High elasticity

- High heat resistance
- Impermeable to water vapor
- Very good release action
- High elasticity
- High-definition printing
- Resistance to monomers
- Good leveling properties
- Pore-free surface

- High heat resistance
- Good release action
- Pore-free surface

SOLVENTLESS DEHESIVE® SILICONES  
ARE ECONOMICAL AND CAN ASSIST  
IN MINIMIZING ENVIRONMENTAL AND  
HEALTH CONCERNS



**Outstanding controlled release combined with low volatile organic compounds (VOC), a low order of toxicity and economical application are the properties that have made solventless systems so compelling in so many applications over so many years.**

**Better for Mankind and the Environment**

Where there are no solvents, potential health risks and environmental releases can be minimized and/or controlled and there are fewer problems with maintenance, ventilation and transport. Processing solventless DEHESIVE® silicones is therefore not only better for minimizing the potential impact on human health and the environment but also more economical. Solvent recovery units and treatment equipment are eliminated, therefore energy costs can be saved and neither fresh air nor solvent evaporation is required.

**Efficient Processing**

Solventless DEHESIVE® silicones not only have the shortest curing time of all heat-curing silicones, they also offer trouble-free processing. The use of

Solventless DEHESIVE® Silicones	Suitable Substrates
<ul style="list-style-type: none"> <li>• Lower energy costs</li> <li>• Economical</li> <li>• Addition-curing</li> <li>• Fastest curing of all</li> <li>• Very good controlled release</li> <li>• Excellent anchorage</li> <li>• For in-line and off-line processing</li> </ul>	<ul style="list-style-type: none"> <li>• Paper</li> <li>• PE-laminated paper</li> <li>• PP paper</li> <li>• BOPP, HDPE, PP, LDPE films</li> <li>• Polyester films</li> </ul>

CRA® modifiers enables their release values to be matched to all types 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 coating weights and for providing low release values.

# DEHESIVE® EMULSIONS ARE TRULY PRODUCTS OF MANY TALENTS



With their unique properties, DEHESIVE® emulsions are a new departure in the world of silicone coating.

#### Compelling Benefits

DEHESIVE® emulsions are processed as addition-curing two-component systems. Because they cure quickly in traditional drying ovens, they avoid blocking of double-coated papers. Further advantages include long pot lives, good shear stability, outstanding wetting properties and excellent anchorage to a great many different substrates.

#### Simple Switchover

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

#### DEHESIVE® Emulsions

- Solventless
- Ready-to-use concentration
- May be used diluted
- Rapid curing
- Long pot life
- Good shear stability
- Very good wetting properties
- Excellent anchorage

#### Suitable Substrates

- Smooth machine papers (baking papers)
- Glassine papers
- Kraft, clay-coated kraft papers, polypropylene (PP) and/or polyethylene (PE) coated papers
- PP, PE and polyester (PET) films

#### Concentrated or Diluted

Emulsions can be processed in the highly concentrated 50% delivery form or as a dilution with deionized water. The dilute formulation usually has a silicone content of between 10 and 20%. Suitable processing systems include simple roll coaters, airbrushes, gravure rolls or in-line size presses on the paper machines and drying sections of adequate lengths. Since emulsions contain water, they need to be protected against frost and excessively high storage temperatures. Stir thoroughly prior to processing. This applies especially to crosslinking emulsions.

# SOLVENT-BASED DEHESIVE® SILICONES ARE ECONOMICAL



## Solvent-Based DEHESIVE® Silicones

### Addition-Curing

- Long pot life
- No blocking of double-sided coat
- 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 have low coefficient of friction

### Suitable Substrates

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

**There are many applications in which solvent-based systems are simply irreplaceable. Reasons for this include ease of handling, excellent leveling and first-class coating results from just the smallest amounts of silicone.**

### Rapid Addition-Curing

Generally, addition systems cure faster than condensation systems. Good reactivity at low temperatures is particularly important for the processing of films. WACKER SILICONES also offers specialty DEHESIVE® products tailored to the requirements of film coating. These systems allow the formulation flexibility to increase platinum catalyst levels and thereby boost curing at temperatures as low as 90 °C.

### Economical Condensation-Curing

Since condensation-curing DEHESIVE silicones will even cure slowly at room temperature, coating machines can be operated at temperatures as low as 65 °C. This advantage is especially useful for the coating of low-density polyethylene film.

A low processing temperature is not the only advantage of condensation-curing DEHESIVE® systems. Thanks to an added reaction accelerator, these silicones adhere extremely well to plastic film. In general, condensation-curing systems are inert toward catalyst poisons, since the tin catalysts used are much more stable. It is also unlikely that special chemical components in the substrate will inhibit the catalyst.

# CONTROL RELEASE VALUES THE WAY YOU WANT – WITH CRA<sup>®</sup> MODIFIERS



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

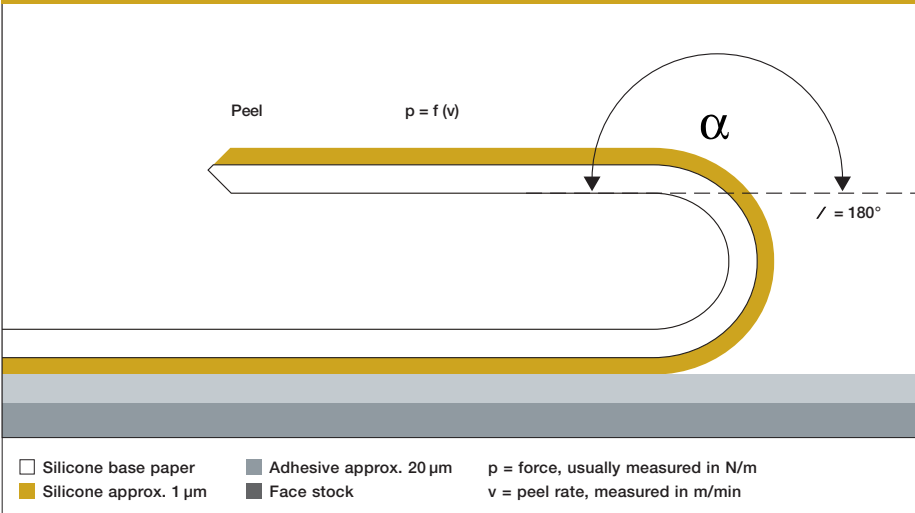
## **High Release Forces**

When it comes to producing adhesive tapes and transfer papers, CRA<sup>®</sup> modifiers are indispensable. They incorporate specialty silicone resins into the chemical structure of the coating system, selectively raise the level of the release force and so make it difficult for the adhesive to peel off. The desired level of release force is determined by the CRA<sup>®</sup> grade, its concentration and the quantity in which it is added. CRA<sup>®</sup> also affects the final application because the release film becomes harder and its elasticity decreases. This changes the peel properties of the release liners, e.g. during labeling, matrix peeling or when adhesive tape is unrolled.

## **Verified Effect**

For precise control over the release properties and peel rates, it is essential to test how the CRA<sup>®</sup> affects the DEHESIVE<sup>®</sup> system employed. This is because the release behavior of the release liner changes with the peel rate. At low peel rates ranging from 0.3 to 3 m/min, the controlled release effect is primarily governed by the interfacial property of the silicone and the adhesive. As the peel rate increases, the mechanical properties of the silicone and adhesive (curing agent, elasticity, elastic modulus) increasingly come into play.

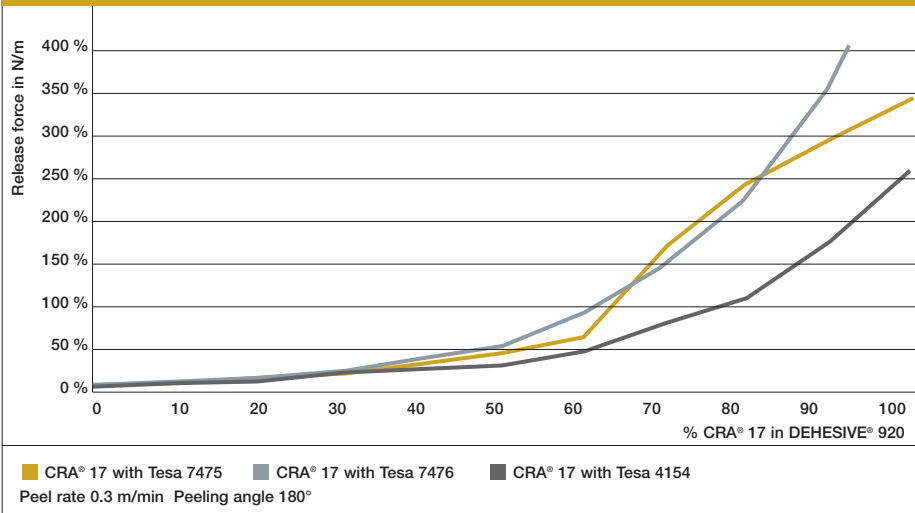
Schematic diagram of the peeling of a siliconized paper from an adhesive



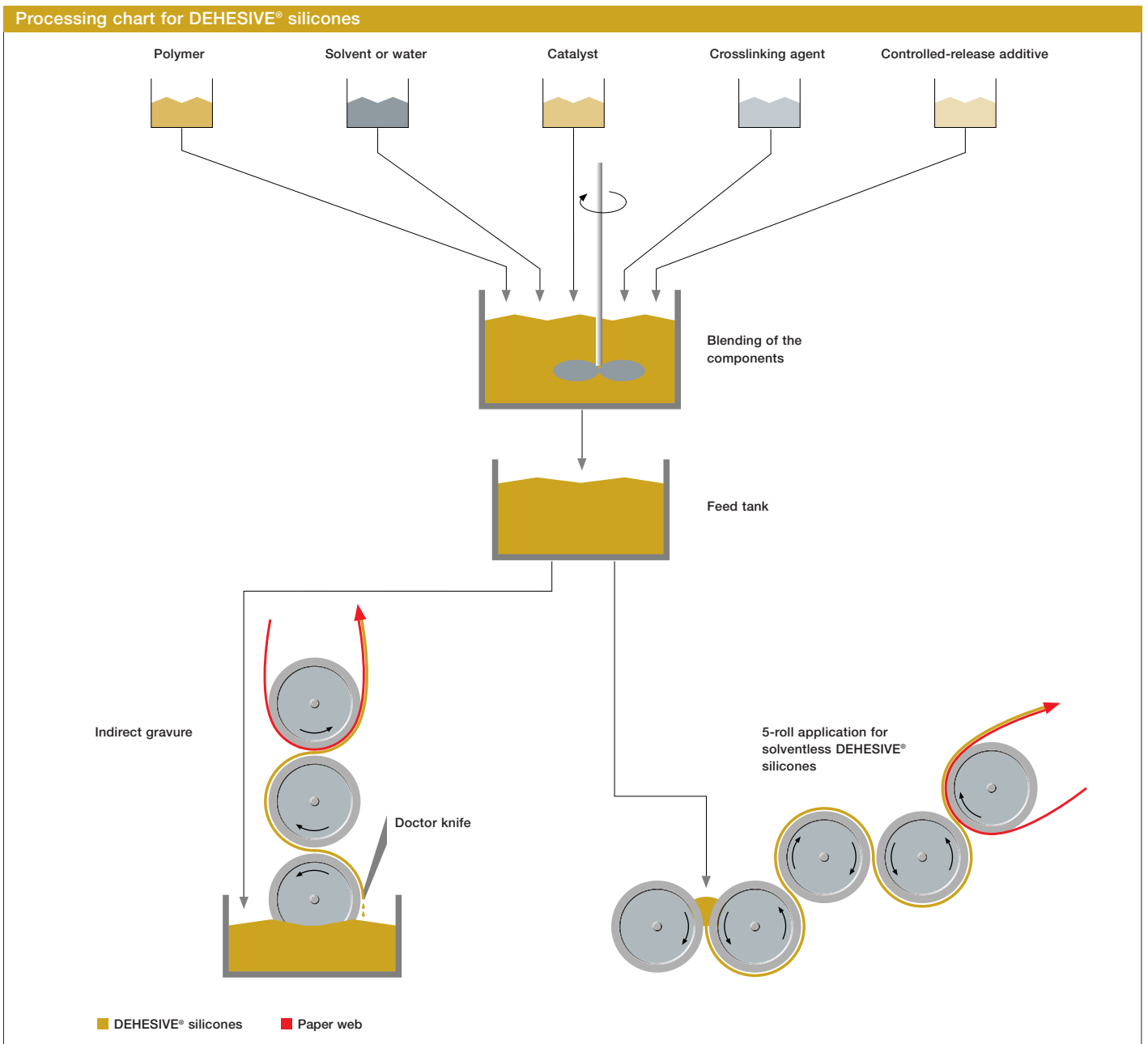
CRA® Modifiers

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

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



# THE EFFECTIVENESS OF A RELEASE COAT DEPENDS ON THE PROCESS



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

#### Correct Metering

Metering is a key determinant of proper release coating function. The correct dose varies with the DEHESIVE® product group, the nature of the substrate and its surface. The following ranges are generally recommended:

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

#### Possible Problems

Certain auxiliaries that might be contained in paper and film surfaces can interfere with processing, and, in addition-curing, inhibit the platinum catalyst. These auxiliaries need only be present in tiny quantities. In such cases, perfect cross-linking of the silicone release layer cannot be guaranteed.

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

- 5-roll application
- Indirect gravure

#### 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

# SPEED AND PRECISION MAKE FOR GREATER ECONOMY



**High-speed coating machines and appropriate coating systems are a must for smooth, economical production processes. DEHESIVE® silicones help you get the most from your coating process.**

## **Pot Life**

The pot life is the length of time during which a mixture of DEHESIVE® base component, crosslinking agent and catalyst is fully workable and will cure perfectly. It starts the moment the components are mixed. If the mixture is stored beyond its pot life, the reaction speed may be affected and gelling problems might occur on the rolls. Certain systems can minimize the occurrence of problems.

## **Temperature and Speed**

DEHESIVE® silicones are processed on coating machines fitted with curing ovens. The production speed varies with the length of the oven, the temperature of the hot air and the reactivity of the silicone.

## **Efficient In-Line Production**

In-line processing is extremely efficient, from siliconizing to adhesive application to lamination. The finished composite can be printed and punched immediately. Addition-curing DEHESIVE® silicones are eminently suitable for this process because they rapidly attain a full cure. They need separate applicator systems and driers for the silicone and the adhesive, as well as a laminating device in the process line.



### **Solventless Systems**

Since these systems entail the dispersion of 1 g or less silicone over one square meter, the applicator system must be extremely precise to avoid vacancies or pinholes in the coating. Paper with varying levels of absorbency cause problems. Two typical application systems are:

Offset gravure

- Indirect gravure
- Diagonal roll rotating in the ready-to-use formulation
- Transfer and metering of the silicone via differences in rotational speeds of rubber roll, gravure roll and substrate

Polishing roll system

- Speeds of 1,000 m/min and more possible
- Alternating arrangement of polishing rolls of steel and rubber or plasma-coated rolls
- Formulation metered into the nip of the first roll pair

### **Processing of Emulsions**

Emulsions can be applied by nearly all types of systems. Sizing presses, kiss-coaters, roll systems with air knives and reverse gravure are the most common. With air knives, the speed must be lower than 150 m/min to apply the silicone evenly.

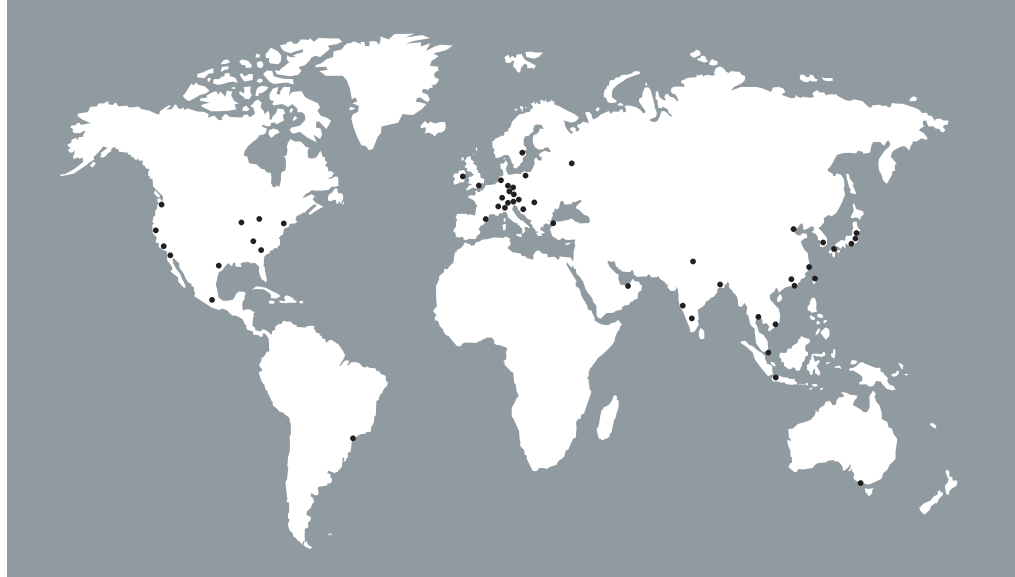
### **Solvent-Based Systems**

These systems may be applied with a Meyer bar, by direct or indirect gravure systems. Because of their solvent content, use of these systems is limited to machines with good ventilation and air circulation, and in which the excess solvent is either incinerated or recovered.

### **Electrical Charging**

Since silicones have a very high surface resistance, they may become statically charged. This cannot be compensated by high air humidity alone; special discharge devices are necessary.

# WACKER AT A GLANCE



## **WACKER**

is a technology leader in the chemical and electrochemical industries, as well as an innovative global partner for its customers in key sectors worldwide. Our portfolio mix focuses on semiconductor technology, silicone chemistry, polymers and fine chemicals, and the production of polysilicon. In line with its fields of specialization, the Group comprises a chemical and a semiconductor segment.

With some 14,700 employees, WACKER generates annual sales of EUR 2.5 billion. Germany accounts for 23 % of sales and Europe (excluding Germany) for 33 %. North America (NAFTA) and Asia-Pacific (incl. ROW) account for 22 % each.

Headquartered in Munich, Germany, WACKER has 20 production sites worldwide and a global sales network of over 100 subsidiaries and sales offices.

With R&D spending in excess of 6 % and capital expenditures at 14 % of sales, WACKER is among the most research-intensive chemical companies worldwide.

## **Siltronic**

is one of the world's leading producers of hyperpure silicon wafers, supplying many major chip manufacturers. Siltronic develops and supplies wafers up to 300 mm in diameter at facilities in Europe, the USA, Asia and Japan. Silicon wafers form the basis of state-of-the-art micro- and nanoelectronics used, for example, in computers, telecommunications, motor vehicles, medical technology, consumer electronics and control systems.

## **WACKER SILICONES**

is a leading supplier of complete silicone-based solutions that comprise products, services and conceptual approaches. As a provider of solutions, the business division helps customers press ahead with innovations, exploit global markets fully, and optimize business processes to reduce overall costs and boost productivity. Silicones are the basis for products offering highly diverse properties for virtually unlimited fields of application, ranging from the automotive, construction, chemical, electrical engineering and electronics industries, through pulp and paper, cosmetics, consumer care and textiles, to mechanical engineering and metal processing.

## **WACKER POLYMERS**

is the global leader for high-quality binders and polymer additives. This business division's activities encompass construction chemicals and functional polymers for lacquers, surface coatings and other industrial applications, as well as basic chemicals, i. e. acetyls. Products such as redispersible powders, dispersions, solid resins, powder binders and surface coating resins from WACKER POLYMERS are used in the construction, automotive,

paper and adhesives industries, as well as by manufacturers of printing inks and industrial coatings.

## **WACKER FINE CHEMICALS**

is an expert in organic synthesis, silane chemistry and biotechnology, providing tailored solutions for its customers in the life sciences and consumer care industries. The range of innovative products includes complex organic intermediates, organosilanes, chiral products, cyclodextrins and amino acids. With its comprehensive expertise, WACKER FINE CHEMICALS is a preferred partner for highly challenging custom-manufacturing projects in the fields of chemistry and biotechnology.

## **WACKER POLYSILICON**

has been producing hyperpure silicon for the semiconductor and photovoltaics industries for over 50 years. As one of the largest global manufacturers of polycrystalline silicon, WACKER POLYSILICON supplies leading wafer and solar-cell manufacturers.

**WACKER**

CREATING TOMORROW'S SOLUTIONS



The data presented in this brochure are in accordance with the present state of our knowledge, but do not absolve the user from carefully checking all supplies immediately upon receipt. We reserve the right to alter product constants within the scope of technical progress or new developments. The information given in this brochure should be checked by preliminary trials because of conditions during processing over which we have no control, especially where other companies' raw materials are also being used. The information provided by us does not absolve the user from the obligation of investigating the possibility of infringement of third parties' rights and, if necessary, clarifying the position. Recommendations for use do not constitute a warranty, either express or implied, of the fitness or suitability of the product for a particular purpose.

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