



Finalist  
„Label Industry  
Global Awards“

# TwinCoat™

Innovative Non-contact Dual Slot Die Applicator



**TW Dynatec®**  
*The Next Level of Technology*

# New Connections. New Thinking. New Bonding Ideas.

## **The challenge.**

Producing a plastic label is a multi-faceted challenge, one that comes with complex considerations and, conventionally, high costs. Using traditional technology, manufacturers must address the unique considerations involved in the continuous process of label printing:

- Printing a film with a special motif, then coating the back with a pressure sensitive adhesive, which is possibly UV-crosslinked.
- Covering the adhesive with a release liner.
- Punching the label contour in the film, then removing the matrix.
- Cutting the release liner that hold the punched out labels and winding up that liner.

The amount of adhesive on the label is always about 20g/m<sup>2</sup>, regardless whether the film or the release liner was coated with adhesive or a label stock is used.

Materials create a whole different challenge. Some materials are difficult to glue, and some labels will be exposed to fluctuating environmental stresses, such as labels for shampoo bottles in showers (wet/dry, hot/cold). Those conditions demand higher performance and therefore more price intensive adhesives, further increasing costs. Additionally, the conventional process, because it can only use one adhesive type, demands that the higher-performance (and higher-cost) adhesive be used not just on the high-stress part of the application, but also in the filler layer, which simply creates volume to compensate for irregularities in the materials being bonded.

Throughout this process, manufacturers are limited to one high-cost adhesive to solve manufacturing challenges, which increases costs and diminishes profit margins. Until now, no technology existed to remedy those manufacturing challenges or to combat rising costs.

## **The solution.**

The new patent-pending TwinCoat, a non-contact metered slot die applicator, addresses these challenges and the entire label printing process by offering manufacturers a greater range of capabilities and options. TwinCoat not only has the ability to split the required amount of adhesive into two layers that have different characteristics, but also to apply them simultaneously on a substrate. The benefits are clear: Two layers combined in one, requiring one applicator and only one production step. TwinCoat accomplishes all of this with highly transparent and streak-free results.

## **The Benefits.**

### **• Reduced production time and costs.**

For the first time in history, the new TwinCoat Technology offers the possibility of creating films with dual characteristics, by splitting the required amount of adhesive into two layers. The first layer could work as a filler (75%) for example, while the second layer does the actual bonding (25%). Compared to the adhesive in the second layer, which has partly to stick on difficult packaging surfaces, the adhesive of the filling layer requires significantly lower quality. That benefit is clear: no longer does the manufacturer have to use 100 percent of the higher-quality, higher cost adhesive, but only 25 percent, all without sacrificing bond quality.

- **Improved product quality.**

Conventional technology simply allowed manufacturers a “good enough” compromise. Using traditional application equipment means using an adhesive with no right and left side: both sides are identical and thus also equal in their properties. TwinCoat allows manufacturers to differentiate the products from competitors because it allows dual optimal bonding. The adhesive film is now double-ply, creating a significant increase in bond strength because each layer is matched optimally to the material to which it is bonded.

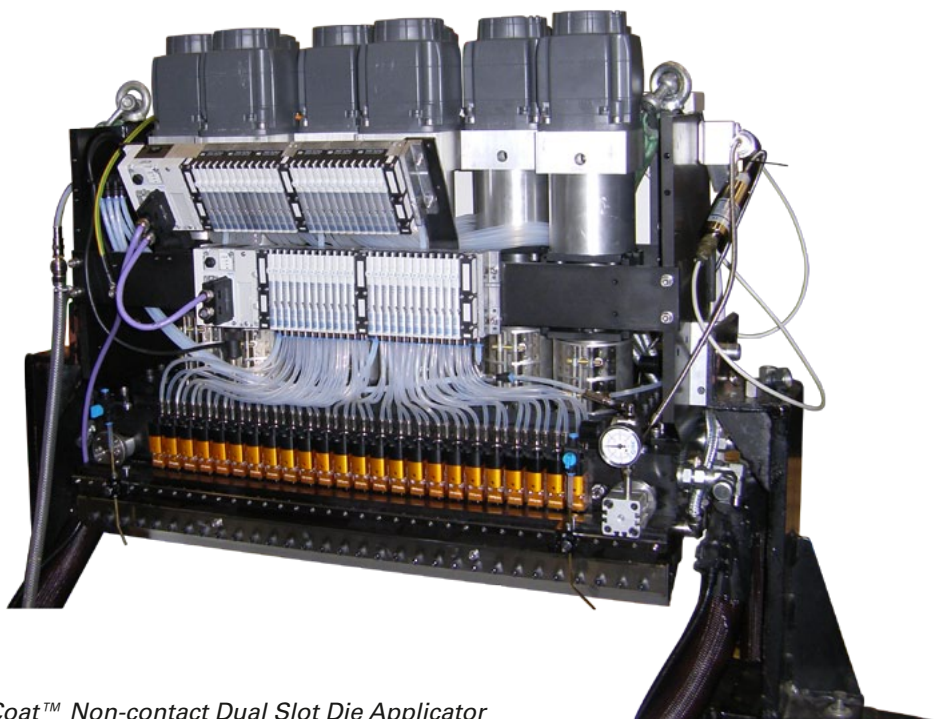
- **Compliance with environmental specifications.**

Environmental benefit is another area where TwinCoat excels. Conventionally equipment glues two products together, which inevitably creates a certain mixing of materials that can lead to an undesirable degree of contamination and loss of reuse potential in the recycling process. TwinCoat counteracts this by applying of two perfectly matched adhesives, creating varietal purity. If appropriately formulated, a mono-material separation of the material connections, possibly by ultrasonic sound, is conceivable. This separation could be achieved in the interface of the adhesives or the material, extensively simplifying the separation process.

- **Fast changeover, reduced downtime, increased productivity.**

TwinCoat’s immediate benefits are obvious: putting adhesive films on top of or next to each other, increasing product quality and decreasing product costs. But a different use of the TwinCoat is also conceivable. As already described, the two different adhesives can also be applied in succession. Conventionally, an adhesive change requires a costly, line-stopping system changeover. This is almost completely eliminated with the use of TwinCoat. If a production cycle completed, it can be quickly and easily switched from adhesive Type A to adhesive Type B. After a brief rinse of the nozzle lip by adhesive Type B, the system can go back into operation immediately. The entire changeover process takes no more than 1-2 minutes, delivering a drastic reduction in downtime and a significant increase in productivity. Additionally, TwinCoat system cleaning uses 90% less adhesive, delivering a further reduction in production costs.

*It's time for label production to change, for manufacturers to have options that increase quality and decrease costs. TwinCoat is making that change a reality. TwinCoat addresses the challenges manufacturers have faced for decades, along with new challenges – such as sustainability regulations – that will only increase in future decades. That means manufacturers can turn their attention to creating their own new product innovations, setting their products apart from the competition and expanding their advantage.*



TwinCoat™ Non-contact Dual Slot Die Applicator

## Application capabilities | TwinCoat

The listed applications from the Label Industry are just exemplary possibilities for the use of TwinCoat and the potential of this technology. By the unique concept of the TwinCoat, to apply two layers of adhesive with different characteristics, on top of or next to each other, results a variety of combination possibilities and thus gives the user the latitude to develop a wide variety of new product ideas. Following just a few more examples of other possible combinations.

Examples for possible combinations of different types of adhesives among themselves and with each other:	
Thick	Thin
Equal	Equal
Organic	Non-Organic
Tacky	Non-tacky
Formulated	Non-Formulated
Reactive	Non-Reactive
Colored	Transparent
With formulated additive	With non-formulated additive
High softening point	Low softening point
Same chemical basis for substrate	Different chemical basis for substrate
With stripes	Full covered
And others...	And others...

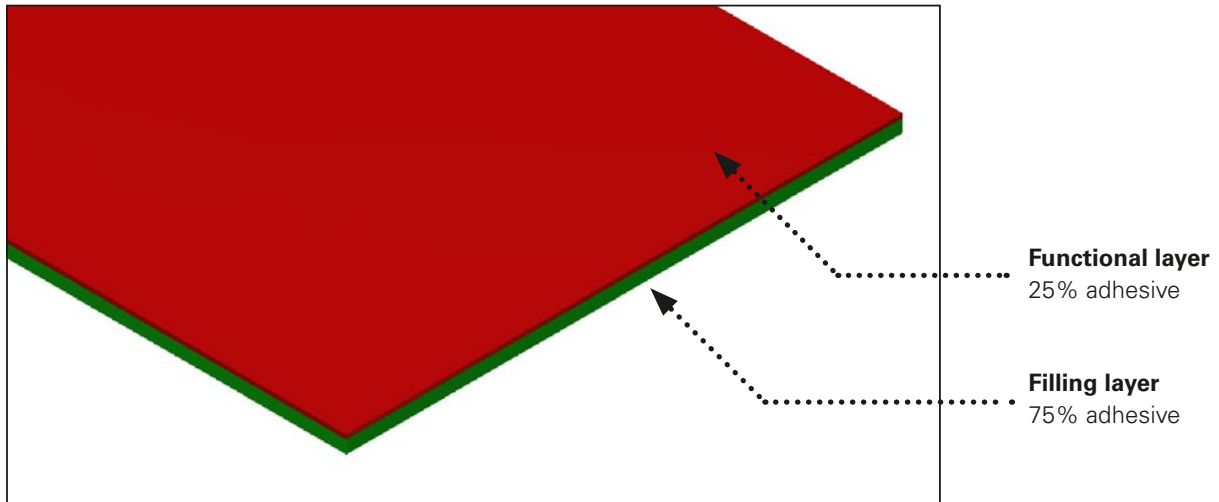
Applications with TwinCoat always consist of a „Two-layer“ adhesive film. Both layers can have individual and independent properties depending on the product specification.

### Application Examples:

Application	Example for products	Explanation
Combination of thin tacky with thick non-tacky	Upper foil, reclosable	The thin non-tacky adhesive layer is used to seal the thermoformed tray. The thick tacky adhesive layer breaks when the package is opened (cohesive failure) and this is used for the re-closure.
Combination of thin formulated with thick non-formulated	No-Label-look labels	The unformulated thick adhesive layer (filler layer) is used for the compensation of irregularities in the surface of the material. The thin formulated adhesive layer (functional layer) ensures the quality of the bond.
Combination of 2 adhesives of the same kind	Double-sided-tape	Standard double side adhesive tapes have a support in the middle and are normally made in two steps. Using the TwinCoate a carrier is no longer necessary as an intermediate layer. These two different products can be processed in one operation with a special formulated adhesive. i.e. carpet on screed.

## Typical TwinCoat Sample | Full Coating

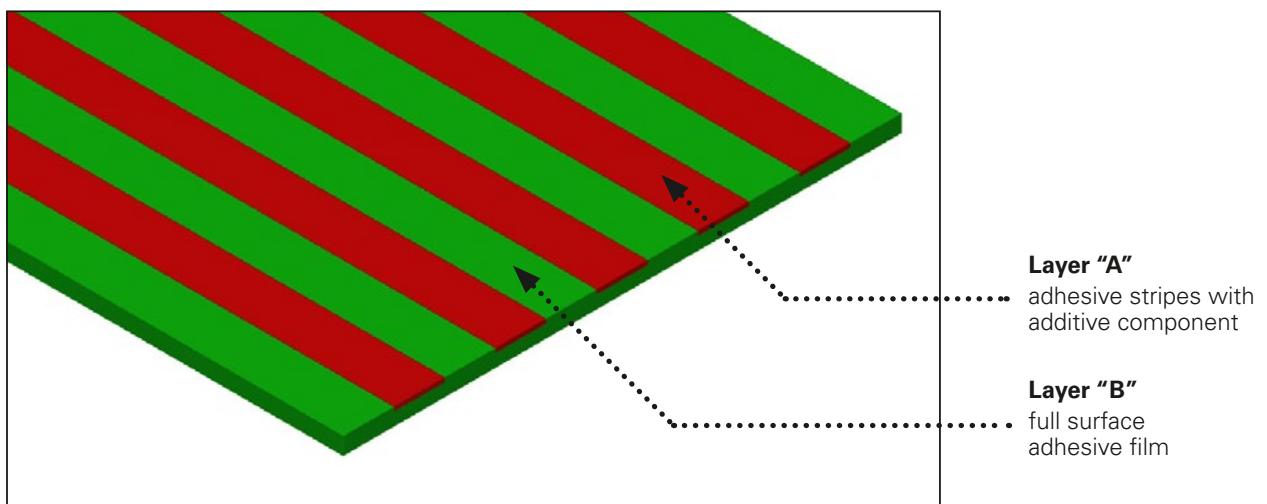
This exemplary pattern shows two superimposed adhesives, which are different in their thickness and function. Green here could be, for example, a low-cost adhesive (filler). The red thinner layer is a high-quality adhesive that adheres well on difficult surfaces (functional layer). The total layer thickness would be in the ratio 75 to 25% in this case. In another application green could be the functional layer and a type of or an active ingredient incorporated in red layer. Many other possibilities are also conceivable.



## Typical TwinCoat Sample | Stripe Coating

This sample shows a full surface adhesive film in which a second adhesive is lamellar embedded. The number of strips as well as the width and height can be suit individually according to the particular task. For example, the strips could have different adhesion. Another possibility would be the invisible mark of the label for unambiguous recognition.

This could be accomplished by the application of an adhesive stripe added with an additive component (e. g. optical brightener), which is embedded invisibly in the first adhesive layer. In the case of need, it could then be visualized by black light. The label can thus be clearly identified. Again, many other functions are conceivable.



## Reduced Production Costs | Calculation Example\*

This high-level example shows that, in comparison to a conventional coating, with only one expensive adhesive, by applying two different adhesives in different layer thicknesses and different purchasing prices, significant savings are possible.

Conventional System	
Application width	670 mm
Application weight	20 gsm
Production speed	100 m/min
Operating time	8 h
Glue consumption	643.2 kg
Adhesive cost	€ 6.50/kg
<b>Total adhesive cost / 8h</b>	<b>€ 4,180.80</b>

TwinCoat™ System	
Application width	670 mm
Application weight Type 1	5 gsm
Application weight Type 2	15 gsm
Production speed	100 m/min
Operating time	8 h
Glue consumption Type 1	160.8 kg
Glue consumption Type 2	482.4 kg
Adhesive cost Type 1	€ 6.50/kg
Adhesive cost Type 2	€ 5.00/kg
Adhesive cost Type 1 / 8h	€ 1,045.20
Adhesive cost Type 2 / 8h	€ 2,412.00
<b>Total adhesive cost / 8h</b>	<b>€ 3,457.20</b>
<b>Adhesive cost savings / 8h</b>	<b>€ 723.60 (17.3 %)</b>

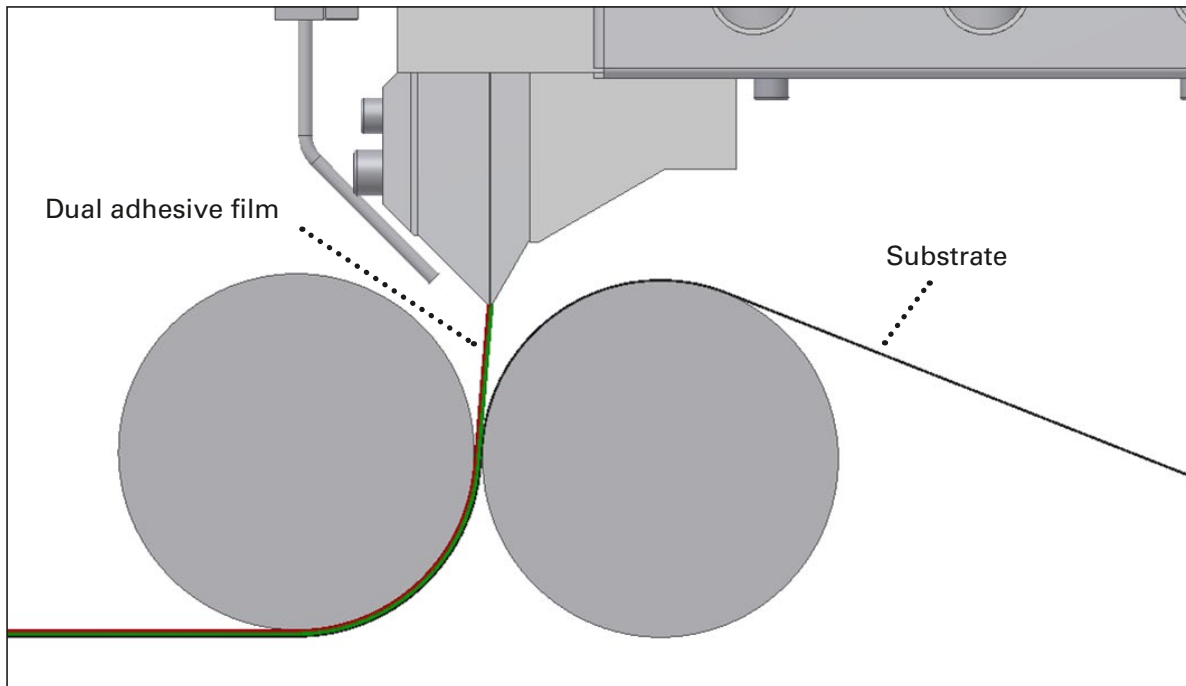
\*actual savings may vary based on many variables such as adhesive, viscosity, line speeds, etc.



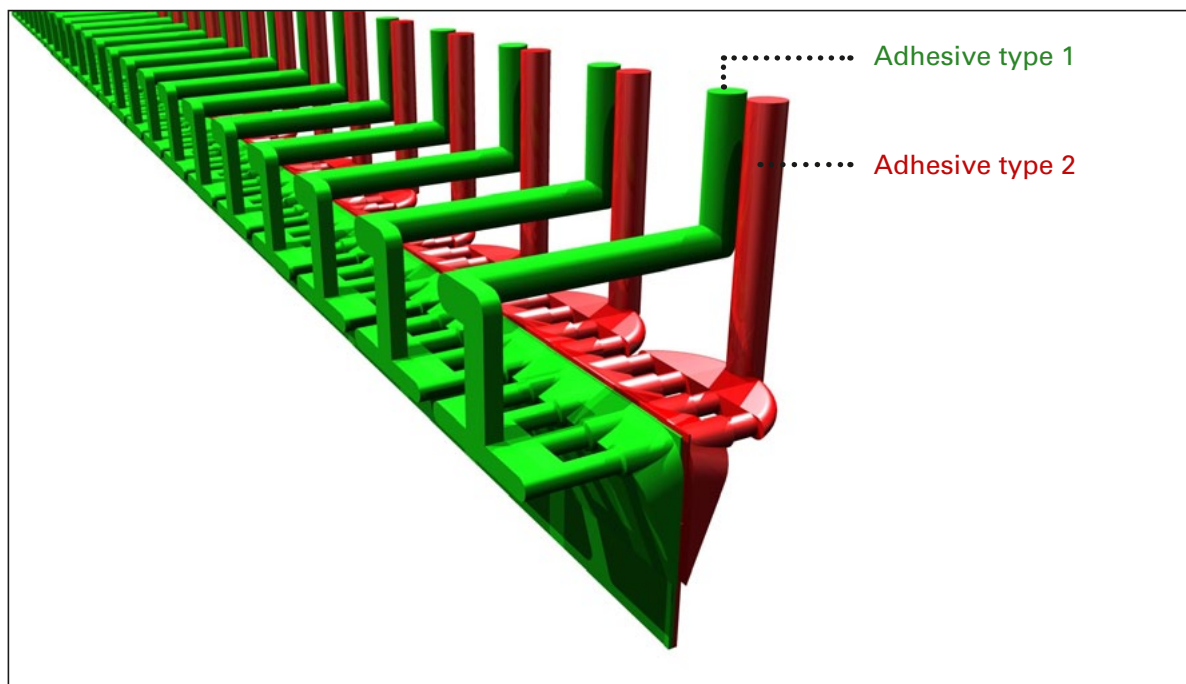
Non-Contact Film Extrusion



## The TwinCoat Principle



## The Adhesive Flow



ITW Dynatec, a division of Illinois Tool Works, Inc. (ITW) designs and manufactures a full range of industrial adhesive applications for the disposable hygiene products, coating and laminating and packaging industries worldwide. ITW Dynatec's fluid dispensing systems are used globally in the manufacturing of a wide range of customer and industrial products.

A worldwide network of industry-leading customer service and support backs the company's state-of-the-art technology. ITW Dynatec operates five world-class production facilities strategically located around the globe. For more information, please visit [www.itwdynatec.com](http://www.itwdynatec.com)

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