

# Waxes

Paper, Packaging & Adhesives

# Paper & Packaging

Paper and paper board are superior materials for packaging applications - they are more resilient and economically viable than glass, plastics or metal. However, they exhibit only limited barrier properties for moisture, water, gases and odour. To enhance these properties paper products can be coated with waxes or laminated to plastic films or foils. Hywax is able to offer a wide range of paraffin, microcrystalline and Fischer-Tropsch waxes suited to impregnate, laminate or coat different paper stocks. Our wax coatings for food packaging conform to the rules and regulations set out by both the „Bundesinstitut für Risikobewertung“ (BfR) and the Food and Drug Administration (FDA).

## HydroWax emulsion

HydroWax emulsions are finely dispersed wax particles in water with a mean diameter of only a few microns. The products are commonly used for paper sizing. Internal sizing is performed by adding the emulsion directly to the stock at the wet end of the paper machine. This results in enhanced paper properties such as increased wet strength and a decreased propensity to linting. In many cases internal sizing with wax emulsions increases the efficiency of a following size press application.

|              | Water Content [%] | Viscosity typical [mPa*s] | pH  | Emulsifier |
|--------------|-------------------|---------------------------|-----|------------|
| HYDROWAX 215 | 52 - 56           | 500                       | 7.0 | Anionic    |
| HYDROWAX RV  | 48 - 52           | 1000                      | 7.0 | Anionic    |
| HYDROWAX 46  | 38 - 42           | 300                       | 7.5 | Cationic   |

## Coating waxes for flexible packaging

A variety of waxes can be offered for food packaging applications like papers for creams, meat and fruits or wrappers for candies and sweets as well as for various technical applications. They are usually made from fully refined paraffin or microcrystalline waxes as well as mixtures thereof. Paper coated with these waxes show enhanced barrier properties against moisture and odour. Additionally, due to the low viscosity of the waxes, low coating weights can be achieved.

|            | Congealing Point °C | Penetration at 25 °C [1/10 mm] | Oil Content [%] |
|------------|---------------------|--------------------------------|-----------------|
| HYWAX 4110 | 60 - 62             | 13 - 16                        | 0 - 0.5         |
| HYWAX 4610 | 46 - 49             | 40 - 80                        | 0 - 2           |
| HYWAX 5603 | 56 - 58             | 15 - 19                        | 0 - 0.5         |
| HYWAX 5803 | 58 - 60             | 15 - 19                        | 0 - 0.5         |
| HYWAX 6403 | 62 - 66             | 16 - 22                        | 0 - 0.5         |

Hywax is able to offer a wide range of waxes suited to impregnate, laminate or coat different paper stocks.

## Technical Data

### Coating waxes for more gloss and improved barrier properties

Bespoke properties can be obtained depending on the selection of the wax blends. These blends exhibit exceptional barrier properties against water odour and fat, increased abrasion resistance and feature an enhanced glossy appearance. Depending on the formulation, abrasion resistance and viscosity can be adjusted individually. Gloss waxes are mainly used for edibles like sweets, candy, meat, sandwich and vegetables as well as dairy products like cheese. Other papers may also be upgraded in function and design.

|            | Congealing Point [°C] | Penetration at 25 °C [1/10 mm] | Viscosity at 100 °C [mm <sup>2</sup> /s] |
|------------|-----------------------|--------------------------------|--|
| HYWAX 7579 | 70 - 80               | 11 - 13                        | 40 - 50                                  |
| HYWAX 7853 | 75 - 85               | 8 - 14                         | 110 - 130                                |
| HYWAX 7855 | 75 - 85               | 8 - 12                         | 200 - 220                                |

### Coating waxes for gloss and sealing abilities

Coatings manufactured with these waxes exhibit higher strength and hence abrasion resistance as well as an improved gloss impression. These special formulations are based on waxes and a variety of different additives. They are used to coat all different kinds of paper and board, which are used for a variety of packaging applications like bread wrappers, ice cream cones and chewing gum. Paper and coated board with higher basis weights are key raw materials for the manufacture of disposable plates and soap wrappers as well as packaging for frozen food. In addition to the improved barrier property here the wax acts as a release agent.

|            |         |         |           |
|------------|---------|---------|-----------|
| HYWAX 1276 | 64 - 68 | 8 - 13  | 600 - 700 |
| HYWAX 5870 | 60 - 70 | 10 - 20 | 105 - 115 |
| HYWAX 5883 | 64 - 66 | 12 - 15 | 58 - 63   |
| HYWAX 7513 | 85 - 95 | 5 - 15  | 500 - 600 |

### Laminating waxes

Hywax laminating waxes are used to bond different substrates to each other to form a composite material. These composites used in packaging applications exhibit superior barrier properties against moisture and fatty materials. Base materials for these laminates are typically paper, aluminium and plastic foils as well as parchment and parchment substitutes. Hywax laminating waxes are tailor made for different base materials and can be used for inductive cap sealing. The final products are used for butter, margarine, cheese, yeast, bullion cubes, chocolate and many more.

|            |         |         |         |
|------------|---------|---------|---------|
| HYWAX 6908 | 65 - 72 | 30 - 45 | 15 - 25 |
| HYWAX 6909 | 65 - 75 | 30 - 45 | 33 - 43 |

# Adhesives

## Hot Melt Adhesives

Hot Melt Adhesives have numerous advantages over the solvent-based adhesives. The lack of solvent in HMAs leads to dramatic decrease in volatile components during application. Moreover, since the adhesive material does not have to be dissolved in a solvent, redundant transportation costs or storage problems are prevented. However, HMAs are also known with some inherent limitations.

They are sensitive to temperature; softening and failure takes place at elevated temperatures and at low temperatures HMA becomes brittle.

HMA formulations are based on three main components named as base polymer, wax and tackifier. In general, the base polymer increases the viscosity during application and provides cohesive strength to the adhesive while the tackifier improves tacking to the substrate. The wax is used to control formulation viscosity (during processing and upon application), provide heat resistance to the HMA, and to regulate open time and setting time. The type of each component as well as their relative amounts in the formulations can significantly influence the HMA properties and the application area of the adhesive. Generally, the wax can take up to 1/3rd of the total HMA formulation. Various types of waxes can be considered for HMA application

## FISCHER TROPSCH WAXES

|            | Congealing Point [°C] | Penetration at 25 °C [1/10 mm] | Viscosity at 135 °C [mm <sup>2</sup> /s] |
|------------|-----------------------|--------------------------------|--|
| HYWAX 2710 | 98 - 102              | < 1                            | 7 - 14                                   |
| HYWAX 2720 | 98 - 102              | < 1                            | 7 - 14                                   |
| HYWAX 2780 | 75 - 85               | 8 - 14                         | -  |
| HYWAX 2781 | 75 - 85               | 8 - 14                         | -  |
| HYWAX 2782 | 72 - 80               | 10 - 16                        | -  |

## PARAFFIN WAXES

|            | Congealing Point [°C] | Penetration at 25 °C [1/10 mm] | Oil Content [%] |
|------------|-----------------------|--------------------------------|-----------------|
| HYWAX 4117 | 59 - 62               | 13 - 16                        | < 0.5           |
| HYWAX 5203 | 52 - 54               | 16 - 20                        | < 0.5           |
| HYWAX 5403 | 54 - 56               | 16 - 20                        | < 0.5           |
| HYWAX 5603 | 56 - 58               | 15 - 19                        | < 0.5           |
| HYWAX 5803 | 58 - 60               | 15 - 19                        | < 0.5           |
| HYWAX 6705 | 62 - 66               | 16 - 22                        | < 0.5           |

## MICROCRYSTALLINE WAXES

|            | Congealing Point [°C] | Penetration at 25 °C [1/10 mm] | Oil Content [%] |
|------------|-----------------------|--------------------------------|-----------------|
| HYWAX 1800 | 70 - 80               | 18 - 22                        | < 2             |
| HYWAX 2528 | 70 - 75               | 25 - 35                        | < 4             |
| HYWAX 3971 | 70 - 75               | 25 - 33                        | < 2             |

# Hywax GmbH

Worthdamm 13-27  
20457 Hamburg, Germany



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