

Make the most of your finishing options

As we said before, paperboard is a forgiving base material. This becomes particularly obvious when it comes to the finishing operations. Below the strong, smooth and white surface you find all the strengths you need to carry out the most demanding applications. Whether you just add a varnish to highlight the graphic presentation or you produce the most advanced designs in multi-step processes, you can rely on getting excellent results.

In post-press finishing you will discover how well the substrate performs in practice when it comes to runnability and cost effectiveness in the different processes. The multi-ply construction and surface characteristics of our paperboard products facilitate a wide range of finishing options. We describe the runnability aspects in conjunction with the different sections in this chapter.

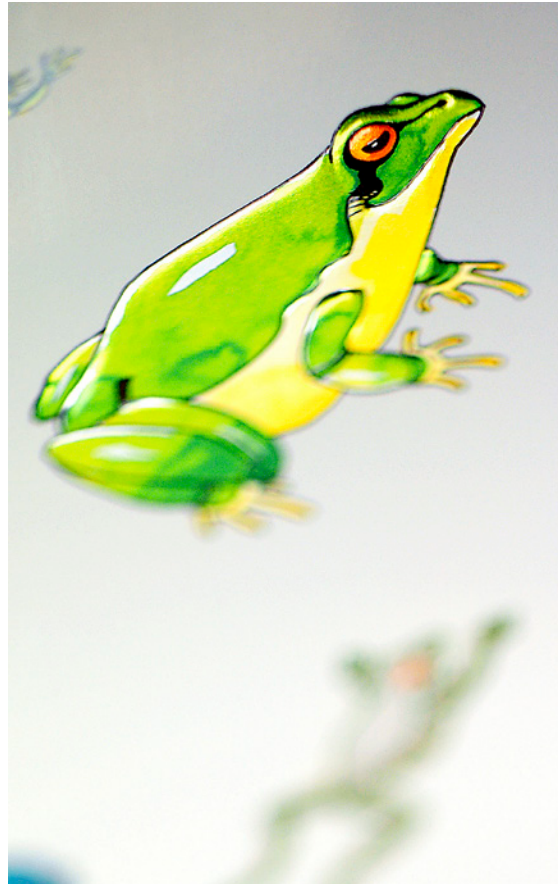
Finishing techniques place different demands on the substrate. The following paperboard features allow you to make the most of your finishing options.

Strength and toughness are measurable as tensile strength, tearing resistance, delamination strength and compression strength. These properties are vital for achieving intricate designs such as embossing and complex structural shapes.

Creasing and folding abilities depend on a complex combination of factors such as tensile strength, compression strength, delamination strength, bending resistance, flatness, and dimensional stability. These factors are vital for the paperboard's ability to "forgive" the permanent deformation of deep and narrow creases and to retain the intended shape of folds.

Flatness and dimensional stability are vital for achieving excellent results in the finishing operations. The choice and composition of raw materials combined with carefully controlled manufacturing processes result in a paperboard that retains its flatness and dimensional stability throughout all operations. However, since paperboard is a hygroscopic material, it should not be exposed to conditions that affect its moisture content. Please refer to the chapter "Handling" for information on how to prevent moisture problems.

The above-mentioned paperboard characteristics plus many more are described in the **Iggesund Reference Manual** and most are specified in the **Product Catalogue**.



Varnishing in practice

Varnishing, be it matt or gloss, is a way to enhance the surface design and also to protect the printed surface. There are many possible combinations of printing methods, printing inks, types of varnish and varnishing methods. You can also increase adhesion for film wrap, apply heat seal varnish or reduce permeability. We will describe the most common combinations below.

Varnishing methods

There are many types of varnishes. They are similar to printing inks but contain no coloured pigments. The vehicle might be a solvent, drying oil, pre-polymer, or monomer. In addition to the vehicle, the varnish may contain resins, dryers, waxes, or photo-initiators.

The varnishing operation can be carried out before printing (matt varnishing is formulated to have a finish which can be overprinted), during printing (inline) or as a separate process after printing (offline). The varnish is applied on a printing unit or by using a special varnishing unit attached to the press, after all the colours have been printed.

The application methods are:

- conventional plate and blanket via a normal ink unit
- modified dampening system
- end-of-press roll coater, dedicated for varnishing
- multiple-coating units for combination work.

Different types of varnishes

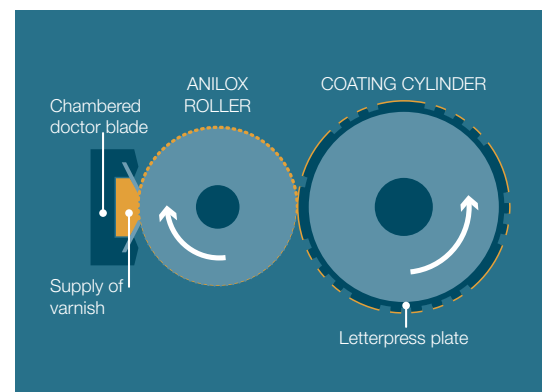
We recommend that you check with your ink supplier which varnish is most suitable for the type of ink you are using, especially if you are considering a UV cured varnish or if you plan to hot foil.

In offset printing the following types of varnish can be used:

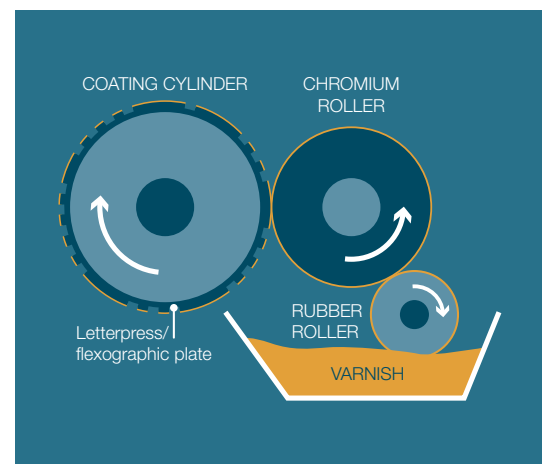
- Overprint varnish, which can be described as conventional offset ink or UV ink. The drying takes place with the same mechanism as for quick-setting offset inks, i.e. absorption of the low viscosity part of the varnish and then oxidative polymerisation drying of the vegetable oils.
- Dispersion varnish, which resembles water-based flexo ink. The varnish is applied inline in the printing press in a coating unit and is usually dried with an IR drying unit or heated air.
- UV cured varnish, which can be described as a UV printing ink. The drying is a polymerisation process in which the varnish film is cross-linked with the aid of UV light. The gloss depends on the varnish thickness and viscosity.
- A combination of UV and dispersion varnish for special effects.



Since there are many types of varnish, we recommend that you check with your ink supplier which varnish is most suitable to use with the type of ink you are using.



Chambered doctor blade system.



Varnish application with metering roller.

The advantages and disadvantages of the different types of varnishes are summarised in the following table. All three varnish types are also available in matt versions.

Varnish type	Advantages	Disadvantages
Over-print varnish (conventional offset ink)	High gloss	Slow varnish drying
	Very good rub resistance	Spray powder necessary
	Does not affect the paperboard's dimensional stability	Risk of yellowing
	Resistant to alcohol	Not odour neutral
	Processable as a printing ink	
Dispersion varnish	Very high gloss	Can affect the dimensional stability of the paperboard
	Very good rub resistance	Resistance properties have a limited lifetime
	Quick drying	Alkali-resistant inks necessary
	None to very little spray powder necessary	
	Odour neutral	
	Deinkable	
UV varnish	No risk of yellowing	
	Highest gloss	Odour neutral under some conditions
	Best mechanical and chemical resistance properties	Content declaration necessary (skin irritating)
	No spray powder necessary	Limited deinkability
	No set-off in the stack	High varnish cost
		Difficult to apply inline with conventional inks

Recommendations

The key paperboard properties to consider for varnishing are the same as for printing. Since gloss varnish is used for the purpose of reflecting light in a uniform way, the result depends on a very smooth and uniform paperboard surface. To be able to reflect – and retain – as many colours as possible, the whiteness of the board is also crucial. These criteria are well fulfilled by graphic paperboard. To avoid blemishes, the surface of the paperboard must be clean and especially free from dust or anti-set-off spray powder.