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Frequently asked questions about EasyProtect inkjet protection varnishes.

1. What is the optimum thickness for the EasyProtect varnish layer and how do I apply the correct thickness?

Maximum protection is achieved by a varnish layer of approximately 100µm wet thickness (30µm when dry). This will provide optimum protection from fading due to UV exposure, excellent water resistance, and protection against mechanical wear and tear, abrasion and damage from most cleaning chemicals and solvents.

A 30µm layer will have a dry weight of 30g/m². To achieve this you must cover the print with a wet varnish layer of about 100g/m² which will then dry to required 30g/m². To achieve this, follow the application procedures outlined in the EasyProtect Application Guide. Varnish some practice pieces of 1m² measuring the "before" and "after" varnish weight, this will give you a guide as to what a wet 100g/m² layer looks and feels like.

2. How much coverage should I get from 1kg of easyProtect?

From question 1, the recommended wet varnish layer is about 100g/m². Therefore 1kg of easyProtect will cover a banner approximately 10m². Small differences may result from the application method (manual or automatic, rolled or sprayed) and wastage.

3. What is the life expectancy of a print when EasyProtect has been applied?

Protecting a print with EasyProtect will ALWAYS increase the life of the print - One component 480 varnishes will give your print an indoor resistance of several years, protecting against abrasion, mechanical wear, chemicals, moisture and dirt with some UV protection for short term outdoor application (>6 months). Two component 482 varnishes will give your print protection outdoors for 5 years or more providing essential protection against UV fading and the natural elements, mechanical wear and abrasion, cleaners, dirt and grime.

Absolute print longevity will depend on many variables including application, quality of media and ink used for the job and recommend your own trails to assess suitability of EasyProtect for your project.

4. Can I clean a print protected with EasyProtect?

Yes, extensive laboratory tests and practical experience shows that two component varnishes (EasyProtect 482) have good resistance to many commonly used cleaning agents. These include but are not limited to:

- water
- alcohol
- dilute acids + alkaline solutions
- many chemicals commonly used in anti graffiti cleaning agents

Two component (EasyProtect 482) varnishes have exceptional chemical resistance because they are chemically cured with hardeners and therefore should be used in preference to one component varnish (EasyProtect 480) for applications subject to regular cleaning. As one component varnishes (EasyProtect 480) have a limited resistance to water, water based cleaners should be used with caution.

As we can not test all cleaning products, always test a small area of the print before cleaning!

5. How long does it take for the varnish to reach maximum chemical and UV resistance?

One component systems (EasyProtect 480): Varnish will be touch dry in 1-3 hours depending on the varnish thickness, print media, temperature, air circulation and humidity, and require a further 24 to 48 hours to develop maximum resistance properties.

Two component systems (EasyProtect 482): Varnish will be touch dry in 1-3 hours depending on varnish thickness, print media, temperature, air circulation and humidity, the chemical reaction within the varnish (curing) continues for 5-7 days, after which time the chemical and physical resistance properties of the varnish will be fully developed.

6. Can I use easyProtect on banners printed with oil-based inks?

No, varnishing over oil based ink with water-based varnish is not possible as the varnish will not adhere to the ink layer. As inks are constantly changing with new formulations and brands being developed, all inks should be tested for compatibility with EasyProtect varnishes before starting a project. (See also question 25)

7. Why is it important to varnish right to the edges of the print?

The surface of a print is only fully protected by a complete edge to edge varnish layer. A common mistake is to leave edges that will not be exposed (such as under a frame), or damage the varnish layer when trimming or installing eyelets and ropes. These "open" spots are weak points where water and solvents may penetrate and weaken the whole film.

8. Can the drying time be reduced by applying heat?

Yes, a drying tunnel may be used to significantly reduce drying time allowing prints to be stacked or rolled soon after application. A tunnel temperature of 50-55°C with air circulation can be used (even a hair dryer!), but the print must be allowed to cool before being handled. Higher temperatures are not recommended as the melting point of the varnished material (especially soft PVC) could be exceeded. Note however that the final resistance properties still take a further 24 to 48 hours for EasyProtect 480 and 5 to 7 days for EasyProtect 482 to fully develop. (See also question 5)

9. Can self-adhesive vinyl graphics be applied to a banner varnished with EasyProtect?

Yes, but successful application depends on the quality and adhesive properties on the vinyl. If adhesion is poor, roughening the varnish surface with fine sand paper where the lettering is to be applied may improve results. Alternatively masking these areas prior to varnishing may be a solution. If lettering is to be changed at a later date, you should check the adhesion of the varnish layer is sufficient to withstand the physical effects of removing self adhesive graphics from the print.

10. Is it possible to varnish over computer cut PVC self-adhesive graphics applied to an inkjet print?

Yes, but all cutting and weeding should be completed prior to varnishing. Laboratory trials shown that better results may be obtained with one component EasyProtect 480-5900 (Ecosol), be sure to test your substrate with EasyProtect prior to undertaking a job.

Be aware that the PVC backing paper may leave a silicone film on the surface of the lettering preventing adhesion of the varnish layer. This can be cleaned with citrus based cleaners commonly available from super markets, but test for compatibility with your printing ink first.

11. What is the shelf life of EasyProtect?

All EasyProtect varnishes have a shelf life 2 years if stored unopened in the original container (see also question 27). The two component hardener (482-HDA) should be used within 6-8 months from date of manufacture. Partially used containers should be carefully re-sealed as hardener especially will react with moisture and polymerize if left open (Tip: store hardener in the fridge - a low humidity environment).

12. When can I use one component protection varnish (EasyProtect 480)?

One component varnishes provide good protection against mechanical stresses and humidity but only short term resistance from fading caused by UV exposure outdoors, and limited water resistance. EasyProtect 480 will extend the life of print for most indoor applications such as trade show banners, display stands, wall graphics, point of sale signage etc and even short term (>6 months) outdoor use on sandwich boards, advertising posters and temporary displays.

For best results on prints for outdoor applications requiring maximum protection from UV, wear and water resistance we recommend the more resistant two component EasyProtect 482.

13. Can banners printed with Ecosol inks be varnished?

Yes! EasyProtect 480-5900 has been specifically formulated for use with Ecosol inks. It is important the print is completely dry and free of solvents prior to varnishing to achieve the best adhesion and protection results. UV and water resistance of 480-5700 is limited and, as there are many different versions of Ecosol inks on the market, we suggest you test EasyProtect to ensure suitability.

14. What viscosity do I need for roller application? How can it be measured?

EasyProtect varnishes are supplied ready to use for roller application and generally do not require adjustment to viscosity prior to use. For roller application the viscosity should measure between 40–60 seconds through a 4mm DIN cup for all EasyProtect types. If thinning is required add small amounts of water while stirring (less than 5% by weight). Changing the viscosity influences the layer thickness, flow and drying characteristics of the varnish, and should therefore be kept within this recommended range. (See also question 17)

15. The varnish beads on the print and does not wet the surface evenly – Why?

Inkjet media is manufactured using many different types of plastics. Depending on the intended application, print media substrates commonly have plasticisers and other chemicals added during manufacture. These substances may "sweat" or migrate to the surface of the substrate over time and prevent the varnish from wetting the surface, much like rain on a newly polished car. Some solutions to this problem may be:

- Careful cleaning of the print, using a soft rag soaked with an alcohol/water mixture.
- Rolling up and down several times when applying the varnish, may also help. Be careful, excessive rolling will load the surface with more air than the auto levelling compounds in EasyProtect can remove, resulting in a varnish layer with many entrapped air bubbles.

16. Bubbles have appeared in the varnish layer when applied over some specialist coated media types.

Some media coatings are based on specially modified mica primers which absorb the inkjet ink. In the (porous) spaces of these coatings is a lot of air which may be displaced during varnishing in the form of small bubbles. If the printed media is moistened with a clean wet rag prior to varnishing the formation of bubbles from air trapped in the pores of the media may be avoided. Test EasyProtect on each media/ink type before production to ensure compatibility.

17. Do I need to thin EasyProtect for spray application?

Yes. EasyProtect varnishes are supplied with a viscosity of about 50 seconds when measured with a 4mm DIN cup. This is ideal for squeegee and roller application but is too thick for spraying. Use clean water (up to 5% by weight) to thin the varnish to achieve a viscosity of 30-40 seconds when measured with a 4mm DIN cup). Shop conditions for spray application should be between 15-25 degrees and about 50% relative humidity, in adverse conditions the addition of a small quantity of Special Retarder 400–018/09 may also be required for spray application.

18. How can I prevent the varnish from drying too quickly.

Drying of the varnish layer before the auto levelling phase is complete may result in unevenness and possibly air bubbles remaining in the varnish surface or, if spraying in very hot/dry conditions, the varnish may dry before even wetting the print. In these conditions adding a small amount of Special Retarder 400-018/09 will help. This retarder has a strong effect on drying time and should be added to a maximum of 3-5%, adding more retarder is not recommended, as protection properties may be reduced.

19. I am using a PVC self-adhesive media and the varnish won't "wet" the print – why?

This problem can have many causes. One possibility is additives in the media migrating to the surface during storage causing incompatibility with the varnish (see question 15).

The problem may also be caused by incorrect application technique.

- EasyProtect is delivered "ready-to-roll", excessive additional dilution may cause this "wetting" problem. (See question 17)
- Excessive pressure on the roller during application may also be a factor; the required wet film thickness of 100mµ cannot be achieved if excessive roller pressure is used - don't press down, use only the weight of the roller.

20. How can equipment be cleaned after using two component EasyProtect 482?

Wash up EasyProtect one or two component with water, tools should be cleaned immediately. To remove dry varnish residue a 1:1 alcohol/water mixture or weak alkaline water solution (e.g household ammonia). Never use any other solvents to clean spray equipment (especially thinner or nitro based solvents) as damage may result. (See also question 24)

21. Is it possible to varnish tarpaulins that have been welded or had eyelets installed?

It is preferable to apply varnish prior to all print finishing operations, however varnishing after welding or eyelet installation is possible. Care should be taken to ensure complete coverage so as not to create an "open" edge that will allow penetration of water or cleaning solvents under the varnish layer.

22. Should truck curtains and vehicle wraps and graphics be varnished before or after installation?

Although not an absolute requirement, in practice, varnishing prior to applying vehicle graphics is preferred, because;

– in the case of vehicle wraps and graphics, the varnish is more flexible than the printed media - therefore when heated to conform to compound curves the integrity of the varnish layer will be maintained.

- on truck sides and curtains, spray application on vertically mounted surfaces is much more difficult than roller application on a horizontal print on a table or workshop floor. Additionally the vehicle would have to be masked to prevent over-spray damage.

23. Can prints varnished with one component EasyProtect 480, be used several times for short term outdoor applications?

Yes, however the outdoor resistance of one component protection varnishes is limited, especially against water damage (see also questions 12 and 13). In practice, the longevity of the varnished print will be quite adequate for infrequent outdoor use, such as several times over a weekend or when a semester or school year starts etc, but storage is critical. If the banner gets damp when in use, and is stored rolled or stacked, the varnish will soften and adhere to adjacent layers, damaging the print. Banners should therefore be rolled (not folded) and stored in cool dry conditions and only when completely dry. For frequent and long term outdoor use, varnish with EasyProtect 482.

24. How can dried varnish be removed from equipment and tools?

When dry and cured, two component varnishes are very chemically resistant. Commercial paint stripper may be used if the contaminated parts will not be damaged by it, but for small and delicate parts (hose pipes, pumps, valves and the like) we do not recommend this method. (See also question 20)

25. Can water-based inkjet prints also be varnished?

All variants of easyProtect are water-based, therefore it is likely that they will dissolve the print. However if carried out carefully it might be successful depending on ink and media type. Preferably use spray application to apply several thin coats and avoid over wetting the print. Standard roller application may be successful with some combinations of media and ink, but you should always test a small area before undertaking a project.

26. Can storing varnish in very cold conditions cause problems?

Water-based varnishes are naturally susceptible to the effects of sub-zero temperatures. Temperatures below 10°C may cause thickening or jelling of the varnish, and very low temperatures may cause an irreversible crystalizing of some of additives which will adversely affect application as well as the resistance characteristics of the varnish layer. To avoid these problems, store EasyProtect products above 15°C and maintain temperature in the application room between 18 and 25°C.

27. How can I tell the shelf life of a can of EasyProtect I have stored?

The label of all 5kg containers states the expiry date e.g. *Exp 12/07* (see also question 11). If unopened and in the original container the varnish may still be usable after this date, test prior to use to ensure adequate performance! All Printcolor products are manufactured under an ISO 9001 quality assurance system to ensure consistent quality between batches and maximum shelf life.

28. What are the common causes of surface imperfections when using spray application?

If we exclude formula and mixing mistakes due to operator error, most imperfections can be traced to premature drying before the spray droplets reach the print. Some causes of this are:

- unsuitable thinners (see question 17)
- room temperature too high, especially during summer
- the viscosity is incorrect (see question 17)
- humidity too low, especially during the winter
- spray gun distance is too great
- spray gun / nozzle adjustment is incorrect (use a 1.5mm nozzle)

29. Can mesh materials be varnished?

Yes, mesh materials may be varnished! Because of the open spaces in this material, which of course need to remain open after varnishing, a different application method is required, this is described in our leaflet "Application techniques for varnishing mesh materials".

30. Can self adhesive graphics be applied on a varnished tarpaulin?

Yes. This is a very common, however the anti-dirt properties of EasyProtect may cause poor adhesion of self adhesives graphics. The number of possible combinations of media-ink-varnish-self adhesives mean generalisations are not possible - test a small area before committing. (See also questions 9 and 10)

31. Is EasyProtect compatible with UV cured inkjet inks?

Yes, however good adhesion of the UV layer to the printed substrate is important. It's a common misconception that poor ink adhesion can be cured by the application of a varnish layer. It doesn't work, poor ink layer adhesion cannot be "concealed" by varnishing. With advent of UV flat bed printers the spectrum of printable substrates has increased substantially to include substrates such as glass, wood, PVC, metals and a variety of plastics. Experience has shown that although adhesion of the ink layer to a substrate may seem OK to the touch, a cross hatch tape test reveals adhesion is sometimes unsatisfactory under duress. Testing is therefore strongly recommended before proceeding.

32. What causes bubbles in the varnish layer?

Besides those reasons already mentioned (see question 16), the atmospheric conditions in the workshop are most commonly the cause. High summer temperature and/or low humidity may result in the surface of the varnish layer drying before the auto levelling properties of EasyProtect can dissipated bubbles caused by roller action. The same problem may occur in winter if conditions are very dry, with relative humidity below 40%.

EasyProtect includes flow agents and additives for optimum performance and does not require alteration under normal conditions. However in extreme weather adding SMALL additional amounts may be beneficial.

- Flow Agent 400-VMS/482 (added to a max. 0.5% by weight) will increase the self levelling properties of the varnish layer. Note that EasyProtect supplied in Australia and New Zealand may already contain additional flow agent, adding more may adversely affect varnish performance.

- Special Retarder 400-018/09 (add 3-5% by weight) will retard the drying of the varnish layer allowing more time for de-gassing (see also question 18). Naturally the possibility for dust contamination increases as drying times are extended.

33. Can EasyProtect matt and gloss varnishes be mixed?

Yes, you can mix matt and gloss varnishes of the same type to obtain any desired gloss/matt or semi-matt effect. For example 482-5700 (gloss) and 482-5700/MT (matt) or 480-5700 (gloss) and 480-5700/MT (matt), can be mixed in any ratio.

36. Can the EasyProtect Floor Graphic (482-5700/AR) be applied to floor graphics that have already been installed?

Yes in principle, however drying time may present practical difficulties. Complete curing of the two component varnish takes 5-7 days depending on temperature, etc, during which time the floor graphic must not be stressed i.e walked on! So it would be better to varnish it before installation.

37. How long will the anti-slip properties of EasyProtect Floor Graphic (482-5700/AR) last?

An absolute statement of floor graphic effective life in "days, weeks or months" is almost impossible. Floor graphic longevity is dependant on the conditions and frequency of use. A floor graphic at the entrance to an exhibition hall is obviously more stressed than a logo on a company boardroom floor! EasyProtect Floor Graphic has undergone slip rating testing and meets or exceeds the recommended Australian Standard for use in many public areas. We recommend you review the recommendations of the Australian Standard AS/NZS 4586:2004 to ensure EasyProtect is suitable for you application.