

Application Solutions and Edge Sealing: *Requirements and Recommendations*

Updated: January 21, 2008

Document Summary

This document 1) lists all LLumar and Vista film products and specifies what application solutions are recommended, allowed, and specifically NOT permitted. 2) It also notes which products *require* the use of an edge sealant, and which products are *recommended* to have an edge sealant used if the installation is located within approximately 10 kilometers (5-7 miles) from the ocean. For some films as noted, the combination of salt and excessive moisture or the use of acidic application solutions presents an elevated risk for edge corrosion. 3) It also reminds installers that reverse osmosis (RO) filtered water or distilled water should be used rather than tap water. RO or distilled water helps activate CDF adhesive, is free of contaminants and minerals, and improves the slip-quality of the application solution.

Overview and Discussion

Over the years, as window films have grown in variety and sophistication, the perennial question has been: What is the best application solution? The question must now be sharpened and answered. For it is no longer acceptable to merely assume that “while some liquids may be better than others, anything will do.” As adhesive chemistry has improved and our knowledge has deepened about the consequences of using different mounting solutions, it has become apparent that many of these application solutions will *not* do.

CPFilms’ approach has been to find the very best solutions to both promote long-term bond stability and satisfy the practical needs of the installer in the field. The objectives have been three-fold:

- 1) Find the mounting solution that allows for greatest ease of installation, providing good slip for (a) nice positioning mobility during lay-up, (b) adequate squeegee lubrication, and (c) maximum water extraction during final squeegee passes.
- 2) Find a solution that is chemically innocuous, one that does not harm (a) the adhesive chemistry, (b) the film-to-glass bond strength, (c) the metallic or other depositions within the film laminates, and (d) items in the immediate window environment.
- 3) Find a solution that actually enhances adhesive activation and maximizes product longevity, consistent with the preceding two objectives.

After years of study and field research, we have learned that most solutions traditionally used by installers fall short of these ideals. And now that window films are growing in complexity we have also learned that there is, to date, no *single* mounting solution that is best, or even acceptable, for *all* films. We have therefore compiled for your convenience and ready-reference the following chart laying out what we specifically *recommend, allow, or forbid* regarding the use of application solutions with *each* of our window film products. Please note that if there is a product (such as various dish detergents) that you “have been using for decades” and you don’t find it listed on the chart, you are obliged to assume it is not recommended.

Remember also that best application solutions are not always the best glass-cleaning compound. X-100 remains the best window cleaning solution, but remember to exercise caution when working above marble sills and floors. Marble surfaces are susceptible to slight etching from the mild acid content of X-100. You must either drape these surfaces completely (to prevent prolonged contact) or use a non-acidic, non-ammonia cleaner, such as Film-On (neutral pH). The latter will not clean as well, so thoroughly blade-scrub and scrub with the approved nylon pad.

When using X-100, remember, too, that it is best not to spray the application solution in an extremely fine mist. A more direct and slightly coarse spray is recommended so that more of the solution lands on the glass rather than vaporizes and is breathed into the lungs. The solution is mildly acidic and can be a slight irritant to the nasal passages.

Johnson’s Baby Shampoo specifically receives the “permitted” rating because it is known to NOT contain a host of additives that are undesirable (from a film installation point of view). ***Check to be sure that a baby shampoo one has selected does NOT contain silicone or lanolin that will greatly reduce bond strength.***

A Word on Water: Does it really make a difference what kind of water I use in my window cleaning and application solutions? Is distilled water really better than regular tap water?

This question is a fundamental one for all installers of all films for all applications. The answer: Actually, it can make a great deal of difference what kind of water you use for window cleaning and film installation. Over many parts of the world (and from city to city within any given region), water quality varies with regard to what dissolved minerals and chemicals it contains. Highly mineralized water (often

called "hard water"), contains dissolved calcium carbonate or other substances that react with the liquid soap (Film-On, Dirt-Off, X-100, or Baby Shampoo). The reaction forms a solid residue that contaminates your solution and reduces its "slip." The loss of slip makes the film harder to maneuver, and, in consequence, installers often feel the need to add yet more contaminating soap to the application solution. This, in turn, can seriously reduce adhesive tack strength, potentially affecting adhesion to dot matrix in cars or the quality of the bond in architectural safety film applications. The solid residue, in turn, increases the likelihood of spots forming as the film cures.

Excessive chlorine can react with mounting adhesives and some metals and may also produce spotting after curing. Dissolved sulfur in water can also attack metals in the film.

On top of all this, remember that water companies routinely flush their pipes from time to time to dislodge and prevent settling of particles in the water and eventual pipe blockages. At these times the use of tap water can cause moderate to extremely high contamination during installation no matter how much the installer tries to clean the glass. This contamination depends upon how soon after the water company's action the tap water is used and the distance of the water tap from the main pipes. Often the particles are opaque or white but may be orange or other colors. Sometimes running the tap water for a while solves the problem, but the risk is a random danger, no matter how rarely pipe flushing occurs. In some areas, especially where acid rain is a problem, the water in local reservoirs may be more acidic than desirable. Acidic water for installing some film types, such as those containing silver or copper (including some low-e or N series bronze films) can damage those metals.

For these reasons we strongly recommend to everyone that they follow the basic rule: "Better safe than sorry" when it comes selecting the water to be used in film application. We urge the consistent use of distilled water or water obtained from a high quality reverse osmosis (RO) machine, the latter being the most cost-effective. Distilled or "RO" water is stripped of minerals, suspended particles, chlorine, etc., and will consistently improve slip, yield cleaner installations, reduce the amount of needed slipping agent (such as Film-On or Baby Shampoo), and hence improve the quality and durability of the adhesive-to-glass bond. (Remember that RO machines require filter changes every 3-6 months, depending on source water quality.)

Perhaps most importantly, should there be a problem with the installation down the road, the use of highly purified water will eliminate of host of unknown variables in analyzing the cause of the problem.

The bottom line is simply this: when it comes to water, better safe than sorry.

PRODUCT NAME Sorted Alphabetically	Application Solutions <i>(Always use R/O filtered or distilled water with the following...)</i>		
Solution Key: Ø = Forbidden (Do not use!) 1 = Permitted (good) 2 = Recommended (better) 3 = Highest Recommendation (best)	Johnson's Baby Shampoo	Film-On	X-100
	No 0 → 3 Yes	No 0 → 3 Yes	No 0 → 3 Yes
AUTO FILMS			
AT05CHSRHPR	1	3	Ø
AT05GRSRHPR	1	3	Ø
AT15CHSRHPR	1	3	Ø
AT15GRSRHPR	1	3	Ø
AT35CHSRHPR	1	3	Ø
AT35GRSRHPR	1	3	Ø
AT50CHSRHPR	1	3	Ø
AT50GRSRHPR	1	3	Ø
AT70GRSRHPR	1	3	Ø
ATN20NSRHPR	1	3	Ø
ATN35NSRHPR	1	3	Ø
ATR05CHSRHPR	1	3	Ø
ATR05STRHPR	1	3	Ø
ATR15CHSRHPR	1	3	Ø
ATR18STRHPR	1	3	Ø
ATR20BSRHPR	1	3	Ø
ATR20CHSRHPR	1	3	Ø
ATR30CHSRHPR	1	3	Ø
ATR30STRHPR	1	3	Ø
ATR35BSRHPR	1	3	Ø
ATR35CHSRHPR	1	3	Ø
ATR38STRHPR	1	3	Ø
ATR40CHSRHPR	1	3	Ø
ATR50BSRHPR	1	3	Ø
ATR50CHSRHPR	1	3	Ø
ATR50STRHPR	1	3	Ø
AU75UVSRHPR	1	3	Ø
JT05BKS RHPR	1	3	Ø
JT15BKS RHPR	1	3	Ø
JT35BKS RHPR	1	3	Ø
JT50BKS RHPR	1	3	Ø
PP18LUSRHPR	1	3	Ø
PP20LUSRHPR	1	3	Ø
PP35LUSRHPR	1	3	Ø
PP45LUSRHPR	1	3	Ø
PP50LUSRHPR	1	3	Ø
PP60GNSRHPR	1	3	Ø
PT05GHSRHPR	1	3	Ø
PT18GHSRHPR	1	3	Ø
PT28GHSRHPR	1	3	Ø
PT38GHSRHPR	1	3	Ø
PT50GHSRHPR	1	3	Ø
SUV38STRPS4	1	3	Ø
SUV50STRPS4	1	3	Ø
FLAT GLASS FILMS			
DECO BLUE SR HPR	1	3	Ø
DECO GREEN SR HPR	1	3	Ø
DECO RED SR HPR	1	3	Ø
DECO YELLOW SR HPR	1	3	Ø
DL15BSRCDF	1	2	3
DL15GSRCDF	1	2	3
DL30GNSRHPR [Green]	1	2	3
DR15SRCDF	1	2	3
DR25SRCDF	1	2	3
DR35SRCDF	1	2	3
E1220SRCDF	1	2	3
GCLSRP	1	3	Ø
LE35SRCDF	1	3	Ø
LE50SRCDF	1	3	Ø
N1020BSRCDF (BRONZE)	1	3	Ø
N1020SRCDF	1	2	3

PRODUCT NAME Sorted Alphabetically	Application Solutions <i>(Always use R/O filtered or distilled water with the following...)</i>		
Solution Key: Ø = Forbidden (Do not use!) 1 = Permitted (good) 2 = Recommended (better) 3 = Highest Recommendation (best)	Johnson's Baby Shampoo	Film-On	X-100
	No 0 → 3 Yes	No 0 → 3 Yes	No 0 → 3 Yes
N1020SRPS4	1	3	Ø
N1020SRPS8	1	3	Ø
N1035BSRCDF (BRONZE)	1	3	Ø
N1035SRPS4	1	3	Ø
N1035SRPS8	1	3	Ø
N1040SRCDF	1	2	3
N1050BSRCDF (BRONZE)	1	3	Ø
N1050SRCDF	1	2	3
N1050SRPS4	1	3	Ø
N1050SRPS8	1	3	Ø
N1065SRCDF	1	2	3
NRMBPS2 (BRONZE)	1	3	Ø
NRMFBSRHPR (WIDE VENETIAN BANDS)	1	3	Ø
NRMFMDSRHPR (MINI DOTS)	1	3	Ø
NRMFSDSRHPR (SMALL DOTS)	1	3	Ø
NRMFQSRHPR (SQUARES)	1	3	Ø
NRMFSSRHPR (NARROW VENETIAN STRIPE)	1	3	Ø
NRMFTLSRHPR (THIN LINES)	1	3	Ø
NRMMP3 (BLACK)	1	3	Ø
NRMMSQSRHPR (MATTE SQUARES)	1	3	Ø
NRMPS2	1	3	Ø
NRMWPS3	1	3	Ø
NUV65SRPS4	1	3	Ø
PCR15BLSRCDF (Blue)	1	2	3
PCR35GNSRCDF (Green)	1	2	3
R15BLSRHPR [Blue]	1	3	Ø
R15BSRCDF	1	2	3
R15GOSRHPR [Gold]	1	3	Ø
R15GSRCDF	1	2	3
R20SRCDF	1	2	3
R20SRPS4	1	3	Ø
R20SRPS8	1	3	Ø
R30BSRCDF	1	2	3
R30BSRPS4	1	3	Ø
R30GSRCDF	1	2	3
R35SRCDF	1	2	3
R50SRCDF	1	2	3
RK20SIHPR (Required neutral silicone edge sealant)	1	3	Ø
RMPS2	1	3	Ø
SCLSRPS4, 7, 8, 11, 15	1	3	Ø
UVCLSRPS	1	3	Ø
V14SRCDF	1	2	3
V18SRCDF	1	2	3
V28SRCDF	1	2	3
V28SRPS8	1	3	Ø
V31SRCDF (Terre) (Edge sealant recommended if within 10 km of ocean)	1	3	Ø
V33B (BRONZE) SRCDF	1	3	Ø
V33SRCDF	1	2	3
V38SRCDF	1	2	3
V38SRPS8	1	3	Ø
V40SRCDF (Ciel) (Edge sealant recommended if within 10 km of ocean)	1	3	Ø
V41SRCDF (Terre) (Edge sealant recommended if within 10 km of ocean)	1	3	Ø
V42SRCDF (Nova Stellaris) (Use edge sealant)	1	3	Ø

PRODUCT NAME Sorted Alphabetically	Application Solutions <i>(Always use R/O filtered or distilled water with the following...)</i>		
Solution Key: Ø = Forbidden (Do not use!) 1 = Permitted (good) 2 = Recommended (better) 3 = Highest Recommendation (best)	Johnson's Baby Shampoo	Film-On	X-100
	No 0 → 3 Yes	No 0 → 3 Yes	No 0 → 3 Yes
V50SRCDF (Ciel) (Edge sealant recommended if within 10 km of ocean)	1	3	Ø
V45SRCDF	1	2	3
V48SRCDF	1	2	3
V51SRCDF (Terre) (Edge sealant recommended if within 10 km of ocean)	1	3	Ø
V58SRCDF	1	2	3
VE35SRCDF (Edge sealant recommended if within 10 km of ocean)	1	3	Ø
VE50SRCDF (Edge sealant recommended if within 10 km of ocean)	1	3	Ø
VS60SRCDF (Edge sealant required)	1	3	Ø
VS61SRCDF (Edge sealant recommended if within 10 km of ocean)	1	3	Ø
VS65SRCDF (Edge sealant required)	1	3	Ø
VS70SRCDF (Edge sealant required)	1	3	Ø
VS75SRCDF	1	2	3

For further information concerning installation challenges, call 1-800-2LLUMAR

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PRODUCT NAME (Sorted by Category)	Application Solutions		
	<i>Johnson's Baby Shampoo</i>	<i>Film-On</i>	<i>X-100*</i> (see note below)
Solution Key: Ø = Forbiden (Do not use!) 1 = Permitted (good) 2 = Recommended (better) 3 = Highest Recommendation (best)			
	No Ø → 3 Yes	No Ø → 3 Yes	No Ø → 3 Yes
AUTO FILMS			
AT05CHSRHPR	1	3	Ø
AT05GRSRHPR	1	3	Ø
AT15CHSRHPR	1	3	Ø
AT15GRSRHPR	1	3	Ø
AT35CHSRHPR	1	3	Ø
AT35GRSRHPR	1	3	Ø
AT50CHSRHPR	1	3	Ø
AT50GRSRHPR	1	3	Ø
AT70GRSRHPR	1	3	Ø
ATR05CHSRHPR	1	3	Ø
ATR05STRHPR	1	3	Ø
ATR15CHSRHPR	1	3	Ø
ATR18STRHPR	1	3	Ø
ATR20BRSRHPR	1	3	Ø
ATR20CHSRHPR	1	3	Ø
ATR30CHSRHPR	1	3	Ø
ATR30STRHPR	1	3	Ø
ATR35BRSRHPR	1	3	Ø
ATR35CHSRHPR	1	3	Ø
ATR38STRHPR	1	3	Ø
ATR40CHSRHPR	1	3	Ø
ATR50BRSRHPR	1	3	Ø
ATR50CHSRHPR	1	3	Ø
ATR50STRHPR	1	3	Ø
AU75UVSRHPR	1	3	Ø
JT05BKSRHPR	1	3	Ø
JT15BKSRHPR	1	3	Ø
JT35BKSRHPR	1	3	Ø
JT50BKSRHPR	1	3	Ø
PP18LUSRHPR	1	3	Ø
PP20LUSRHPR	1	3	Ø
PP35LUSRHPR	1	3	Ø
PP45LUSRHPR	1	3	Ø
PP50LUSRHPR	1	3	Ø
PP60GNSRHPR	1	3	Ø
PT05GHSRHPR	1	3	Ø
PT18GHSRHPR	1	3	Ø
PT28GHSRHPR	1	3	Ø
PT38GHSRHPR	1	3	Ø
PT50GHSRHPR	1	3	Ø
SUV38STRPS4	1	3	Ø
SUV50STRPS4	1	3	Ø
FLAT GLASS FILMS			
DECO & MATTE FILMS			
DECO BLUE SR HPR	1	3	Ø
DECO GREEN SR HPR	1	3	Ø
DECO RED SR HPR	1	3	Ø
DECO YELLOW SR HPR	1	3	Ø
NRMBPS2 (BRONZE)	1	3	Ø
NRMFBDSRHPR (WIDE VENETIAN BANDS)	1	3	Ø
NRMFMDSRHPR (MINI DOTS)	1	3	Ø
NRMFSDSRHPR (SMALL DOTS)	1	3	Ø
NRMFSQSRHPR (SQUARES)	1	3	Ø
NRMFSSRHPR (NARROW VENETIAN STRIPE)	1	3	Ø
NRMFTLSRHPR (THIN LINES)	1	3	Ø
NRMMP3 (BLACK)	1	3	Ø
NRMMSQSRHPR (MATTE SQUARES)	1	3	Ø

PRODUCT NAME (Sorted by Category)	Application Solutions		
	<i>Johnson's Baby Shampoo</i>	<i>Film-On</i>	<i>X-100*</i> (see note below)
Solution Key: ∅ = Forbidden (Do not use!) 1 = Permitted (good) 2 = Recommended (better) 3 = Highest Recommendation (best)	No ∅ → 3 Yes	No ∅ → 3 Yes	No ∅ → 3 Yes
NRMPS2	1	3	∅
NRMWPS3	1	3	∅
RMPS2	1	3	∅
DELUXE SERIES			
DL15BSRCDF	1	2	3
DL15GSRCDF	1	2	3
DL30GNSRHPR (Green)	1	2	3
EXTERIOR SERIES			
RK20SIHPR (Use edge sealant)	1	3	∅
LOW E SERIES			
E1220SRCDF	1	2	3
VE35SRCDF (Use edge sealant)	1	3	∅
VE50SRCDF	1	3	∅
MUSEUM FILMS			
UVCLSRPS	1	3	∅
N SERIES (SPUTTERED)			
N1020BSRCDF (BRONZE)	1	3	∅
N1035BSRCDF (BRONZE)	1	3	∅
N1040SRCDF	1	2	3
N1050SRCDF	1	2	3
N1020SRCDF	1	2	3
N1065SRCDF	1	2	3
REFLECTIVE SERIES			
R15BLSRHPR [Blue]	1	3	∅
R15BSRCDF	1	2	3
R15GOSRHPR [Gold]	1	3	∅
R15GSRCDF	1	2	3
R20SRCDF	1	2	3
R30BSRCDF	1	2	3
R30GSRCDF	1	2	3
R35SRCDF	1	2	3
R40SRPA	1	3	∅
R50SRCDF	1	2	3
SAFETY SERIES			
N1035SRPS4	1	3	∅
N1035SRPS8	1	3	∅
N1020SRPS4	1	3	∅
N1020SRPS8	1	3	∅
N1050SRPS4	1	3	∅
N1050SRPS8	1	3	∅
NUV65SRPS4	1	3	∅
R20SRPS4	1	3	∅
R20SRPS8	1	3	∅
R30BSRPS4	1	3	∅
SCLSRPS11	1	3	∅
SCLSRPS15	1	3	∅
SCLSRPS4	1	3	∅
SCLSRPS7	1	3	∅
SCLSRPS8	1	3	∅
N1035SRPS4	1	3	∅
N1035SRPS8	1	3	∅
N1020SRPS4	1	3	∅
N1020SRPS8	1	3	∅
N1050SRPS4	1	3	∅
N1050SRPS8	1	3	∅
NUV65SRPS4	1	3	∅
VISTA SERIES			
V14SRCDF	1	2	3
V18SRCDF	1	2	3

PRODUCT NAME (Sorted by Category)	Application Solutions		
	<i>Johnson's Baby Shampoo</i>	<i>Film-On</i>	<i>X-100*</i> (see note below)
Solution Key: ∅ = Forbidden (Do not use!) 1 = Permitted (good) 2 = Recommended (better) 3 = Highest Recommendation (best)			
	No ∅ → 3 Yes	No ∅ → 3 Yes	No ∅ → 3 Yes
V28SRCDF	1	2	3
V28SRPS8	1	3	∅
V31SRCDF (Edge sealant recommended if within 10 km of ocean)	1	3	∅
V33B (BRONZE) SRCDF	1	3	∅
V33SRCDF	1	2	3
V38SRCDF	1	2	3
V38SRPS8	1	3	∅
V40SRCDF (Edge sealant recommended if within 10 km of ocean)	1	3	∅
V41SRCDF (Terre) (Edge sealant recommended if within 10 km of ocean)	1	3	∅
V42SRCDF (Nova Stellaris) (Use edge sealant)	1	3	∅
V48SRCDF	1	2	3
V50SRCDF (Ciel) (Edge sealant recommended if within 10 km of ocean)	1	3	∅
V51SRCDF (Edge sealant recommended if within 10 km of ocean)	1	3	∅
V58SRCDF	1	2	3
VE35SRCDF (Edge sealant recommended if within 10 km of ocean)	1	3	∅
VE50SRCDF (Edge sealant recommended if within 10 km of ocean)	1	3	∅
VS60SRCDF (Use edge sealant)	1	3	∅
VS61SRCDF (Edge sealant recommended if within 10 km of ocean)	1	3	∅
VS65SRCDF (Use edge sealant)	1	3	∅
VS70SRCDF (Use edge sealant)	1	3	∅
VS75SRCDF	1	2	3

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