



Print Erosion

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Rely on it.

Print Erosion 2

RENOLIT Printed Pool Liners are manufactured in a 2 stage process. The 0.75mm foil is calendared and reeled up on master rolls.

The master rolls are then printed in a two or three colour process with the foil passing through a drying oven between each colour. Then in the same process it is coated with an acrylic protective lacquer.

The polymers and pigments used have been carefully formulated over many years to ensure that they will be as resistant as possible to the chemical conditions that are present in every swimming pool.

The foil is also protected on the reverse side to prevent degradation from bacterial and fungal attack caused by dirt and dampness on the pool substructure.

Once manufactured into a pool liner and vacuum fitted into the pool substructure the liner is then exposed to the chemicals necessary for the cleaning of the pool water. Unfortunately, the most efficient agent for ensuring pool hygiene is chlorine.

Thus PVC is permanently exposed to a chemical that will cause it to break down and weaken the bond between the sheet, the print and also the very components of the PVC itself.

This has been a long standing problem since PVC pool liners were first used in the 1970s. Since then a number of factors have combined to make the manufacture of printed liners more difficult. Heater Pumps have meant that pool water temperatures have risen which increases the potency of chlorine. A whole range of sun creams and oils have been created some of which leave damaging oily deposits on the liner. Salt chlorinators have been introduced and experience has shown that they tend to over-chlorinate the water, particularly when there is poor circulation.

High Active Chlorine levels in the pool water create an acidity that degrades lacquer, print and eventually the liner. Low pH levels increase the acidity of the chlorine. Temperatures higher than 28°C make the balance of the pool water chemistry more difficult to control, and accelerate the effect of low pH and high levels of free chlorine.

Poor water chemistry can affect lacquer, pigments and the print within 12 months, However, even in these conditions, the membrane will retain its waterproofing qualities for several years.

Print Erosion 3

RENOLIT Research Technicians have worked to develop polymers and pigments that will be resistant to degradation from chlorine.

RENOLIT Laboratories have established pool water conditions that will give the greatest resistance to erosion, these are:

Water temperature of 27° C (80°F) or less; pH 7.2 - 7.6; Free chlorine concentration between 0.3 and 0.8 grm/m³(PPM)

The further away from these values the faster the print and the foil will degrade, as an example laboratory tests have shown:

For 1-2 ppm of stabilized chlorine, print erosion can be expected after:

10 years if pH is 7-7.5

1 year if pH is 6-6.5

When Chlorine has been stabilised with Cyanuric Acid it may be used in higher concentrations than unstabilised chlorine.

The areas of a pool that will show the effects of chlorine degradation are the heavily trafficked areas such as steps, and those areas put under stress when the pool is vacuum fitted to the pool shell: the corners and wall/floor joints. The stress is caused by the stretching of the protective acrylic lacquer which does not have the same elasticity as the membrane.

RENOLIT recommend that pools which are used regularly and by large numbers of bathers such as school and community pools should be lined with a plain colour.

For Pools where there are high chlorine levels, and high temperatures RENOLIT have developed the XTREME Range of unicoloured foils.

This Table shows perfect conditions for pool water and chemical levels where damage will occur.

Pool Water Conditions for Plasticised PVC Pool Liners			
	Green	Amber	Red
	perfect conditions	conditions that may shorten liner life	conditions that will cause liner damage
pH	7.2-7.6	6.8-7.2	below 6.8
Unstabilised Free Chlorine	0.3 - 1ppm	1-1.5 ppm	Above 1.5 ppm
Stabilised Free Chlorine	1-1.5 ppm	1.5-2 ppm	Above 2 ppm
Total Chlorine	1.6 - 2.1 ppm	2.1 - 2.6 ppm	Above 2.6 ppm
Alkalinity	100 < TAC < 175	80 < TAC < 100	below 80 ppm
Cyanuric Acid	25-30 ppm	below 25 ppm	below 15 ppm
Temperature	below 28°C	28-30°C	above 30°C