MAINTENANCE CHALLENGES
Aquatic pools, whether they be coated concrete or a tiled finish, will always require a maintenance program to keep them in good working order.

A number of challenges and factors affect the condition, durability, appearance and functionality of the internal pool surface.

CLEANING CHEMICALS
Pool cleaning chemicals are typically made up of a combination of disinfectants and acids which can include:
- chlorine gas
- sodium hypochlorite (liquid bleach)
- calcium hypochlorite (granular or tablet)
- sea salt
- lithium hypochlorite

When chlorine-type compounds become in contact with or are dissolved in water they create hypochlorous acid (HClO), which acts as the active sanitising agent. Their corrosive characteristics also affect cementitious grouts, adhesives, sealants, fillers and coatings. Dosage rates, concentrations and temperature can especially affect the performance of the protective lining.

Other issues include:
- Substrate movement, resulting in cracking and lifting of the pool surface
- Hydrostatic pressure from surrounding landfill as a result of inadequate drainage and waterproofing
- Concrete cancer, or reinforced concrete degradation due to carbonation leading to an unsound substrate

Water types can range from potable water, salt-containing and bore water which all require specific treatment to address their chemical and mineral composition.

WEAR AND TEAR
Automatic type pool cleaning equipment can have an abrasive affect resulting in general wear and tear of the lining.

UV EXPOSURE
UV rays from the sun increase the degradation rate of applied coatings and substrates in exterior swimming pools and indoor pools surrounded by large expanses of glass. Some coating types (such as epoxies) are particularly prone to UV degradation.

The effect of all of the above in various combinations contribute to stress on coated surfaces.
COATINGS USED FOR POOLS

The traditional coatings used for lining concrete swimming pools include epoxies and chlorinated rubbers. Both coating types are suitable for immersion and have good resistance to corrosive chemicals, but they are not compatible with each other, and the entire lining system – from new application to maintenance – must comprise of only one system or the other.

Despite their individual suitability as pool linings their limitations are:

- The coating can fade or chalk upon exposure to UV light, and not always consistently. Coloured pigment from the coating film can rub off on hands and feet.
- Blistering due to osmotic pressure, incorrect application, the curing or the operational use of the coating system
- Degradation of the coating resin or pigment due to excessive exposure to corrosive chemicals and over dosing
- Complete delamination from the concrete substrate due to inadequate surface preparation or interference from surface contaminants e.g., bond breakers, concrete treatments etc.

SUBSTRATE REFURBISHMENT OPTIONS

When coating refurbishment works are required its always preferable to completely remove the existing coating and to start at the bare concrete substrate. Abrasive blasting using an experienced operator is the preferred method for full coating removal and proper preparation of the substrate. This process allows for the inspection of the pool wall and floor surfaces to detect any underground leaking or cracks that will require repair prior to coating.

Substrate defects such as holes, voids and cracks can then be filled with suitable immersion-grade repair compounds to prevent out-gassing of the applied coating and premature blistering. The new coating will also have the best chance of penetrating and adhering to the concrete substrate to achieve maximum adhesion and integrity.

Coating products and parameters around their correct application can also be better controlled to avoid costly non-conformances.

Recoating of existing coatings can be done, but a number of aspects are particularly important:

- Thorough cleaning to remove scum, skin moisturisers, sunscreen residues and other contaminants, particularly from the tide line.
- The generic nature of the existing lining MUST be unequivocally established. Epoxy and chlorinated rubber coatings are NOT compatible with each other in any permutation.
- The pool must be fully dry and kept dry throughout the entire cleaning and recoating operation.
- The weather (especially for outdoor pools) can significantly influence application; mild overcast days are better than hot days, and low humidity is better than high.
- Epoxies require thorough abrasion before another coat of epoxy can be applied.
- Use of the correct solvent for the coating and in the correct ratio.
TECH NOTE 4.4.1
RECOATING SWIMMING POOLS

- Good ventilation; if there is inadequate ventilation, a mechanical fan or extractor is required throughout application and coating cure. Solvent is heavier than air and will accumulate in the pool recess.

- Chlorinated rubber coatings generally have good aged recoatability, but surface cleanliness is vital for good adhesion.

- Film builds must be strictly controlled to the product data sheet’s recommendations – too thin, and the coating may dry too quickly and not adhere adequately; too thick, and solvent entrapment may cause blistering and disbondment.

- The use of specialist protective coating applicators rather than commercial or decorative painters is strongly recommended.

FILLERS AND JOINT SEALANTS
Specialised fillers are available for the repair of concrete cracks, bugholes, divets and other substrate defects in swimming pools. These non-flexible fillers can be overcoated with coatings in accordance with the manufacturer’s product data sheets. These fillers are suitable for immersion and can tolerate the corrosive elements within the pool water. Pool-water tolerant elastomeric joint sealants should be used for the expansion joints and must not be coated over, otherwise the rigid coating will restrict movement of the sealant and may crack and delaminate.

COATING CURE AND TIME TO POOL REFILL
Most coating types require a minimum “full cure” period of seven days at 25°C, with adequate ventilation to completely achieve their intended protective properties. Film builds, temperature, humidity and ventilation factors all greatly affect coating cure rates. Premature exposure of the coating to the pool water and chemicals can affect the coating’s performance, reducing its expected service life.

Pools should not be filled until full cure has been achieved. If in doubt, seek advice from the coating manufacturer to confirm full cure.

SEEKING THE RIGHT ADVICE
In light of the above variables it’s important to select the best possible project timing, weather conditions, surface preparation method, coating type and application method to maximise the required result.

Each pool or project should be inspected by the coating manufacturer’s representative to survey existing substrate condition and coating type so as to suggest the best coating or recoating options available. Coating performance expectations and limitations should be discussed and agreed so the asset owner understands performance expectations and ongoing pool management and maintenance.

Due to the complexity of the works required, only competent, experienced contractors should be selected who have the ability and resources to understand and execute all of the required tasks and procedures associated with the works and have case histories of previously completed projects confirming their ability.

For more information, please contact the Dulux Protective Coatings Technical Consultant in your state.