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"SOLVING TOMORROWS BUILDING PROBLEMS - TODAY"

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WHAT IS CEMPRO?

Cempro is radically different and a much more reliable approach to spray on, roll on and trowel on methods to protect and decorate brick or masonry walls, and also as a durable coating medium for industrial floors and driveways.

Read on, and we will attempt to dispel the myths and legends about cement and what concrete is all about, and explain the chemistry of **Cempro** and what makes it different from other products on the market.

Cement is a wonderful but surprisingly fragile material.

Whenever the word cement is mentioned we automatically visualise the grey stuff that comes in bags. More accurately it is described as “Portland Cement”, because after it has cured it looks like Portland stone, a form of limestone quarried in Dorset in the UK. Portland cement was invented by an Englishman called Isaac Johnson in 1845, and has since become an essential ingredient in modern construction.

Portland cement is cheap, versatile and adaptable, but although great as a construction medium, it has a very complex chemistry.

Although it sets hard, Portland cement based concrete is surprisingly fragile. Its two biggest enemies are the people that mixed it, and attack from acids some of which occur naturally and others that are manmade.

People working with Portland cement based concrete in the building and construction trade, rarely have an understanding of the complexities of the chemistry they are dealing with. For the majority, the art of mixing concrete is simply a matter of chucking in some cement powder, some aggregate, some water and a few additives, to improve workability, and then mix it while adding a bit more of this or that until the mixture feels okay.

For concrete to fully cure (i.e. fully hydrate), the water content has to be just right. Not enough and it will cure weak and unstable. Too much and the result will also be weak and unstable. One peculiar trait, which will also result in weak and unstable cured concrete, is that Portland cement will only accept the original dose of water. Any water that is added later (e.g. when the mix starts to stiffen on a hot day) will be rejected by the chemistry, and will be thrown out as bleed water leaving voids in the concrete.

Workability aids and other so called performance enhancing additives, actually do more to assist the cured concrete when they are left out of the mix altogether. Most of these products interfere with the hydration process of the cement, and some actually prevent complete hydration. What later could be diagnosed as “concrete cancer”, may well be a result of an original overdose of an additive. Waterproofing additives are notorious in this regard. PVA (polyvinyl acetate), which is the basis of most popular concrete modifying additives, can prevent cement from hydrating when added to concrete in dosages greater than 8% by weight of cement.
If the concrete survives the well intentioned mistakes made by the person that mixed it, then it must contend with a service life of acid, and pollutant attack. Concrete is

particularly susceptible to acid attack, even mild acids that occur naturally. A 25mm x 25mm block of concrete will dissolve in a 10% solution of sulphuric acid within a matter of days. The emissions of motor vehicles come back to earth as acid rain. Acid rain eats away the concrete, as efficiently as whiteants eat trees. This becomes quite apparent where concrete structures are located near highways. Chloride sources are another form of acid attack from such sources as salt laden ocean breezes and well-intentioned household cleaning methods such as washing down concrete with a mixture of chlorine and water.

Putting aside the mixing mistakes and service life acid attack, Portland cement has a peculiar ageing characteristic that contributes to service life problems. For the first 10 years or so it contracts in microscopic increments, resulting in micro cracking. Then in the next 10 years or so it begins to expand in microscopic increments resulting in more micro cracking.

Given this fragility, plastering and resurfacing contractors must understand the surfaces they are working on are inherently unstable. Industry terminology's describing the aged condition of concrete such as "spalled", "carbonated", "plastic shrinkage" etc can all be covered to satisfy the practical purposes of the tradesman working with them – "unstable".

One therefore can see there is not a great deal of logic in resurfacing a Portland cement based substrate, be it on a floor or a wall, with another Portland cement based medium. If the Portland cement substrate over 10 years old is in expansion mode, and the resurfacing medium being applied (because it is freshly laid) is in contraction mode, the results will be obvious.

Who then will bear the brunt of the customers displeasure when surfaces begin to crack, craze, and take on that all to familiar tired look? Usually the contractor!

Cempro is different because it is made from organo cement emulsion

This is the **critical** difference between it and all the Portland cement based plastering and resurfacing products for walls and floors on the market today.

Cement doesn't necessarily have to mean the Portland cement variety. Cement is more broadly defined as being a substance or mixture of substances that react with water and sets hard into a mass that won't re-dissolve in water.

Mother Nature has been in the cement manufacturing business since the dawn of creation. We better know its creation as "limestone".

Industries have always needed cement substances for construction and protective coating purposes. So how did they go about this before Isaac Johnson invented Portland cement in 1845? They took a leaf out of mother natures book and made cements from naturally occurring materials.

In an ancient Italian village called Pozzuoli, near Vesuvius, some time before the birth of Christ, the ancient Romans developed their Roman cement known today as Pozzolanic cement. They made it by mixing clay, volcanic ash, lime and water. They constructed their sewers out of it, some of which are still in use today. They used to glue together huge structures such as the Coliseum. Many of these structures still stand today.

The Druids of ancient England & Wales were also in the cement business in order to make waterproof coatings for their dwellings and structures. They based their cement on a mixture of ox blood and lime. This rather disgusting mixture is still in use today by primitive African tribes who use it for waterproofing purposes. The ancient South American Indian cultures also employed organic mineral combinations to make cement. However they obtained their organic ingredients from human body parts taken from the unlucky poor devils selected for human sacrifice.
There is one very important difference between all the ancient cements and modern day Portland cements. The ancient cements were not susceptible to acid degradation. That is why many structures made from these cements are still standing today. These ancient

civilisations really knew what they were doing when it came to making cement.

So what is organo cement emulsion?

Organo cement emulsion borrows chemistry principles from each of the ancient cements used by other civilisations, but instead utilises modern day ingredients as a substitution. Instead of using ox blood or human body parts it uses purpose designed modern organic polymers. Instead of volcanic ash and mud from rivers, it employs a selection of minerals with the equivalent chemical structure. Water is then added to emulsify these organo cement ingredients.

The last element of the organo cement equation is the alkaline curing component. In order for the chemical combination of the ingredients to occur the environment must be alkaline. The ancient Druids used lime to generate the required alkalinity. The ancient Romans and the Egyptians also used lime in their respective organo cements. **Cempro** uses lime too but not in a powder format. It uses the lime that is generated as a bi-product of the hydration of the minerals.

If organo cement adhesive technology has such a good track record, is cheaper, more durable and capable of handling all plastering or resurfacing jobs, why hasn't it been adopted by the mainstream plastering and resurfacing product manufacturers? The answer is simple. Of the hundreds of grades of water based organic polymers that are commercially available there is only one with the capability to chemically **bond** with cementitious minerals. Most of the rest will happily **blend** (i.e. live side by side) with cementitious minerals, but they won't bond with them.

This one organic polymer became commercially available only a few years ago. Its organo cement role wasn't recognised until discovered by accident a couple of years or so ago. Since then we have taught ourselves to understand and apply a modern version of this old and proven technology. First, as a performance upgrade to Flexi-point ridge security (a high strength, high flexibility, exterior adhesive used to glue down the ridge caps of tile roofs), and next, as a performance and versatility upgrade to our original Flexi Wall 'n Floor ceramic tile adhesive product. And in the future for various new and improved product concepts such as cementitious roof coatings, paints, waterproofing membranes, etc and as a new approach to major concrete structures in high rise and dam construction.