

ENCAPSULATION CLEANING TECHNOLOGY

An overview of encapsulation chemistry and its applications



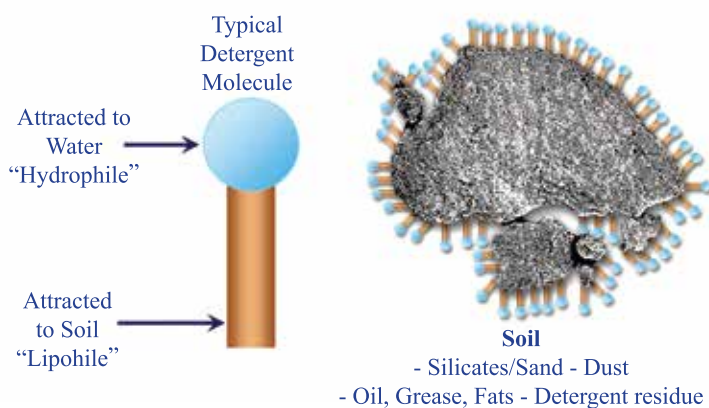
ENCAPSULATION THE CHEMISTRY AND APPLICATIONS FROM THE LABORATORY

Encapsulation chemistry is a significant step forward for the carpet cleaning industry, and is set to change many commercial cleaning programs over the next few years. This overview of encapsulation is intended to take you through the chemistry of the concept, show how formulators have employed it in new carpet cleaning products, describe its application in cleaning programs and answer a range of typical questions and misconceptions.

THE CHEMISTRY

Encapsulation chemicals are formulated using specialty polymers and detergents which are compatible with each other. These polymers bind the detergents and emulsified soils in a brittle structure as they dry.

Cleaning Chemistry Suspends Organic Phase and Particulate Soil



In the conventional cleaning process, surfactant molecules attach themselves to oily soil particles, suspending them (emulsification), so that they can be easily rinsed away. Surfactant (detergent) molecules and emulsified soils which escape being rinsed away, remain in the fibre and continue to attract soiling, causing the condition of the carpet to deteriorate, often resoiling faster than before it was subjected to the cleaning process. Encapsulators overcome this phenomenon.

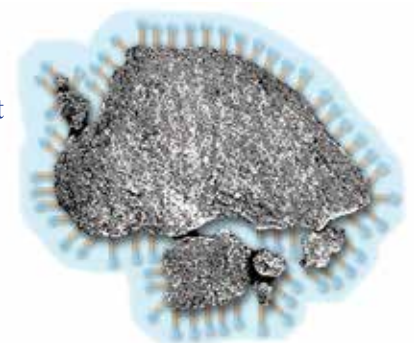
Encapsulators are specialty detergent polymers which become part of the detergent system. As drying occurs after cleaning, these encapsulators bind the detergent molecules and residual soils in a brittle crystalline structure. Detergent and soil particles can no longer attract other soils and are easily removed by dry vacuuming. In addition to binding the soil and detergent residues, the encapsulation chemistry coats the clean fibre with the same brittle film. This reduces the fibre's affinity for oily and particulate soils. As this brittle structure "breaks away" and more soil is removed, the appearance of the fibre improves as opposed to soiling more rapidly.

Products which also employ fluorochemical technology, display dramatically extended anti-resoiling time periods.

Encapsulation Chemistry Binds the Detergent Molecules and Soil in a Brittle Film

Soil particles cannot attract other soil

Soil particles are easily removed when dry vacuuming



ENCAPSULATION CHEMISTRY APPLICATION IN INTERIM CLEANING

Interim cleaning (low moisture) products utilize encapsulating technology to maximum effect. This is because there is no rinse/extraction involved and a much higher level of detergent and soil has to be encapsulated and embrittled. A professionally formulated encapsulator will emulsify the oily soil particles and dry down to a totally dry, brittle structure which will not attract other soils and be easily released to vacuuming.

These interim cleaning encapsulator products are normally diluted 1:16 - 1:32 with water and spray applied to the carpet or fed through a solution tank. The solution is then worked into the carpet with a single, double or triple rotating brush at low speed. After thorough agitation, the area is allowed to dry (20 - 30 minutes) after which time the area can be re-opened to traffic.

After 24 hours the encapsulation polymers will have cured and the area is vacuumed to remove the encapsulated soil. This system is ideal for large commercial areas and is significantly easier, quicker and less equipment intensive than hot water extraction.

It is important to note that these products are designed for interim cleaning. Because you do not have the advantage of the flushing action of hot water extraction where high quantities of soil can be removed, these products are to be used within a cleaning program where hot water extraction is periodically used to deep clean the carpet.

A common failing found in poorly formulated encapsulating cleaners is their ability to successfully embrittle the emulsified soil. These products will generally exhibit good grease cutting and emulsification action but will be unable to encapsulate and embrittle these residues. They mostly dry down to a wax like substance. Although improving the initial appearance of the carpet, the soil residues are not readily released to dry vacuuming and the carpet becomes choked with unremoved residues.

The Actichem interim encapsulating cleaners inherit a unique ability to emulsify oily soils and embrittle them for easy release to vacuuming.

AP460/1 Encap Plus & Encap Pro

These two encapsulation products employ an advanced combination of high performance encapsulators for a wide range, more effective lifting and encapsulating of soils, spots and stains. The added advantage of fluorocarbon technology enhances the carpets stain resistance and soil release.

AP464 Encap Fine Fabric

Ultimate encapsulation technology that has powerful cleaning action while still being gentle on delicate fibres. Wide range emulsification technology lifts oils and suspends them while still preventing resoiling. Ideal for delicate upholstery and area rugs.

AP462 Conquer

Conquer is an unbeatable multi-task spotting solution effective on a wide variety of water based and oily stains, with the added benefit of anti-resoiling, encapsulation technology.

ENCAPSULATION CHEMISTRY

DEVELOPING COMMERCIAL CLEANING PROGRAMS

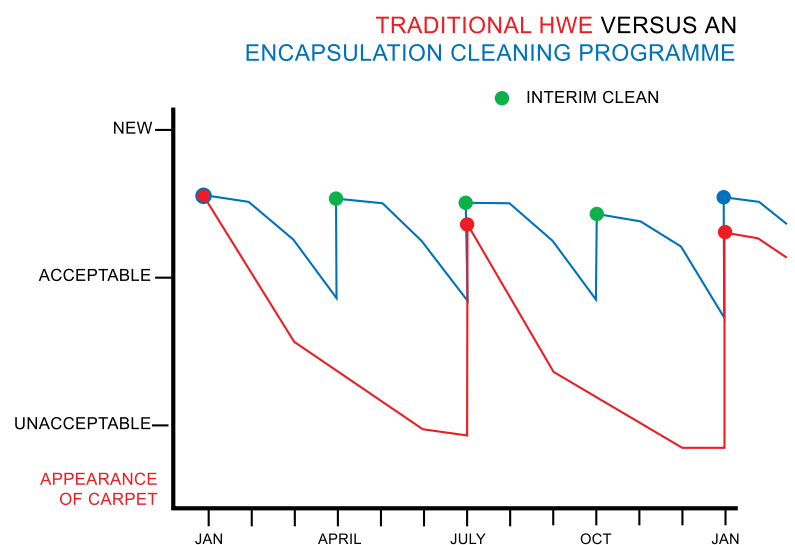
The Actichem hot water extraction products work hand-in-hand with the interim encapsulator products. For the first time in cleaning history, the hot water extraction industry has its own effective interim cleaner for integrating into commercial cleaning programs.

To maximise the benefits offered by these new and unique encapsulating products, they should not be treated as stand-alone cleaning methods but developed into a coordinated maintenance system. A typical yearly cleaning program is outlined below.

Example: Gemma's Fashion Clothing Store Looped pile nylon carpet.

- January: Hot water extract
- Prespray: Performance Plus
 - Rinse extract: Rinse Pro
 - Protector: Fibre Shield
- April: Interim Clean - Encap Plus
- July: Interim Clean - Encap Plus
- October: Interim Clean - Encap Plus

January: Program repeats.



Note: Day-to-day spotting should be done using Conquer and Citrus Gel (for chewing gum)

There will arise many variations to this example program, but significant savings can be realized and convenience to building owners if this concept is marketed and used as a complete maintenance system or program.

ENCAPSULATION

THE 7 MOST COMMONLY ASKED QUESTIONS

1

Q: How does encapsulation cleaning compare with other low moisture cleaning methods?

A: The most commonly used low moisture cleaning system is based on a sponge like material which is saturated with cleaning agent. These sponges are spread over the carpet area and vigorously agitated into the carpet pile. Soiling present on the face of the yarn is emulsified and removed as the sponges are vacuumed away.

Interim encapsulation cleaners however, are applied to the carpet in the form of a fluid solution and also vigorously agitated into the carpet pile. The advantage is that the liquid penetrates right into the inside of the carpet yarn which coupled with a liquid's significantly greater emulsifying capacity, means that the quantity of soil ultimately removed is dramatically increased. It is also the only low moisture cleaning process which promotes a reduction in resoiling propensity.

2

Q: How does interim/low moisture encapsulation cleaning compare with the bonnet cleaning method?

A: Bonnet cleaning is performed using a cleaning solution which is often solvent based and is presprayed onto the carpet. This is then agitated with a bonnet pad which also absorbs the emulsified soil. The detergent and soiling not absorbed into the bonnet pad remains in the carpet fibres., often causing accelerated soiling. Low moisture encapsulation cleaning however encapsulates the detergent and soils into a dry brittle structure which is easily vacuumed away. The most effective method of bonnet cleaning therefore is to use an encapsulation low moisture cleaning product such as Encap Plus as the bonnet prespray.

The other chief difference is that most dry cleaners sell their services as the only clean a carpet needs, whereas the dry encapsulation clean is incorporated into a total maintenance program which includes periodic hot water extraction.

3

Q: How does interim/low moisture encapsulation cleaning compare with the foam cleaning solutions used in the past?

A: Foam cleaners used through low moisture foam carpet cleaners are still used on delicate upholstery. These are based on surfactant chemistry which dries down to a waxy residue. The idea of the foam is to limit the moisture transferred to the fibre and also to provide a medium in which the soiling can be suspended off the fibre. Although these surfactant molecules dry down to drier crystalline structure than most other surfactants, they are still surfactants and still hold the same cleaning properties when they are left as a residual in the carpet. Although they don't necessarily attract dirt like a sticky surfactant residue does, they are still effective at cleaning the bottom of shoes, causing rapid resoiling.

Encapsulation chemistries however, entirely encapsulate this surfactant molecule, negating its cleaning action. This means that it is now not only a brittle particle but cannot attract any further soiling.

4 Q: Can I change across to encapsulation cleaning without reverting to periodic hot water extraction cleans?

A: Ultimately the answer is no. The dry vacuuming which is relied on to extract the encapsulated soil is not sufficient to release and remove all of the soiling. The nature of the fibre, yarn and carpet pile will all affect the effectiveness of this dry vacuuming. For instance, short, cut pile synthetic carpeting will typically respond better to dry vacuuming. The flushing action of the water in the periodic hot water extraction process is the only way of removing the deep set, stubborn soiling which contributes so significantly to premature carpet wear.

5 Q: Some jobs have just not responded to encapsulation cleans, while others have been amazingly successful. What is the difference?

A: The answer is the amount of soil (visible or invisible) present in the carpet, the carpet type and the facility type. Remember that dry interim encapsulation cleaning solutions are not designed to do the work of a hot water extraction restorative clean. Secondly, they are designed around commercial carpet types and typical soiling. Using this system in homes can be met with limited success. The answer lies in working it into a cleaning program. Always start the program with a hot water extraction clean. The programmed dry interim cleans which follow will then give you no unwelcome surprises.

6 Q: Can I apply a carpet protector after a low moisture encapsulation clean?

A: No. The application of a carpet protector should only be done after a hot water extraction clean or to a new carpet. If carpet protector is applied to a carpet which has only been dry encapsulation cleaned, the protector is unlikely to adhere to the fibres and would likely dry and be vacuumed away. The performance of any carpet protector relies heavily on the correct preparation of the carpet fibres. Just like paint must only be applied to a clean surface. This fibre preparation requires the cleaning action of the hot water extraction process and the buffering of to a slightly acidic pH by an acid rinse.

7 Q: Why add interim low moisture cleaning into a cleaning program?

A: Many commercial carpets are subjected to a large volume of foot traffic and can soil relatively fast. A large proportion of this soil type can be effectively removed using the interim encapsulation cleaning process and the hot water extraction clean limited to every 2nd or 3rd clean. The advantage of the interim encapsulation cleaning process, is that it is significantly less expensive to perform in terms of labour, equipment use and chemical costs. It also enables the carpet to be put back in use after only 20 - 30 minutes which is excellent in many commercial applications.