

On-Site Coating System Upgrade

When it is not possible to remove a system from the cleanroom easily, or where the disruption must be kept to an absolute minimum, we can still offer a WAVE upgrade. Some compromises must be considered, however in a matter of a few days we can turn an old, unreliable system into an up to date tool featuring our latest process controls.



A BAK760 coating system, pre-upgrade

A WAVE 760 system

Normally, in a working system ready for an on-site upgrade, the stainless-steel process chamber, the chamber frame and the chamber internal components are in good order so they can be retained and used as the basic platform for the new process controls. This makes our offering of the on-site WAVE upgrade our most cost effective and popular route to a reliable production platform.

Day 1.

Our team of two engineers arrive on site, complete any contractor requirements, and then begin the most difficult phase of the upgrade, dismantling, removing and preparing the system so that the new components and controls can be fitted. This normally presents us with a few challenges. There is always something that will not unscrew, or a wheel missing from something that needs to move.

By the end of the day, the system is completely stripped down to its most basic layout. The control racks, all wiring, all cooling water distribution and all pneumatic system components are removed leaving just the chamber, baffle, pump set, system frame etc.



Day 2

The new, pre-built control rack is wheeled up next to the chamber.

The control rack houses the system PC and screen, the high voltage power supplies, the electrical switchgear and in some cases, where there is no room underneath the chamber, there is also space for heater transformers, filament and thermal source transformers. The rack, when bolted to the side of the system provides a clear pathway to the chamber base, allowing the high current cable route to be as short as possible.

The control rack can be built left or right-handed so it can be wheeled up to the left or right side of the process chamber. This means that the cleanroom layout can be retained. The new water distribution panel is fitted to the rear of the system and the process of making the interconnections begins. Fortunately, the pre-made inter-connection cables are made to the correct length and fully labelled at the time of build, we use pre-wired plugs and socket wherever possible, to make this phase of the installation as easy as possible.

The water distribution pipes are made on site and neatly connected to the water distributor as are the compressed air distribution manifold connections. These are also neatly tucked into the trunking. Finally, the system is connected to the electrical supply. Typically, the WAVE system has a much lower power rating so in most installations so usually, the same power outlet can be used. The system is also connected to the cooling water supply, the compressed air supply and the factory ground. Normally, we hope to get the power on towards the end of day two.



Day 3

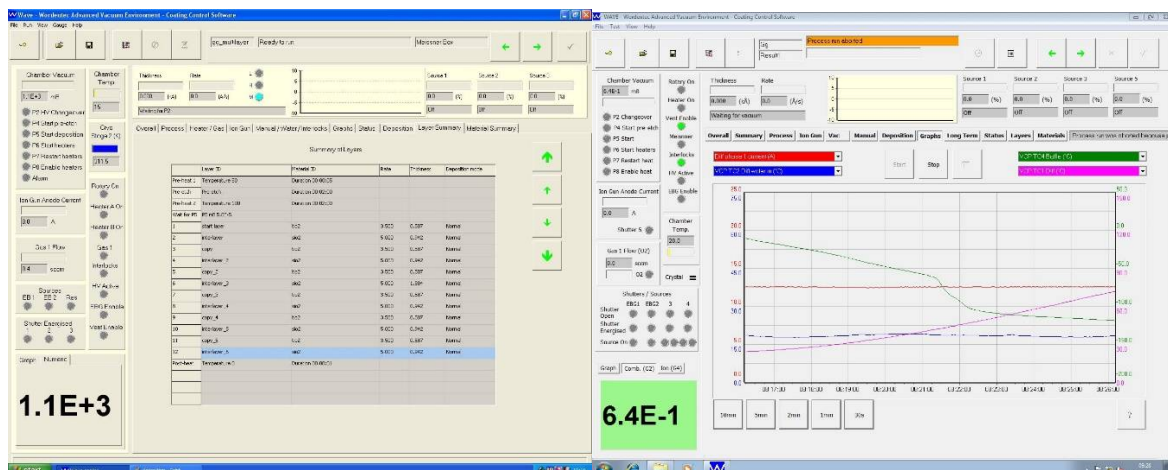
This is commissioning day and manual functional tests begin. We ensure that the water channels have flow are connected correctly and that there are no leaks. We check the electrical connections are correctly made and that all components of the system operate as they should in manual set up mode.

The WAVE system can be used across a variety of pumping platforms and chamber configurations so there is a list of pumping and process set up variables to work through. This is to ensure that the system is correctly tuned to the chamber volume, valve configuration and pump type.

Once the checklist is complete the pump system is put into fully automatic mode and the warm up, or cool down can begin. During this time the engineers on site are checking that everything is progressing as it should be. This time is also spent tidying up the installation and documenting any alterations that have been made.

We actively encourage the machine operators and maintenance engineers to engage with the commissioning procedure, its extremely useful to see the set up and how the various control screens interact with the system. Early familiarity with the controls and the way the system operates is always extremely valuable.

The sign off for the upgrade is typically its ability to run the processes that it previously ran. Working together with the process engineers and the machine operators Wordentec engineers can assist with setting up the first process. This involves the set-up of the various materials used, and so very quickly the operators can learn how to operate the system with the new process controls whilst setting up a real-world process. Once set up correctly the system should complete the process without intervention whilst logging every second of every process for later evaluation. This first process can then be used as a template, as in our experience, once the set of usual materials are set up, the creation of most other processes will be the transfer of layer thicknesses from the previous process controller.



Day 4

This can be spent helping the operators gain further familiarity with the new process controls which do look complicated at first view. Just like all new coating systems, our on-site system upgrades feature the latest version of our legendary WAVE coating software. The software is easy to use at operator level, so within a few short hours an experienced operator will be confident enough to take control of the machine and run processes.

By the end of day four we expect the upgrade to be complete. The operators and maintenance team should be reasonably familiar with the systems servicing and operating requirements. We don't expect to instantly resume production however we do expect the system to have completed a multi-layer process that can be analysed.

Overall tooling factors and material dispersion data should be very close to those used by the previous stand-alone controller making the route back into full production straightforward.

Day 5

It's always good to have a spare day at the end of the installation. We do expect to be on site for day five, it is possible that the schedule will have slipped by a day and there is still work to do. There may also be further training needed for additional personnel who were not around for the initial trials.



For more information about Wordentec system upgrades please get in touch.

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