Cleaning solvent issues solved for Prima Dental

Millions of its dental burs help dentists improve smiles globally every year. Prima Dental itself had cause to smile after component cleaning specialist Fraser Technologies helped the manufacturer solve some component cleaning solvent issues.

With a 150-year dental manufacturing heritage, Gloucester-based Prima Dental produces around 30 million dental burs - or drill bits - per year. In June 2015, Prima’s Production Engineer, Nigel Frampton, contacted Fraser with a view to replacing the Methylene Chloride cleaning solvent used to clean the burs with an agent offering an improved health and safety profile.

Prima has two Crest AVD 500 semi-automated solvent cleaning systems, one used for gross-cleaning and the second for final cleaning before packing and dispatch. The burs are made typically in batches of 1000 and stacked in baskets which are then hung on an auto-loader ready for cleaning.

After initial discussions, Fraser recommended comparing the technical performance of the existing Methylene Chloride agent with Opteon™ Sion™, a new-generation fluorinated solvent combining high 100 KB cleaning power with an improved safety profile.

Fraser held initial trials at its Livingston in-house trial unit, and the cleaning performance results with Sion were superior. The specialists also considered aqueous cleaning but decided against this as it would have meant installing a new cleaning system and would have been less efficient given Prima’s high-volume cleaning requirements.

A further issue of concern to Prima was high solvent losses in its existing process. It was agreed to run on-site trials, in which Fraser would be involved in the changeover of chemistry, tank clean-out and system set-up. Ahead of the changeover, Fraser conducted a full system audit, which revealed a number of issues with the equipment. These were corrected by repairs and cleaning process optimisation, significantly reducing solvent usage.

Trials were therefore run using off-line distillation equipment to recover solvent for re-use. Encouragingly, these demonstrated that 74 per cent (in this case Sion) of the overall waste stream that would normally be disposed of could be recovered for re-use. The remaining 26 per cent was mainly waste oil. Despite its higher cost per litre than Methylene Chloride, Sion’s high recoverability, combined with process optimisation, meant that running costs would be comparable to previous ones.

Furthermore, Prima would avoid costly cleaning equipment replacement, while benefiting from Sion’s improved performance and a superior health and safety and environmental profile. On this basis, Prima adopted the Sion process, and performance to date has met original expectations.

Performance levels were so good that Prima wanted to use the process elsewhere. Fraser installed a new-generation Crest F100-1010 cleaning system together with Sion fluid on site to allow Prima to assess the performance and solvent usage. Following the successful trial, Prima purchased the system, as well as an off-line still which had a 6-month payback period.

Fraser Technologies Managing Director, Graham Fraser, commented, “On-site trials were very successful, although the high levels of oil introduced to the process resulted in frequent tank clean-outs and solvent disposal. Unlike Methylene Chloride, Opteon Sion is very stable and readily recoverable, allowing recovery levels of stable product of 90 - 95 per cent of the solvent content from the waste stream.”

Nigel Frampton commented, “Fraser Technologies demonstrated that they go beyond supplying equipment and chemistries...”
Fraser also helped Prima improve the removal of carbide deposits from the necks of dental burs, by specifying and supplying NGL’s Rodastel cleaning agent for a separate existing aqueous cleaning process used before the final clean with Sion.

Nigel Frampton commented, “Fraser Technologies demonstrated that they go beyond supplying equipment and chemistries. Their pre-sale audit of our cleaning process, product trials and innovative thinking helped deliver a component cleaning solution that yields better performance, an improved health and safety profile, and excellent solvent recovery.”

Fraser Technologies continues to support and optimise Prima’s cleaning systems and processes, keeping them at the cutting edge in more ways than one.

Further information from Fraser Technologies, Telephone: 01506 443058 Or visit: www.frasertech.co.uk

<table>
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<th>Cleaning agent</th>
<th>Cleaning power (KB value)</th>
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