Well known Birmingham plating company enhances its environmental footprint

E C Williams Ltd, the well-known plating company in Birmingham has just commissioned a new effluent treatment plant for its facility on the fringe of the Jewellery Quarter, close by the old Canning headquarters on Great Hampton Street. The new treatment plant was designed, constructed and commissioned by Puretech Environmental Ltd with an installation slot of just five working days to coincide with E C Williams' annual shutdown at the end of July 2007.

E C Williams was founded in 1921, so it must be one of the oldest plating shops still in existence in Birmingham. Henrik Skouby, who has been its managing director since 1989, has run the business in a highly professional manner with investment decisions that have maintained the company in a lead position through the several difficult times that the surface treatment industry has suffered since the early seventies. The company was an early proponent of water conservation measures long before the PPC Regulations of 2000 were introduced. Skouby ensured that the company was a pioneer in zinc-nickel alloy at a time when the value of this technology was not fully understood by either manufacturing industry or the treatment industry itself.

E C Williams has operated a large multi-station zinc-nickel barrel plant for almost fifteen years, with its much of its output dedicated to the automotive industry.

Supporting its zinc and zinc-nickel business is a wide range of other electroplated finishes that are processed in semi-automated and manual plant. Backing all this is a modern control laboratory and administrative office that is the envy of other similar businesses.

PPC Permit

Soon after 2000, it became clear that E C Williams would need to sign up for a PPC Permit authorisation with the Environment Agency, since the plating shop's installed process tank volume was in excess of the 30m^3 threshold. The Permit application was granted without any difficult conditions, although attention was drawn to a need to enhance the bunding of the ETP and to review the materials of construction of parts of the plant that had been in place since the early 1980s.

The existing technology followed traditional practice with sodium hypochlorite oxidation of the cyanide containing rinses, sodium metabisulphite reduction of the chromium rinses and heavy metals precipitation with sodium hydroxide. Typically, Skouby saw this as an opportunity to examine the potential advantages of other technologies, eg: ion-exchange, reverse osmosis and electrochemical systems.

Following consultation with Marquis Associates, and bearing in mind the several diverse plating operations carried out by the business, Skouby decided to retain the traditional technology and remove the bulk of the existing ETP, to be replaced in the same location with a new plant. The work was planned to take place during the 2007 annual shutdown - an arduous condition that would demand the utmost planning and scheduling from the contractors that were approached for proposals.

E C Williams placed the order for the plant with Puretech Environmental during May 2007. Although this water treatment company was only founded in 2006, Jean-Michel Monserand, its managing director and co-owner had become well known in the surface treatment industry through his association with projects at Robert Stuart plc, Peugeot, Rolls-Royce, Derby and Penn Engineering in Galway, Eire, the latter project being an effluent treatment plant for a large zinc and zinc-nickel barrel plating plant processing small precision fasteners for the automotive industry.

Thorough analysis

Puretech's work is characterised by a thorough analysis of the process plant drag-out properties, detailed mass balance calculations, and quantitative design procedures that bear little relationship to the 'back of the envelope' approach exhibited by some others in the surface treatment industry. Its proposals are comprehensive and leave no doubt in the clients' mind as to what is envisaged. The location of existing E C Williams ETP was such that there was little space for the new and larger reactors that were deemed to necessary as a result of the expansion of the process plating plant facilities since the existing TP was installed, so that Puretech prepared detailed three-dimensional CAD drawings confirming not only the adequate working spaces for the operating personnel, but also demonstrating the efficacy of the hydraulic gradients of the connecting pipework.

Up and running in a week!

The reactors, input chemicals tanks, pipes and fittings were delivered to site several days before the planned shutdown and all were checked and protected whilst awaiting installation. Once the plating shop had shut down, the old equipment was removed and the floor fitted with a thick polyethylene base and bund wall. The site dismantling and preparation took two full days. The circular baffled reactors and ancillary tanks were then moved in so that the piping and fitting of instrumentation could start. The overall site preparation and installation period started on the late afternoon of Friday 27 July, 2007, and was completed tested and ready for operation on Friday 3 August — a magnificent achievement thanks to the thorough pre-planning of the work and the management and quality of the site erection team.

The former reactor section pictured just before demolition.

The new reactor section.

A view of the sodium hydroxide dissolution and storage tank.

Henrik Skouby was delighted with the project's outcome. He said that "the Puretech Environmental's performance was outstanding and exceeded all my expectations; I was especially pleased that there was no disruption to the company's production operations."

Not least, the performance of the ETP has demonstrated a heavy metals control well within Severn Trent plc's trade effluent consent limits.

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