



European Solvents Industry Group

Advice and help in hydrocarbon  
and oxygenated solvents

[www.esig.org](http://www.esig.org)

## **CASE STUDY - Dr Martens factory takes steps to capture VOC emissions**

A biological filtration system has been installed at a Dr Martens™ footwear factory to destroy VOC emissions from solvents used in adhesives.

The UK footwear industry faced stringent VOC limits set by the UK Environmental Protection Act of 1990 and was also aware of forthcoming European legislation. Therefore the Shoe and Allied Trade Research Association (SATRA) was researching solutions for compliance including abatement techniques, non-solvent alternatives and even the outsourcing of solvent-using processes.

R Griggs & Co Ltd, UK manufacturers of the Dr Martens™ brand, was determined to implement a solution which would in no way compromise product quality. As production manager Peter Jarvis explains: "Dr Martens™ footwear is legendary for its durability and resistance to oil, fat, acids and petrol. We had to find a cost effective, practical solution for the continued use of solvent-based adhesives in our factory".

SATRA research into destroying VOC emissions through the use of catalytic incineration units showed that capital and running costs were too high because of the relatively low concentration of solvents in the air emissions. Therefore, a trial into biotechnology was set up at Griggs' factory in Wellingborough, supported by SATRA, the BOC Foundation for the Environment and the Department of Trade and Industry's Biotechnology Means Business initiative.

In the so-called BIOVOX® process, VOCs pass through a unit containing naturally occurring micro-organisms which breakdown and digest VOCs.

"The air flow is passed through a biological treatment plant where solvents and solvent mixtures are efficiently metabolised by micro-organisms, leaving harmless by-products - carbon dioxide, water vapour and biomass," explains Bruno Erasin, Process Engineer at IBS Viridian, the technology designers.

Within the biological reactor, micro-organisms grow as a biofilm where they produce enzymes to break down VOCs. The micro-organisms grow on novel support media which provides a high surface area for maximum contact between the waste air and water. Nutrients containing nitrogen, phosphorous, sulphur and trace elements supplied on a daily basis encourage micro-organism growth.

The results of the six-month trial showed the biological abatement to be very effective - removing up to 96 per cent of VOCs from the waste water and gas. A full-scale unit is now being installed at Griggs' factory.

"Biological systems can be scaled up or down to treat air flows from 1 000 to 500 000 m<sup>3</sup>/hour containing up to 2.5 grams of VOCs per m<sup>3</sup>," continues Dr Erasin. "At Griggs' factory we estimate the capital costs of installing our BIOVOX® system to be 30 per cent less than an incinerator and operating costs are 55 per cent less, so BIOVOX® is cost-effective, efficient and more than meets environmental requirements".

**For further information on BIOVOX®, contact Dr Bruno Erasin on +44 (0)1227 770 505.**

**For additional information please contact the ESIG secretariat in Brussels,  
Pierre de Kettenis, at +32 676 72 64 or visit [www.esig.org](http://www.esig.org)**

REPRESENTING THE HYDROCARBON &  
OXYGENATED SOLVENT PRODUCERS OF



Avenue E. Van Nieuwenhuysse 4, bte 2  
B-1160 Brussels  
Tel 32 (0) 2 676 72 64  
Fax 32 (0) 2 676 73 01  
T.V.A. 538.183.516

Atofina - BASF - Borealis Polymers - BP Chemicals - Celanese Chemie - CEPSA - Clariant  
DHC Solvents Chemie - DOMO Caproleuna - Dow Europe - Eni Spa - Ercros Industrial - Ertisa  
ExxonMobil Chemical Europe - Fortum Oil & Gas - Galp Energia, Sggs, S.A. - Haltermann Products - Ineos Oxide  
Ineos Phenol - Lyondell Chemical Europe - Oxochimie - Oxeno - Perstorp - Petrochem Carless - Polimeri Europa  
Rhodia - Sasol Solvents - Sekab - Shell Chemicals - Sodes - Solutia Europe - Total Solvents