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## The 2000 MacRobert Award for the Platinum CRT™

The MacRobert Award is the premier prize for engineering innovation in the U.K. and is awarded annually by the Royal Academy of Engineering to a team responsible for a world-leading engineering development demonstrating technological achievement, successful commercial exploitation and benefit to the community. In 2000 the MacRobert Award was won for the second time by Johnson Matthey, this time for the diesel emission control system known as the Continuously Regenerating Trap (CRT™). This revolutionary system has enabled trucks and buses to control the pollution emitted by their diesel-powered engines, especially the particulate matter (soot), the health impacts of which are causing increasing concern.

The MacRobert Award was first presented in 1969, when it was shared between Rolls-Royce, for the Pegasus engine used in the Harrier jump-jet, and Freeman, Fox and Partners for the Severn Bridge near Bristol. Johnson Matthey won the Award in 1980 with its catalytic converter technology for passenger cars (1). Other winners have included BP, British Gas and ICI.

The modular CRT™ comprises a filter downstream of a specially-formulated platinum catalyst. The CRT™ utilises the discovery that nitrogen dioxide burns soot at temperatures typical of diesel exhaust,  $\geq 275^\circ\text{C}$ . The innovative design of separating catalyst and filter sees the platinum catalyst convert nitric oxide normally present in diesel exhaust into nitrogen dioxide. This is then used to burn the diesel soot trapped on the filter. The platinum catalyst also converts over 85 per cent of the hydrocarbons and carbon monoxide

in the diesel exhaust into less harmful carbon dioxide and water.

While the CRT™ concept was patented in 1989, it could not be commercialised because the diesel fuel then available had a high sulfur content which inhibited the generation of nitrogen dioxide. The breakthrough occurred in the early 1990s when Sweden introduced low-sulfur fuel in response to environmental concerns. Low sulfur fuel and the CRT™ are now sold across Europe, in the U.S.A. and in Japan.

The MacRobert Award coincided with the fifth anniversary of the commercial launch of CRT™, first described in this Journal in a paper by Pelham Hawker (2). Hawker is a member of the winning team, along with Pär Jones and the co-inventors of CRT™, Barry Cooper and Jim Thoss. Barry Cooper was also in the team which won the MacRobert Award in 1980 and so becomes the first person to win the Award twice.

To celebrate the Award, Johnson Matthey has produced a special commemorative report, "CRT5: Fifth Anniversary Publication". Copies of this may be requested from: Ms Vanessa Bystry, Johnson Matthey CSD, Orchard Road, Royston, Herts SG8 5HE, U.K; Fax: +44 1763 253 475 or E-mail: bystrv@matthey.com.

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