

# Project Report

## Recuperative Thermal Oxidizer

4 Cyte/Triple S  
SPIDA Paint Process Facility  
Fort Worth, TX, USA



Custom Engineered Recuperative Thermal Oxidizer

## The application

In mid 2001, 3Ts International Ltd was asked by 4 Cyte Ltd, a UK based Company to design and manufacture a suitable compact. Skid-mounted exhaust gas thermal treatment system to oxidise the solvent laden air coming from their own newly designed and innovative continuous paint line named the SPIDA.

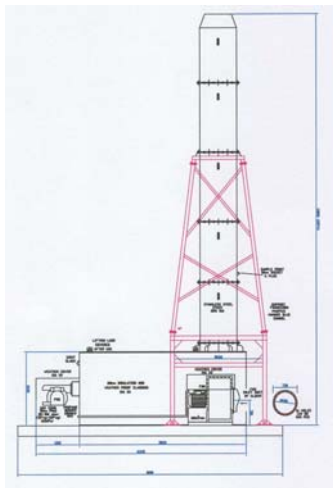
The oxidiser was required to treat a minimum 3.098 m<sup>3</sup>/sec exhaust from the SPIDA and to comply with PG6/23 (95), EC & US standards.

The location of the plant was to be in Fort Worth Texas at the premises of Triple S which was about to commence a contract with Nokia to spray mobile phone cases.

## The product

The design criteria was for a thermal oxidiser to treat exhaust gases from a continuous process producing VOCs as follows

Exhaust gas temperature	20°C
Volume Flow	11,120 Nm <sup>3</sup> / hour (3.089m <sup>3</sup> / sec)
Solvent contamination	1.33 litres/hour
Residency time	0.70 second
Continuous operating temperature	800°C
Main Combustion Chamber volume	12.62 m <sup>3</sup>
Natural gas burner energy volume	223m <sup>3</sup> /hour max at initial pre heat
Flow rate out of oxidiser	16.26m <sup>3</sup> /sec @ 800°C



A horizontally configured combustion chamber fired by a single Propane (LPG) modulating gas burner. The combustion chamber is constructed from high temperature 310 stainless steel throughout with external cladding in 316 grade stainless steel

Outer casing supported by a mild steel box section and L section support frame. Internally lined with lightweight ceramic fibre modules coated with hard face cement to protect against erosion by high velocity hot gases. Cold face temperature no more than 60°C at continuous internal temperature of 800°C.

A recuperative system was incorporated within the design. Thus heat is recovered from the oxidising chamber to pre heat the incoming exhaust air from the paint plant. Incoming air pre heated to approximately 400°C thus reducing the amount of prime fuel required. Overall fuel consumption therefore reduced by around 55% to 60%

The system included burner management system and fully integrated controls for automatic plant operation and safety interlock.

## Delivery

The T/O 185 was ordered by the customer on 1<sup>st</sup> May 2001 and completed by 31<sup>st</sup> August 2001. Although weighing in excess of 8.5 tons the unit was air freighted to the USA by the customer.

3Ts International contractors and engineers installed and commissioned the unit during September 2001 and complete training, testing and hand over was complete by February 2002.

## Recommendations

For product recommendations please contact:

1. Mr. Mark Robinson      4 Cyte Ltd      Tel: +44 1483 281081
2. Mr. Steve Peterson      Triple S      Tel : +1 817 491 1500

---

### United Kingdom

3Ts International Ltd, Lower Church Street, Chepstow, Monmouthshire, NP16 5XT, United Kingdom  
Web: [www.3tsinternational.com](http://www.3tsinternational.com)

### Middle East

PO Box 74925, Dubai, United Arab Emirates  
Tel: +971 4 394 5201 • Fax: +971 4 394 5205 • E-mail: [sales@3tsinternational.com](mailto:sales@3tsinternational.com) • Web: [www.3tsinternational.com](http://www.3tsinternational.com)

