

# PRODUCTS AT WORK

W E T S C R U B B E R

## F-105 Wet Scrubbers Installed at Semiconductor Wafer Fab in Singapore

### Background

In order to comply with Ministry of the Environment emission requirements, Project Engineers at Chartered Silicon Partners, Singapore (CSP) needed gas scrubbers for their FAB-6 expansion.

They required six (6) new 40,000 CFM scrubbers with chemical addition and high efficiency mist eliminators to treat acidic process exhaust.

CSP also required that each scrubber be supplied with an energy efficient exhaust fan. After thorough analysis of equipment features and benefits, CSP selected Duall model F105 scrubbers complete with redundant recycle pumps and Duall NH fans. All equipment was constructed of UV-PP to provide maximum corrosion resistance and weather protection for outdoor installations subjected to Singapore's intense sunlight and tropical climate.

Duall engineers designed the NH fans with airfoil impellers in order to provide mechanical efficiencies in excess of 85%. With excellent service support from Duall's distributor in Singapore, the systems were installed on time per customer requirements in December 1998.

### Results

In March 2000, the systems were performance tested while the Fab was processing wafers. All airflows and efficiencies were verified to be accurate and in accordance



with specified design. Emissions of HF, HCl, and NH<sub>3</sub> tested at the scrubber outlets, were verified to be non-detectable. Three months later, CSP purchased a seventh scrubber system from Duall. This system treats over 43,000 cfm of acid gases. All scrubber systems are electronically monitored daily by the in plant SCADA system to assure compliance with permit regulations.

### Present Status

These reliable Duall systems, operating on a demanding 7 days per week 24 hours per day schedule, have provided uninterrupted service for over 3 years. All systems have been approved and permitted by the Ministry of the Environment.

**Application:** Hydrofluoric Acid (HF)  
Hydrochloric Acid (HCl)  
Ammonia (NH<sub>3</sub>)

**Purchaser:** Chartered Silicon Partners (CSP) Singapore

**Reference:** 8830-98

- UV-PP construction
- Low profile, cross flow design ideal for rooftop installation
- Duall NH exhaust fans
- Non-detectable outlet emissions



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