UOP Callidus Catalyst Systems

Selective catalytic reduction and catalytic oxidation

SCR SYSTEMS FOR THE POWER AND PROCESS INDUSTRIES

A Honeywell Company
Reducing NOx and CO levels for simple-cycle systems, heat recovery steam generators, package boilers, and thermal oxidizers.

UOP Callidus offers thermal oxidizers, retrofit catalyst systems, and simple-cycle systems for catalytic oxidation. UOP Callidus understands all aspects of SCR processes, including turbine exhaust gas conditioning, ammonia vaporization, ammonia injection and mixing, catalyst selection, acoustic attenuation, and related process control integration. UOP Callidus draws upon vast experience in mechanical, electrical, chemical, process, structural and project engineering as well as computational fluid dynamic (CFD) modeling and other technical disciplines to design custom solutions that exceed customer requirements.

**Ammonia Vaporization:**
UOP Callidus uses a proprietary method that utilizes turbine exhaust to provide the heat required to vaporize the aqueous ammonia.
- Allows for fast startup (< 10 minutes)
- Reduces parasitic load of conventional electric heat vaporizing systems
- Reduces oxidation of ammonia to NOx during vaporization

**Ammonia Injection Grid (AIG):**
Our experience in flow and mixing for industrial combustion processes is unparalleled. Our field proven patent pending ammonia injection grid (AIG) technology provides superior mixing and distribution of ammonia in SCR applications. Our High Performance Mixing (HPM) technology can:
- Improve NOx Reduction
- Reduce Ammonia Slip
- Extend Catalyst Life

**Acoustic Attenuation Technology:**
UOP Callidus is evaluating a proprietary sound attenuation technology that reduces break-out noise without the need to increase wall panel thickness resulting in:
- Equipment weight savings (reduced shipping weight, reduced foundation loading)
- Reduction of downstream stack baffles
- Lower pressure drop than conventional baffle designs

**Control Integration:**
Complete integration of the SCR controls with other plant systems can provide improved visibility to plant operators. As a member of the Honeywell family, UOP Callidus offers broad capabilities to integrate SCR controls with:
- Plant DCS and turbine controls
- CEMS equipment
- DARS reporting software

**Modular Design Features:**
UOP Callidus leverages its global experience in field assembly to provide efficient modular designs that reduce overall project costs. Our modular design with bolted flange connections:
- Reduces shipping costs
- Reduces assembly time in the field
- Reduces field welding
- Utilizes lower cost field labor

**Selective Catalytic Reduction (SCR) technology overview:**
UOP Callidus understands all aspects of SCR processes, including turbine exhaust gas conditioning, ammonia vaporization, ammonia injection and mixing, catalyst selection, acoustic attenuation, and related process control integration. UOP Callidus draws upon vast experience in mechanical, electrical, chemical, process, structural and project engineering as well as computational fluid dynamic (CFD) modeling and other technical disciplines to design custom solutions that exceed customer requirements.

**Turbine Exhaust Gas Conditioning:**
Providing leading edge SCR performance begins with understanding turbine exhaust emissions. We recognize that different turbines provide different exhaust profiles, and that these individual turbine profiles are also subject to change based on various operating conditions. Our design philosophy is to create SCR systems which accommodate a wide variety of exhaust profile inputs and operating conditions. Our experience in CFD modeling combined with Six Sigma evaluation methods allows us to create turbine independent designs that modify turbine exhaust profiles to achieve:
- Even flow distribution
- Even velocity distribution
- Even temperature distribution

**Commutational Fluid Dynamic (CFD) Modelling**
- Dedicated in-house CFD since 1990
- Over 32 man years of modeling experience
- Over 500 models created
- Currently modeling 16 to 25 per year
- Currently have access to over 300 CPU cores
- Allows for more complex models
- Reduced run-time, faster turn-around
- 4 different solver technologies available
- Primary use Ansys/Fluent

**Ammonia Vaporization**
- Cold flow modeling of ammonia injection grid
- High Performance Mixing technology provides superior mixing and distribution of ammonia in SCR applications. Our High Performance Mixing (HPM) technology can:
  - Improve NOx Reduction
  - Reduce Ammonia Slip
  - Extend Catalyst Life

**Acoustic Attenuation Technology**
- UOP Callidus proprietary ammonia injection grid (AIG) design produces 5.2% RMS at 3 feet

**Modular Design Features**
- Reduces shipping costs
- Reduces assembly time in the field
- Reduces field welding
- Utilizes lower cost field labor

**Control Integration**
- Complete integration of the SCR controls with other plant systems can provide improved visibility to plant operators. As a member of the Honeywell family, UOP Callidus offers broad capabilities to integrate SCR controls with:
  - Plant DCS and turbine controls
  - CEMS equipment
  - DARS reporting software
Test Facility

The UOP Callidus test facility is in continual use for combustion technology research and development as well as customer witnessed demonstrations. Our array of test systems allows us to closely match actual field operating conditions, providing results which will more accurately predict actual measured performance.

Global Coverage

UOP Callidus reaches the global market through our headquarters located in Tulsa, Oklahoma, USA with regional direct sales offices and independent sales representation around the world. Meeting our customers’ expectations and setting the standards for the combustion industry have always been our company goals. Each burner, flare, thermal oxidizer and catalyst system we design and manufacture is built with those goals in mind.

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