Dilute NCG (HVLC)

pulp & paper group

Collection and treatment of dilute non-condensable gases is a further step that Kraft pulp mills take to mitigate ambient odor In the U.S., the EPA Cluster rule mandates that DNCG/HVLC systems be implemented.

NORAM offers a wide range of services in DNCG/HVLC gas systems:

- Audits of existing operation, including troubleshooting and debottlenecking
- Studies to evaluate and recommend system improvements
- Process Safety Management (PSM)/HAZOP analysis
- Operator training
- Design and supply of state-of-the-art technology

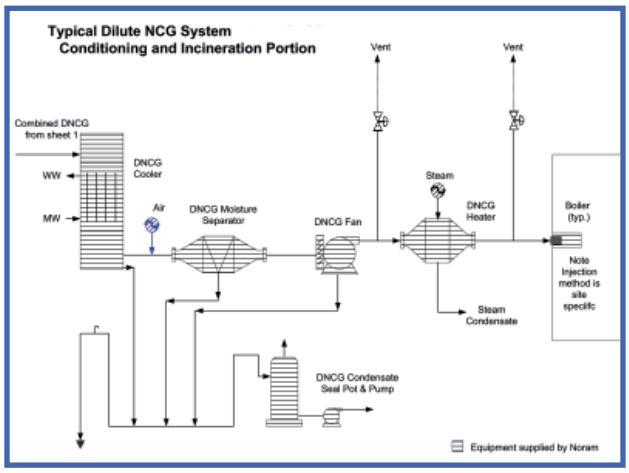
NORAM systems focus on the following:

- Safety and reliability
- Innovative and effective designs
- Low capital and maintenance costs

Three unique DNCG sources requiring special consideration are chip bins, brown stock washers and heavy black liquor tanks.

Chip Bin Gases require additional conditioning compared to typical DNCG sources. Unsafe TRS and turpentine concentrations can sometimes be present. Chip bin gas collection is the most hazardous of all the sources within a mill and NORAM engineers know what is necessary to ensure safe collection and disposal.

Brown Stock Washers are typically the largest volumetric source of DNCG, particularly if the hoods are not properly enclosed and air ingress not controlled. NORAM will work with mills to best reduce overall flow without adversely affecting operation.



Heavy Black Liquor Tanks are generally operated hot and the gases that are vented contain substantial amounts of water vapor. Based on experience, NORAM engineers have found that installation of a condenser is often justified.

DNCG/HVLC conditioning:

After collection, the combined DNCG/HVLC gas must be properly conditioned prior to final treatment, in order to minimize its impact on the treatment device and reduce project costs.

DNCG/HVLC control:

The DNCG/HVLC system is designed for simple operation and minimal control. The two main objectives are:

DNCG Cooler

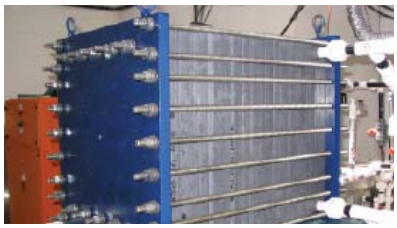
- Provide automatic isolation of the system during unsafe operations (primarily the Chip Bin System).
- Stabilize the DNCG/HVLC gas flow, temperature, and pressure
  to reduce the net effect on the incineration location.

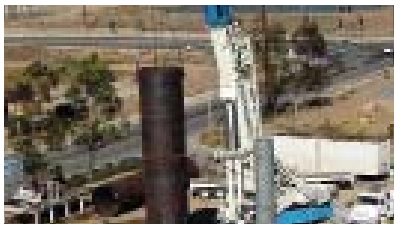
Put NORAM Expertise to work in ensuring the safe and effective operation of your existing DNCG/HVLC system or in the design of a cost effective system to achieve new levels of environmental performance.

technology and engineering solutions for the process and resource industries

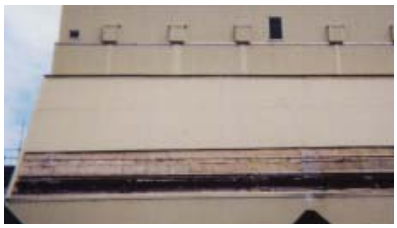

Nitration


Sulfuric Acid


Electrochemical


Biosystems


Pulp&Paper


Environmental

Company Profile

NORAM is a private engineering and technology firm based in Vancouver BC, Canada. We specialize in the development, engineering and commercialization of new chemical processes, and in the improvement and optimization of existing technologies. Since 1988 NORAM has provided leading-edge technologies to the chemical, pulp and paper, minerals processing, wastewater and electrochemical industries.

Today NORAM is the world's leading supplier of nitration technology. In addition, we offer sulfuric acid plants, biological treatment facilities, energy systems, and technologies for the clean-tech sectors.

Our business has developed around the supply of proprietary engineering and equipment packages to our clients.

Core competencies include:

- Nitration and NOx Technology
- Electrochemical Systems
- Sulfuric Acid Manufacture
- Biological Wastewater Treatment
- Computational Fluid Dynamics & Finite Element Analysis
- Heat Transfer & Heat Exchangers
- Hydrogen, Sulfur and Chlorine Chemistry
- Fluidised Bed Systems
- Energy Storage
- System Closure

Partnering with Innovation and Experience

NORAM works extensively with early-stage technology companies. We draw on established competencies in process design and engineering, provide custom in-house fabrication capabilities, and offer pilot plant and contract research facilities to support the commercialization process.

We've teamed up with organizations around the globe to allow project execution on 5 continents. Our strategic relationships include:

- Bateman Engineering BV
- Canadian Hydrogen and Fuel Cell Association
- ECO-TEC Inc.
- First Chemical Corporation (a DuPont Company)
- FP Innovations
- Kemetco Research Inc.
- Membrane Reactor Technologies
- Ostara Nutrient Recovery Technologies Inc.
- Radient Technologies Inc.
- Siloxy Limited
- Simon Carves Ltd (Punj Lloyd Group)
- Electrosynthesis Company Inc.

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