

In the softwood Kraft process, significant quantities of crude turpentine are released via the digester system. In a continuous digester system the turpentine and Total Reduced Sulfur (TRS) gases are transported with the steaming vessel vent and No. 2 flash steam. In a batch digester system they are contained in the relief steam. Turpentine is a valuable by-product, either to sell to chemical processors or to burn as a fuel.

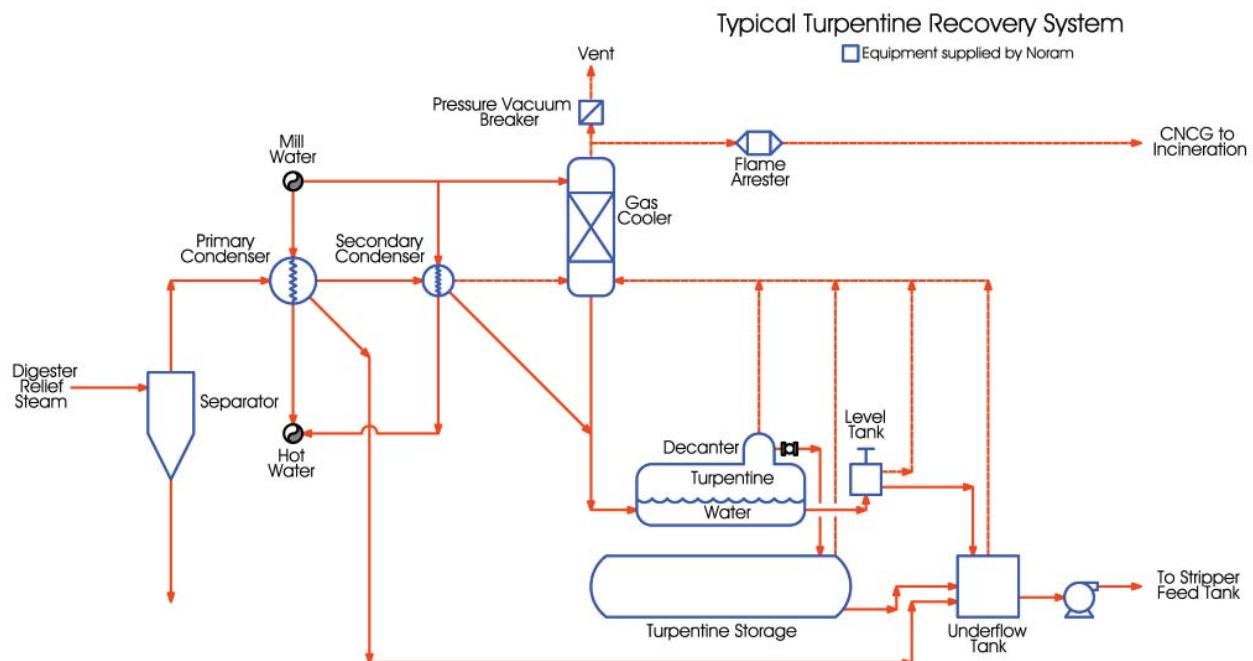
SYSTEM DESCRIPTION

Relief steam from the digester(s) enters the relief separator where entrained fibres are removed by cyclonic action. The hot turpentine vapours, NCG and steam then flow to the primary condenser where the steam is partially condensed. A fixed flow of steam, which includes virtually all the original turpentine and TRS, exits the primary condenser overheads and enters the secondary relief condenser. More water vapour plus all the turpentine is condensed here and the remaining vapour/NCG is cooled to at least 60°C (140°F). The vapour/NCG from the secondary condenser is further cooled in a direct contact gas cooler and the remaining non-condensables are collected in the CNCG/LVHC collection system.

FEATURES AND BENEFITS

- Condenses the turpentine into a condensate stream that is less than 30% of the total incoming vapor flow
- produces hot water at a temperature suitable for process use
- high purity turpentine product

The second stage condensate, now free from solids, liquor and soap, flows into a decanter where the turpentine phase rises up and is recovered via a continuous overflow from the decanter to a storage tank. The heavier condensate phase flows continuously via an underflow tank and is treated in a condensate stripper or hard-piped to effluent treatment. An adjustable level device on the condensate underflow line maintains the interface level between the two phases in the decanter. Typically the decanter, underflow and storage tanks are contained in a dyked area.



Turpentine Recovery System

NORAM Engineering and Constructors Ltd.



COMPANY PROFILE

NORAM is an engineering and technology development firm based in Vancouver, Canada. Founded in 1988, NORAM employs a highly qualified technical staff of approximately one hundred. NORAM has a global client base and has successfully completed projects on five continents.

Today NORAM is the world's leading supplier of mononitrobenzene (MNB) plants, a key intermediate in the production of polyurethane. In addition, NORAM offers sulfuric acid equipment, biological treatment facilities, energy systems, and technologies for the chemical, minerals processing, environmental, and pulp & paper industries.

NORAM offers proprietary technology to customers through engineered equipment and complete chemical plants. NORAM's core competencies include:

- Biological Treatment Technologies
- Electrochemical Systems
- Energy Systems
- Environmental Technologies
- Feasibility Studies
- Fluid Dynamics & Finite Element Analysis
- Heat Transfer Systems Designs
- Nitration Technology
- Project Management
- Pulp & Paper Technologies
- Sulfuric Acid Manufacture

PARTNERING WITH INNOVATION AND EXPERIENCE

NORAM is focused on the development, commercialization and supply of established and novel processes. With its entrepreneurial culture, NORAM has a demonstrated track record of thinking outside the box to provide innovative solutions. Technologies can be evaluated and integrated into an advanced engineering solution based on first principles.

NORAM has made its mark internationally by supplying proprietary systems to various industries world-wide. NORAM can bring this expertise and innovative ideas to your projects.

NORAM has established strategic relationships with the following organizations:

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

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