We help make pulp white and bright

Eka Engineering is the engineering and contracting division within AkzoNobel Pulp and Performance Chemicals. We specialize in the design and supply of chlorine dioxide plants and equipment to the pulp and chemical industries. Our main assets are our experienced personnel, our technology and project management capabilities. We operate globally and offer our customers quick and personal service backed by the economic strength and stability of AkzoNobel.
Chlorine dioxide systems

Eka Engineering is a world-leading supplier of chlorine dioxide (ClO2) plants. We have developed a number of different process technologies, for safe and efficient ClO2 generation.

The SVP processes

The different processes are distinguished from each other by use of different reducing agents and acids for converting sodium chlorate (NaClO3), to chlorine dioxide (ClO2). The most common process today is the SVP-LITE process based on the use of methanol (CH3OH).

SVP-LITE Process

The production of ClO2 in the SVP-LITE process is based on the reaction between NaClO3, sulfuric acid (H2SO4), and CH3OH. The heart of the process is an all-titanium ClO2 generator, a large vessel in which the NaClO3 is reacted to form ClO2.

Since then several new processes have been developed, providing different by-products, improved ClO2 yield and minimized environmental impact.
Gas absorption

The chlorine dioxide (ClO₂) gas leaving the generator is cooled in the generator condenser and absorbed in a packed tower, the ClO₂ absorber, by means of chilled water. The resulting product is a strong solution of ClO₂ with negligible levels of chlorine gas (Cl₂). The solution is then pumped to storage tanks for further use in the bleaching process. As the gas from the ClO₂ generator does not contain any diluting gases like air or chlorine, absorption efficiency is high and ClO₂ concentrations in excess of 10 g/l can easily be reached.

Typically, the vacuum in the ClO₂ generation system is created by means of a steam ejector, but a liquid ring vacuum pump could also be used.

After passing the ejector, the tail and vent gases are washed with chilled water in the vent scrubber. The effluent water from the scrubber is transferred to the main absorption tower and thus all the ClO₂ in the vent gases is recovered and added to the produced ClO₂ solution.

Sodium sulfate recovery

The sodium sesquisulfate crystals (Na₃H(SO₄)₂) formed in the generator are pumped to a titanium bottom feed, rotary drum filter for removal as a near dry solid. The filter is equipped with a hot water wash system. The wash water and mother liquor are withdrawn from the filter and returned to the generator, leaving behind a dry, high-quality salt cake. The Na₃H(SO₄)₂ is discharged into the dissolving system and pumped to the pulp mill.

This filter comes standard with a tantalum filter cloth, providing years of trouble-free service and high reliability. The filter is much less sensitive to crystal size or production rate fluctuations than competing top feed filters.
Other SVP processes

**SVP-SCW**
The SCP-SCW process is an add-on option to the SVP-LITE process. The formed salt cake in SVP-LITE is sodium sesquisulfate (Na₃H(SO₄)₂), which is an acidic version of sodium sulfate (Na₂SO₄), containing about 18wt% of sulfuric acid (H₂SO₄).

In the SCP-SCW process, the filtered Na₃H(SO₄)₂ crystals are transferred to a metathesis tank where the metathesis tank slurry is pumped to a second salt cake filter. Here the Na₂SO₄ and H₂SO₄ components are removed and sent to the mills recovery system. The filtrate from the second filter containing the H₂SO₄, to be recovered, is discharged back to the SVP generator.

**Benefits of the SVP-LITE and SVP-SCW processes**
- Very high yield
- Very low emissions
- High strength ClO₂ solution produced
- Easy to operate
- Fast reaction rate, minimum start-up and stop time (a matter of minutes)
- Low frequency of boil-outs
- Negligible levels of Cl₂ as by-product

### HP-A ClO₂ process

**HP-A chemistry**

Sodium chlorate (NaClO₃) reacts in a two-stage reactor system with a proprietary hydrogen peroxide (H₂O₂) solution in sulfuric acid (H₂SO₄) solution to produce ClO₂. The reaction byproduct as sodium chloride (NaCl) is then separated and containing sodium bisulfate (NaHSO₄).

The older atmospheric ClO₂ processes use other reducing agents. Some of the reducing agents contain sodium chloride (NaCl) and then form chlorine gas (Cl₂) as a by-product. Sulfur dioxide (SO₂) and methanol (CH₃OH) are also used as reducing agents.

The HP-A is one of the newest processes introduced on the market by Eka Engineering. This proprietary technology has several advantages over earlier atmospheric chlorine dioxide (ClO₂) processes.
Sodium chlorate is crucial to environmentally compatible pulp bleaching. In New Zealand in the 1930s, farmers reportedly had trouble with exploding trousers of all sodium chlorate produced worldwide goes into the pulp and paper industry.

Sodium chlorate is available in crystal and solution forms. Additional products and systems You normally need the following systems in association with the chlorine dioxide (ClO₂) equipment:

- Chlorate, acid and reducing agent storage and delivery
- ClO₂ product storage and delivery
- Chilled water supply

Our extensive experience in this field has enabled us to become experts in the design and installation of customized systems.

Benefits of the HP-A process

- Higher capacity can be achieved when changing chemistry in an existing atmospheric process
- Easy to operate
- Fast reaction rate
- Negligible levels of Cl₂ as by-product
- High yield > 95%
- Less maintenance on equipment and instruments compared to using SO₂ as a reducing agent

Additional products and systems

You normally need the following systems in association with the chlorine dioxide (ClO₂) equipment:

- Chlorate, acid and reducing agent storage and delivery
- ClO₂ product storage and delivery
- Chilled water supply

Our extensive experience in this field has enabled us to become experts in the design and installation of customized systems.
World-class service & spare parts

Eka Engineering has designed, built, re-built, handled spare parts and operated chlorine dioxide (ClO₂) systems for pulp bleaching for over 40 years. As the international leader in ClO₂ technology, we offer service, support, spare parts and equipment for the large-scale production and application of both vacuum and atmospheric processes.

We have long experience in supporting ClO₂ systems. Our service and support team can handle all types of support in mechanical and process engineering.

Scope of supply

Eka Engineering can supply all the ClO₂ processes needed to match your requirements, from the design and procurement of the process equipment to a complete turnkey installation. Our experience and know-how range from rebuilds of existing plants to brand new installations.

Process safety

Spare parts for optimal uptime

Eka Engineering’s spare parts service helps ensure maximum plant availability and minimum downtime. All spare parts are delivered rapidly and reliably using our extensive supply chain and global logistics network.

Keeping things running smoothly

Eka Engineering maintains an extensive inventory of spare parts essential to keeping your plant and associated processes running with parts available when and where you need them.

For quality assurance, we deliver spare parts from the original supplier whenever possible. Some typical spare parts we provide include pump parts, instruments, valves, and filter inserts.
AkzoNobel Pulp and Performance Chemicals is the leading global supplier of bleaching chemicals and we deliver customized solutions for bleaching pulp to our customers. Our world-class technology, application know-how, optimized supply chain and global logistic solutions provide customers with a significant advantage for their operations.

Global presence

AkzoNobel Pulp and Performance Chemicals is present in 35 countries all over the world. AkzoNobel as a whole has operations in more than 80 countries with 45,000 people globally committed to delivering leading products, technologies and services to meet the growing demands of our fast-changing world.

Bka Engineering can offer the following service and support:

**Optimization**
- Measurement and calculation of the yield on sodium chlorate, reducing agent and acid
- Capacity tests

**Process safety**
- Participation in safety audits and risk analysis at the chlorine dioxide plant

**Training**
- Operator training
- Safety training
- Laboratory analysis

**Storage systems**
- Inspection and advice on sodium chlorate, sulfuric acid and chlorine dioxide storage
- Inspection and advice on methanol and hydrogen peroxide storage
- On-site troubleshooting for process disturbances in the chlorine dioxide plant

**Bottleneck investigations**
- Investigations of process and production limitations in the chlorine dioxide plant

**Inspection**
- Inspection of all critical equipment at the annual shutdown

**Emissions**
- Investigations of emissions to both air and sewers

**Equipment**
- Design, purchase and installation of new equipment

**Spare parts**
- Order and delivery of spare parts to chlorine dioxide plants

Bka Engineering is part of AkzoNobel Pulp and Performance Chemicals that is present in 35 countries all over the world.
AkzoNobel creates everyday essentials to make people’s lives more liveable and inspiring. As a leading global paints and coatings company and a major producer of specialty chemicals, we supply essential ingredients, essential protection and essential color to industries and consumers worldwide. Backed by a pioneering heritage, our innovative products and sustainable technologies are designed to meet the growing demands of our fast-changing planet, while making life easier. Headquartered in Amsterdam, the Netherlands, we have approximately 45,000 people in around 80 countries, while our portfolio includes well-known brands such as Dulux, Sikkens, International, Interpon and Eka. Consistently ranked as a leader in sustainability, we are dedicated to energizing cities and communities while creating a protected, colorful world where life is improved by what we do.

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