EVONIK INDUSTRIES

Hydrogen Peroxide

Products and solutions for the mining industry

Evonik. Power to create.

Hydrogen peroxide is often used as an oxidant in such metallurgical process steps such as ore leaching, concentrate preparation or effluent treatment. Depending on the ore composition as well as the leaching conditions, utilization of hydrogen peroxide results in savings of effluent treatment reagents and acids, simplifies management of chemicals or wastes and improves the overall process performance.

Evonik is one of the world's largest producers of hydrogen peroxide. We are the innovative leader in high quality products and services, offering more than a century of worldwide experience to serve the megatrends of modern society and to deliver an exceptional value for our customers.

Excellence

Our environment, safety, health and quality values set out our commitments in these areas. Together with more detailed guidelines and procedures, they form a binding framework. The ESHQ values define protection of people and the environment as central elements of our activities. We strive for a steady improvement in our ESHQ performance. Evonik is committed to the global Responsible Care initiative, and we constantly strive to improve our performance in health, safety, the environment and product stewardship. Our manufacturing facilities worldwide are certified according to the ISO 9001 as well as 14001 series.

Grades

For mining applications Evonik recommends use of HYPROX® standard grade hydrogen peroxide.

Grade	Specified hydrogen peroxide content, % (w/w)	Available packaging
HYPROX® 500	49.5–49.9	all forms
HYPROX® 600	59.5–59.9	all forms
HYPROX® 700	69.5–69.9	ISO container

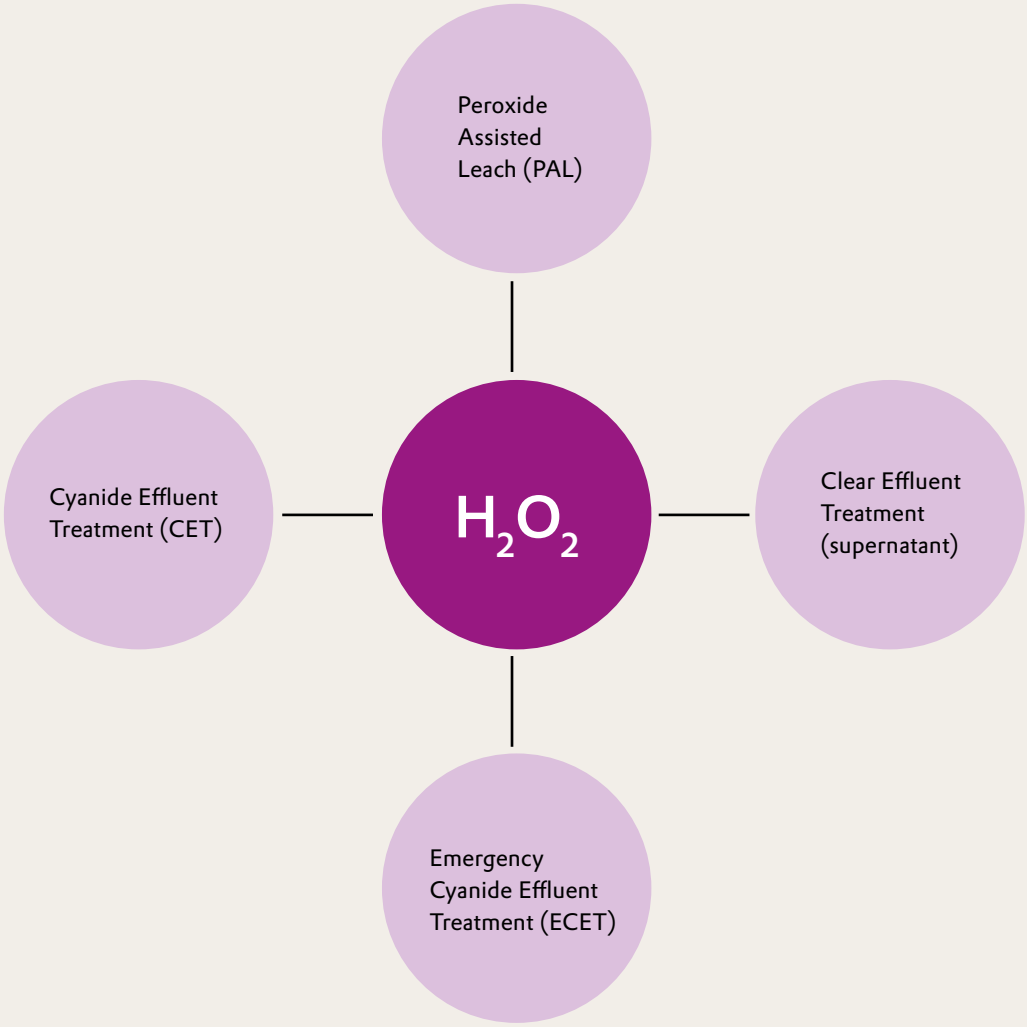
Reliability

Evonik global presence as well as our highly developed supply chain guarantee a reliable worldwide product availability. Our products are available in 65 kg plastic canisters, plastic IBC-containers, in bulk Iso-containers or by railway deliveries.

ISO container – 24 t

IBC – 1,100–1,150 kg

Use of hydrogen peroxide (H_2O_2) in gold mining



Applications of hydrogen peroxide in the mining industry

Manufacturing of gold

Peroxide Assisted Leach (PAL) and effluent treatment

For gold production, the most common method used nowadays is the cyanidation process, which involves the leaching of gold-containing ores by dilute aqueous cyanide solutions in the presence of lime and oxygen. The concentration of dissolved oxygen is a crucial factor for the overall leaching efficiency. Depending on the leaching conditions, solids content as well as concentration of the oxygen consumers, the leaching efficiency can fall below the acceptable level. Hydrogen peroxide ensures the necessary dissolved oxygen concentration in the system and leads to an increased leaching efficiency. On the downstream side hydrogen peroxide is often used for the removal of the cyanides from the waste water. The cyanide oxidation takes place in a single step, without the formation of toxic intermediates.

Manufacturing of uranium

In nature uranium occurs in the form of tetravalent or hexavalent oxides minerals. Tetravalent uranium has, however, a very low solubility in both acidic or alkaline media. Thus, to achieve an economic uranium recovery, oxidation to the much more soluble hexavalent state is of great importance. Trivalent iron compounds are commonly used to increase uranium's oxidation state. Hydrogen peroxide is applied for regeneration of the active Fe(III) ions in the eluent. Hydrogen peroxide is also used for preparation of the yellow cake, resulting into a denser and coarser precipitant structure and improving thus the efficiency of the dewatering process.

Services of Evonik and CyPlus

Tank installation

It is our declared policy to pass on the many years of experience we have accumulated in connection with hydrogen peroxide to our customers. This includes the planning and construction of tank installations. Our service covers initial consultation, project planning and construction work, start-up, repair and modification work on hydrogen peroxide installations and predelivery inspection. Our applied technology team of highly qualified and experienced specialists can assist you in any aspect regarding the storage, handling and application of hydrogen peroxide.

CyPlus profile

CyPlus GmbH is a globally established company in cyanides and technologies and services covering the whole life cycle of cyanides. The Evonik subsidiary provides innovative products, technologies and services to customers in the mining, chemical, pharmaceutical and surface treatment industries.

The company meets the extensive and strict requirements of the international mining industry as a supplier of cyanides in accordance with the guidelines of the International Cyanide Management Code (ICMC).

CyPlus® CET – Cyanide Effluent Treatment

The key to meet stringent discharge limits while optimizing capital and operation costs

CyPlus® CET provides customers with the most advanced cyanide treatment processes available in order to minimize both capital and operating costs. We offer feasibility studies, basic engineering, equipment, cyanide analyzers, commissioning and training, as well as expert consultation.

CyPlus® CET is especially suitable for treating cyanide-containing effluents from ore processing operations so that they comply with stringent limits, such as those set by the ICMC, the World Bank, the EU Mining Waste Directive and local authorities.

Feasibility studies

Basic engineering

Equipment

Analyzers and control concepts

Commissioning and training

H_2O_2 as effluent treatment reagent

- Evaluating the optimal cyanide destruction process and parameters
- Reducing reagent consumption while meeting stringent discharge limits
- Optimization of capital and operating costs
- Reliable scale-up to site-specific conditions
- Technical assistance during start-up and commissioning
- Training of operators
- Processes and equipment available for virtuality any application
- Vast experience: CyPlus® CET has been applied on all continents

CyPlus® ECET – Emergency Cyanide Effluent Treatment

CyPlus® Emergency CET provides customers with a cyanide treatment process to treat their tailings pond supernatant or storm pond water in the event of an unwanted overflow. We offer a feasibility study, equipment, commissioning and training.

CyPlus® CET – features and benefits

- Complies with stringent limits, such as those set by the ICMC, the World Bank, the EU Mining Waste Directive and local authorities
- Optimization of capital and operating costs
- Vast experience: CyPlus® CET has been applied on all continents
- Detailed engineering and construction widely available
- Safe and reliable equipment in accordance with customers' needs and regulations
- One Stop Service, fewer interfaces, better transfer of information and dependable recommendations regarding process parameters

Disclaimer

This information and all further technical advice is based on our present knowledge and experience. However, it implies no liability or other legal responsibility on our part, including with regard to existing third party intellectual property rights, especially patent rights. In particular, no warranty, whether expressed or implied, or guarantee of product properties in the legal sense is intended or implied.
We reserve the right to make any changes according to technological progress or further developments. The customer is not released from the obligation to conduct careful inspection and testing of incoming goods.

Performance of the product described herein should be verified by testing, which should be carried out only by qualified experts in the sole responsibility of a customer. Reference to trade names used by other companies is neither a recommendation, nor does it imply that similar products could not be used.

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RE-20-1-NOV15a_300