

Zinc Technology

Sherritt's Zinc Pressure Leach Process involves the direct leaching of zinc sulphide concentrates in cellhouse return electrolyte, followed by conventional purification and electrowinning. The process offers important advantages over the conventional roast leach process: lower capital cost; recovery of sulphur in elemental form; ability to treat high lead, high silica, high copper and low grade zinc or bulk concentrates; and, ability to treat finely ground concentrates which are unsuitable for roasting. In particular, it has the flexibility for incorporation into commercial flowsheets which dispose of iron as jarosite, hematite or goethite.

In the direct oxidative pressure leaching of zinc sulphides, sulphur is converted to its elemental form:

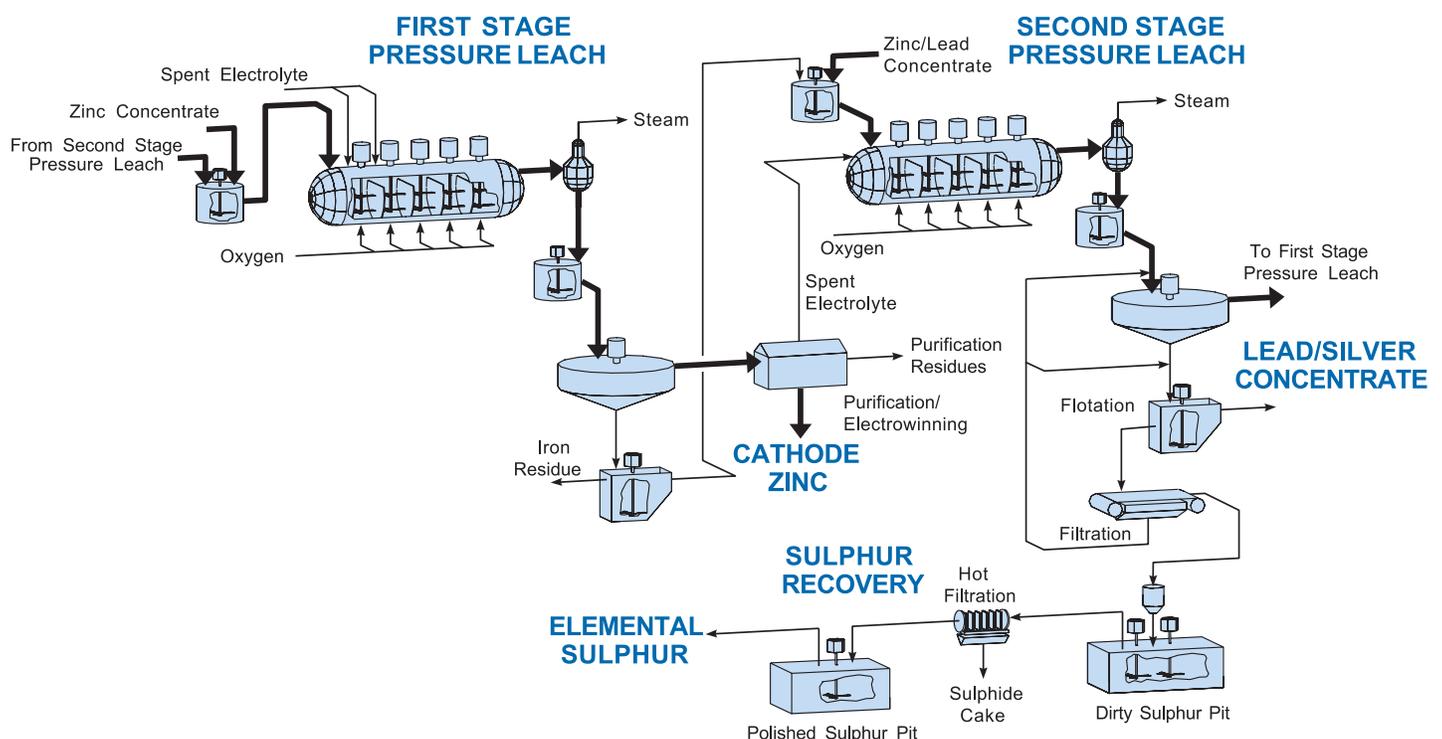


Elemental sulphur can be sold or stockpiled. Consequently, there is no need to produce sulphuric acid or to discharge sulphur dioxide to the atmosphere. Replacing roasting by direct pressure leaching also eliminates the formation of zinc ferrite and increases zinc recovery.

The process is applicable to a wide range of zinc sulphide concentrates ranging from high grade marmatitic or sphaleritic material to complex zinc-lead bulk concentrates. The process is readily integrated with existing roast-leach plants or it can entirely replace roasting in a new plant, in which case a two stage version of the process is used.

Significant capital cost savings accrue in pressure leaching compared to a conventional leach plant, since the roaster, acid plant and conventional leach plant are not required. Operating costs are similar. The outstanding advantage of Sherritt's process is that it eliminates the primary environmental concern of the zinc industry.

Treatment of Zinc and Zinc/Lead Concentrates



More than 20 years of process development and piloting culminated in the first commercial application of the Sherritt Zinc Pressure Leach Process at Cominco Ltd. in Trail, Canada, in 1981.

The second commercial plant, at Kidd Creek Mines in Timmins, Canada was commissioned in 1983. Both facilities are currently operating significantly above their design rates. A third commercial facility, (no longer operating) at Ruhr-Zink GmbH (Datteln, Germany) was commissioned in early 1991. The fourth commercial application, for Hudson Bay Mining and Smelting Co. Ltd. was started up in 1993 and replaced all the original roasters and calcine leach circuits. It is the first zinc refinery to replace roasting entirely with pressure leaching.

Zinc Technology Clients

PROCESS DEVELOPMENT AND ENGINEERING

North America

- Noranda Mines Ltd.
- Servicios Industriales Peñoles, S.A.
- Platinova A/S

South America

- Compania Minera San Ignacia de Morococha S.A.
- Empresa Nacional de Fundiciones

Europe

- Rio Tinto Minera S.A.
- Plovdiv Lead-Zinc
- Kardjali Lead-Zinc

Africa

- Gecamines Exploitation
- Gold Fields of South Africa Ltd.

Asia

- Hindustan Zinc Ltd.
- Two Projects in Japan

Australia

- Australian Associated Smelters Ltd.
- Broken Hill Associated Smelters Ltd.
- M.I.M. Holdings Ltd.
- Electrolytic Zinc Company of Australasia Ltd.
- CRA Technological Resources Pty Ltd.
- Normandy Poseidon Limited

COMMERCIAL PLANTS

- Hudson Bay Mining and Smelting Co. Ltd., Canada(1993)
- Ruhr-Zink GmbH, Germany(1991)
- Kidd Creek Division of Falconbridge Limited, Canada(1983)
- Cominco Ltd., Canada(1981)

The Technologies Division of Sherritt is a recognized leader and pioneer in the development and application of pressure hydrometallurgy. In addition to supporting Sherritt's existing business units, the division provides metallurgical services, including test work, analytical services, engineering and commercial operations support to existing and emerging clients in the metals industry. We provide a suite of services to help take projects from the process and flowsheet development stage, to piloting and demonstration and onto commercialization. Sherritt has more than 60 years of experience in the development and commercialization of hydrometallurgical technologies for the recovery of non-ferrous and precious metals. More than 40 operating plants worldwide have successfully applied Sherritt's processing expertise.

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