

Rainer Kahrger

Early in his career, Structural Engineer Rainer Kahrger realised that belt conveyors are intrinsic to virtually all continuous material handling operations. Over the past 40 years, his achievements in material handling have altered the approach to belt conveyor design

today. Retired from TAKRAF, Rainer continues to lay the groundwork for the future of innovative design and construction of conveyor systems.

During his tenure as CEO and President of TAKRAF, Rainer led the design of two world record-setting projects in bulk material handling: the largest capacity downhill regenerative conveyor and the longest single flight conveyor.

The first project involved the largest capacity downhill regenerative belt conveyor and first high capacity leach pad bucketwheel reclaimer.

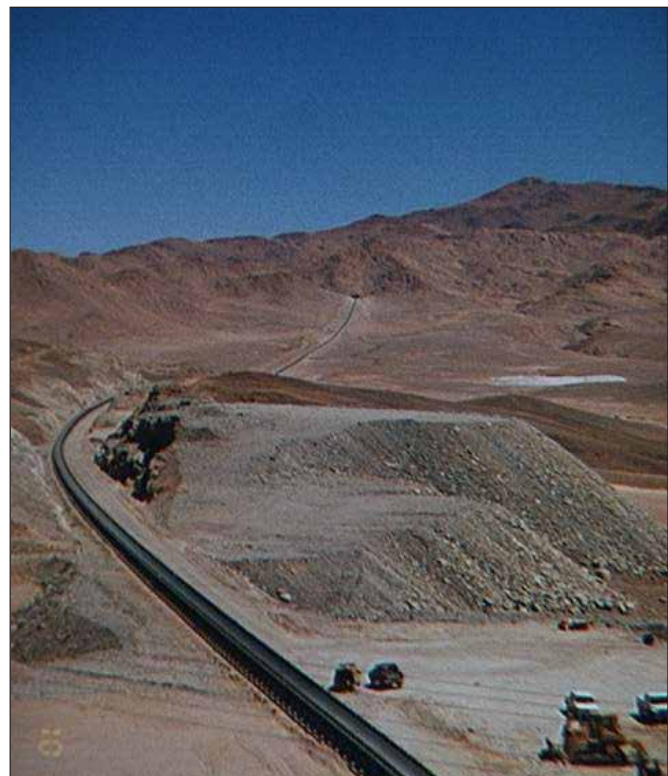
High in the Atacama Desert of Chile is the El Abra mine. In 1996, TAKRAF designed and built the largest capacity downhill regenerative belt conveyor system. The 8,600 t/h, 9.5 km long overland conveyor descends over 500 m in elevation from the mine to the crushing circuit, during which time the vertical drop is used to regenerate 5,500 kW of power. The system employed the strongest belt available at the time with a strength rating of ST6800 N/mm and revolutionary splice efficiency greater than 50%.

Subsequent to the world record-setting downhill belt conveyor is the first “racetrack” or “on/off” dynamic heap-leach system developed by Rainer and his team. This innovative and first, for its time, high capacity 6,300 m³/h leach pad bucketwheel reclaimer, operating in conjunction with mobile stacking and reclaiming conveyors, was developed and put successfully into operation. The same general design concept was replicated, a couple of years later, at the Radomiro Tomic mine and, most recently again, at the Antucoya copper complex.

This arrangement has become the standard in the (oxide) copper industry.

The belt conveyor, stacking and bucket-wheel reclaiming system enables high capacities of copper ore to be leached and the “spent ore” to be discharged, occupying a minimum footprint and minimising the use of sulphuric acid (inventory), thus resulting in a most economical system.

At the Henderson (Climax) Molybdenum mine in Colorado, USA, Rainer was instrumental in the design and installation of the longest single flight belt conveyor in the world. Designed to the lowest known running resistance ever measured (DIN f-value below 0.01), the 17 km long single conveyor was installed and commissioned in 1999. This conveyor system replaced a train arrangement which had, by then, become economically unsustainable. The single flight conveyor, part of a system of three conveyors, was essential to the client’s requirements for reduced environmental impact.



Dedicated to improving bulk material handling

After his retirement in 2009 as CEO of TAKRAF, Rainer continues to work with TAKRAF as consultant in the field of materials handling. In this capacity, he has made significant contributions to the development of TAKRAF's innovative new gearless drive technology for the El Teniente and Chuquicamata underground conveyors in Chile. The two Chuquicamata principal conveyors will boast the highest installed drive power ever produced with four 5,000 kW drives per installed conveyor and will also employ a ST10,000 N/mm steel-cord belt. This again represents another world first and will ensure the future viability of one of the largest copper mines in the world.

Background of a materials handling pioneer

Rainer's engineering thesis was performed in cooperation with his employer Weserhütte, a well-known German materials handling company at the time. The thesis dealt with the design of a shiftable drive station for a 1,600 mm wide overburden conveyor in Spain.

After graduation, Rainer continued to work at Weserhütte before moving to PWH, O&K and Krupp in various positions.

The last 20 years of his career were with TAKRAF with the last 10 years as its CEO and President. Rainer's vocation was dedicated entirely to the materials handling industry. His positions have varied, but he has always maintained a strong focus on engineering.

His professional life and achievements were influenced by his extensive international experience. He spent 10 years, from 1978 to 1988 in Australia and was then stationed in the USA from 1988 to 2000. Having executed

projects all over the world, he gained a profound understanding of the international mining industry particularly in copper, iron ore, coal/lignite and bauxite having worked in association with most of the world's major mining companies.

Having to work frequently in developing countries with restricted access to high-tech materials and often with a lack of skilled labour, taught him to keep designs simple and to focus more on constructability and maintainability rather than on stylish and non-practical designs.

Through his extended materials handling experience, he has been involved in a wide variety of materials handling systems, ranging from stockpile machines, open-cast mining equipment, crushing plants of stationary, semi-mobile and fully mobile versions, to shiftable, stationary or overland high capacity belt conveyors transporting over 30,000 t/h. His dedication and expertise undeniably pushed the materials handling envelope and will forever impact the fields of conveyor and material handling design.

