

Enhancing productivity

with custom, innovative and energy-efficient solutions from Semperit (Sempertrans)



*Multitrans product, quarry in France
(all photos: © Semperit AG Holding).*

Conveyor systems are the most commonly used mechanisms for the handling or transportation of bulk solid in the mining, cement, steel, power, harbour, chemical and fertilizers industries etc. The effective handling or transportation of bulk solids is a critically important aspect and therefore reliable, cost-efficient, optimum performance and life expectancy of conveyor belts plays a very vital role in the success of a plant's productivity, cost per tonne and performance.

The advancement in conveyor technology in terms of the transportation of bulk solids over a longer distance — negotiating horizontal as well as vertical routing efficiently without polluting the environment — is also eliminating the conventional transport of bulk solids by road with long-distance open or closed conveyor systems.

Semperit AG Holding has been a

renowned worldwide as a supplier of natural and synthetic polymer products for almost 200 years. The group is one of the largest and most technologically advanced conveyor belt manufacturers in the world with production facilities in Poland and India, from which it serves the global market. With more than 50 years of experience in conveyor belt technology and the relevant in-depth knowledge, Semperit knows what customers around the world expect and helps them to accelerate their operational performance. Semperit provides tailored conveyor belt solutions for the most demanding applications in the mining, cement and steel industries, as well as many others, starting from standard products such as textile belts to the highest-breaking-strength steel cord belts. Semperit ensures safe, high-quality and highly efficient conveying solutions even under extreme conditions,

which require both high-performance and economical transport of raw materials and other goods.

MANUFACTURER PROFILES

Semperit's conveyor belt manufacturing facility is located in India, namely Sempertrans India, and is among India's most prominent manufacturers and exporters of conveyor belts. This manufacturing facility is in Roha town, 100km from Mumbai on the Mumbai-Goa Highway. The site has a state-of-the-art plant which maintains ISO 9001-2015, in addition to other high-quality standards relating to conveyor belting manufacturing.

Sempertrans India offers a broad range of high-performing conveyor belts for applications in the mining, cement and steel industries, as well as for other applications such as ports, power and heating plants, quarries and the chemical industry with

international standards and are optimized to meet its customers' specific requirements.

Sempertrans India uses the latest technologies for developing, testing and manufacturing high-quality belt solutions. These belts are manufactured with specially formulated compounds and high precision. The highly skilled professional research and development team of Sempertrans India is constantly in search of new innovations and upgrading the existing techniques applied in the manufacturing of conveyor belts.

Sempertrans India's ambition is to be a trusted partner for its customers and to help enhance their business operations with innovative and reliable solutions. Sempertrans India places particular importance on the quality of its products and services, as well as creating long-term value to all its stakeholders by delivering excellence and effectiveness in anything it does. Sempertrans India strives to ensure that its customers achieve maximum operating life with the lowest cost of ownership achievable.

Sempertrans India's strengths are combined in:

- ❖ world-class polymer processing equipment;
- ❖ products that adhere to national & international standards such as IS, CAN, etc.;
- ❖ world-class belt testing equipment;
- ❖ comprehensive production practice with complete traceability of



Sempertrans entrance in Wimpassing, Austria.

materials;

- ❖ experienced professionals and skilled employees; and
- ❖ a global R&D centre in Wimpassing, Austria.

SUCCESS STORY IN INDIAN CEMENT PLANTS

The Indian cement industry's demand to expand the capacity of existing plants has resulted in the increase of the handling capacity of all associated conveyor belts. Consequently, the material cooling time in the storage of plants has reduced and increased the demand for conveyor belts to handle higher-temperature materials. Heat causes the rapid acceleration in the ageing process of the polymer, consequently hardening and cracking the polymer covers.

The higher temperatures of material handled also has a very destructive effect

on the carcass of the belt as it damages the adhesion between the covers on the top and bottom of the carcass and the adhesion between the inner plies confined within the carcass, consequently, the plies start to separate.

Since the heat-resistant polymer covers on the top and bottom of the belt work as a wall between the heat source and the carcass; this protects the carcass from heat damage. Therefore, the heat-resistant properties of the covers need to be selected very carefully considering the actual operating temperature of the plants.

In late 2016, Sempertrans India captured site data of one of the biggest cement manufacture plants, which is located in the western part of the country. The basic aim of Sempertrans was to study site operating conditions and accordingly verify the



Sempercord at Belchatow, Poland.

conveyor belt specification. After studying the site data, Sempertrans experts established the variation in belt specification, pulley diameter etc. from the requirement of site operating conditions. Subsequently, Sempertrans India selected the suitable cover grade and fabric of conveyor belts needed and delivered them to the site. The customer then installed the belt in 2017 which gave improved performance over the expected life and availability.

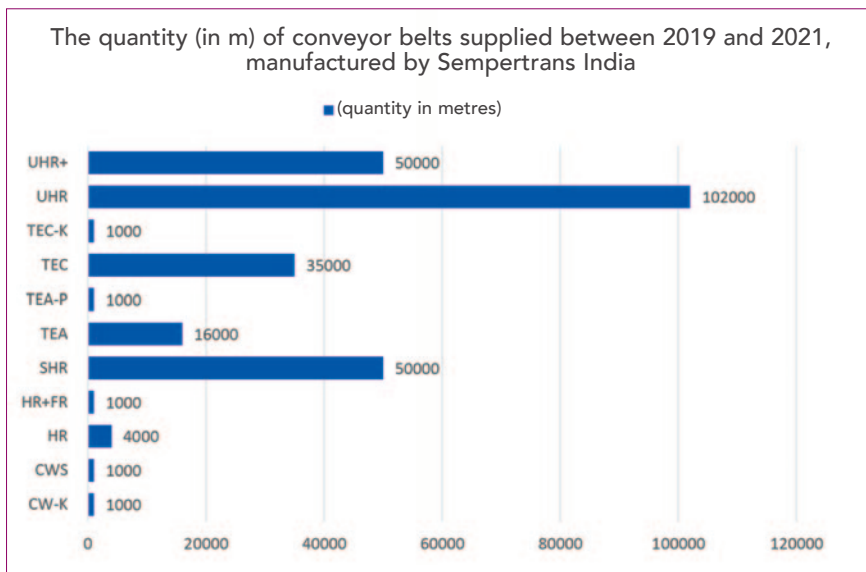
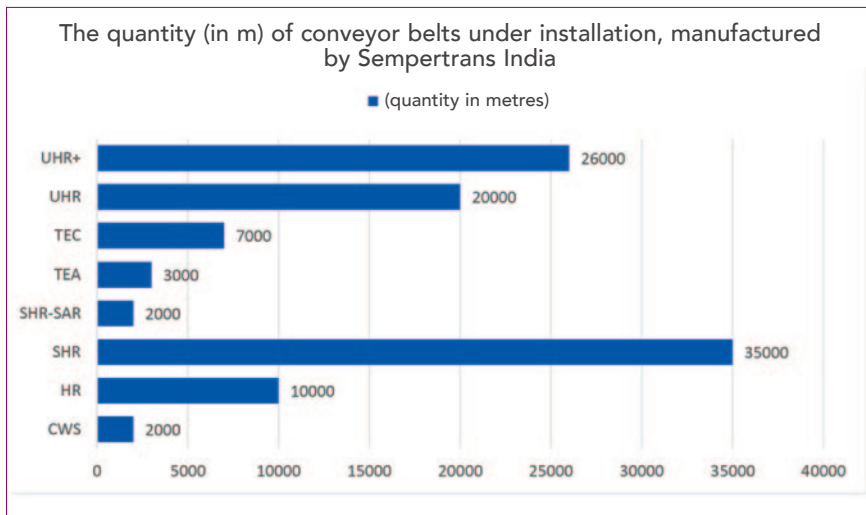
Sempertrans India collected the data of various cement plants, which show the significant variations in the temperature from plant to plant of the same cement producer. Thus, the selection of conveyor belts is always based on the plant operating condition and not as a standardization practice for all the plants and subsequently Sempertrans India started offering the conveyor belt specifications after studying the site operating conditions. These operating conditions consisted of the operating temperature and the variations of those which the operating site had, in comparison to different industries. These studies have led to the development of the cover grade mainly SHR, UHR and UHR+ and the provision of the customized solutions to the Indian cement, steel and other industries.

The successful development of the cover grade with support of the Global R&D centre in Wimpassing, Austria for handling of higher temperatures, Sempertrans India has started the production of conveyor belts with TEA, TEA-P, TEC, TEC-K, SHR, UHR and UHR+. This development has provided offshore as well as onshore customers with the possibility to handle the material with higher temperatures in their plants.

Sempertrans India is now supplying the application specific products to the Indian cement plants and plant owners witnessed the increase in overall availability of the system, the longevity of the conveyor belt and consequently the improved productivity. Consequently, Sempertrans has a more than 60% share in their present requirement of belts for handling of higher temperature materials to their various plants located in western, southern and central parts of India.

CONVEYOR BELTS UNDER INSTALLATION

The graph above presents the various grades of conveyor belts manufactured and/or under manufacturing from the recent on-shore as well as off-shore contracts by Sempertrans India, supplied to various industries.



CONVEYOR BELTS INSTALLED IN THE PAST THREE YEARS

The following grades of conveyor belts have been manufactured by Sempertrans India and supplied to various industries located on-shore as well as off-shore during the year between 2019 and 2021.

TECHNOLOGICAL DEVELOPMENTS

Standard conveyor belts are not suitable for the handling of high heat materials and will quickly deteriorate. Such deterioration of conveyor belts always creates safety hazards, damages of conveyor components and costly belt replacements. Sempertrans conveyor belts are developed to handle extremely high temperatures up to 400°C short term peaks.

The right cover for high temperatures ensures the longest belt life. The standard types of Transtherm covers are:

- ❖ **CW:** the cover grade especially designed for the transportation of coal, providing medium heat resistance combined with flame-retardant properties according to DIN EN ISO 340.
- ❖ **TEA:** the cover grade with excellent

mechanical properties, providing heat resistance for medium temperatures. In specific markets TEA is also known as HR.

- ❖ **TEB:** the cover grade for high heat resistance and special applications such as transporting chemicals. In specific markets, the cover grade SHR is available for this temperature range, if no specific resistance to chemicals is required.
- ❖ **UHR:** the efficient cover grade providing heat resistance for high temperatures up to 200°C short term peaks.
- ❖ **UHR+:** the efficient cover grade providing heat resistance for high temperatures up to 250°C short term peaks.
- ❖ **TEC:** the cover grade for extremely high temperatures up to 400°C short term peaks.

CONCLUSION AND RECOMMENDATIONS:

There is always a major difference between the temperature of the product conveyed and the temperature transmitted to the cover by the materials conveyed. This

difference between the surface temperature of the belt and the inherent temperature of the product conveyed may vary according to various parameters:

- a) The actual temperature range of the materials being conveyed on that conveyor, the maximum continuous temperature of the conveyed material and the maximum temporary peak temperature.
- b) Particle size distribution of bulk material conveyed: the type and nature of the material i.e., with fine particles usually cause a greater concentration of heat on the belt surface. The coarse material allows better air circulation, which allows the heat to dissipate.
- c) Length and speed of conveyor: the length and running speed of the conveyor plays a critical role in the life of a conveyor belt. The rapid acceleration in the ageing process of the polymer and shorter conveyor length has less time to cool down on the return side (empty belt). The higher temperature and abrasive materials are at speed on a short conveyor is the toughest combination of all and many heat-resistant belts often last only a few weeks or months before having to be replaced. But there are heat-resistant belts available that are capable of lasting two or three times (or more) longer.
- d) Type of installation: the installation of conveyor belts with covering or in closed gallery prevent the proper ventilation.

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Cement, Multitrans.

