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Largest system worldwide  
for toothpaste production



Mixing,  
rapidly and continuously



High capacities,  
yet flexible and resilient

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## Drive solutions for toothpaste production

Case study: EKATO SYSTEMS





*The world's largest toothpaste batch production system features giant agitators put in motion by industrial geared motors with output torques well above 200,000 Nm – and a single-piece cast housing for the gears.*



Personal care products industry  
Toothpaste batch production system

### Project challenge

There is a growing trend in the hygiene and personal care industry towards the concentration of production facilities in only a few select locations. These fewer sites must inevitably turn out a broad variety of products. Production machinery therefore has to be designed to yield great quantities as well as to provide top flexibility. EKATO SYSTEMS GmbH set out to develop a new toothpaste production system that would meet both challenges.

**Higher capacity and more variety.** – Toothpaste can be made in a continuous process or in batches. Continuous production scales well, but is quite inflexible as regards product changes, since different ingredients sometimes need their own dispensing and blending technology, and recipe changes often call for re-adjustments. Discontinuous systems, on the other

hand, are much more accommodating of a broader product range, but significant boosts in capacity do require advanced engineering know-how.

**Robust and compact agitator drives.** – In order to create a larger-than-ever batch production mixer, EKATO had to thoroughly consider dosage and dispersion times, blend and homogenization times, and vacuum values for the super-sized design. NORD's task as the drive supplier was to configure gears and motors suited to the agitator and homogenizer specifications, with a view to high efficiency and durability. As the agitator drives were to be installed on top of the production mixers, they also had to be kept as compact as possible – in spite of the extremely high performance expected of them.

### Application solution

UNIMIX systems consist of a vessel fitted with an agitator, a homogenizer, and various dispensing mechanisms for the introduction of ingredients into the process. Until recently, such toothpaste batch production vessels were designed for no more than 4,000 to 5,000 liters. The two mixers newly engineered by EKATO hold roughly twice the volume of the largest previously available mixers, and the production system as a whole achieves at least three times the former maximum production output.

**Huge loads and high torques.** – Homogeneous product quality is paramount in this application. That means the drive solution must be designed to respond quickly, unfailingly ensure continuity, and sustain the formidable forces on the agitator shaft owed to the mixture's high viscosity. NORD DRIVESYSTEMS configured and supplied

two motors delivering more than 150 kW with industrial gears that provide nominal output torques of 242,000 Nm.

**Super-sized space-savers.** – NORD is the only manufacturer in the world to produce even industrial gear units as powerful as these in a single-piece cast design. Their impressive size notwithstanding, the type SK 15407 3-stage helical bevel gear units used in this process achieve a comparatively compact footprint. The one-piece housing provides for

- ▶ a highly reliable and leak-proof construction,
- ▶ bearings accommodating greater torques,
- ▶ high resilience against axial and radial strain,
- ▶ low maintenance needs and a long service life.



**Robust single-piece construction**  
Industrial geared motors at the agitator handle massive loads.



### Geared motors

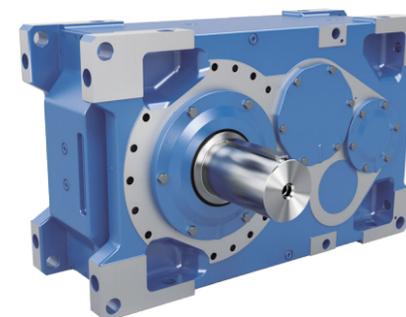
Industrial geared motors with helical bevel gears

### Customer profile

Based in Schopfheim at the fringes of the Black Forest, EKATO SYSTEMS GmbH is one of the leading developers and manufacturers of process mixing systems especially for large-scale plants in the cosmetics, pharmaceutical, specialty chemicals, and food industries. In addition to ever more powerful industrial agitators, the company's product range comprises high pressure homogenizers, solids mixers and dryers as well as mechanical seals and supply systems.



**EKATO**



### The project at a glance

In the world's greatest toothpaste batch production facility, the agitators of EKATO's giant UNIMIX systems are moved by powerful industrial geared motors from NORD, which rely on a resilient gear housing cast in a single piece. Providing about three times the capacity of the previously largest installation, the plant features

- ▶ two mixers with an effective volume of 10,000 liters each and
- ▶ an output of 6,000 to 11,000 kg of product per hour.