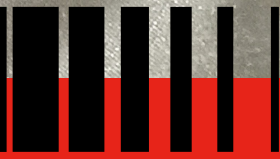




LIST⁺



Kneading - Mixing - Drying

Technology Center

*“Hands-On”-Science for
Successful High Viscosity
Process Trials.*

First we listen

“Hands-On”-Science for Successful High Viscosity Process Trials.

When your agitator stops due to high viscosity, LIST Technology AG is the right partner to help. With more than 50 years experience in KneaderReactors for high viscosity processing, we will find the appropriate solution to your challenge.

LIST Technology AG provides a strong team of dedicated Process Experts to find the optimal KneaderReactor process solution to fit your requirements. Our experts provide fundamental science-based knowledge and practical process experience paired with the experience of our Technology Center in Arisdorf, Switzerland.

With more than 50 years experience and thousands of trials run, we know exactly what is necessary for safe and successful process trials.

Safety First.

Usually, even before our clients have ordered trials, we are starting to analyze the safety measures needed to secure the process trial challenge. In particular, we consider the handling and preparation of raw materials, the behavior of materials during the process and finally the handling of the product, by-products and waste. The planned trial process gets meticulously investigated in terms of potentially hazardous and harmful situations during the trial run.

The basis for the Safety Risk Analysis is the description of the process by our clients with the active help of LIST Technologists. This enables all team members - such as Technology Research & Developers, Safety Engineers and Technology Center Engineers - to understand the risks of the process and take the right actions to prevent incidents. A final comprehensive check of all trial requirements and boundaries is made during a final meeting together with the client on the day of trial.

Fundamental Process Knowledge and Careful Process Preparation Make Trials Successful.

Senior members of the LIST Technology Process Experts Team have more than 30 years of experience designing thermal and mechanical processes performed with LIST Technology KneaderReactors.

Next to the specifics of the KneaderReactor itself, a very important aspect in the development of the process is the handling and feeding of materials into the Reactor, as well as the appropriate and safe handling of products and waste.



LIST Technology Customer Center in Arisdorf, near Basel Switzerland.

Our profound knowledge in Chemical Reaction, Multi-Phases Material and Drying processing led to more than 500 successful industrial installations worldwide. The majority of these successful industrial implementations have been preceded by trials using the core of our technology: the LIST Technology Center with its wide range of customizable Pilot Equipment.

Development and Scale-up: A Proven Modular Procedure.

Generally our KneaderReactors are available in Lab-, Pilot- and Pre-Industrial-Scales from volume sizes of 3 liters up to 160 liters. The single and twin shaft KneaderReactors can be run in batch and continuous modes to ensure a safe scale-up to production line size.

LTK3.2: the first step. For the first scale-up step, LIST Technology has recently developed a very strong tool - the new Laboratory Twinshaft KneaderReactor LTK3.2. It was developed in order to provide a flexible laboratory machine for batch and continuous trials, while using less material and reducing trial duration, requiring the use of less than 2 liters of material.

The LIST KneaderReactor configuration can be modified in different ways to serve several applications. Batch or continuous mode, different operating modulus and shaft designs lead to the well-known and approved reactor types CKR, CRP and CKC to match your specific process. Furthermore, a new type of dome enables the important visual observation of the whole reaction volume.

New mechanical seals allow stable vacuum down to 1 mbar or pressure up to 10 barg. The LTK3.2 is Ex-proofed (ATEX) and operates up to 300°C. Of course, the LIST KneaderReactors' main design advantage is to manage very high torque values for viscosities up to 50000 Pas through even solid materials.

Further Scale-up Steps: Custom Solutions and State-of-the-art Partnerships.

Further scale-up steps, especially for large final production machines, are available to reduce the scale-up factor and ensure a safe scaling with trials on larger equipment at our Technology Center.

If it is needed to run even longer continuous pre-industrial trials with large amounts of material, we work together with our long term partners at the Fraunhofer Pilot Plant Center for Polymer Synthesis and Processing (PAZ) in Schkopau and with the Thuringian Institute of Textile and Plastics Research (TITK) in Rudolstadt, both in Germany. Additional internationally recognized Technical Institutes are in the process of being established as development partners.

When trial planning is completed and the date of the trial comes closer, our Technology Center Team builds-up your customized “production process” in one of our three trial facilities (Bay 1, 2 and 3).

Here we can process many materials as long as they are conforming to environmental, safety and law standards and are run under ex-proofed ATEX conditions.



LIST Technology Test Center, Arisdorf, Switzerland

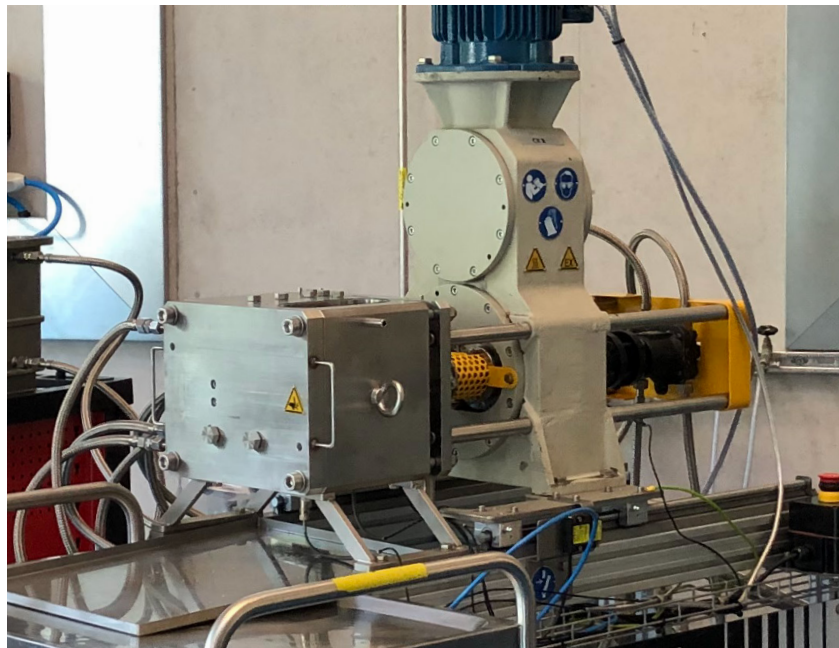
Analysis and Reporting: A Fully Documented Understanding of Process Challenges and Opportunities.

Process trial data is recorded with our data recording system. Together with the trial observations, our R&D Technologists perform an in-depth analysis to design the optimal process solution. Finally all results are summarized in an extensive analytic report providing clients a hands-on, fully documented understanding of the challenges and potential of their specific process. In the later phase, this also provides the basis for the industrial scale-up of the production machine and peripheral equipment.

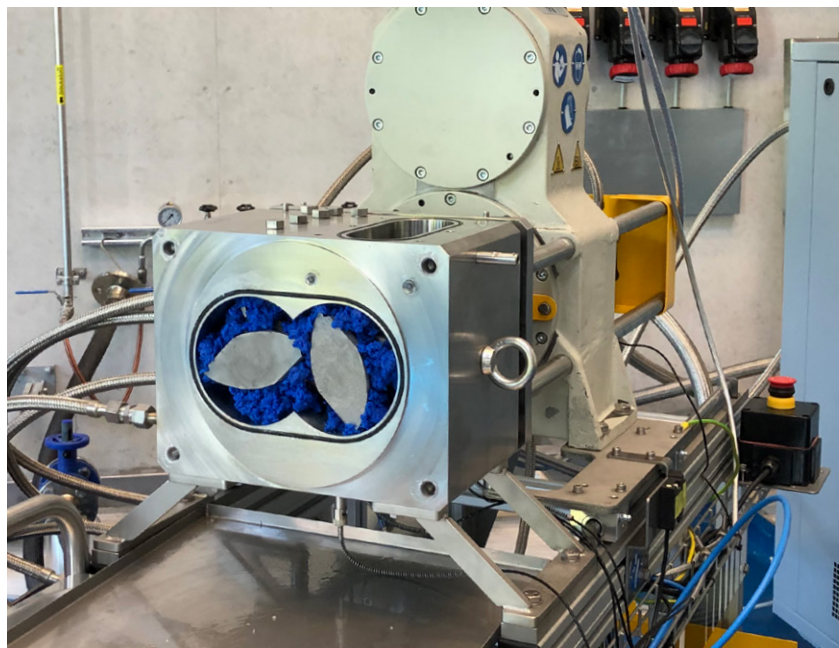
Kneader Rental For In-house Process Development.

To enable clients to develop processes in their own facilities at unique conditions, LIST Technology offers custom-made KneaderReactors' rental services. This can be economically interesting if investigations such as a series trials are planned. At LIST Technology clients can choose from hundreds of parts and accessory equipment we have in store to design their specific process ready to be put into action.

In terms of safety and process function, the preparation phase for a rental program is similar to that of a trial planning. The rental KneaderReactor - including peripheral equipment like heating unit, discharge or feed screw or a condenser - will be installed on your premises by a dedicated LIST Technology team of specialists that will also assist you "all along the way" until the start-up of the machine.



The new LTK3.2 Lab KneaderReacher



Each test bay can be operated completely separately to ensure client privacy, confidentiality and your IP protection.

first we listen



A Jakob Müller Company

