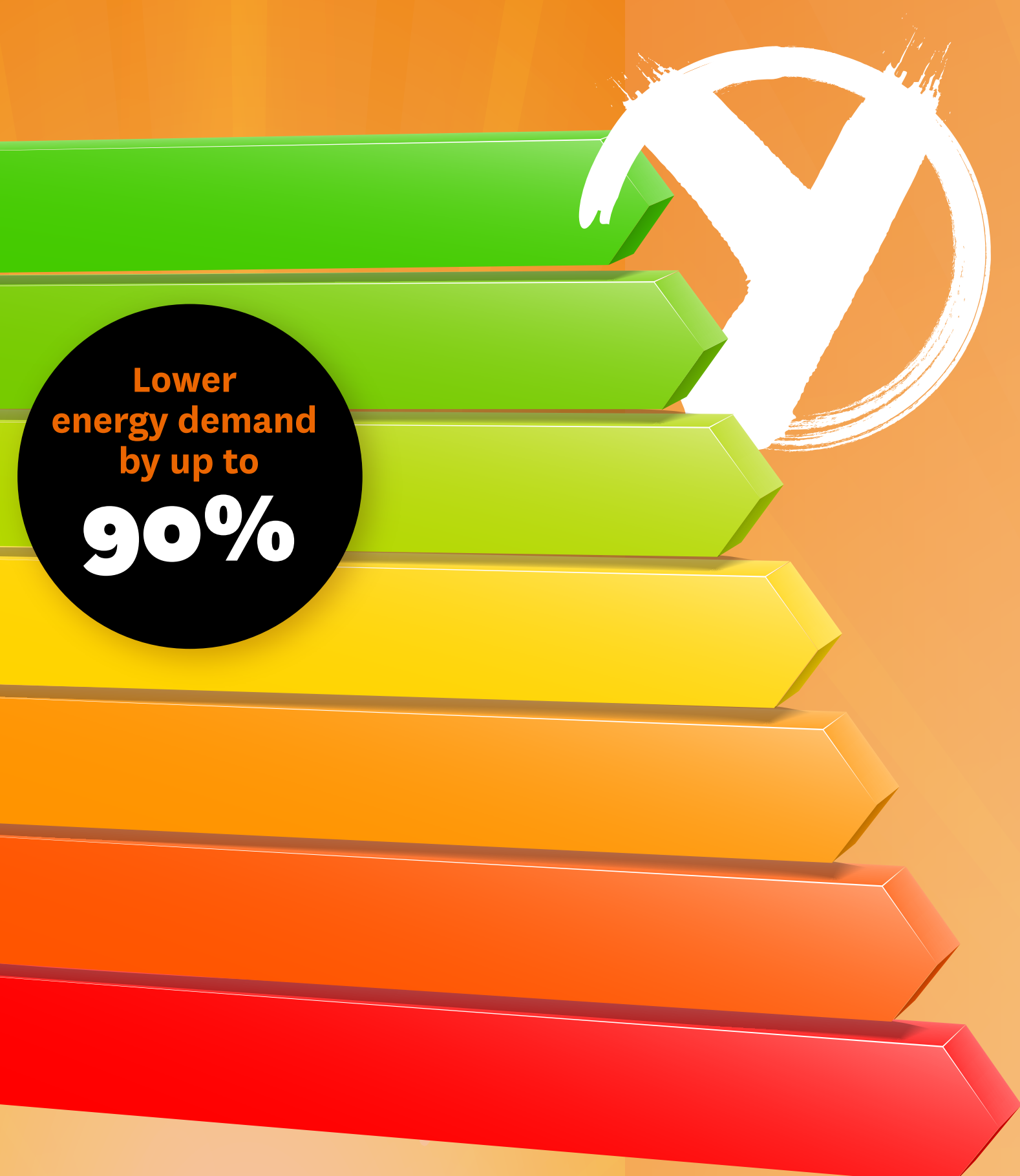


8 levers for lowering the energy requirement

SAVING ENERGY BY MORE EFFECTIVE PROCESS ENGINEERING



Innovative mixing and dispersion technologies achieve enormous improvements with regard to their energy requirement compared to conventional technologies such as dissolvers and agitators: depending on the application, the energy requirement can be lowered by up to 90%. Find out about 8 crucial levers with which users can reduce their energy requirement, and learn how processes are implemented energy-efficiently with technologies from ystral, the mixing and dispersion technology specialist.



Lower energy demand by up to **90%**



SHORTEN PROCESS TIMES

Modern mixing and dispersion technologies can drastically shorten process times compared to dissolvers or agitators. As a result, this leads to a significantly reduced energy demand even with a higher output used, as energy is power multiplied by time.

IMPLEMENTATION WITH YSTRAL

Using process intensification and a realisation of intense processes outside of the vessel, ystral, the mixing and dispersion technology specialist, achieves significantly shorter process times: For a manufacturer of ketchup, ystral was able for example to reduce the process time when dissolving sugar in cold vinegar water from so far 6-7 h per silo juggernaut of sugar to 900 seconds.



REPLACE ENERGY-INTENSIVE PROCESSES

By using innovative mixing and dispersion technologies, energy-intensive processes can be reduced or fully eliminated. An example for this is the use of grinders: For example, in a dissolver process in the production of varnishes and paints, the required fineness can often only be achieved with subsequent grinding – a very time- and energy-intensive process.

IMPLEMENTATION WITH YSTRAL

With technologies from ystral, powder particles can be immediately broken down fully when introduced into liquids. Therefore, for many applications, the use of a grinder is not necessary at all any more – and where a grinder must be used, the grinding time is significantly reduced, for example from 30 h to 16.5 h for a black automotive top coat.



REALISE COLD PROCESSES

Many processes, which previously had to be carried out at high temperatures, can be implemented by means of dispersing under high shearing and optimised pressure conditions with significantly lower process temperatures. This not only lowers the energy requirement, but also enables a more gentle processing of raw materials.

IMPLEMENTATION WITH YSTRAL

Technologies from ystral enable cold chemical engineering processes using more effective dispersing. An example for this is the solution of polyvinyl alcohol with a medium or low degree of hydrolysis. A temperature of 80-85 °C is usually required for this. However, with ystral technologies, this is possible without high temperatures.



ACHIEVE REPRODUCIBLE RESULTS

When using conventional technologies, the product quality depends on numerous factors, and the dispersion results fluctuate greatly. For this reason, rework on the product has so far been common practice in many areas of the process industry – bringing with it a not insignificant energy demand. If there are faulty batches, this is also accompanied by costly disposal and preparation of materials.

IMPLEMENTATION WITH YSTRAL

Through constant process parameters and an immediate and complete breakdown of powdered raw materials, ystral achieves a consistent product quality. As the powders are not added to the open vessel from the top, but are absorbed into the dispersing zone under vacuum, the quality of the end product cannot be affected by operating errors. Reworking for final adjustment of the product is not necessary. The risk of faulty batches is minimal.

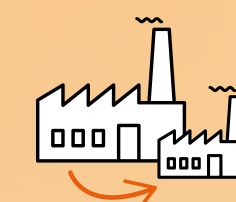


WORK ON THE BEST EFFICIENCY POINT

To be able to realise production processes energy-efficiently, machines must be operated in the area of their maximum efficiency – their Best Efficiency Point (BEP). For conventional mixing technologies such as a high speed dissolver, this is difficult to implement, as it is responsible for the dispersing and mixing of the entire vessel content at the same time, and the machine performance must be adapted in relation to the viscosity.

IMPLEMENTATION WITH YSTRAL

The process steps “dispersing” and “homogenisation” are implemented with different machines in the circulation process at ystral: Dispersing occurs outside of the vessel with an inline disperser, homogenisation occurs within the vessel with an ystral mixer. This separation makes it significantly easier to operate individual machines in the area of their maximum efficiency.



REDUCE SPACE REQUIREMENT

The use of conventional technologies in process technology is associated with a high space requirement due to their low efficiency, long mixing and grinding times and their lack of flexibility. This involves a respectively high energy consumption – for example for heating or cooling the production areas, but for example also for conditioning the ambient air.

IMPLEMENTATION WITH YSTRAL

For the same output, a mixing and dispersing system from ystral only requires 25% of the building volume that would be needed if conventional technologies were used. This is not only due to the significantly reduced process times, but also because, quite different from a dissolver, very different batch sizes can be processed in one vessel, rendering production processes highly flexible.



OPTIMISE CLEANING PROCESSES

Many machines and systems used in process technology are not designed according to the principles of hygienic design. Frequently, very large process vessels are being used, and cleaning usually occurs manually. Through optimisation and automation of cleaning processes and a size reduction of systems, the expenditure of time as well as energy for cleaning can be reduced.

IMPLEMENTATION WITH YSTRAL

Machines and systems from ystral have been designed in accordance with the rules of hygienic design, and are therefore easy to clean. In terms of cleaning processes, ystral uses experiences from industries with very high hygiene requirements, such as the pharmaceutical or food industry, for applications in other industries. Depending on the version, the cleaning of an ystral system can be performed fully automatically.



DISPENSE WITH INTERMEDIATE STORAGE

As the powder particles cannot be sufficiently broken down during a conventional mixing process, intermediate storage between one or several days is often required, before the product can be finally adapted and filled. For manufacturers, in addition to an unnecessary space requirement, this also means unnecessary energy consumption – for example for pumping the product or final mixing and dispersing in the process vessel.

IMPLEMENTATION WITH YSTRAL

When using an inline disperser from ystral, the product can be filled directly without intermediate storage. Even layered silicates, which are used for example in the production of window varnishes, can be fully broken down with ystral technology. An undesirable post-thickening of the end product in the sales packages (“in-can thickening”) can be ruled out here.

More on energy savings using more efficient process technology at:

ystral.com/energy