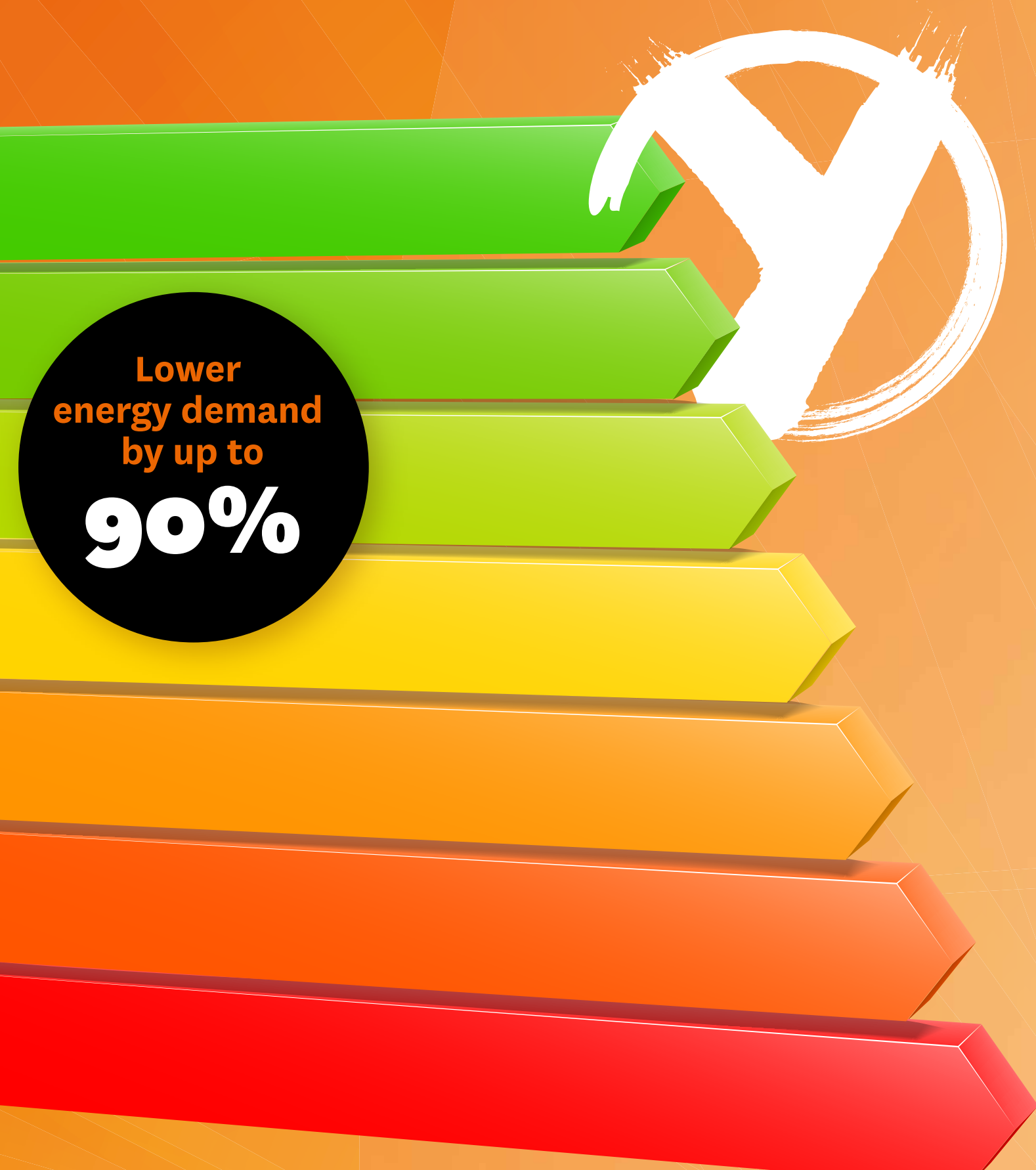


8 levers for lowering the energy requirement

# SAVING ENERGY USING MORE EFFECTIVE PROCESS TECHNOLOGY



The drastically increased energy prices challenge manufacturers to increase the efficiency of their production processes and lower energy consumption to ensure their competitiveness. Compared to conventional technologies such as high speed dissolvers or agitators, modern technologies achieve significant improvements: Depending on the application, the energy consumption can be lowered by up to 90%. Find out about 8 crucial levers with which producers of varnishes and paints can reduce their energy requirement, and learn how processes are implemented energy-efficiently with technologies from ystral, the mixing and dispersion technology specialist.



## SHORTEN PROCESS TIMES

State-of-the-art mixing and dispersion technologies can significantly shorten process times with regard to the production of paints and varnishes compared to conventional solutions. 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 in the production of paints and varnishes: For example, resins can be dissolved in a fiftieth of the previously required time, and the total production time can be decreased by more than 80%.

Energy saving potential **10/10**



## MINIMIZE THE USE OF A GRINDER

With conventional mixing technologies, powder particles are not fully wetted when induced into liquids, and agglomerates are generated as a result. The required fineness in the production of paints and varnishes can frequently only be achieved through subsequent grinding – this is a very time-consuming and energy-intensive process due to the insufficient particle breakdown.

### IMPLEMENTATION WITH YSTRAL

Powder particles are fully wetted and dispersed immediately one by one by means of dispersion under vacuum. Agglomerates cannot form in the first place during powder induction into liquids. Subsequent grinding can be completely dispensed with for many applications. For products that require the grinding of particles, the grinding times are reduced significantly – for example, in the case of a black automotive top coat, from 30 hours to 16.5 hours.

Energy saving potential **09/10**



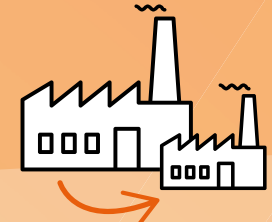
## REALISE COLD PROCESSES

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.

Energy saving potential **08/10**



## REDUCE SPACE REQUIREMENT

The use of conventional technologies in the production of varnishes and paints is associated with a high space requirement due to their low efficiency, long mixing and grinding times and their low 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.

Energy saving potential **08/10**



## 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 the production of paints and varnishes – 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.

Energy saving potential **07/10**



## WORKING 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.

Energy saving potential **07/10**



## OPTIMISE CLEANING PROCESSES

Many machines and systems used in the production of paints and varnishes 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. This enables manufacturers to realise even extreme colour changes, i.e. from black to yellow pigment paste, as no residues are introduced from the previous batch into the next batch. Depending on the version, the cleaning of an ystral system can be performed fully automatically.

Energy saving potential **06/10**



## DISPENSING 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.

Energy saving potential **05/10**

More on energy savings using more efficient process technology at:

[ystral.com/energy](https://ystral.com/energy)