MAINTENANCE-FREE DRYER FOR SOLAR CELL METALLIZATION LINES

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Introduction

A state of the art metallization dryer should be capable of completely drying cells without contamination of cells, the dryer or the environment. This poster illustrates how the Dritech dryer, through the innovative application of heating and airflow technologies eliminates internal condensation. In addition, smoke and fumes are prevented from escaping into the environment. Under the rigors of full production the dryer has demonstrated a virtual elimination of the need for cleaning.

DriTech Design

When designing the DriTech dryer an emphasis was put on air flow management. Airflow is crucial in achieving complete removal of solvent and also in preventing any contamination from building up, especially since every month a typical single lane dryer has to remove over 400kg of solvent.

Clean Furnace
Clean Facility
Clean Environment

To facility exhaust - no additional abatement required

VOC Thermal Oxidizer

→Point of use VOC abatement is integral part of Dritech

→Clean dryer and ductwork

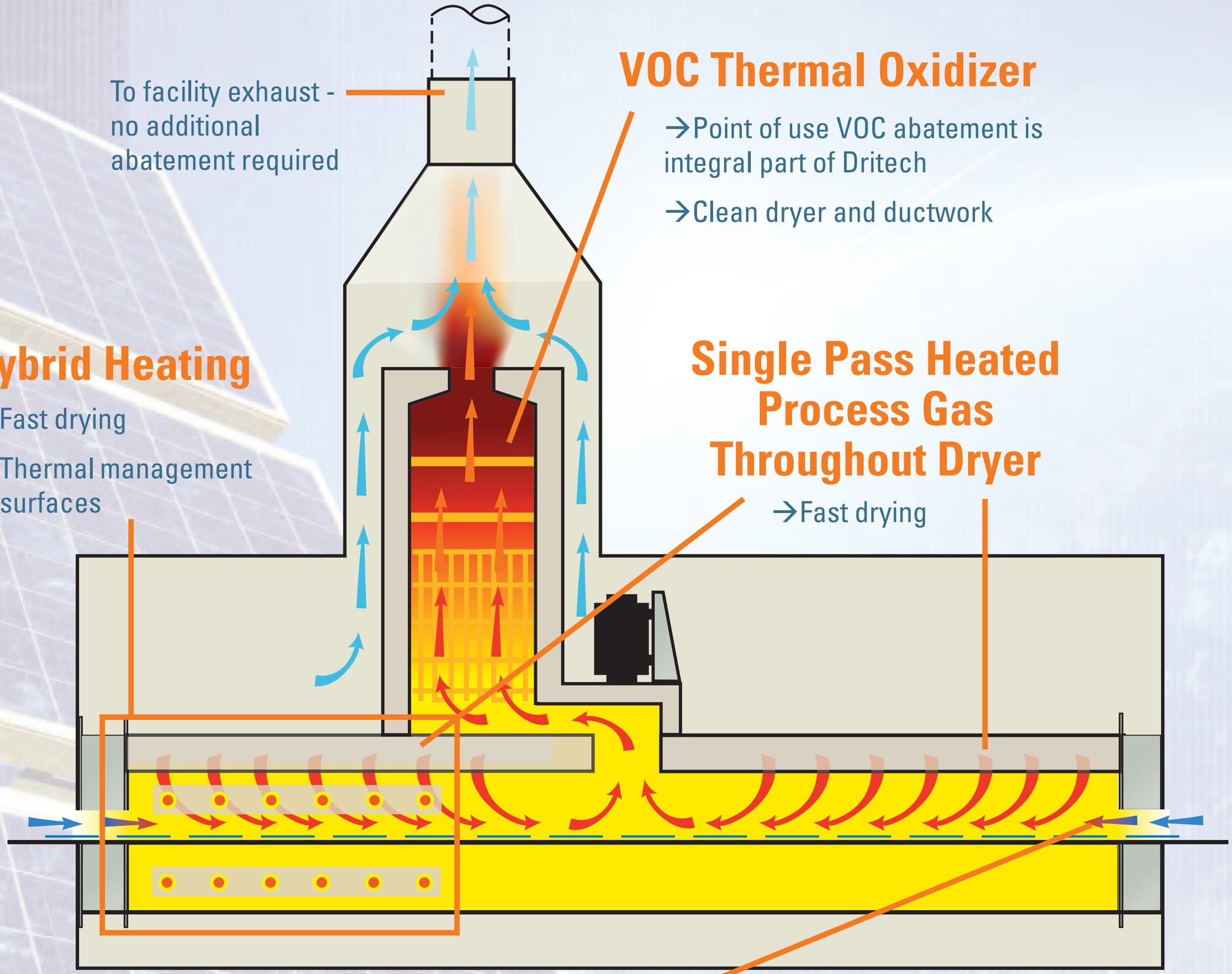
Hybrid Heating

→Fast drying

→Thermal management of surfaces

Single Pass Heated Process Gas Throughout Dryer

→Fast drying



Ends to Center Air Flow

→Solvent contained within the unit

Smoke Containment

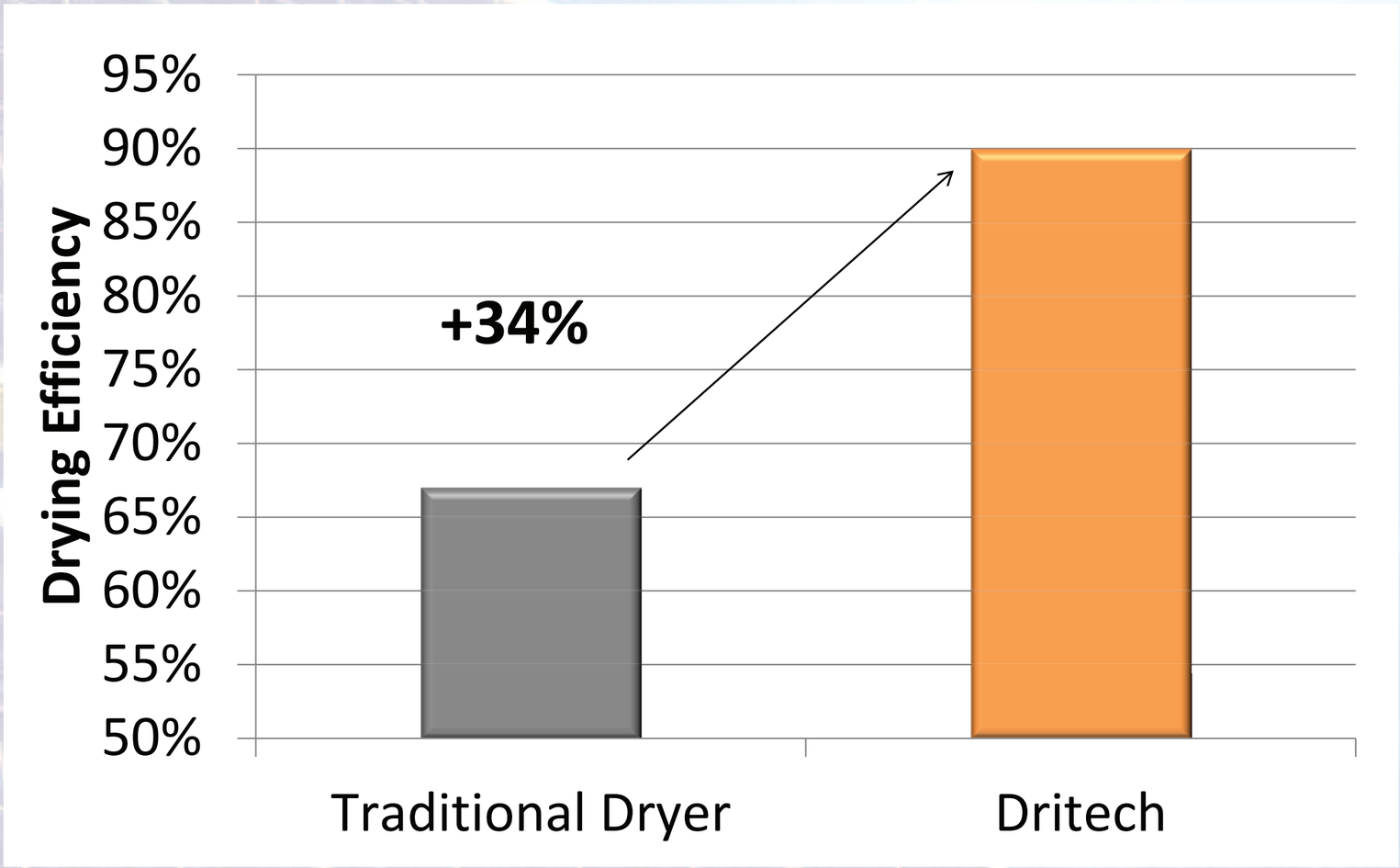
→Comparison of dryer with traditional air flow management (left) and advanced air flow management (right)

→DriTech prevents any smoke from escaping

Drying Effectiveness

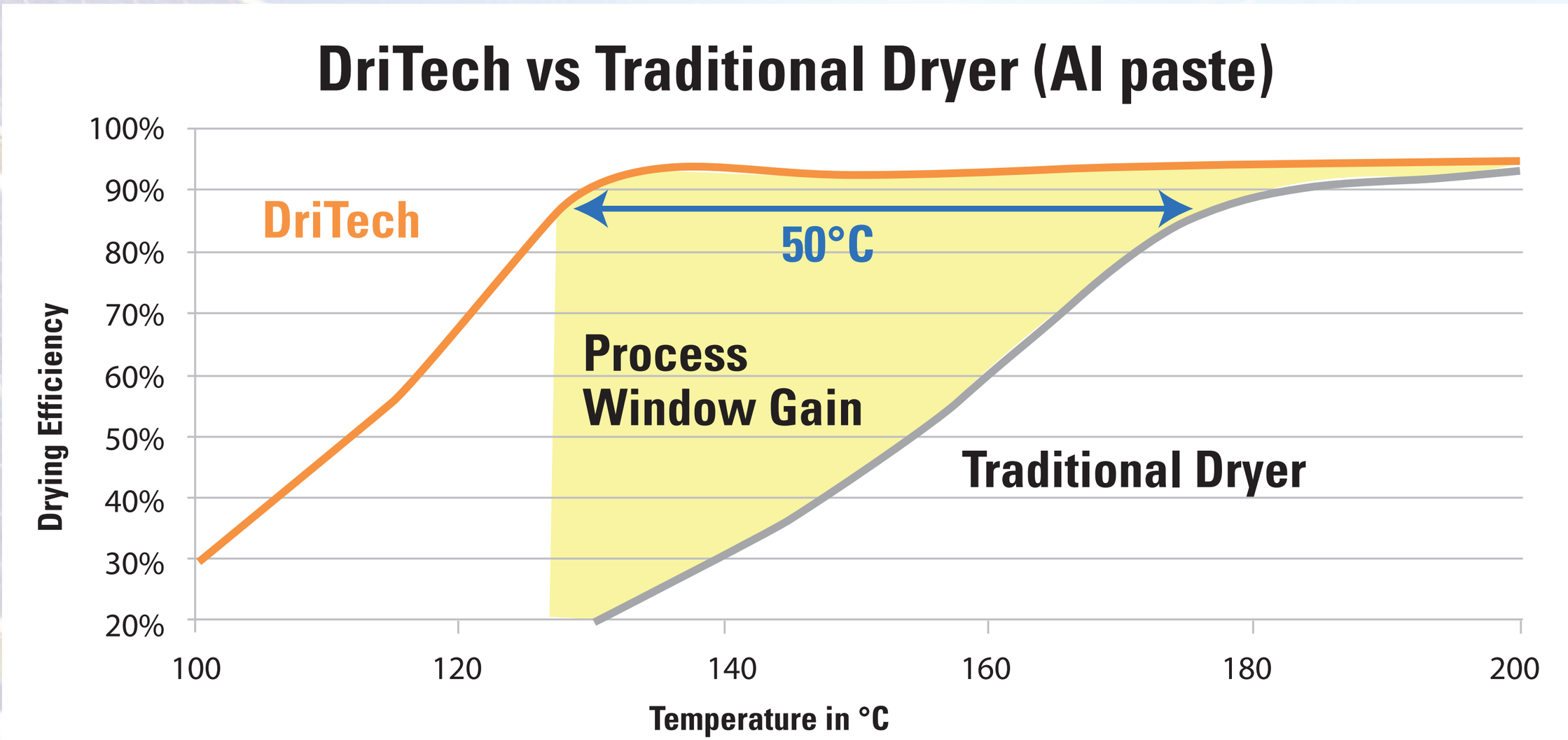
As a result of the advances made in air flow management, DriTech delivers unsurpassed drying results. Both in terms drying effectiveness as well as low temperature drying capability. The low temperature drying makes it possible to dry each paste at its ideal drying window without harming high temperature binders. It also leads to an enlarged process window which ensures completely dried cells at all times.

Silver Paste Drying at 115°C



→DriTech completely dries cells at just 115°C peak temperature

Drying Process Window

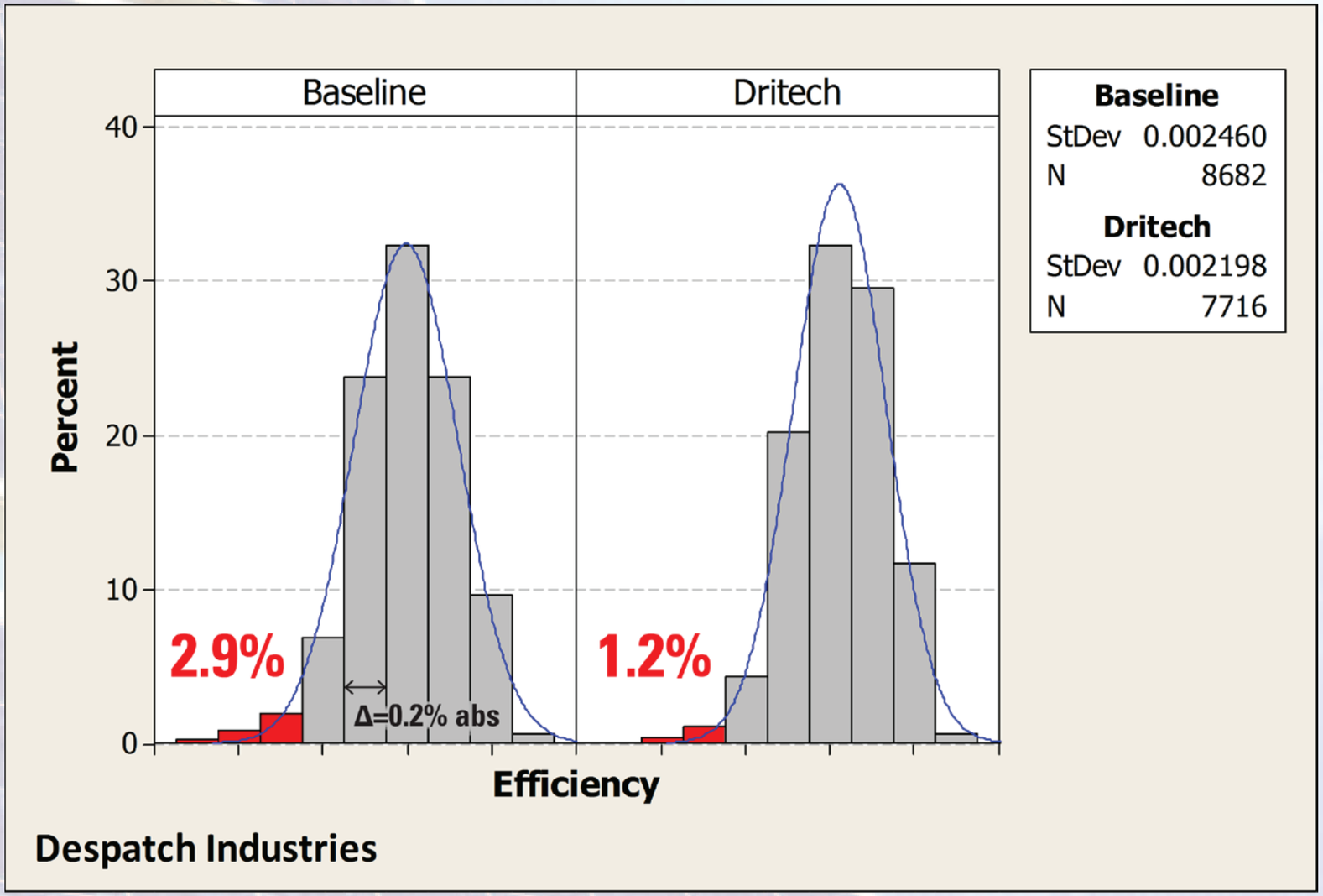


→Dritech opens drying process window by 50°C

High Volume Production Results

DriTech's superior performance was validated at three solar cell manufacturing pilot sites. At each site no contamination was found even after millions of cells.

Due to the consistent drying performance, DriTech was able to significantly reduce the number of low efficiency cells.



1.7% reduction in low efficiency cells

Impact on Maintenance

3 production installs	**ZERO CLEANING CYCLES REQUIRED**
>10 million cells	
>12 months	

Conclusions

DriTech with its innovative air flow management and hybrid heating technology provides a highly flexible drying solution that is able to deliver superior drying results without machine or facility contamination. Thus, DriTech is the ideal dryer choice for each print step.