

# ALKA-TEX .Free

ADDITIVE FOR IPA-FREE ALKALINE TEXTURING OF MONOCRYSTALLINE SI-WAFERS



## SITUATION

Environmentally friendly manufacturing is one of the major topics for solar cell producers. The standard wet chemical treatment for texturing the surface of monocrystalline Silicon wafers includes a high content of isopropyl alcohol (IPA). This causes an organic contamination of the waste water and high costs for waste water treatment.

The solution is a texturing process in which the functionality of the IPA is taken over by a very effective additive. Processing without IPA results in poor texture quality. Moreover, the process is very difficult to control and accordingly, the results are inhomogenous and unsteady.

Effective IPA-free additives were not available so far.

## DESCRIPTION

ALKA-TEX .Free is the first additive worldwide that enables IPA free texturing and increases the texturing quality at the same time! The process control is much easier compared to the standard IPA process and the bath lifetimes are significantly higher in most cases. Thus, ALKA-TEX .Free offers a big cost saving potential.

The application of ALKA-TEX .Free is very easy: Our experienced engineers support you to find the perfect texturing recipe for each application. The chemical bath contains just water, KOH or NaOH and a small amount of additive. Regular dosing ensures a long bath lifetime.

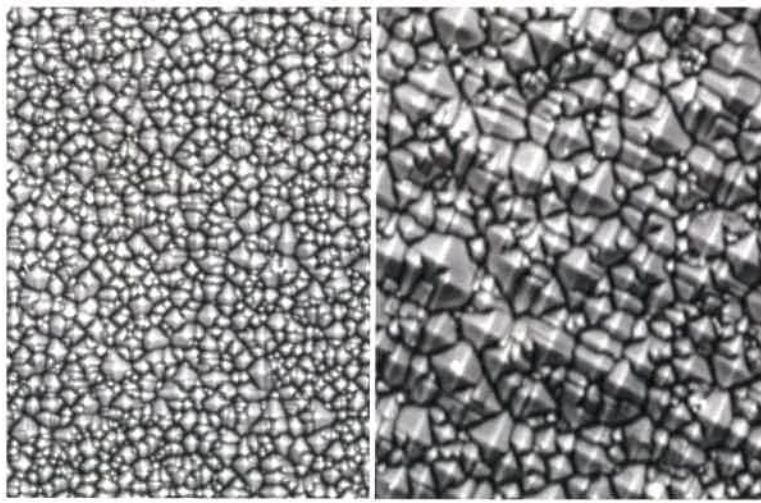
## ADVANTAGES

- › Stable IPA-free texturing process
- › Reduced costs for waste water treatment
- › Low additive consumption
- › Higher average cell efficiencies
- › Longer bath lifetime
- › Ready for high temperature processing

TOPIC	DESCRIPTION
Physical characteristics	Boiling point: > 200°C Density: 1.07 g/cm <sup>3</sup>
Waste disposal	COD waste water: 2.7 g/l*
Useful life	> 90 days from production date
Article number	05.20.0004

\*value measured by customer





50µm  
ALKA-TEX .Free Process

50µm  
Standard Process

## GREAT TEXTURE

The IPA-free texturing process of ALKA-TEX .Free enables very good texturing results in every single run.

### TEXTURE AND PROCESS

Pyramid size	2 - 5 µm base length
Reflectivity	10.5 - 11.5%
Process time	10 - 15 min
Bath lifetime	> 10.000 wafers

## CONSUMPTION

Only a minimal amount of additive is needed to reach highest efficiencies.

### SAMPLE RECIPE

	FIRST FILL*	DOSING*
KOH (45 % solution)	10.4 l	1100 ml
ALKA-TEX .Free	0.5 l	10 ml
DI-Water	160 l	950 ml

\*200 wafer 5"

Note: These are average values which may differ depending on production conditions, such as wafer quality, pre-clean processing, machine type and parameters or chemical purity of KOH.

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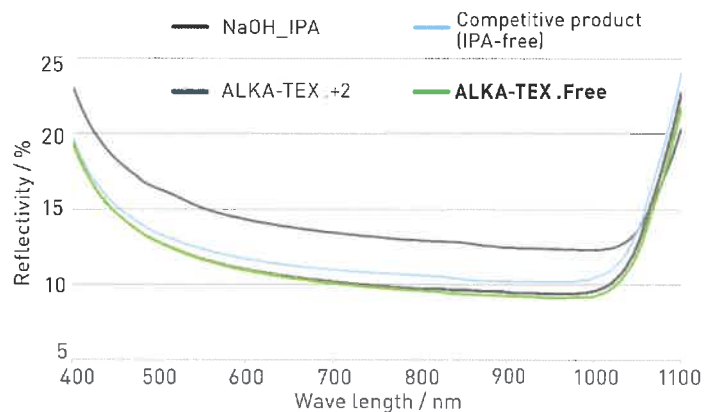
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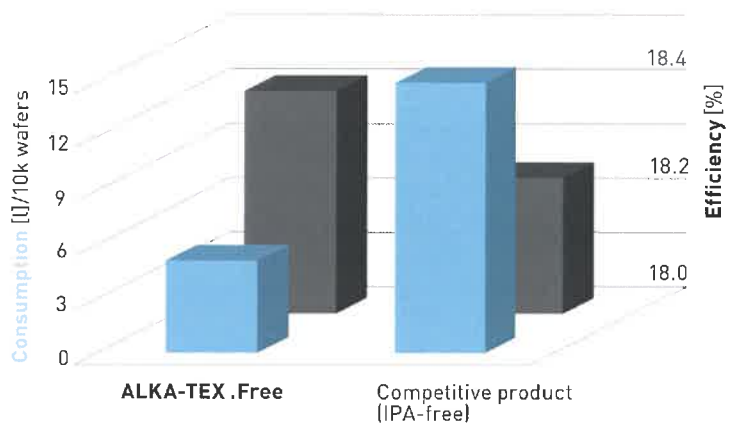
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## COMPARISON



The standard process with IPA and ALKA-TEX .+2 is the benchmark for lowest reflectivities in the pv industry. Now, such low reflectivities can be achieved with our IPA-free process.



Low consumption of ALKA-TEX .Free has been proved in comparison with a competitive IPA-free additive. Consequently, the chemical waste water of the ISRA VISION/GP Solar development shows a low COD value. Despite the low consumption an increase in efficiency can be achieved.