



FREECURE
REVOLUTIONARY LIGHT CURING

FREECURE IS A REVOLUTIONARY TECHNOLOGY AND STANDS FOR OUTSTANDING FEATURES

The curing of varnishes and inks with UV light is a fast, proven and energy-efficient method for cross-linking reactive ink and varnish systems. UV curing is used in many different areas, such as in wood processing or surface coating. The new FREEcure UV system, developed by IST METZ together with BASF SE, represents a new kind of cross-linking technology. The shared patent resulting from the collaboration follows the approach of increasing the UVC percentage in the spectrum of a UV lamp. FREEcure is a revolutionary technology that achieves outstanding results with the option of opting out:

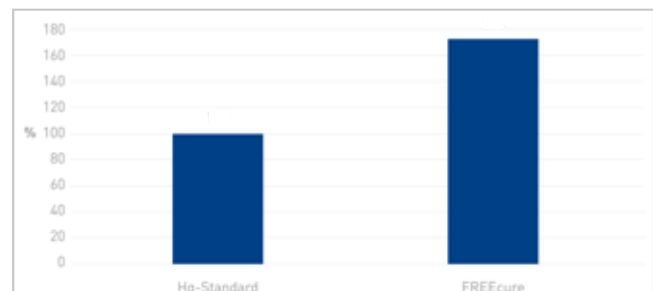
- Photo initiators
- Inertisation
- Electron beams.

PROVEN BLK TECHNOLOGY

The BLK® LAMPcure was developed for the highest industrial requirements. Compared to conventional UV systems, there is an extraordinary increase in drying performance with the FREEcure. This means more productivity at reduced operating costs.

Based on the proven IST UV system BLK®, a system was developed, resulting in an increased performance of more than 70% in the process relevant UVC spectral range. This was achieved by a coordinated package of measures including the following points:

- Adaptation and optimisation of the plasma technology
- Use of special materials for the lamps, reflectors
- Optimisation of the electronic controls

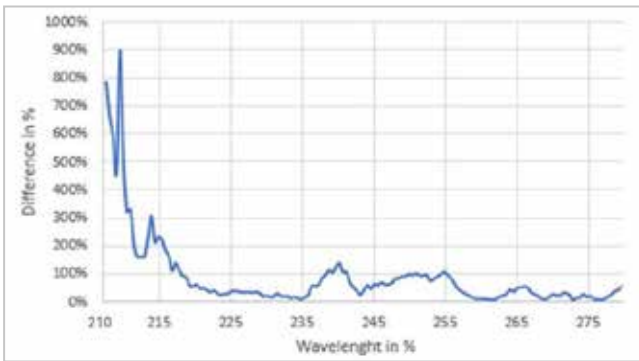


increased performance FREEcure in % (up to 280 nm)

REACTIVITY WITHOUT INITIATORS

FREEcure is not only suitable for 100% UV systems, but also for water borne UV systems. When defining the UV systems, the following aspects were taken into account:

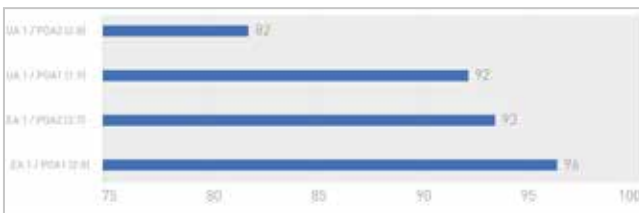
- No photo initiators
- Chemical composition of the binding agent
- Functionality of the binding agent
- Amine modification for effective suppression of oxygen inhibition
- Physical surface drying of water borne UV dispersions



Difference spectrum Freecure 240 W/cm to standard BLK 200 W/cm

In addition to VOC reduction or VOC avoidance (Volatile Organic Compounds), the process impresses with:

- high production speeds,
- low space requirements,
- high mechanical and chemical resistance,
- excellent double bond conversion and
- immediate further processability.



FREEcure curing of resin blends (double bond conversions in %)

When using pure epoxy acrylates (EA) and amine-modified polyether acrylates (POA), higher double bond conversions are obtained than with highly functional urethane acrylates (UA). However, with appropriately optimized mixing of the binder composition, urethane acrylates (UA) also achieve high double bond conversions comparable to standard curing using a photoinitiator.

WATER BORNE UV VARNISHES

In water borne UV varnishes, the physical surface drying (non-sticky surface after drying) prevents excessive oxygen inhibition. This leads to high double bond conversions in cured varnishes without the use of photo initiators. The double bond conversions of two UV polyurethane dispersions (PUDs) with and without photo initiators, for a standard medium-pressure lamp are shown in the graph.

These double bond conversions were compared to FREEcure curing of the same binding agent, but without photo initiators. The conversions achieved by FREEcure are at least equivalent to standard curing with photo initiators, and the loss of quality in standard curing without photo initiators is clearly recognizable.



Double bond conversions with and without photo initiators

BENEFITS FREECURE

In summary, it can be concluded that FREEcure results in very high double bond conversions and excellent chemical and mechanical properties when using 100% and water borne UV binding agents:

BENEFITS OF FREECURE AT A GLANCE

- Environmentally friendly curing
- No photo initiators
- Beneficial from a human sensory point of view
- Energy-efficient
- Extremely short curing times
- Simple process
- High cost-efficiency

WE HAVE THE CURE

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