

# Laser Direct Structuring Additives

## Irasorb & StanoStat



# Laser Direct Structuring Additives

The desire to make equipment smaller and to concentrate more functions on a tiny area is one of the major driving forces behind many developments in the electronic industries.

The invention of the Laser Direct Structuring (LDS) process was a break-through in these industries. For the first time, it allowed the a large number of functionalities to be transferred onto three-dimensional base bodies, which can be made out of a wide range of substrates.

Today the LDS technology is an established process in many industries ranging from automotive engineering, consumer electronics, telecommunications and medical technologies to name just a few.

## The process

The LDS process consists of four major steps:

### 1. Polymer formulation

Most engineered polymers respond poorly to laser light, but this can be improved by incorporating an LDS additive. Suitable additives are compounded into the polymer and the desired parts are injection moulded or 3D printed.

### 2. Laser Activation

The substrate is then structured with laser light. Usually NIR / fibre lasers with wavelengths around 1064 nm are used to transfer the required circuitry onto the surface. The LDS additive helps to convert the laser light into heat which activates the polymer or ceramic surface for the next step.



*PC Lasermarked*

*PC metallized*

### 3. Metallization

After cleaning, the activated polymer parts are immersed into a series of plating baths to deposit copper and other metal layers. The plating will only appear on those areas of the surface which have previously been activated by the laser light. The LDS additive additionally serves as catalyst for the copper deposition, providing seeding points from which the copper layer can grow.

### 4. Assembly

Once the wet chemical processes are finished and the parts are dry, the mechanical assembly of the electronic components and their soldering to the finished LDS part can take place.

## Keeling & Walker Ltd.

Operating out of Stoke-on-Trent, Keeling & Walker is the leading manufacturer of tin oxides and functional pigments for a wide variety of industrial applications.

Backed by many decades of manufacturing experience, Keeling & Walker pioneered the development of antimony tin oxides, which are important LDS additives.

Keeling & Walker is always interested to cooperate and to develop new products and processes with interested parties.

Keeling & Walker is a member of the research association 3D-MID and supports the community to push the boundaries of the LDS technology.



# Product Range

Name	Product	Composition	Colour	Particle size D50 (µm)	Key Feature
StanoStat	CP5C	ATO	Grey-blue	1,0	Multipurpose additive for polymer and ceramic substrates
StanoStat	CP05	ATO	Dark grey-blue	1,4	High catalytical activity
StanoStat	CPM10C	ATO	Dark blue	2,6	High catalytical activity
StanoStat	A20W	ATO	Dark blue	< 0,1	Nanodispersion for powder coating or impregnation of ceramic carrier
Irasorb	BITO	ITO	Light blue	< 10	For transparent polymers, Sb / Cu free
Irasorb	LM005	Mixed Oxides	Light grey	0,9	Light colouration
Irasorb	LM007	Copper Tungstate	Yellow		Sb-free additive
Irasorb	CCTO	Calcium Copper Titanate	Brown	< 10	Sb-free additive

As part of the StanoStat and Irasorb ranges, Keeling & Walker offers a range of LDS Additives tailored for various process conditions and substrates.

The LDS additives show the following advantages:

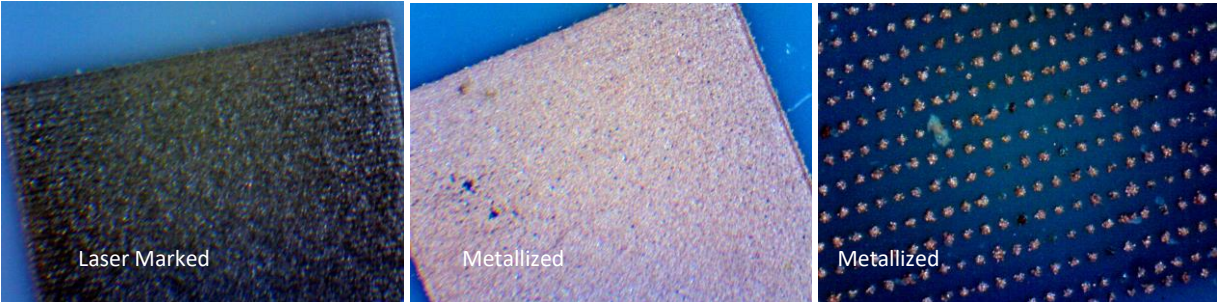
- Chemically inert
- High temperature stability
- Low influence on physical properties of the polymers
- Easy to disperse
- High NIR Laser absorption
- High catalytical activity
- Low colouration solutions available

- Suitable for many substrates including ceramic materials
- Low toxicity
- Antimony free products available to match OEM requirements

StanoStat and Irasorb LDS Additives are offered in powder form. Liquid nanodispersions for coating or soaking of substrates are available too.

Masterbatches of the LDS have been developed and are available upon request.

Technical consultancy for performance optimization is part of Keeling & Walker’s offerings.





UK | WHIELDON ROAD, STOKE ON TRENT, ST4 4JA, UNITED KINGDOM

+44 (0) 1782 744 136

[sales@keelingwalker.co.uk](mailto:sales@keelingwalker.co.uk)  
[www.keelingwalker.co.uk](http://www.keelingwalker.co.uk)



GERMANY | BREDENEYER STR. 2B, 45133 ESSEN, DEUTSCHLAND

+49 201 12 59 622

[sales@thermox.eu](mailto:sales@thermox.eu)  
[www.thermox.eu](http://www.thermox.eu)

