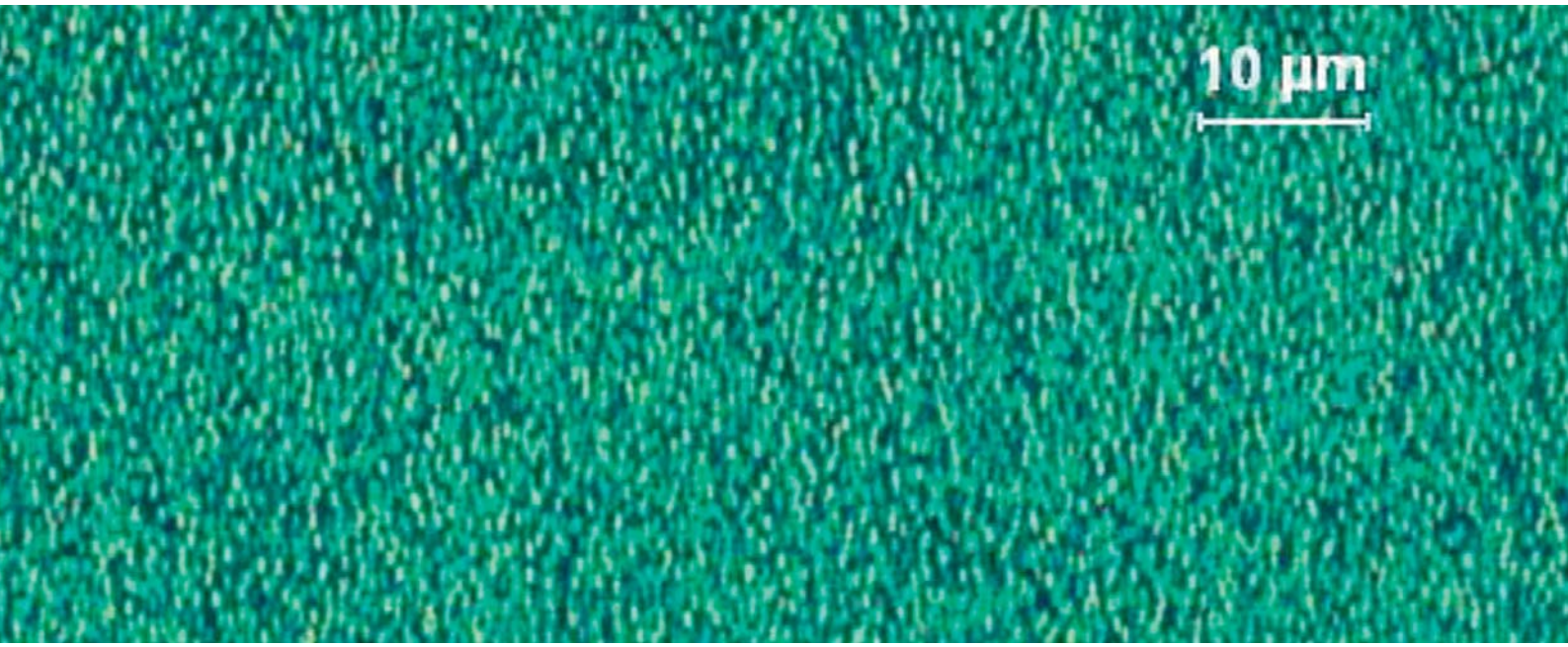
JENOPTIK

200mm Line a-Si Crystallization "Shot Mura"-Free and Super Uniform



Microscope view of 50nm a-Si film after partial melt (600mJ/cm², 500ns, 1µm pitch scanning)

INNOVAVENT® LASER OPTICS

operated by JenLas® **ASAMA** Diode Pumped Thin Disk Laser

Make the Move to the Next INNOVATION in a-Si Crystallization

Crystallization of Thin a-Si Films

Advanced thin disk laser based annealing of a-Si films has progressed to 200mm long Gaussian Line Focus beams for "Shot Mura"-free super uniform crystallization.

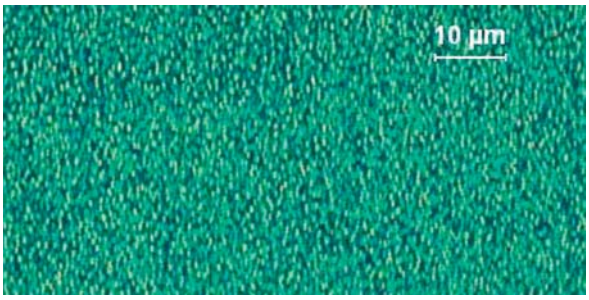
Crystallization of amorphous silicon films is of great importance for OLED (organic light-emitting diode) displays. OLED display panels are thin (~3mm) and provide high contrast, high peak brightness, pure color reproduction and rapid response time for highest image quality at low power consumption.

Green Laser Wavelength Benefits

The special features of the 515nm JenLas® ASAMA laser allow to form a thin Gaussian Line Focus of typically 8µm width. Highly efficient scanning at 1-2µm pitch results in "Shot Mura"-free uniform crystallization in the **partial melt** (500-800mJ/cm^2) and **full melt** (900-1100mJ/cm^2) operating mode. Optimum long axis homogeneity is obtained by matching the ASAMA anamorphic beam properties with the INNOVAVENT homogenizer optics.

FALCON p-lens (NA=0.25, up to 100mm line length) mounted on a motorized z-stage for auto focusing, field curvature <5µm, depth of focus ~30µm.

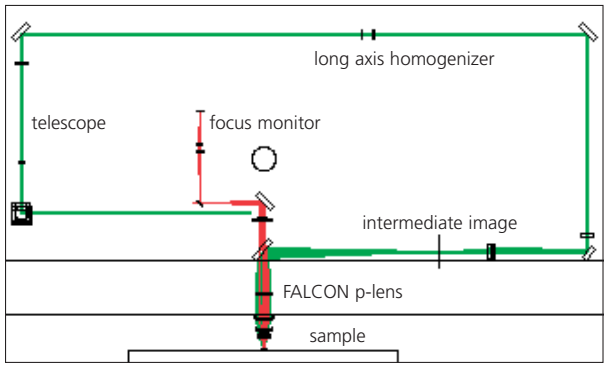
The ASAMA laser technology enables 10 to 100 kHz repetition rate and allows electronic setting of the optimum process pulse length (300-800ns, no optical pulse length extender needed).



600mJ/cm^2 partial melt processing for super uniform mobility in the range of ~50 cm^2/Vs.

VOLCANO LASER OPTICS

The new VOLCANO 160 LASER OPTICS system is equipped with the FALCON 100/200 projection lens and operated with the dual ASAMA laser module. Two ASAMA laser heads are coupled by homogenizer optics to provide up to 800mJ/cm^2 into a line 200mm x 5µm.



VOLCANO set up sketch with FALCON p-lens

The VOLCANO LASER OPTICS design results in a small foot print due to the integrated laser head (~50% of an excimer laser based ELA-system). The uptime of the solid state ASAMA laser is >90% and related cost of ownership is reduced to ~1/3 of a standard ELA-system (no gas and laser tube exchange as with excimer lasers).

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