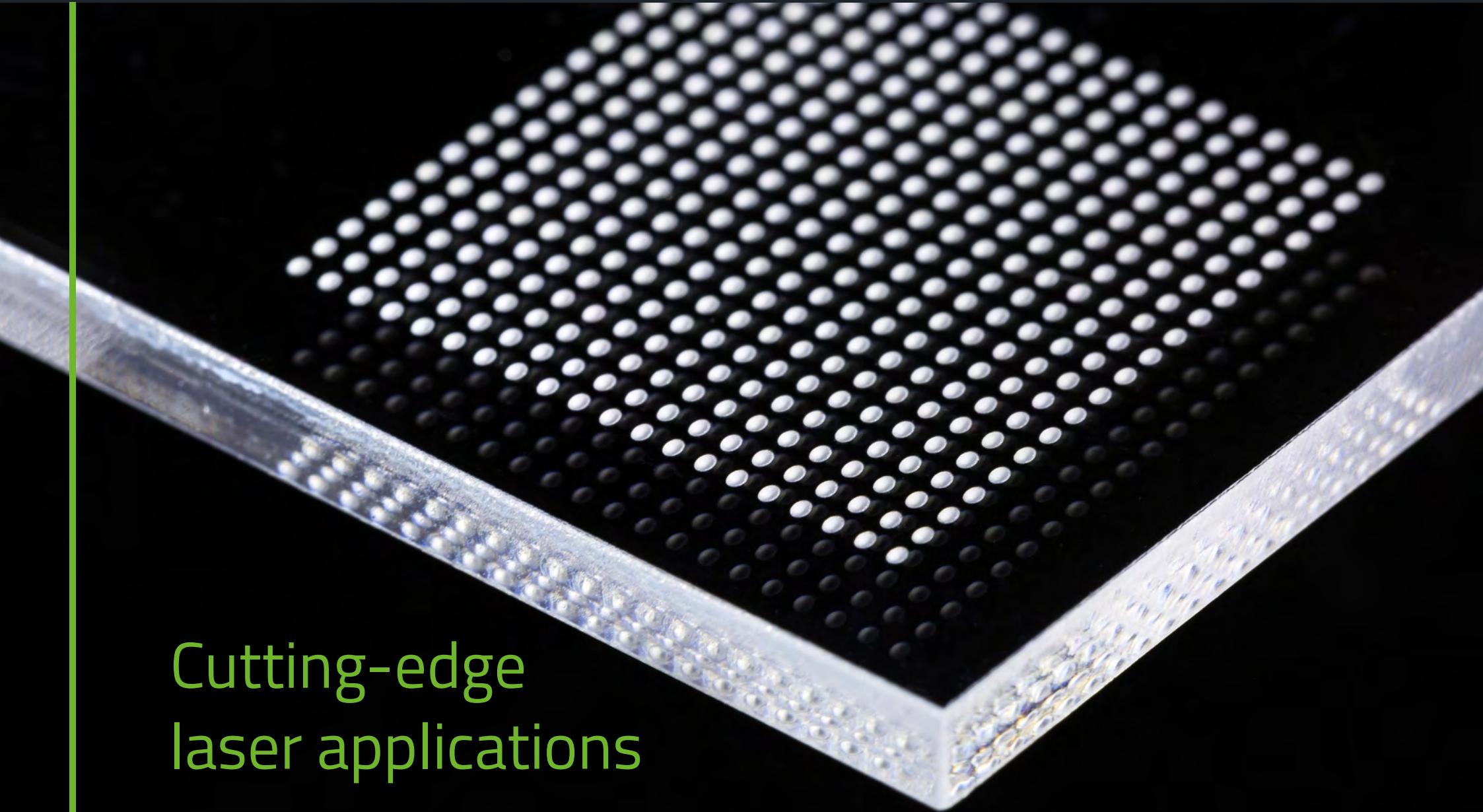




Cutting-edge
laser applications

Used in all areas of manufacturing

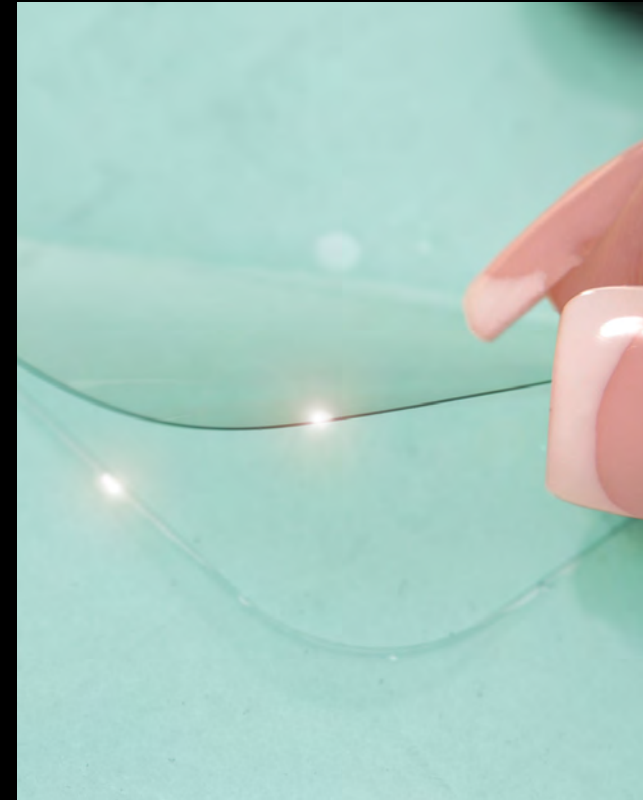
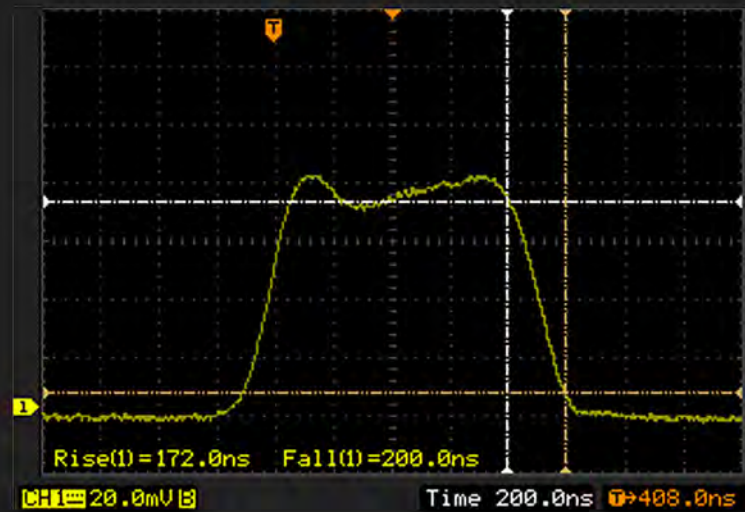
Using a CO₂ laser with an integrated acousto-optic modulator (AOM) gives the advantage of very short rise and fall times*. This reduces heating around the processing area which in turn lessens the heat-affected zone (HAZ).

Luxinar's **SR AOM** series is ideal for a variety of high-precision processes such as microfilm cutting in the flat panel display market and scribing, engraving, marking and surface patterning applications where minimising HAZ is critical. Other thin film applications, including those in the automotive, electronics, lighting and flexible packaging industries, can benefit from the higher quality cutting edge which the **SR AOM** offers when compared to standard pulsed CO₂ lasers.

* Typically $\leq 0.2\mu\text{s}$

Luxinar SR 25 AOM pulse shape @ 1 μs pulse width

1 μs demand pulse



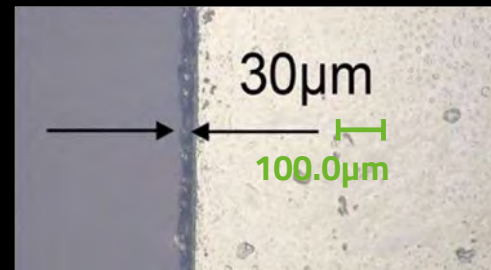
Case study: flat panel display film cutting

Polarised and capacitive films for the tablet and phone industry are both cut using a CO₂ laser with AOM. In some cases, the film may be mounted on glass, and must be kiss cut without damage to the substrate. In other applications the film is unsupported, and must simply be cut cleanly, with minimal debris and HAZ.

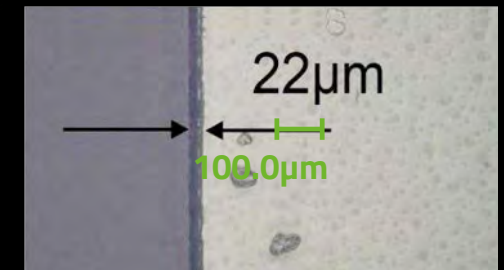
When cutting these thin layered films with a standard CO₂ laser, which typically produces longer pulse rise/fall times of approximately 60µs, a large HAZ remains after processing. However, a CO₂ laser with AOM reduces this HAZ and results in better edge quality.

An additional benefit of cutting with a CO₂ laser with AOM is that, compared to a pulsed laser, it achieves a significant reduction in the melted area which can cause film layers to stick together. With a **SR AOM**, layers no longer stick together thus creating an easy-peel protection film layer. The **SR AOM** can achieve similar results to a picosecond UV laser but with significantly lower investment and maintenance costs.

3-layer polarisation film (courtesy of MDI)

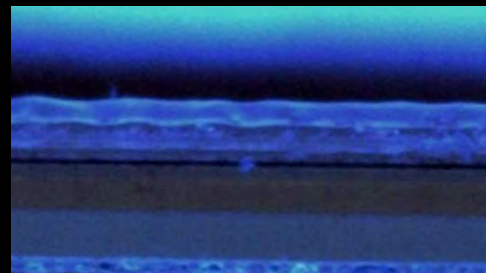


Standard CO₂ laser

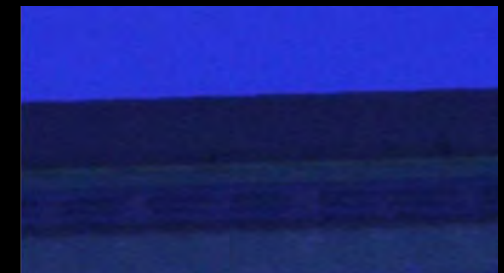


With AOM (c. 30% less HAZ)

5-layer capacitive film cutting



Standard CO₂ laser



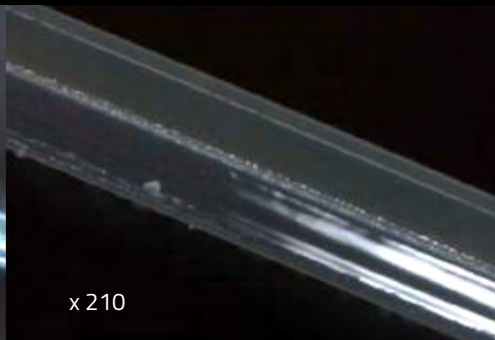
With AOM



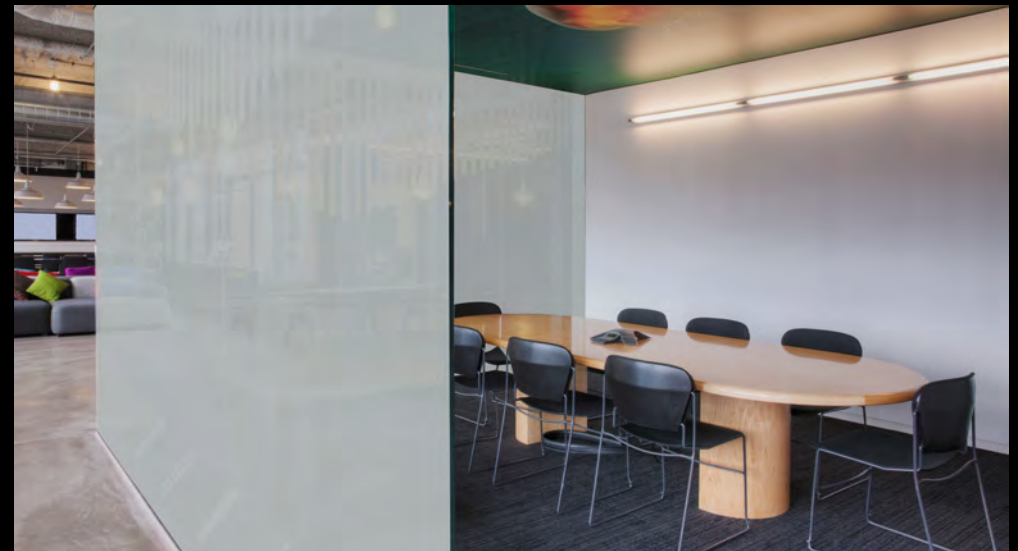
Case study: Polymer-dispersed liquid crystal display (PDLCD) cutting

PDLCD screens can be used in various applications such as meeting room windows to provide privacy by changing between transparent and non-transparent states.

Layers in the film are sensitive to heat which causes discoloration and poor edge quality if cut with a standard CO₂ laser. When cutting with a 9.3µm CO₂ laser with **AOM**, edge quality is smooth and discoloration is greatly reduced as displayed in the photos below.

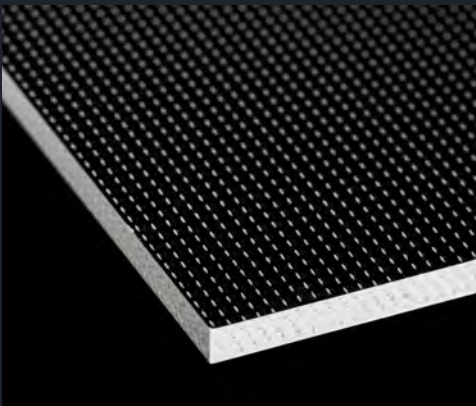


PDLCD is used to provide privacy for a meeting room



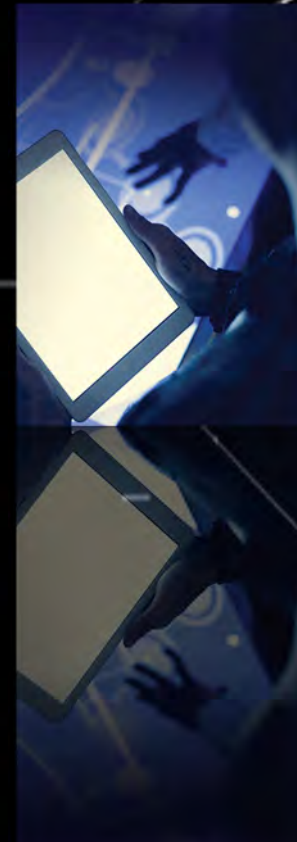
Case study: Backlight unit (BLU) patterning

A CO₂ laser can be used with an AOM to create a consistent backlighting pattern on PMMA (acrylic) material. The AOM allows the user to control the energy within each pulse when processing in order to give uniform light distribution across the finished piece.



Benefits of AOM lasers vs. conventional mechanical processing and other lasers:

- Create very short pulses with sharp rise/fall times
- Ideal for sensitive applications which require less thermal damage:
 - Minimised HAZ
 - An improved cutting edge
 - Less discoloration
 - Reduced melted area



SR AOM series

150W and 75W sealed CO₂ laser sources with integrated AOM

The **SR 10 AOM** and **SR 25 AOM**, both available at a wavelength of 9.3µm and with rated powers of 150W for the **SR 25 AOM** and 75W for the **SR 10 AOM**, add value to the established SR series of sealed CO₂ laser sources from Luxinar. The integrated acousto-optic modulator (AOM) creates much faster optical rise and fall times of less than 1µs which can minimise unnecessary heat energy from typical pulse rise/fall times of approximately 60µs.

In common with the rest of the **SR series**, the **SR AOM** range offers simple integration, clean and high-quality laser processing, and low running and maintenance costs. The laser tube of the **SR AOM** range has more than 20% power headroom to give extended lifetime.



Pre-sales technical support

Could a laser improve your manufacturing process?

Find out by sending us samples of your material or product to test in our labs. Luxinar's engineers can carry out cutting, marking, engraving, drilling, scribing, ablation, and more to replicate your application in the lab.

You'll receive your processed sample within 10 working days and a detailed report of our findings even sooner. You can also receive complimentary advice ranging from fume extraction to sample positioning.

Whatever your process, we can help you to find the best laser for your application.

Contact us on <https://www.luxinar.com/contact/> or info@luxinar.com

Follow us on social media:



DANGER Class 4

Visible and Invisible laser radiation
Avoid eye or skin exposure
to direct or scattered radiation



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