Applications Testing

Synrad offers CO₂ laser application testing to Original Equipment Manufacturers (OEM), laser system integrators, material manufacturers, processors, and end users of automated machinery for a wide variety of materials, including polypropylene. We are CO₂ laser experts, and understand the parameters that will ensure successful, efficient CO₂ laser processing.

Determine optimal laser power and wavelength - Applications Engineers use the latest high performance CO₂ lasers available from Synrad. Combined with a full complement of beam delivery systems, Synrad Applications Engineers will determine the optimal laser power and wavelength for your exact application and target material(s).

Uncover processing know-how and best practices - based on your specific requirements, and using actual materials and/or parts, Synrad Application Engineers will conduct tests using multiple laser configurations and settings to determine the best processes to achieve your desired results. A full report will be provided that details processing steps and best practices.

Investigate new techniques - we have the added ability to investigate new laser techniques, test new materials for laser-process-ability, and solve laser processing challenges.

Visit our Application Labs - direct participation in the applications test is available at any regional Synrad Applications Lab. Direct participation is encouraged for new processing systems and/or applications. The advantage being real-time interaction that can result in faster, more efficient communication and alternative problem solving.

Contact Us
synrad.com

Americas & Asia Pacific
Synrad
4600 Campus Place
Mukilteo, WA 98275
P (425) 349.3500
F (425) 349.3667
synrad@synrad.com

Europe, Middle East, Africa
Novanta Europe GmbH
Division Synrad Europe Parking, 57-59
D-85748, Garching, Germany
P +49 (0)89 31707 0
F +49 (0)89 31707 222
sales-europe@synrad.com

China
Synrad China Sales and Service Center
Unit C, Ting Wei Industrial Park
Lufang Road, Baian District, Shenzhen
Guangdong, PRC 518133
P +86 (755) 8280 5395
sales-china@synrad.com

Japan
Novanta Japan Corporation
4666 Ikebe-cho Tazuki-ku
Yokohama Kanagawa
224-0053 Japan
P +81 45 932 9711
F +81 45 932 9722
sales-japan@synrad.com

High Performance 10.2 µm CO₂ Lasers for Polypropylene Processing
Reliable, Precise 10.2 µm CO2 Lasers

High performance 10.2 µm CO2 lasers increase processing speeds up to 4X when cutting or perforating polypropylene, and create crisp, consistent marks.

25 W Average Power
vi Series

The vi30 sets the industry standard for 30 Watt CO2 lasers in marking and coding applications. The optional 10.2 µm wavelength delivers clean, crisp marking and coding, especially useful to ensure mark or code clarity and positive brand recognition. Engineered for Original Equipment Manufacturers (OEMs), these reliable lasers produce excellent beam quality to ensure exceptional detail.

Improved Marking
Polypropylene (PP) coated paperboard marked with 10.6 µm and 10.2 µm wavelength lasers yielded these results -

10.6 µm: Legible, but the mark is inconsistent
10.2 µm: Clean, consistent, and highly visible

60 - 100 W Average Power
ti Series

Maximum power and performance from an air-cooled CO2 laser is the drive behind our ti Series technology. Available in 60, 80, and 100 Watt models, each with multiple cooling options for unmatched integration flexibility. Fan-cooled ti Series lasers feature symmetrical cooling to maximize air flow around the laser and ensure industry-best power stability. The ti Series enables OEMs to offer multiple laser processing power levels in the same system, by incorporating the same footprint, input voltage, beam size, and beam exit height across all power levels.

375 - 750 W Peak Power
p Series

Cut cleaner, drill and perforate flawlessly with the p Series high performance pulsed CO2 lasers from Synrad. These lasers harness peak power many times greater than the average power to deliver energy more efficiently to your material, ensuring the highest quality results at the best speeds. The p Series with 10.2 µm wavelength expands precision cutting, drilling, and perforating applications to include polypropylene films and products.

The p Series sets the standard for pulsed CO2 performance. Integrated beam conditioning guarantees a high quality, circular output beam for precise cutting, drilling, perforating, and intricate feature details. Excellent power and divergence stability deliver consistent, high quality application results.

Designed for industrial environments, all models were rigorously tested under demanding conditions to ensure they can achieve 24/7 operation over long lifetimes.

200 W Average Power
f Series

Engineered for cost-effective 200 Watt output for cutting, selective cutting, and scoring applications. The f201 has excellent power stability for selective cutting multilayer materials, and easy-open scoring. The fully integrated laser/RF design minimizes size and weight; perfect for mounting on robotic arms, as well as for full integration into cutting systems.

400 W Average Power
i Series

The smallest and most energy efficient 400 W CO2 laser available. The i401 delivers 400 Watts of near-perfect beam quality for high-speed, high-precision applications. Continuous wave (CW) output, and excellent power and divergence stability combine to deliver the very best results when selective cutting multi-layer films or labels. Real-time performance monitoring ensures maximum uptime with onboard advanced diagnostics that are Industry 4.0 ready.

Improved Cut Edge Quality
Cutting OPP/BOPP material with 10.6 µm and 10.2 µm wavelength lasers yielded these results -

10.6 µm: Cutting produces a noticeable melt lip
10.2 µm: Cutting 2.5X faster, and produces minimal melt lip

Tested - Cutting Adhesive Polypropylene (PP) Label

Polypropylene (PP) is the second most produced commodity plastic in the world. PP is produced in a variety of structures, enabling a wide variety of applications including plastic parts, reusable containers, medical equipment, automotive components, packaging, and labeling. It is a durable and flexible material, resistant to many chemical solvents, bases, and acids. When polypropylene is biaxially oriented (BOPP), it becomes crystal clear and serves as excellent packaging and labeling material. A test sample processed using a Synrad p150 - 150 W, 10.2 µm CO2 laser, and a Flyer 3D scanning head yielded the following results:

Throughput Speeds

<table>
<thead>
<tr>
<th>Cut</th>
<th>Kiss Cut</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 cm/second</td>
<td>305 cm/second</td>
<td>150 cm/second</td>
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The Novanta Advantage

As a Novanta company, Synrad has unique access to advanced industry-expertise and laser related products. Novanta's photonics, vision and precision motion component and subsystem solutions meet the needs in growth markets, including Fine Material Processing, Electronics, Metrology, and Robotics & Factory Automation.