FOR PROCESSES DEMANDING WELDING PROCESSES
CAVITAR WELDING CAMERA

Value in Sight

We at Cavitar are here to bring you Value in Sight with our diode-laser based illumination systems and welding cameras that reveal your application and processes with the level of clarity and detail you have never seen before.

For visualization of various welding techniques

- ARC WELDING • LASER WELDING
- HYBRID WELDING • PLASMA WELDING
- ROBOT WELDING • COLUMN AND BOOM WELDING • ADDITIVE MANUFACTURING

We offer versatile products, systems and solutions for industrial visual process monitoring and R&D, as well as for scientific research, for integrators, OEM manufacturers, and end-users alike. In addition to our high-performance CAVILUX systems and Cavitar Welding Cameras, we also offer customized solutions.
See through the blinding welding arc

- High-quality visualization of welding processes in real-time
- Clear view with all details without disturbing process light
- Reveals the details of the welding process core at once (e.g. melt pool, keyhole, defects)

Better quality control through real-time view

- Detection of problems and defects early in the process
- Alignment of the welding torch to the gap, observe melt pool behavior, see the filler material, etc.
- Process documentation for quality assurance

Save time and resources - Less scrap and higher yield

- Early defect detection for immediate process corrections
- Savings in materials, time and work
- Improved manufacturing repeatability and traceability
- Savings in process set-up and problem-solving time
- Minimized downtime or lost production time

Designed, Engineered and Manufactured in Finland
**Improved ergonomics and safety**

- Better ergonomics for the operator - manage and view the welding process without being forced into uncomfortable, far-reaching or dangerous positions
- Remote process monitoring – avoid exposure to arc and toxic welding fumes
- Improved overall employee health and safety

**For welding education and training**

- Novel way of teaching, demonstrating and learning how high-quality welds are achieved
- Sharing welder’s view on a large screen (possible also over remote connections)
- Recording of welding sessions for further learning, practicing, feedback and examination purposes
- Experienced welders can benefit from the camera in perfecting their skills
- Can be used for welders’ qualification and certification purposes

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**FACE AND ROOT SIDE OF TIG WELDING**

(SAKKY FINLAND)

**NARROW GROOVE WELDING**

(SAKKY FINLAND)

**MIG/MAG WELDING (HT LASER)**

**WAAM (RAMLAB)**
## Features

<table>
<thead>
<tr>
<th>MODEL</th>
<th>C400</th>
<th>C300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>4th generation compact welding camera for demanding environments with integrated illumination and cooling channels</td>
<td>3rd generation compact welding camera for demanding environments with integrated illumination and cooling channels</td>
</tr>
<tr>
<td>Main applications</td>
<td>GMAW, TIG, Plasma, Robotic, Additive Manufacturing</td>
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### Camera unit

<table>
<thead>
<tr>
<th></th>
<th>C400</th>
<th>C300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max resolution (pixel)</td>
<td>1440 x 1080</td>
<td>1440 x 1080</td>
</tr>
<tr>
<td>Max frame rate (fps) (1)</td>
<td>70 (2)</td>
<td>70 (2)</td>
</tr>
<tr>
<td>Working distance (mm)</td>
<td>150...300</td>
<td>150...300</td>
</tr>
</tbody>
</table>

### Field of view (mm²)

<table>
<thead>
<tr>
<th>Working distance</th>
<th>C400</th>
<th>C300</th>
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</thead>
<tbody>
<tr>
<td>150 mm</td>
<td>28 x 21</td>
<td>28 x 21</td>
</tr>
<tr>
<td>200 mm</td>
<td>40 x 30</td>
<td>40 x 30</td>
</tr>
<tr>
<td>250 mm</td>
<td>51 x 38</td>
<td>51 x 38</td>
</tr>
<tr>
<td>300 mm</td>
<td>62 x 47</td>
<td>62 x 47</td>
</tr>
</tbody>
</table>

### Size (WxHxL, mm³)

<table>
<thead>
<tr>
<th></th>
<th>C400</th>
<th>C300</th>
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</thead>
<tbody>
<tr>
<td>Weight (g)</td>
<td>350</td>
<td>200</td>
</tr>
<tr>
<td>Laser wavelength (nm)</td>
<td>640</td>
<td>640</td>
</tr>
<tr>
<td>Laser class</td>
<td>3R</td>
<td>3R</td>
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</table>

### Camera interface

<table>
<thead>
<tr>
<th></th>
<th>C400</th>
<th>C300</th>
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</thead>
<tbody>
<tr>
<td>Gigabit Ethernet connector</td>
<td>M12, X-coded</td>
<td>M12, X-coded</td>
</tr>
</tbody>
</table>

### Power & IO connector

<table>
<thead>
<tr>
<th></th>
<th>C400</th>
<th>C300</th>
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<tbody>
<tr>
<td>M12</td>
<td></td>
<td>M8</td>
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</table>

### Cooling options

<table>
<thead>
<tr>
<th></th>
<th>Passive: heatsink, heat conduction</th>
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</thead>
<tbody>
<tr>
<td>Active: air, liquid</td>
<td>Active: air, liquid</td>
<td></td>
</tr>
</tbody>
</table>

1. At full resolution, dependent on computer performance
2. Up to 500 fps with reduced resolution (720 x 540 pixels) with high-speed version having USB3 interface
3. All values are approximate values, design working distance is 200 mm.

Custom solutions are possible.
Cavitari Welding Camera – Compact solution with big vision

- High-performance camera sensor with active illumination
- Designed for 24/7 use in harsh industrial environments, robust with spatter protection and optional air-knife
- Up to 500 fps (with reduced resolution)
- Plug-and-play for easy use and set-up
- Easy adjustment of working distance
- Various active and passive cooling options
- Easily integrated to tight, hard-to-reach places
- Camera platform for AI based process control
Application images

YAG LASER WELDING

LASER WELDING, INSIDE TUBE MONITORING OF THE ROOT SIDE

MIG WELDING, LONGITUDINAL

TIG WELDING, NARROW GROOVE, ORBITAL

TIG WELDING, STRUCTURED LIGHT, INCOMPLETE WELD

TIG WELDING, STRUCTURED LIGHT, COMPLETE WELD

Evolution of Cavitar Welding Camera
– Since 2012