DirectShear™ Sensors
Shear Stress Instrumentation

Sensing System Overview
• Micromachined floating element sensor that enables time-resolved, one-dimensional, direct shear stress measurements
• Compact, robust sensor package for flush mounting
• Optimized Capacitive Sensor Unit (CSU) for high dynamic range and bandwidth
• Suite of sensor performance ranges and form factors for different applications
• Originally developed for NASA

Applications
• Instrumentation-grade skin friction sensing
• Aerodynamic drag research
• Detection of flow separation
• Wind tunnel instrumentation

Benefits
• Direct measurement – no heat transfer calibration
• Non-intrusive – minimal flow disturbance
• High resolution, dynamic range and bandwidth
• Highly accurate, quantitative measurements

Complete sensor systems for non-intrusive, direct, simultaneous mean and fluctuating wall shear stress measurement
Micromachined sensor heads in stainless steel housings for flush-mounted installation
DirectShear™ Sensors

Sensor Heads
- Non-intrusive — backside contacts for minimal flow disturbance
- Standard stainless steel cylindrical housings available with or without shoulder and key for alignment and detachable cable
- Custom housing form factors, materials, and finishes available
- Integrated 1x4 arrays now available
- Suite of six sensor models available for different applications (see spec table)

Capacitive Sensor Unit (CSU)
- Enables mean and fluctuating capacitive sensor measurements
- Available as a rack-mountable 2U standalone unit or 3U CompactPCI® module
- Standalone unit provides low-noise AC and rechargeable Li-ion battery power sources and LED status indicators
- Multi-channel units also available

“CompactPCI®” is a registered trademark of the PCI Industrial Computer Manufacturers Group.

<table>
<thead>
<tr>
<th>Sensor Model</th>
<th>Shear Stress (Pa)</th>
<th>Bandwidth (kHz)</th>
<th>Element Size (mm) x (mm)</th>
<th>Sensitivity (mV/Pa)</th>
<th>Resolution (mPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS-D10</td>
<td>10</td>
<td>0.75</td>
<td>2 x 0.5</td>
<td>100</td>
<td>0.1</td>
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<tr>
<td>CS-D50</td>
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<td>1.5</td>
<td>2 x 0.4</td>
<td>40</td>
<td>0.1</td>
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<td>CS-D100</td>
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<td>2.5</td>
<td>2 x 0.4</td>
<td>10</td>
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<td>CS-A05</td>
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<td>5</td>
<td>1 x 0.2</td>
<td>1</td>
<td>1</td>
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<td>10</td>
<td>0.5 x 0.15</td>
<td>0.3</td>
<td>5</td>
</tr>
<tr>
<td>CS-A20</td>
<td>5000</td>
<td>20</td>
<td>0.5 x 0.15</td>
<td>0.08</td>
<td>10</td>
</tr>
</tbody>
</table>

With a deep knowledge of aerospace test and over two decades researching best-in-class sensor development techniques, IC² delivers scientific-grade precision sensors that push the envelope of aerospace measurement accuracy and performance.