

WELD PENETRATION SYSTEM AND IMAGE ANALYSIS SOFTWARE - TORONW™



Weld Penetration System and Image Analysis Software - ToronW™ is an advanced solution designed for welding inspectors, metallurgists, and materials scientists to analyze weld dimensions with precision. It operates through a streamlined single-window interface.

In projects involving numerous weld joints, the system helps document critical testing procedures using measurement profiles represented in various colors for clear visual differentiation.

APPLICATIONS

Weld Penetration System and Image Analysis Software ToronW™ supports both grayscale (8-bit) and full-color (24-bit) images. Users can open and view multiple images of any size simultaneously for detailed analysis or comparison. It is compatible with widely used image formats, including BMP, JPEG, TIFF, PNG, GIF, and PSD. Live images can also be viewed and captured directly within the same platform.

Since the system runs in a Windows environment, graphs and charts displayed on-screen can be easily exported to Microsoft Word, Excel, or other standard Windows-based applications for creating professional reports and presentations.

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THEORY & METHOD

Annotation

The annotation tools allow for fast and efficient documentation of images. Available tools include: line between two points, horizontal line, vertical line, freehand line, two parallel lines, perpendicular lines, square, circle, text, arrow, grid, crosshairs from the center, scale bar, and highlighter.

Users can customize text color and line thickness to suit their needs.

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Capture Camera

Users can choose from various display and capture sizes. Live image settings such as white balance, brightness, contrast, hue, and saturation can be adjusted in real time. Once the settings are finalized, the image can be captured and saved to a designated folder for further analysis.

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Calibration

Calibration must be carried out for all microscope objectives connected to the digital camera. It should only be performed after all hardware components are securely installed. If any part is readjusted or replaced, calibration must be repeated to ensure accuracy.

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Fillet Measurement

1. Full range of dimensional measurements
2. Programmable (automatic) measurement capability

3. Supports key weld quality parameters such as depth/penetration, percentage penetration, leg length, throat length, root penetration, and more
4. Allows users to define components and specify the parameters to be measured
5. Measures length, area, angle, diameter, radius, and circumference in addition to weld penetration
6. Enables setting of target values and tolerance ranges for each parameter
7. Includes automatic edge detection for improved accuracy

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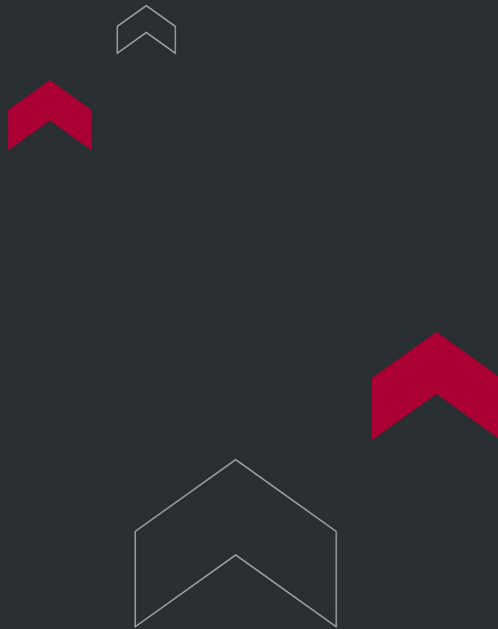
Weld Defects

Weld defects such as cracking and porosity significantly impact the performance of the weld bead. Samples produced using various manufacturing parameters during the LSM process were examined to assess the presence of these defects. The analysis reveals typical examples of solidification cracks and porosity within the weld bead. The results demonstrate a clear relationship between LSM parameters and the occurrence of porosity and cracking.

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Weld Penetration Report

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Torontech Inc.

251 Consumers Road, Suite 1200
Toronto, Ontario, M2J 4R3, Canada 

Phone: +1 416 368 2721 | Fax: +1 416 981 7652
Email: info@torontech.com

Torontech, LLC

601 Brickell Key Drive, Suite 700
Miami, FL 33131, USA 

Toll-Free: 1-866-383-7919
Email: sales@torontech.com

Torontech ME FZE

Meydan Grandstand, 6th Floor,
Meydan Road, Nad Al Sheba,
Dubai-261440, UAE 

Phone: +971 488 19252
Email: me@torontech.com

