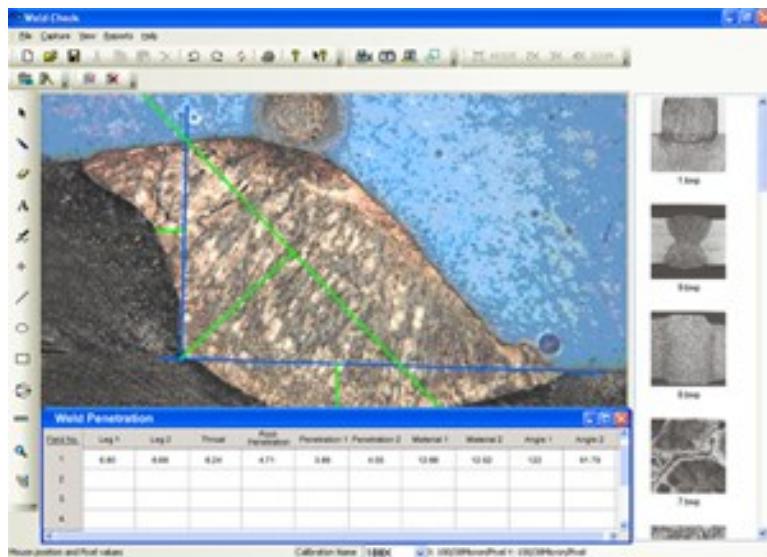




Weld Check

INSTRUCTION MANUAL

3601 E. 34th St. Tucson, AZ 85713 USA Tel. +1 520-882-6598 Fax +1 520-882-6599 email: pace@metallographic.com Web: http://www.metallographic.com



Equipment Type: Weld Check Analysis Software

Version **4.2**

System Requirements: Windows XP/Vista/Windows V7

Memory Requirements: 144 MB

Manual Revision Date: December 22, 2011

Serial Number

This instruction manual is provided with each piece of delivered equipment.

Please read this instruction manual carefully and follow all installation, operating and safety guidelines.



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Customer assumes and shall bear the risk of all loss or damage to the Products from every cause whatsoever, whether or not insured, and title to such Products shall pass to Customer upon PACE Technologies delivery of the Products to the common carrier of Pace Technologies choice, or the carrier specified in writing by Customer, for shipment to Customer. Any claims for breakage, loss, delay, or damage shall be made to the carrier by the Customer and Pace Technologies will render customer reasonable assistance in prosecuting such claims.



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4. ACCEPTANCE:

Customer shall inspect the Products promptly upon receipt of delivery. Unless customer objects in writing within thirty (30) business days thereafter, customer shall be deemed to have accepted the Products. All claims for damages, errors, or shortage in Products delivered shall be made by Customer in writing within such five (5) business day period. Failure to make any claim timely shall constitute acceptance of the Products.

5. PAYMENT:

Customer agrees to provide timely payment for the Products in accordance with the terms of payment set forth on the reverse side hereof or in any proposal submitted herewith. If any payment is not paid on or before its due date, Customer shall pay interest on such late payment from the due date until paid at the lesser of 12% per annum or the maximum rate allowed by law.

6. DEFAULT:

If Buyer is in default (including, but not limited to, the failure by Buyer to pay all amounts due and payable to Seller) under the work or purchase order or any other agreement between Buyer and Seller, Buyer's rights under the warranty shall be suspended during any period of such default and the original warranty period will not be extended beyond its original expiration date despite such suspension of warranty rights.

7. MISCELLANEOUS PROVISIONS:

This agreement has been made in and shall be governed by the laws of the State of Arizona. These terms and conditions and the description of the Products on the reverse side hereof or in any proposal submitted herewith constitute the entire agreement and understanding of the parties with respect to this sale and supersede all prior and contemporaneous agreements or understandings, inducements or representations, expressed or implied, written or oral, between the parties with respect hereto. Any term or provision of this Agreement may be amended, and any observance of any term of this Agreement may be waived, only by a writing signed by the party to be bounds. The waiver by a party of any breach shall not be deemed to constitute a waiver of any other breach. Should suit be brought on this Agreement, the prevailing party shall be entitled to recover its reasonable attorneys' fees and other costs of suit including costs and attorneys' fees incurred on appeal or in collection of any judgment.



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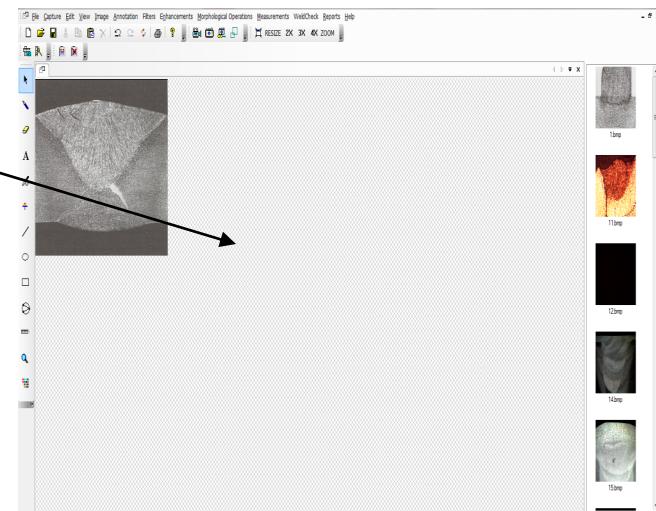
1.0 Product Description

1.1 General Description

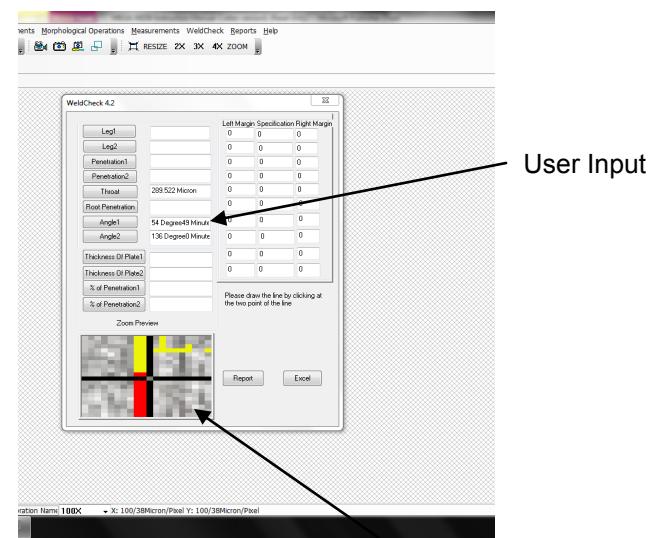
Main Interface

Weld Check is a new generation image analysis software, meant for welding inspectors, metallurgist and material scientist for analyzing weld dimensions. It is a single screen Windows based system.

The **Weld Check** software can handle both gray monochrome (8 bit) and color (24 bit) images. Multiple images of any size can be opened and displayed on the screen for analysis or comparison. The software supports the most common formats like BMP, JPEG, TIFF, PNG, GIF and PSD. Live images also can be observed and captured on the same platform. Since the system is in a Windows environment, graphs and charts displayed on the monitor can be quickly transferred into other Windows based programs such as, MS Word, MS Excel or any other commercial Windows based software for the purpose producing reports and presentations.

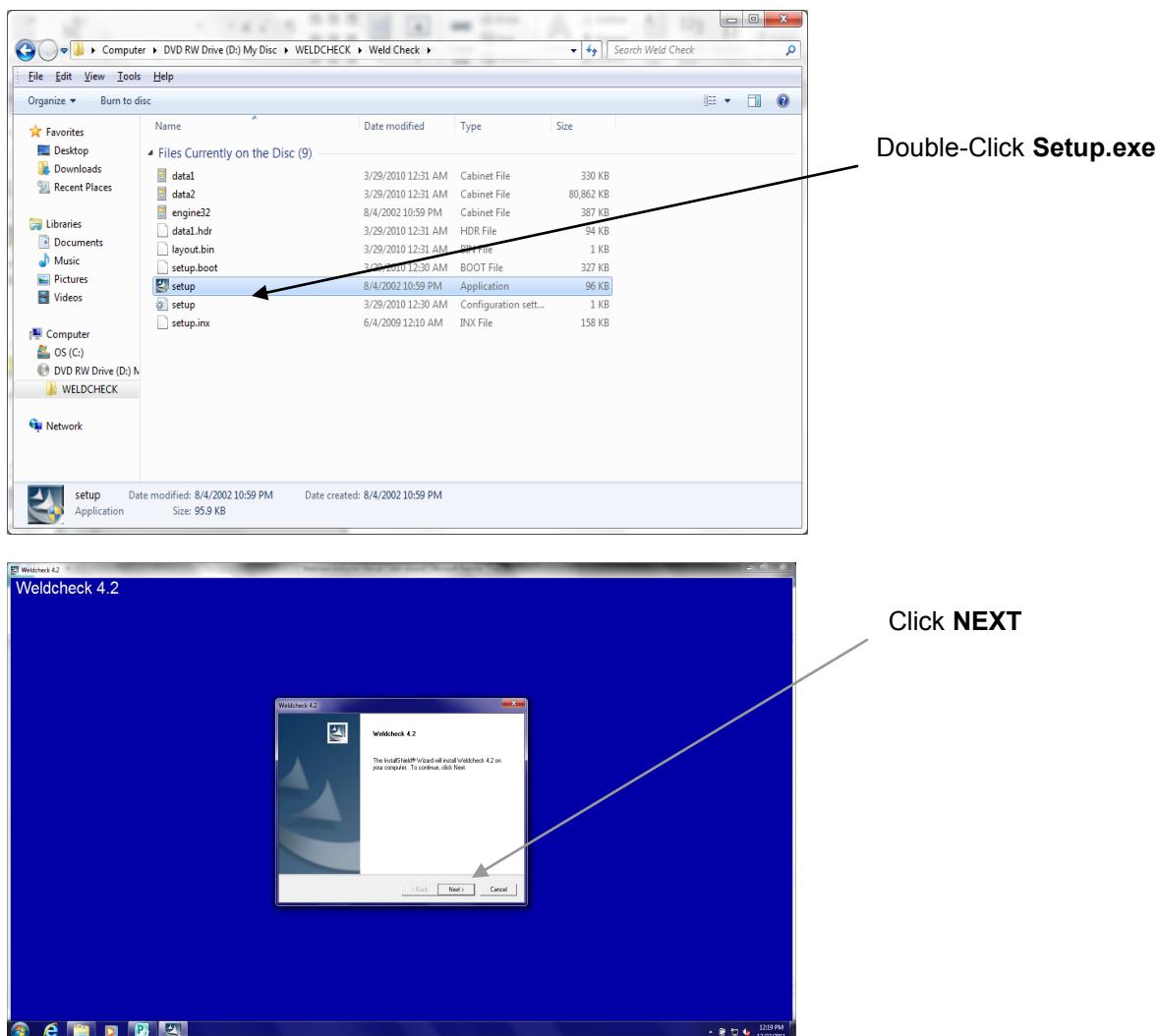


Weld Check Window

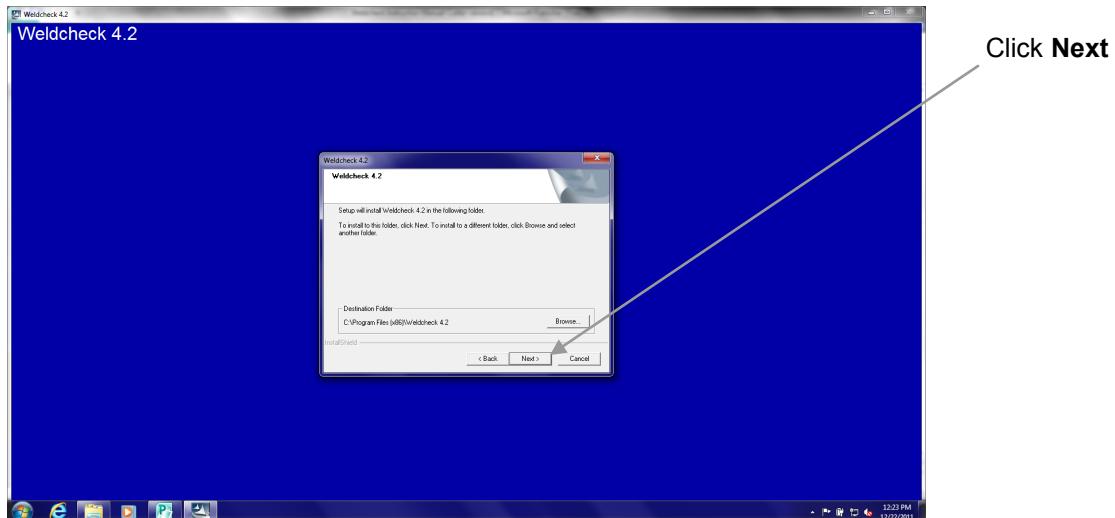


2.0 Installation of Software

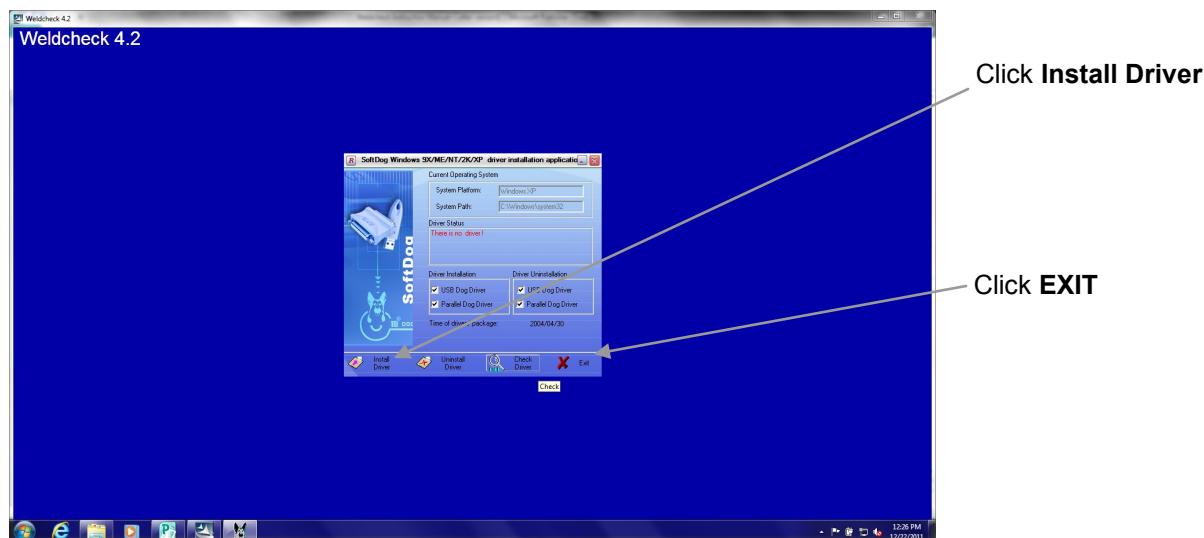
To Install the Software run the software CD. Open the **WELDCHECK** folder. Click on the **Setup.exe** file. The installation window will open. Follow the steps given in the new installation window and click the **NEXT** button.



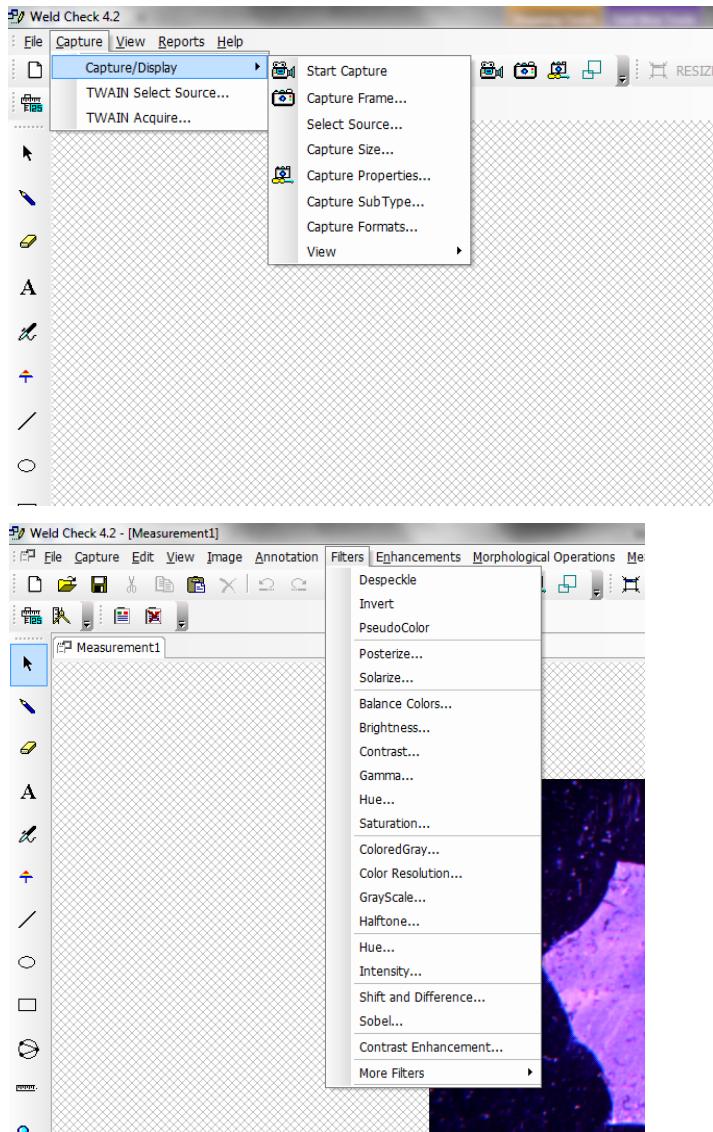
Choose the destination folder that the software will be installed in (C:// Program Files (86x)/WeldCheck 4.2) is the default. Click **NEXT**



The included SafeNet Driver will need to be inserted into a USB port in order to complete installation. Click on **Install Driver**. Make sure the driver was installed successfully then click **EXIT**



3.0 Features



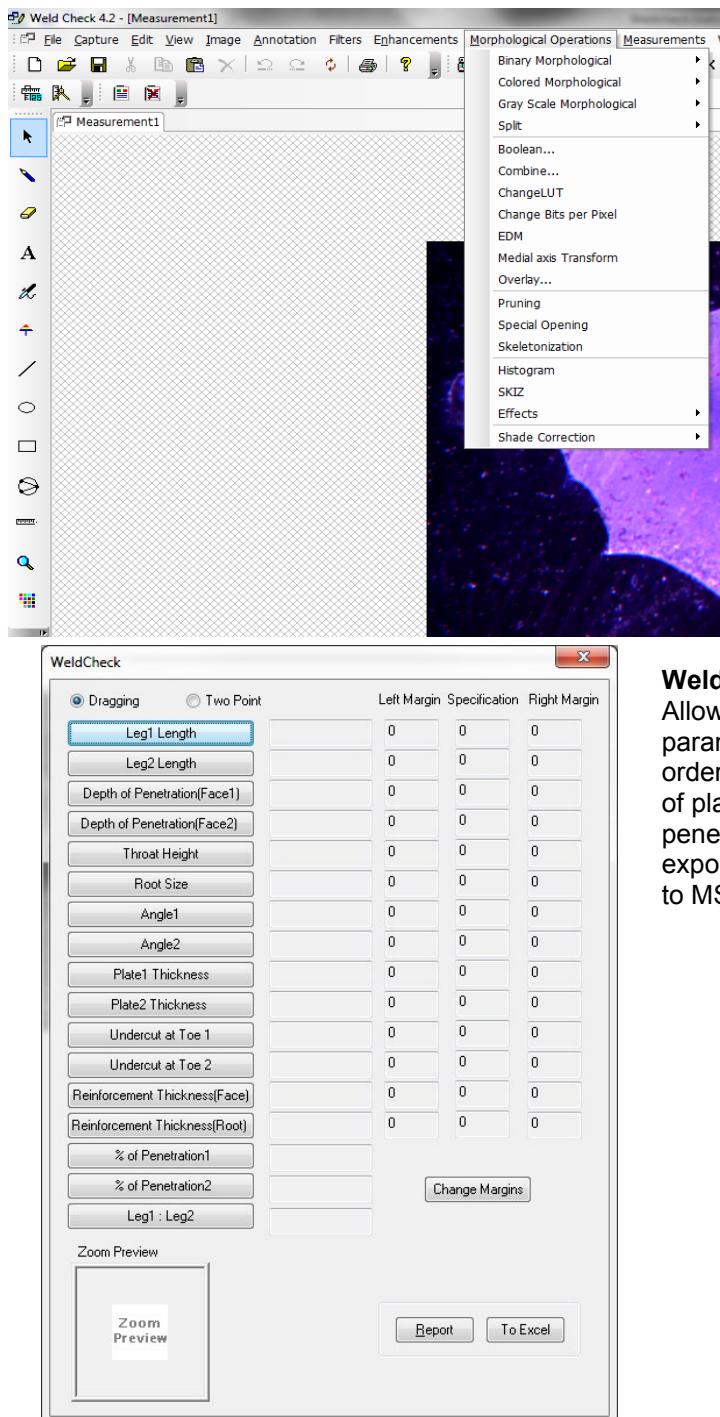
Capture:

Weld Check is equipped with a flexible platform which is able to adopt images from multiple capture cards, cameras and microscopes.

Filter:

Multiple filters can be applied to change the color and contrast of the image.

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Morphological Operations:

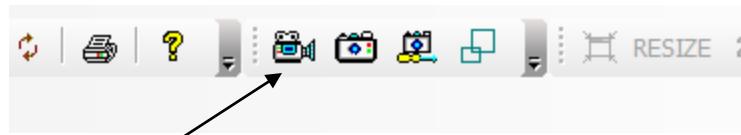
Image analysis and recognition options

WeldCheck 4.2:

Allows the User to input dimensional parameters on the parts of a weld in order to calculate certain thicknesses of plates and percentages of penetration. Weldcheck will also export these values in a report format to MS Excel.

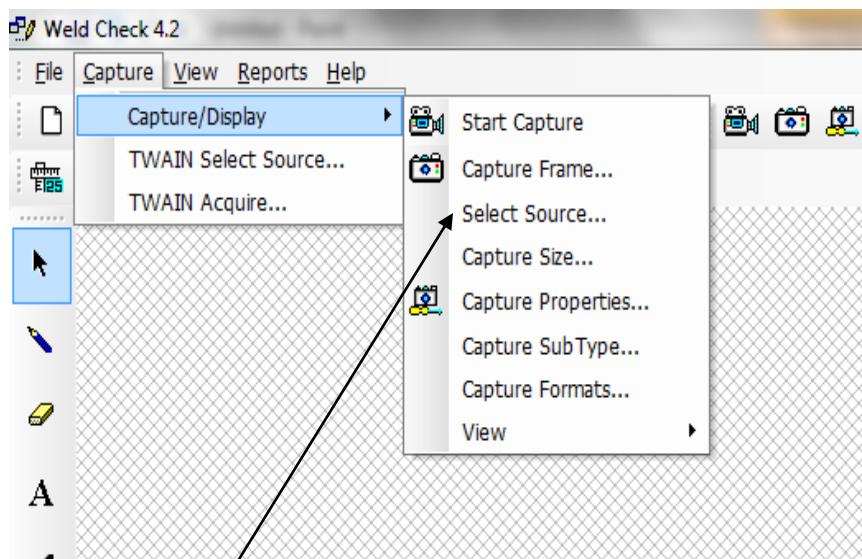
4.0 Camera selection

You must first click on the **Start Capture** button and open the live image.



1. Click the **Start Capture**

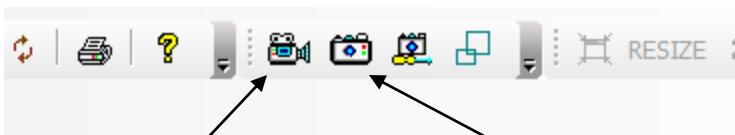
Select the **Capture** drop down menu. Then click **Select Source** and choose from the available sources.



2. Click **Select Source**

2.1 Capture Through Camera

Click **Start Capture**.
Focus the image and
Click the **Capture** button.



1. Click **Start Capture**

2. Click **Capture**

5.0 Calibration

1. Focus a stage micrometer under the first objective of your microscope in the X-Direction. Capture the image and give it a proper name, e.g. if an objective is 4X, save the image as 4X-X. Move the stage micrometer in the Y-Direction. Capture this image and save it as 4X-Y.
2. Repeat the procedure for the other objectives.
3. Open the image of the stage micrometer for the first objective.
4. Click on the  Calibration icon.
5. The dialogue box will appear. (fig. 3.1)
6. Provide a calibration name for the objective being used.
7. Select the measurement unit of the stage micrometer being used. Micro measurements are usually done in micron and Macro in mm.
8. Click on  Calibration along X-axis
9. Click and drag the pointer from the left side of the stage micrometer to a given measurement and in the Scale X window type in the distance of measurement given by the stage micrometer. (zoom feature can be used for pixel by pixel)
10. Next open the Y-Direction scale for the first objective.
11. Click on  Calibration along Y-axis
12. Repeat steps 9 and 10 for Y axis calibration.
13. Click save. This is now the calibration for your first objective lens.
14. Repeat steps 1-13 for all of your objectives.

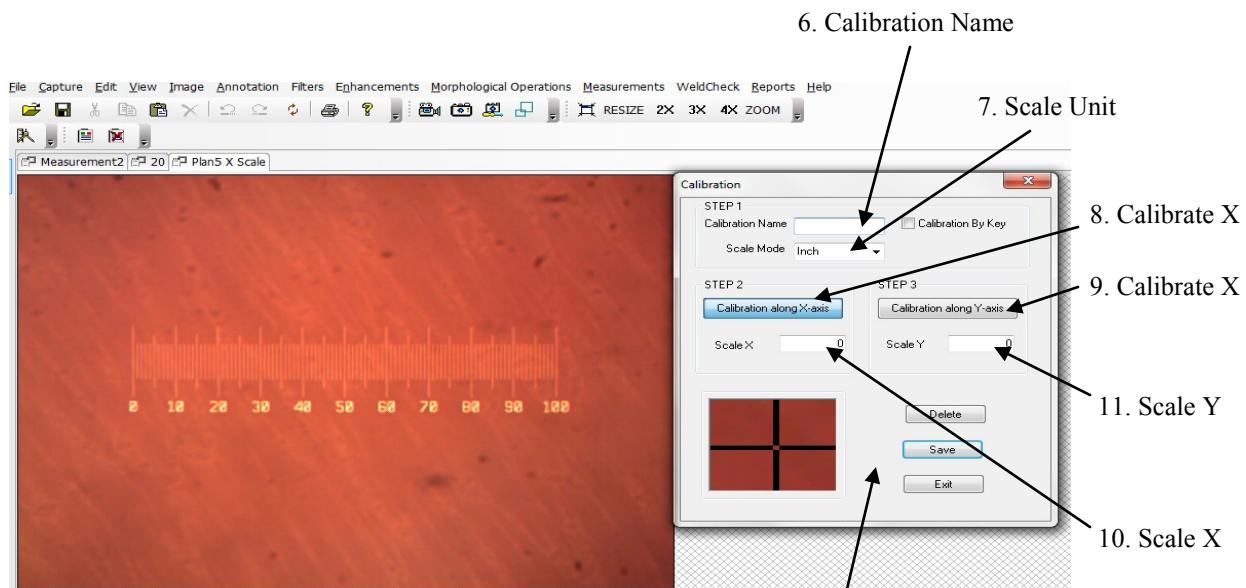


Fig. 3.1

6.0 Opening a Report

Report tool is an integrated module used for viewing reports of the analysis done and saved by the user in main software.

6.1 Open a New Report

To Open a new weld check report, generate a weld check analysis. Then click on the EXCEL button. This will generate a Weld penetration analysis file in a Microsoft Excel format. (see below)

The screenshot shows the Weld Check software interface. At the top right is a table titled "WeldCheck" with various welding parameters and their measured values. Below the table is a "Zoom Preview" window showing a grayscale micrograph of a weld with red lines indicating measurement points. To the right of the preview are "Report" and "To Excel" buttons. A large portion of the screen is occupied by a table of analysis results:

| | Measured | Specification | Passed or Failed |
|-------------------|-----------------|---------------|------------------|
| Leg1: | 103.806 Micron | 0 | Fail |
| Leg2: | 339.514 Micron | 0 | Fail |
| Penetration1: | | 0 | Pass |
| Penetration 2: | | 0 | Pass |
| Throat: | 1156.222 Micron | 0 | Fail |
| Material 1: | | 0 | Pass |
| Material 2: | | 0 | Pass |
| Root Penetration: | | 0 | Pass |
| Angle1 : | 64 Degree41 Mi | 0 | Fail |
| Angle2 : | | 0 | Pass |
| | | Percentage1 : | |
| | | Percentage2 : | |

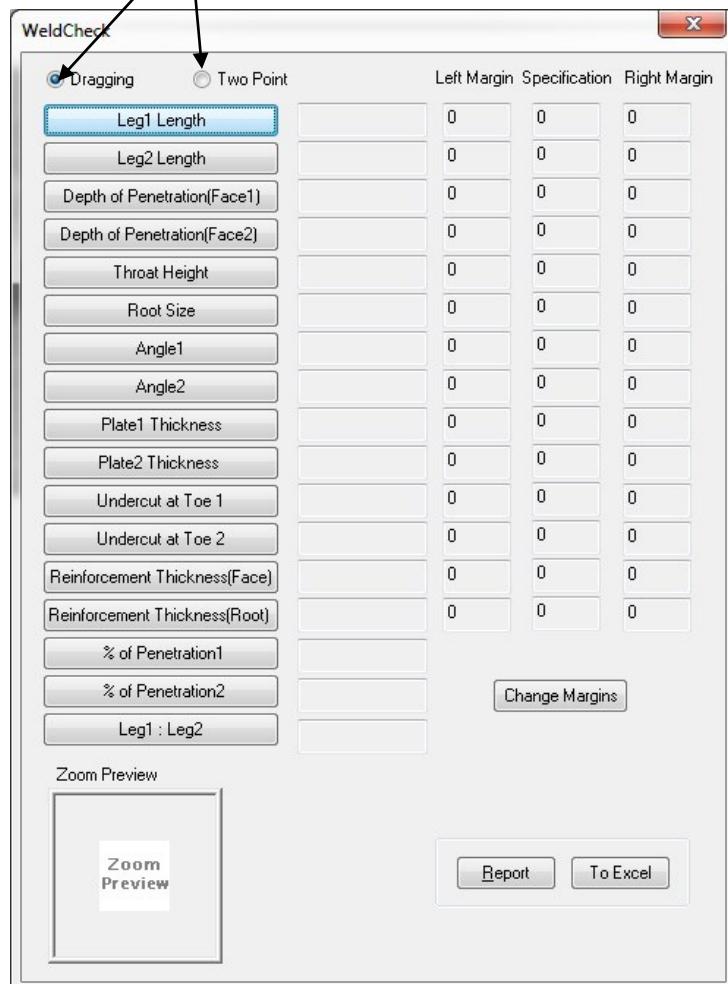
7.0 Weld Check

1. Load the image to be analyzed
2. Click on WeldCheck
3. Select OPEN and the following Weld Check window will appear

From this menu the user can input the weld dimensions by clicking on both ends of the weld parameter. (see pg. 14 for the parts of a weld)

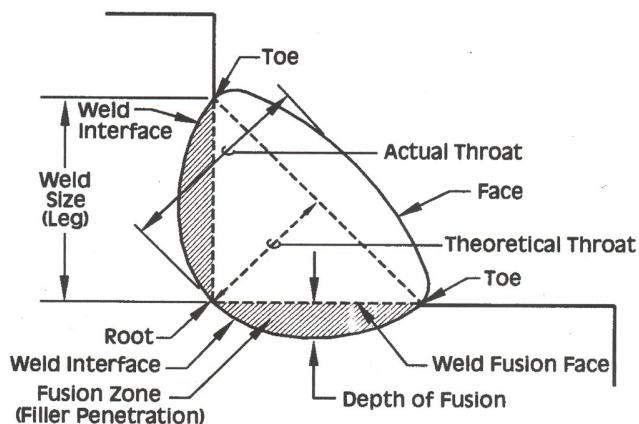
To obtain the value of percentage of penetration, click on the % of Penetration button after parameters have been inserted.

Drag or click start and click end to determine length



8.0 Parts of a Weld

Parts of a Fillet Weld



Parts of a Groove Weld

