Python Documentation

version

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Contents

INTERCEPT

BildoSoft

Bildosoft.com

General

Advices to start using the software:

Check that the method applied is suitable for its use.

Compare the results obtained with the software with values known by the customer.

This software calculates the ferritic or austenitic grain size of steels. It uses the intersection counting method. This method is presented in the ASTM-E112 or the JIS-G0551.

Users are encouraged to send comments to: support@2isystem.com.

Caution: The information in this manual is not contractual. It is subject to change without notice.

Principles

- The microscope magnifies the image.

- The camera digitizes this image.

- The software displays circles and lines on the digitized image. The circles and lines will be called curves. The curves are made by 2ISYSTEM or by the users. The lengths of these curves are known. You can use existing curves. Curves can be created.

- The program looks for intersections between grain boundaries and curves.

The user can add and remove points. He can also give values to the points if the standard requires it.

The grain size is calculated from the number of intersections and the total length of the curves.

Conditions for proper operation

For each image

- Know the magnification. Attention, it is not the value written on the objective. It is necessary to count the camera output optics of the microscope. To calculate this value exactly, you must use an object micrometer.

- Know the resolution.

Files

The software can read several types of files.

Dimensions

The calculations are made in number of intersections per millimeter.

The software must know the magnification and the real size of the image. There are several possibilities:

The image file comes from the **2isystem Pegase Pro** software: the software reads the resolution in the file.

The image file contains a resolution information : the software can use this information in some cases.

The image file does not contain any resolution information : it puts this value in the provided zone.

The magnification value is written by the user in the "Magnification" zone.

Procedure

The curves already exist

There is a Curve File. This file is in xml format. 2ISystem provides some.

For the first image of a list

- **File/open menu**: Load the image in the main window
- **Measurer bar**" panel:
- Write the value " **magnification** ".
- Press on " **validate** ".
- For this image and the following ones:
- Load a curve file with the "**Load**" command
- The list of curves is displayed in the zone " **Set of measures** ".
- Select a line. The corresponding curve turns red;
- If necessary, modify the red curve (see below)
- All curves have been checked:
- In the area "**Accumulated Results**" click on the Add button. The G-value is calculated and the information is displayed below.
- The Add button is used to accumulate the results over a series of images.

Modify or create a curve file

Select the " **Measurer bar** " window

The " **Set of measurers** " zone displays the lines and circles.

- **Load**: Loads an existing model.
- **Add**: Creates new segments or circles.
- **Delete**: Deletes the object selected with the mouse.
- **Save** : saves the current object set in an xml file.

Parameters of a Segment

- A name
- The coordinates of its extremities.

Parameters of a Circle

- A name,
- The coordinates of the center. The box " **auto center** " automatically positions the center in the middle of the image
- The radius of the circle.

Parameters

The " Measurer bar " window

Zone Magnification

This value must correspond to the magnification applied to the image. If you are working at 100 magnification with a microscope, you must put 100 in Magnification.

Accumulated Results Area (A-Z)

Displays and memorizes the value of G, N, P.

G, N, P, are values defined in the standards.

- For a curve

P is the number of intersections

N is the number of grains crossed.

L is the length of the squash

- For the " Accumulated result " area

Pm = P/L is the average P per unit length

Nm = N/L is the average of N per unit length

A counter displays the number N for each curve. Another counter displays the total N number. The images are made at magnification 100, so we can check this parameter object by object.

G is the grain size. The formula to calculate G is : **G = -3.2877 + 6.6439log10(Nm)**

Weighting and customization of intercepts

Select a graphic object by clicking on its name in the "Set of measurers" box. The object is then displayed in red.

- **To delete a point**:

Hold down the CTRL key.

Click on the selected point of the curve.

- **To add a point** :

Hold down the Shift key.

Click where you want to put a point.

Assign a value to a point.

Position the mouse on a point.

Right-click on it.

Select the value and validate.

The " Extractor bar " window

This view is used to set the automatic extraction. The software detects gray level transitions.

- **Filtering** : eliminates noise by low pass filtering.

- **Aperture**: sets the number of points of an object that is used to search for the transition. A high value tends to make the detector less sensitive to noise.

- **Sensitivity**: sets the decision threshold at which it is considered that a transition should be taken for an intercept point.
- The ” **default** ” button resets the previous parameters to their original values.

The ” Favorite bar ” window

The Intercept program can be automated. Like Word or Excel, you can use languages such as Visual Basic Application or Windows scripts (two examples provided) to automate its use. The use of these functions requires knowledge in programming.

This toolbar displays links to programs or files or directories located in the "Favorites" directory itself located in the installation directory of the intercept program.

Here is an example showing the display of the automated functions of the module in Visual basic 6.0.

Menus

"File" menu

- **Open** : opens the selected file
- **Save** : saves the current image in a standard file or a dat file, pegase format.
- Export Excel generates a file in excel format from the result of the calculations.
- Export xml generates a file in xml format from the result of the calculations.

"Edit" menu

Not applicable

"View" menu

The "**fit to window**" command corresponds to the toolbar button. It is the same as the "Tools" toolbar button. It is used to fit the image into the main window. This has no influence on the calculations.

"Help" menu

Gives the software version.

Display

The image loaded in the program is displayed in the main window

The main window consists of menus, panels and an image display area.

The menus can be moved around. :

Move the mouse over the dotted line. This line is located at the beginning of the toolbar.

Click and drag.

The panels

There are three panels:

- Extractor bar
- Measurer bar
- Favorite bar

Each panel has a blue bar at the top.

Removable panels

To the right of a bar there is a cross and a vertical pin

By clicking on the pin the panel becomes automatically removable. The pin becomes horizontal. To make the panel appear. Click on its name.

To fix the panel again: click on the pin when the panel is open.

Moving panels

Grab the blue bar of a panel with the mouse.

Move the mouse: the window is detached

Blue icons appear. The arrows of the icons indicate where the panels can be placed.

Move a panel to the arrow of an icon. Put the mouse pointer on the arrow and release the mouse button.

The panel is fixed there.

Indices and tables

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