Document Introduction and Revision Approval

Title of Document: LVC400 & LVC200 ISO 10360 Verification Procedures - End User Copy

Document Number (if Applicable)   MET-VP-LVC006

Brief Description of change: Format and Verification Certificate Steps

Approval Signatures:

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AMENDMENT RECORD SHEET

Date or previous Revision No.	Change requested by:	Date Released:
Ver. 001	Kalpesh Maniar	03/23/2021
Ver. 002	Kalpesh Maniar	07/12/2021

ISO 10360 Verification Procedure LVC400 & LVC200 with M3
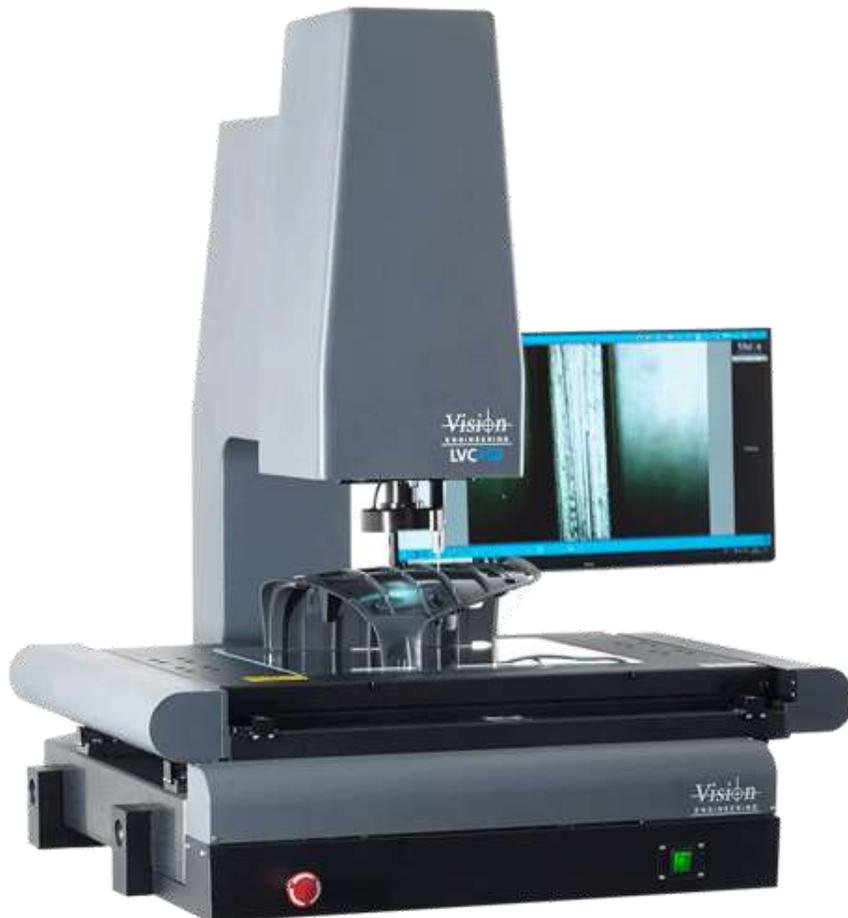
10360 Verification Procedure

This procedure requires the use of the Pyser Glass Scale and follows ISO-10360 Part 7 - 2011, Section 6.2.5.

1. Turn on M3 Software
   a. Auto home the machineAfter you haveAuto homed the machine, , the NLEC indicator will change from a red X to a green tick to indicate that the NLEC corrections are active.

2. Set the system units to "mm" and resolution to "0.0001"
   a. Go to M3>Settings>Display Formats>**Current inch/mm** "mm"
   b. Go to M3>Settings>Display Formats>**Display resolution for mm** "0.0001"> Press "Done" twice to return to M3 live Video

Figure 1

Set up the thermometer close to the machine. Make a note of the Temp and Humidity. The ideal temperature for this test is 20 °C / 68.0 °F and Humidity 50%..

3. In the M3 software, select the zoom magnification M3.

4. Using a soft lint-free cloth, clean the stage and glass calibration scale/rule.

5. Set the view to Fit the screen. In the M3 software, click on the zoom icon and then click on the Fit icon. See Figure 22 below.
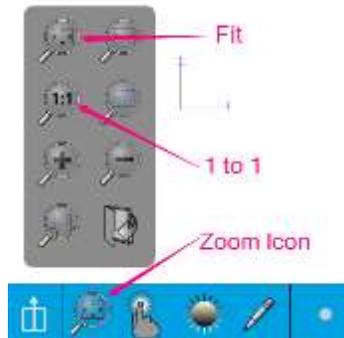

Figure 2

10360 Verification requires 5 different lengths measurements, 3 times each, in 4 different locations yielding 60 measurements. The 4 different measuring scale locations are parallel to the X axes, parallel to the Y axes, perpendicular to the X and Y axes from top left to bottom right, and perpendicular to the Y and X axes from bottom left to top right. See Table 1 LVC-400 and Table 2 LVC-200 below.

Scale Position	Length 1	Length 2	Length 3	Length 4	Length 5
Parallel to X	60 mm circle	120 mm circle	180 mm circle	240 mm circle	300 mm circle
Parallel to Y	50 mm circle	100 mm circle	150 mm circle	200 mm circle	250 mm circle
Perpendicular to X & Y	60 mm circle	120 mm circle	160 mm circle	240 mm circle	300 mm circle

Table 1 LVC-400

Scale Position	Length 1	Length 2	Length 3	Length 4	Length 5
Parallel to X	40 mm circle	80 mm circle	120 mm circle	160 mm circle	200 mm circle
Parallel to Y	30 mm circle	60 mm circle	90 mm circle	120 mm circle	150 mm circle
Perpendicular to X & Y	40 mm circle	80 mm circle	120 mm circle	160 mm circle	200 mm circle

Table 2 LVC-200

X – Measurements

6. Position the glass calibration scale so that it is parallel to the **X-axes** of the machine. The zero circle needs to be on the left-hand side of the stage. See Figure 33 below. Ensure you can drive the axes to reach both the zero circle and the Length 5 circle. Refer to Table one for the LVC400 and Table two for the LVC200. (Use hot glue/putty to avoid any shift)
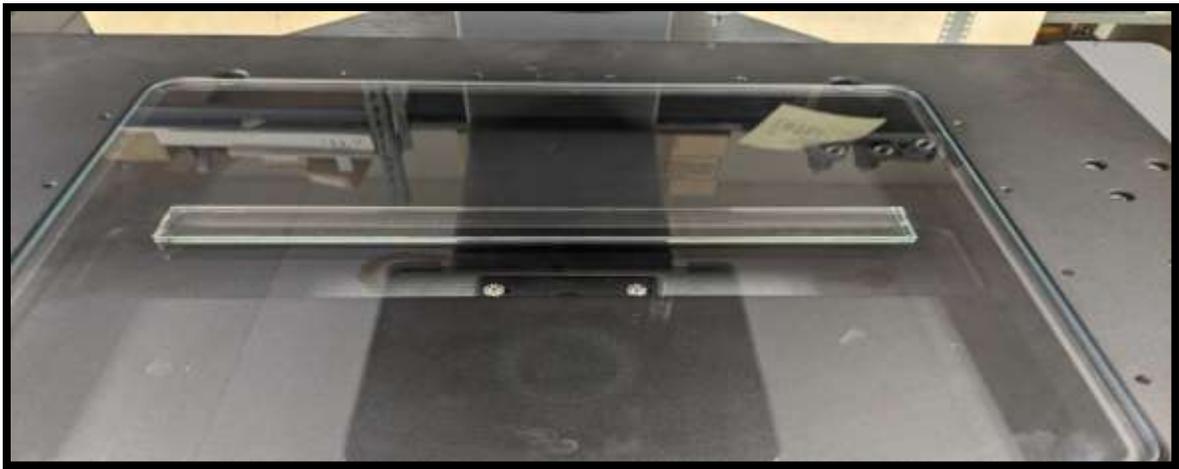

Figure 3

7. Length 1 - Measure the distance between the zero circle and the Length 1 circle on the glass scale and construct a distance between the two circles.

8. Repeat step 7 for Length 2, 3, 4, and 5.

9. Repeat steps 7 and 8 two more times to have three runs with a total of 15 distance measurements.

10. After finishing measuring all 5 lengths along X-axis. Save and Export the 15 distance measurements

    a. Click on the **Data** icon in the top icon bar.
    b. From the feature list on the right, select one of the ***Dist x*** measurements.
    c. Select **All** feature icon from bottom and select **Feature type** last one
    d. Click on the Output icon from the bottom icon bar, and select CSV.
    e. Enter Filename as "***X Verification.csv***"
    f. Click Done to export the file

Y – Measurements

11. Click on the M3 icon and then the new part icon. Click on "yes" to clear all features and skews.

12. Reposition the glass calibration scale so that it is parallel to the **Y-axes** of the machine. The zero circle needs to be on the back of the stage. See Figure 44 below. Ensure you can drive the axes to reach both the zero circle and the Length 5 circle. Refer to Table one for the LVC400 and Table two for the LVC200. (Use hot glue/putty to avoid any shift)

Figure 4

13. Measure the distance between the zero circle and the Length 1 circle on the glass scale and construct a distance between the two circles.

14. Repeat step 13 for Length 2, 3, 4, and 5.

15. Repeat steps 13 and 14 two more times to have three runs with 15 distance measurements.

16. After finishing measuring all 5 lengths along Y-axis. Save and Export the 15 distance measurements

   a. Click on the **Data** icon in the top icon bar.
   b. From the feature list on the right, select one of the ***Dist x*** measurements.
   c. Select **All** feature icon from bottom and select **Feature type** last one
   d. Click on the Output icon from the bottom icon bar, and select CSV.
   e. Enter Filename as "***Y Verification.csv"***
   f. Click Done to export the file.

XY – Measurements

17. Click on the M3 icon and then the new part icon. Click on "yes" to clear all features and skews.

18. Reposition the glass calibration scale so that it is **perpendicular to the machine's X and Y axes**. The zero circle needs to be in the top left corner of the stage. See figure 5 below. Ensure you can drive the axes to reach both the zero circle and the Length 5 circle. Refer to Table one for the LVC400 and Table two for the LVC200. (Use hot glue/putty to avoid any shift)

Figure 5

19. Measure the distance between the zero circle and the Length 1 circle on the glass scale and construct a distance between the two circles.

20. Repeat step 19 for Length 2, 3, 4, and 5.

21. Repeat steps 19 and 20 two more times to have three runs with 15 distance measurements.

22. After finishing measuring all 5 lengths perpendicular to the machine's X and Y axes. Save and Export the 15 distance measurements

    a. Click on the **Data** icon in the top icon bar.
    b. From the feature list on the right, select one of the **_Dist x_** measurements.
    c. Select **All** feature icon from bottom and select **Feature type** last one
    d. Click on the Output icon from the bottom icon bar, and select CSV.
    e. Enter Filename as "**_XY Verification.csv_**"
    f. Click Done to export the file.

YX – Measurements

23. Click on the M3 icon and then the new part icon. Click on "yes" to clear all features and skews.

24. Reposition the glass calibration scale so that it is **perpendicular to the machine's Y and X axes**. The zero circle needs to be in the bottom left corner of the stage. See figure 6 below. Ensure you can drive the axes to reach both the zero circle and the Length 5 circle. Refer to Table one for the LVC400 and Table two for the LVC200. (Use hot glue/putty to avoid any shift)

Figure 6

25. Measure the distance between the zero circle and the Length 1 circle on the glass scale and construct a distance between the two circles.

26. Repeat step 25 for Length 2, 3, 4, and 5.

27. Repeat steps 25 and 26 two more times to have three runs with 15 distance measurements.

28. After finishing measuring all 5 lengths perpendicular to the machine's X and Y axes. Save and Export the 15 distance measurements

    a. Click on the **Data** icon in the top icon bar.
    b. From the feature list on the right, select one of the **_Dist x_** measurements.
    c. Select **All** feature icon from bottom and select **Feature type** last one
    d. Click on the Output icon from the bottom icon bar, and select CSV.
    e. Enter Filename as "**_YX Verification.csv_**"
    f. Click Done to export the file.

29. Retrieve the exported measurements .CSV files from the following location
C:\Users\Public\Documents\MetLogix\Exports

LVC400 and LVC200 – "As Left Certificate"

ISO-10360 Verification Certificate

30. Open the ISO-10360 Verification Certificate file in Excel.

31. Make sure all the required fields are populated on the Verification form.

32. Enter the scale certified values and the saved test position measurement values for 'X" , "Y", "XY\" and "YX/" into the Actual Values
(If using **Copy and Paste** from CSV file, make sure you paste "**Values**" only)

33. If the Actual deviation values are within the allowable range, it is a **Pass** or else **Fail**.

End of Verification Procedure for LVC400 and LVC200