Operation Manual

for

Profilometer

ROLL CALIPERS

Customer:

Manufactured By:

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General

The Rolling Mills Division of RESEARCH & DEVELOPMENT CENTER FOR IRON AND STEEL (RDCIS) SAIL, Ranchi has developed the Profilometer. Keeping in view the requirement of flat product manufactures in the country. The instrument is particularly designed for measuring parallelity, ovality and crown of the Rolls to maintain accuracy and profile of the flat products being rolled in continuous mills. It will ensure the stringent roll profile of WORK ROLLS and BACKUP ROLLS. It also helps to generate valuable data on wear pattern of rolls during rolling of different grade of materials so that optimum contour can be provided for particular thickness, width and grade of the product.

The Profilometer/Roll Caliper is being marketed in the trade name PROFILOMETER model DIGIMAX-05.

Principle

1. The measurement indicates variation in diameter at fixed location around one reference point.
2. The reference point is mostly the roll center. Roll end may also be taken as reference point.
3. Measuring device can be a Mechanical Dial of Digimatic Indicator giving direct readings.
4. The end results can be plotted into curve with the help of measurements taken at different location and compared with target curve to find out profile tolerance.
5. Our design is based on measurement taken from the centerline of the Roll as reference.

Description

The Profilometer/Roll Calipers consists of the following main assemblies –
- Portable carriage with wheels.
- Arms with graduation.
- Measuring device.

The carriage is a lightweight assembly made from aluminum alloy and stainless steel components. The carriage is mounted on spherical anti-friction wheels to ensure free axial movement on the body of the roll. The two arms on either side of carriage accommodate the roll diameter. One of the arms has a bracket with adjustable reference screw while the other arm holds the measuring/sensing device.

The whole instrument is rigid in construction and light in weight. The graduation on arms indicates roll diameter, which can be set directly by adjustable brackets.

Method of Use

1. Place the roll on a vibration free surface.

2. Clean the roll surface with cotton cloth and kerosene oil to remove every trace of dust and grease.

3. Mark center of the roll and locations at fixed distance across the measurement length. Marking may be done at a gap of 100-200mm each.

4. Take out the carriage from the box and put it on the top of the roll. With the help of sprite level, align it approximately horizontal.

5. Fit the arms with scale to the carriage beam with socket head screw M8. Tight properly.

6. Fit digital dial indicator to the bracket and tight by its shank just sufficient to prevent it from rotating. Caution: Do not over tight.

7. Insert the bracket with digimatic indicator on any of the arms you feel convenient. Match the marking on the bracket with the roll diameter marked on the scale and tight the bracket properly. Fit the other bracket having reference screw on the other arm.

8. Bring the beam to one extreme end of the carriage and clamp the shaft with screw provided on the top of the beam at a point about 2-3 mm from the extreme end.

9. Switch 'ON' the digital indicator.

10. Slowly advance the reference screw so that plug below the digital indicator just touches the roll surface.

11. Once the plug and reference screw touches the roll surface rotate the reference screw by 1-1.5 round in the reverse direction and lock it with thumb screw. This will bring the indicator tip on contact with roll surface.

12. Press 'Zero' on the digital indicator. The LCD screen should show 0.000mm.

13. Instrument is ready now to take readings at different marked location.

14. With the forefinger slowly push the carriage from the '0' marking to reach to the first marked location in the direction in which the beam was earlier pushed. Note: Speed of the carriage should be less than 1cm/sec appox.

15. Bring the instrument at the middle of the roll and match the indicator tip with '0' marking done at the roll.

16. After reaching the first location wait till the digital indicator shows a constant reading. Note down the reading on the indicator.

17. Similarly move the carriage and take readings on other marked locations on the same side. Always take the set of reading in one direction only.

Method of Use

18. To take reading other side unlocks the beam and brings it to the other end of the carriage and lock similarly.

19. Set the indicator point again on the '0' marking on the roll.

20. Set the indicator to read 0.000mm by pressing the 'Zero' key.

21. Move to each marking on the roll body in a similar way and take readings.

22. To cross check repeat the process. Reading at any particular point may vary by $\pm$ 0.003mm.

23. Plot the reading at different location on the enclosed chart. Resultant graph will indicate the profile of the roll.

Precautions

1. Always place the instrument in the box after use.

2. Always keep the box in the horizontal position.

3. Do not keep any thing on top of the box.

4. After taking out the carriage never keep it on the ground. Place it directly on the roll body.

5. Surface of the checking roll must be cleaned properly before placing the instrument on top of it.

6. While fitting arms the carriage should be properly held to prevent falling of the instrument on the other side.

7. Do not advance the instrument by pushing the arm or beam. It must be pushed at the center of the hob.

8. Advancing speed should be appx. 1 cm/sec.

9. Please take special care while checking the roll at extreme end of the roll. Wheels should not advance beyond roll body.

10. Instrument must be protected from any vibration, jerk and shock.

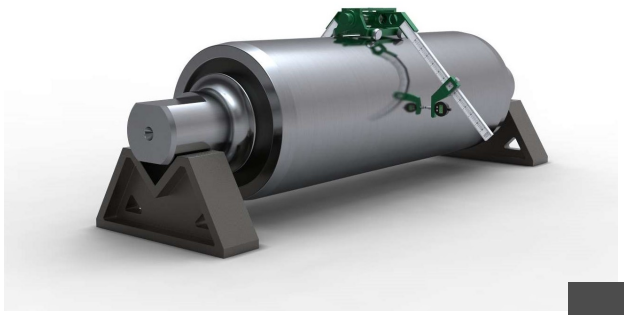
11. In general instrument should be handled gently and it should always be protected from any mechanical or electrical shock.

12. Please do not over-tighten any of the thumbscrews.

13. Whole instrument must be protected from dust, heat, extreme cold, moisture, water and other harmful gases.

14. Do not dismantle any part of the instrument other than arms and brackets.

15. Do not use high voltage equipment directly near the instrument.



Precautions for Digimatic Indicator

1. Do not subject instrument to blow of knocks.

2. Do not dissemble the indicator.

3. Do not press the keys with any sharp objects like ballpoint pen or screwdriver. Always use fingertip.

4. Do not use or store under direct sunlight or extremely hot or cool place.

5. Do not use high voltage equipment, such as electric marking pen, welding machine etc. near the indicator.

6. Do not subject the indicator spindle to a vertical load or torsion.

7. Protect from dust.

8. Use a soft cloth or a cotton swab that is dry or soaked in diluted neutral detergent to wipe stains from the instrument panel.

9. Only use silver oxide battery SR44.

10. Do not disturb the display unit angle.

11. Do not tighten the bracket too forcefully.

12. Replace it immediately in the cover and box as the checking of roll is over.

Checks

1. Both, the reference screw tip and digital indicator tip must touch the roll surface, and the beam should not touch the body while taking readings at different locations.

2. All the four bolts of arm and five thumb screws must be tightened properly before use.

3. Instrument must be moved slowly on the roll surface at speed of 1 cm/sec. And always in forward direction away from '0' mark on the roll body.

Maintenance

Instrument is maintained free. However, always wipe out the dust from the surface and keep the instrument clean. Replace the instrument in the box as soon as the job is over.

Lubrication

The wheel bearings are lubricated for the life. But the surface of the wheel should be lubricated time to time to prevent it from rust. Only add 2-3 drops of lubricant through the beam-locking thumb to every 2-3 months of 100 hrs. of use.

Contact Person for any Problem:

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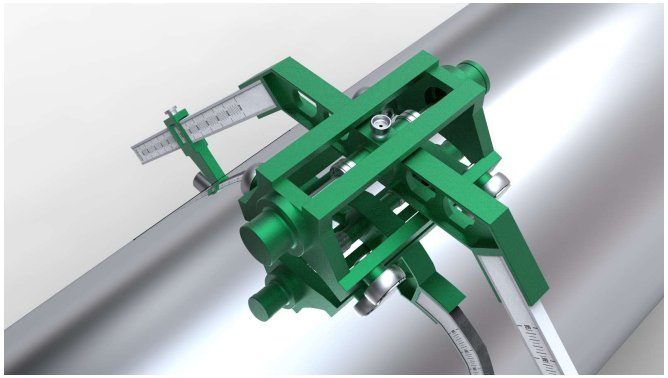

ASSEMBLY OF PROFILOMETER

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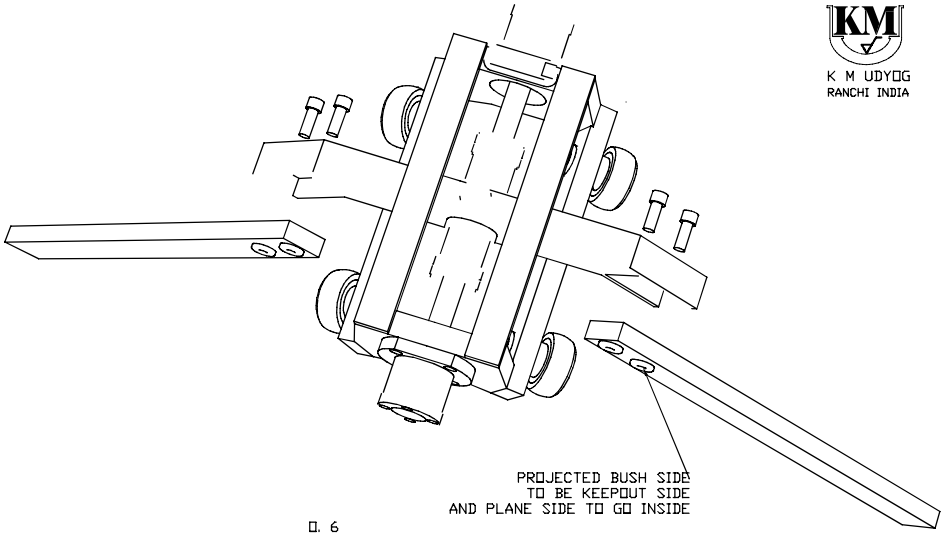

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