Wear amount measuring method using red lead paint to innovate sensory inspection for female taper socket of machine tools

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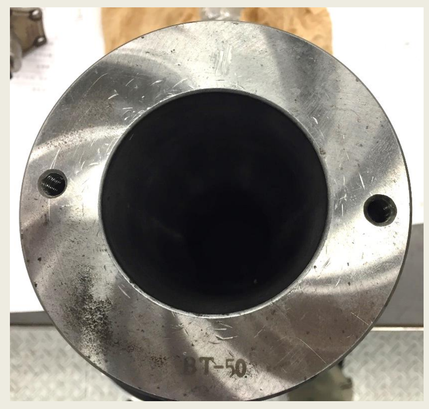
Background

In the future, IoT and full automation will be essential.

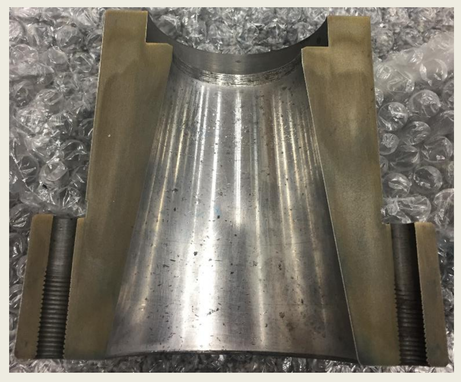
As regards the maintenance for female tapers of machine tools, sensory inspection has been standardized in both JIS and ISO standards. Therefore, highly skilled operators are required.

In order to promote automation and improve productivity by IoT, human workload needs to be reduced.

Taper shank and tool



Female taper socket



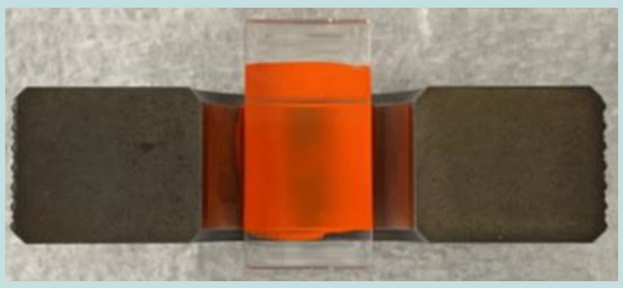
Cross-sectional view of female taper

Purpose

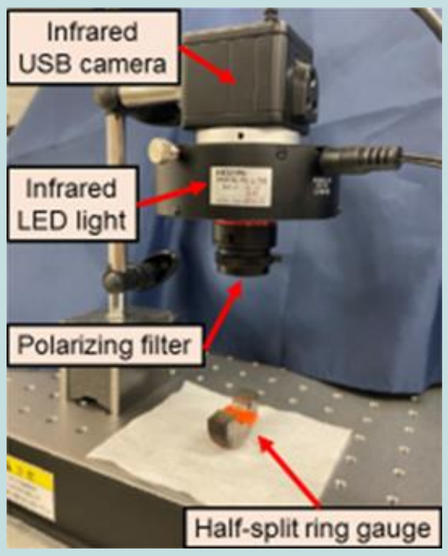
- Develop new measurement method that is less dependent on an operator's skill level.
- Achieve quantification, skillless and automation maintenance.

Method

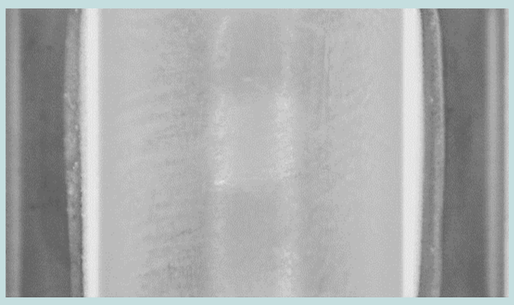
Ring gauge is used instead of the female taper .
The paint is applied onto the measurement surface.



Painted ring gauge.

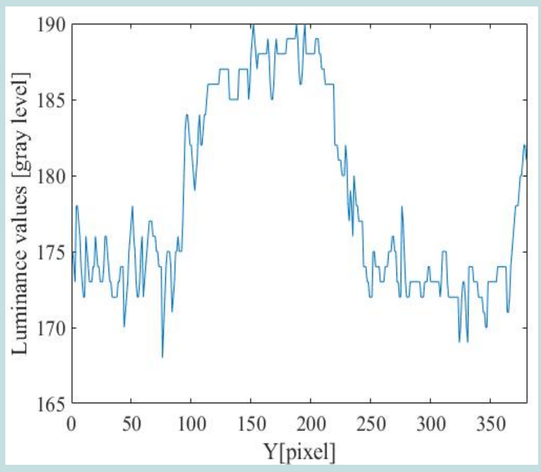


Photograph of imaging device.



photographed image with infrared camera.

The amount of wear is calculated.



Luminance values.

Decide the concentration of red lead paint necessary for accurately measuring the amount of wear.

Conclusion

The most suitable concentration of red lead paint for measuring the amount of wear is that when ratio of red lead powder to oil is 1:1.

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