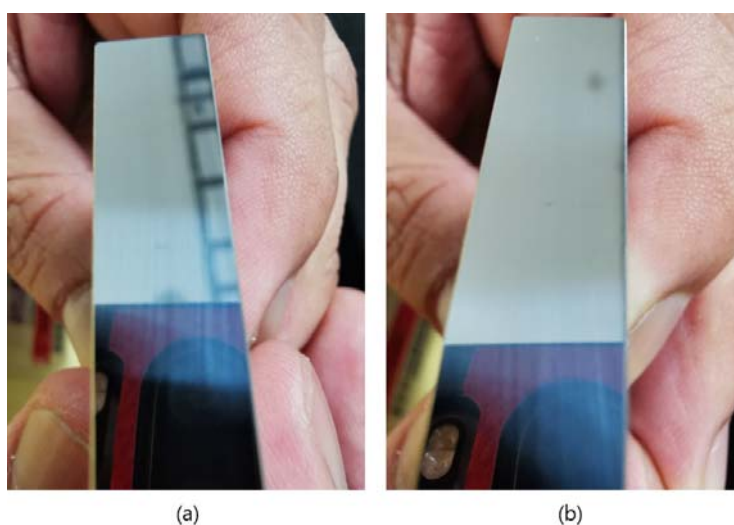


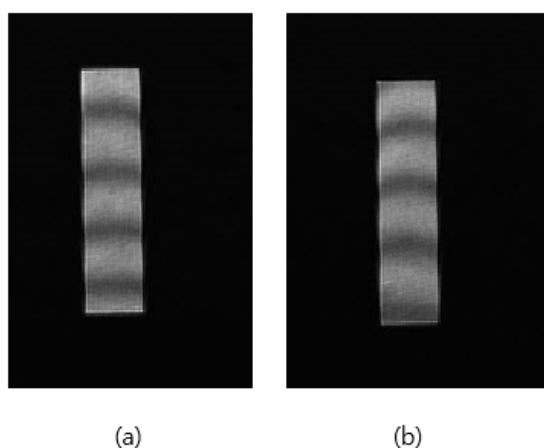
## Important Notice on the APMPL-K1.2018

(Chu-Shik Kang, April 15, 2020)

Please note that the long gauge block of nominal length 400 mm has an indentation at the central point of each measuring face, due to some unexpected accident during the comparison. The photos of the measuring faces are shown in Fig. 1, and the interference fringes obtained from a flatness interferometer are shown in Fig. 2.



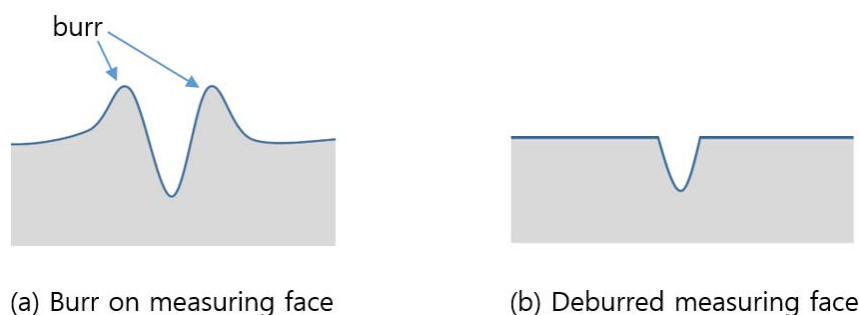
**Fig. 1 Photos of measuring faces of the 400 mm long gauge block. (a) left measuring face (b) right measuring face.** (Photos provided by NIMT)



**Fig. 2 Interference fringes of measuring faces of the 400 mm long gauge block obtained by a flatness interferometer: (a) left measuring face (b) right measuring face.** (Photos by NIMT)

When an indentation is made, it is likely that there would be a burr around the hole (see Fig. 3(a)) which might damage the surface of a platen (or base plate) during the wringing process.

So, the pilot asked NIM to remove the burrs by exceptionally allowing the deburring. Please note that all other NMIs are not allowed to perform a deburring as specified in the technical protocol.

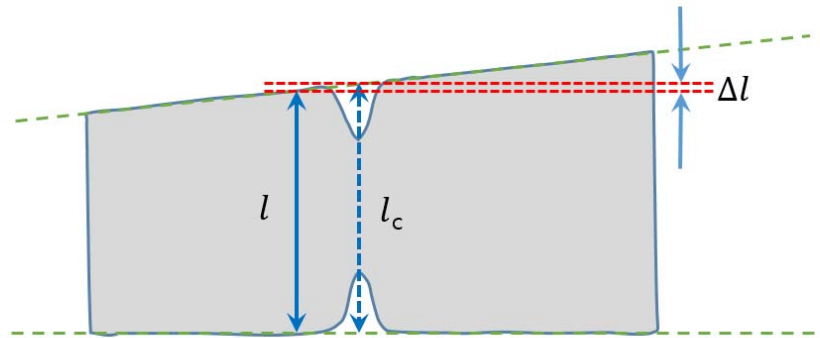


**Fig. 3 Schematic of the surface before and after the deburring process**

As the measuring face after the deburring is expected have a dip as shown in Fig. 3(b), measuring the central length of this long gauge block by using routine calibration method might result in negative measurement error, referencing to the measured value obtained before the accident.

Although it may be ideal to replace the damaged gauge block with a different one, as it is practically impossible to do so during the intercomparison, the pilot of the APMPL-K1.2018 decided through discussion with Dr. Andrew Lewis, the moderator of CCL Discussion Group 1 (gauge block), that the participant should decide one of the following three options for the measurement of the 400 mm long gauge block:

1. If the participant's instrument allows to measure length at 'non-central point' which is near the central point, the central length is to be measured 'indirectly' using extrapolation. That is, the length at the 'non-central point' is measured first, and then the extrapolated central length is found by applying a correction for the flatness/parallelism (see Fig. 4).
2. If the participant's instrument doesn't allow to measure at 'non-central point', then just measure using the normal way keeping in mind that the uncertainty might increase for this measurement.
3. If it is usual to reject the measurement when indentations are found at the central points of the measuring faces in the routine calibration of long gauge blocks, then the participant may decide not to measure this gauge block.



**Fig. 4 Indirect measurement of extrapolated central length ( $l_c = l + \Delta l$ ) where  $l$ ,  $l_c$  and  $\Delta l$  denote non-central length, extrapolated central length, and correction for flatness/parallelism, respectively.**

In either case, please fill in and submit the Table entitled "Detailed information on the measurement of 400 mm long gauge block" given in the Appendix when you submit the Measurement Report.

[End of document]

## Appendix

**Table: Detailed information for the measurement of 400 mm long gauge block**

<b>Measurement method used for the 400 mm gauge block</b>	<b>(Mark 'O')</b>
optical interferometry	
mechanical comparison	
interferometric comparison	
other method [please describe]:	
this long gauge block was rejected and not measured	
<b>Availability of non-central length measurement</b>	<b>(Mark 'O')</b>
instrument used allowed measuring non-central lengths	
instrument used only allows measuring central lengths	
<b>Measured position</b>	<b>(Mark 'O')</b>
central point (direct measurement)	
non-central point (indirect measurement)	
<b>In case of indirect measurement</b>	<b>(Enter value)</b>
distance of measuring point from central point:	
length at non-central point:	
correction value for flatness/parallelism:	
(indirectly measured) central length:	

Date: \_\_\_\_\_

NMI: \_\_\_\_\_

Name: \_\_\_\_\_

Signature: \_\_\_\_\_