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U. S. DEPARTMENT OF COMMERCE  
NATIONAL BUREAU OF STANDARDS  
WASHINGTON 25, D. C.

Letter  
Circular  
IC-1033

Use of the International Inch for Reporting Lengths of Gage Blocks

The Directors of the national standards laboratories of Australia, Canada, New Zealand, South Africa, the United Kingdom, and the United States have agreed that on and after July 1, 1959 these laboratories will use uniform definitions of the yard, the pound, and their multiples and submultiples in all non-metric calibrations for science and technology. These definitions of units are as follows:

1 international yard = 0.9144 meter

hence 1 international inch = 25.4 millimeters

1 international pound = 0.453 592 37 kilogram

Effective July 1, 1959, in conformity with the above agreement, the lengths of gage blocks submitted to the National Bureau of Standards for calibration will be reported in terms of the international inch of 25.4 millimeters. Unless otherwise requested, reports issued prior to that date give the lengths of the gage blocks in terms of the U. S. inch. The U. S. inch is based on the relation 39.37 inches equal 1 meter, exactly, from which 1 inch equals 25.4000508 millimeters, approximately.

Since the international inch is shorter than the U. S. inch, the length of any object such as a gage block expressed in international inches is greater than that expressed in U. S. inches. There are always a greater number of any small units in a fixed space or dimension than there are of a larger unit. The difference between lengths expressed in the U. S. and in international units amounts to 2 microinches (2 millionths of an inch) per inch of length.

Anyone having a report showing the lengths of gage blocks expressed in U. S. inches may convert to lengths in international inches by adding amounts shown below to the deviation from nominal length given in the original report.

Conversely, anyone desiring to convert the lengths of gage blocks expressed in international inches to lengths in U. S. inches may do so by subtracting the amount shown below from the values in the report.

Nominal Length of Gage Block	Change in Microinches
0.010 to 0.250 inch inclusive	none
0.300 to 0.750 inch inclusive	1
0.800 to 1.000 inch inclusive	2
2.000 inch	4
3.000 inch	6
4.000 inch	8
5.000 inch	10
6.000 inch	12
7.000 inch	14
8.000 inch	16
10.000 inch	20
12.000 inch	24
16.000 inch	32
20.000 inch	40

Example 1. A 3-inch gage block having a deviation from nominal length in U. S. inches of +2 microinches has a deviation from nominal length in international inches of  $+2 \div 25.4 = +8$  microinches. The length of this block is 3.000002 U. S. inches or 3.000008 international inches.

Example 2. An 0.5-inch gage block having a deviation from nominal length in U. S. inches of -4 microinches has a deviation from nominal length in international inches of  $-4 \div 25.4 = -16$  microinches. The length of this block is 0.499996 U. S. inch or 0.499997 international inch.

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