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Publication Date

1996

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PRESSURE AND WEIGHT

Jan. 1986

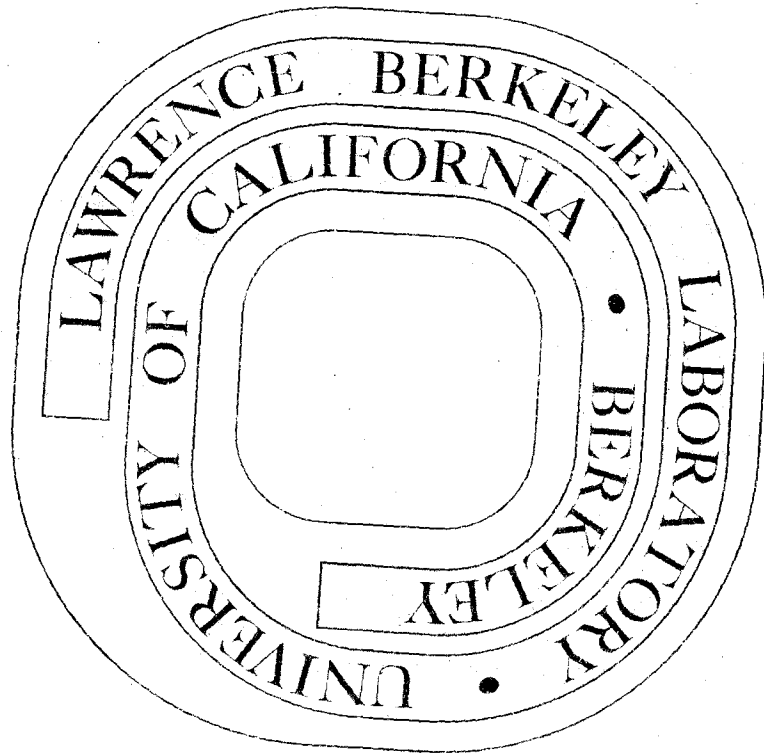
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ENGINEERING NOTE		AA0139	M6458	1 of 2
AUTHOR	DEPARTMENT	LOCATION	DATE	
J. Davey	Mechanical	Berkeley	January 10, 1986	
PROGRAM - PROJECT - JOB				
MECHANICAL ENGINEERING				
METRICATION				
TITLE				
A REVIEW OF METRIC UNITS FOR PRESSURE AND WEIGHT				
<p>Pressure and weight are two units widely used in everyday life, and also used extensively in the technical fields. The conversion of these units to metric has evolved over the years, and with the mix of terminology used, some confusion has occurred. The following recommendations (while not a standard) are intended to serve as a guide to accepted usage of the modern metric system.</p>				
<p><u>UNITS FOR PRESSURE</u></p> <p>The unit recommended for fluid pressure is kilopascal (kPa) for almost all fields of use, such as barometric pressure, gas pressure, tire pressure, water pressure, and hydraulic pressure. A notable exception is in air conditioning, where pressure differentials in air ducts are more conveniently measured in pascals (Pa). Another is the measurement of high vacuum in terms of absolute pressure, for which Pa, mPa, etc., are more convenient. Do not use bar (100 kPa) or millibar (100 Pa) because they are not SI units, and are accepted internationally <i>only for a limited time in special fields because of existing units</i>. They are also objectionable because their use introduces too many different units requiring frequent conversions to the preferred SI Unit kPa (10^3Pa), with consequent chance for decimal point errors.</p> <p>Absolute pressure is specified either by using the identification "absolute pressure" or by adding the word, "absolute", in parenthesis after the unit symbol. Do not add to the unit symbol either 'g' for gage or "a" for absolute.</p> <p>Examples: ----- at a gage pressure of 13 kPa, or 13 kPa (gage);</p> <p> ----- at an absolute pressure of 13 kPa, or 13 kPa (absolute).</p>				
<p><u>UNITS FOR WEIGHT</u></p> <p>The term, "weight", has been used to mean either mass or force of gravity, and the choice of SI units depends on how it is used. The use of the same name, "pound", for both the unit of mass and the unit of force leads to confusion; in SI this confusion is eliminated because the unit of mass is the kilogram and the unit of force is the newton. In many technical fields and in commercial and everyday use, the term, "weight", is usually used as a synonym for mass. Where the term is so used, weight is expressed in kilograms in SI. "Weigh" means "determine the mass of" or "have a mass of."</p> <p>Examples: My weight is 60 kilograms.</p> <p> The suitcase weighs 12 kilograms.</p>				
<p>*This work was supported by the U.S. Department of Energy, Office of Basic Energy Science, under Contract No. DE-AC03-76SF00098.</p>				

ENGINEERING NOTE

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In some fields of science and technology the term, "weight", is defined as the force of gravity acting on an object. Where weight is so defined, it is expressed in newtons in SI.

Example: On earth the weight of a 10-kilogram mass is about 98 newtons.

The capacity rating of a picture hook, a pneumatic tire, a vehicle, or a bridge, etc., is intended to define the mass that can be supported safely in earth's gravitational field. Hence, the rating should be expressed in kilograms or metric tons, as appropriate, rather than newtons.

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These guidelines are based on American Standard Metric Practice, ANSI/IEEE Std. -268-1982; Standard for Metric Practice ASTM 380-84; ISO 1000-1981 and ANMC Editorial Guide, Fourth Edition (Revised) 1985.

This report was done with support from the Department of Energy. Any conclusions or opinions expressed in this report represent solely those of the author(s) and not necessarily those of The Regents of the University of California, the Lawrence Berkeley Laboratory or the Department of Energy.

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