

RECOMMENDATION ADOPTED BY THE INTERNATIONAL COMMITTEE FOR WEIGHTS AND MEASURES

RECOMMENDATION 1 (CI-2001): The neper and the bel

The International Committee for Weights and Measures,

considering that

- the natural logarithm is used for expressing the values of logarithmic decrement, field level and power level in the system of quantities on which the International System (SI) is based,
- quantities and quantity equations become simplified when the natural logarithm (logarithm to the base e) is used, rather than logarithms to other bases,
- in particular, for complex quantities the only useful logarithm is the natural logarithm,
- with the use of the natural logarithm for complex quantities, the radian and neper become analogous units and should thus be given the same status in the SI,
- the 20th General Conference (1995, Resolution 8), decided to interpret the then supplementary units in the SI, namely the radian and steradian, as dimensionless derived units and consequently to eliminate the class of supplementary units as a separate class in the SI,
- the International Committee, through the SI brochure, 7th edition (1998), has accepted for use with the SI the neper, symbol Np , as a special name for the coherent SI unit number one, for expressing the values of logarithmic quantities defined using natural logarithms, and also the non-coherent unit, the bel, symbol B , as a unit for expressing the values of logarithmic quantities defined using logarithms to the base ten, and has emphasized the importance of stating the reference level,
- there is a need to complete the internal consistency of the SI by formally adopting the special name neper with symbol Np for the coherent SI unit “one”, for expressing the values of logarithmic quantities in areas such as signal decay, electrotechnology, and acoustics,

confirms the decision of the International Committee to accept for use with the SI the unit bel, symbol B, and its commonly used submultiple the decibel, symbol dB, when using logarithms to the base ten, and

recommends that the special name neper with symbol Np be adopted for the number one as the SI dimensionless derived unit for expressing the values of logarithmic quantities such as logarithmic decrement, field level, or power level defined using natural logarithms.