

**Proposal for C23
WG14 N2847**

Title: Revised suggested change from N2716
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Proposal category: Editorial
Reference: N2716, N2596

N2716 suggested three changes. By straw poll WG14 approved two of them and indicated a desire for something like the third one which it did not approve. The unapproved suggested change was:

Page 450, paragraph 4, in the Example, change:

The results are numerically equal, but have different quantum exponents, hence have different values.

to

The results are ~~numerically~~ equal, but have different quantum exponents, hence have different values.

For context, the immediately preceding text is:

[3] For expressions of decimal floating types, transformations must preserve quantum exponents, as well as numerical values (5.2.4.2.3).

[4] EXAMPLE $1. \times x \rightarrow x$ is valid for decimal floating-point expressions x , but $1.0 \times x \rightarrow x$ is not:

$$1. \times 12.34 = (+1, 1, 0) \times (+1, 1234, -2) = (+1, 1234, -2) = 12.34$$

$$1.0 \times 12.34 = (+1, 10, -1) \times (+1, 1234, -2) = (+1, 12340, -3) = 12.340$$

The suggested change in N2716 is problematic because of the ambiguity in the term “equal” in this context.

Also, the suggested change (and the current text in N2596) start with “The results” which would seem to refer to the two preceding lines. This is wrong because those lines pertain to two different transformations, the first valid, the second not valid. The intention was to refer to the factor 12.34 and the result 12.340, both in the second line.

The new suggested change below addresses both these problems.

Suggested change:

In F.9.2, change paragraph 4:

[4] EXAMPLE $1. \times x \rightarrow x$ is valid for decimal floating-point expressions x , but $1.0 \times x \rightarrow x$ is not:

$$\begin{aligned} 1. \times 12.34 &= (+1, 1, 0) \times (+1, 1234, -2) = (+1, 1234, -2) = 12.34 \\ 1.0 \times 12.34 &= (+1, 10, -1) \times (+1, 1234, -2) = (+1, 12340, -3) = 12.340 \end{aligned}$$

~~The results are numerically equal, but have different quantum exponents, hence have different values.~~

to:

[4] EXAMPLE $1. \times x \rightarrow x$ is valid for decimal floating-point expressions x , but $1.0 \times x \rightarrow x$ is not:

$$\begin{aligned} 1. \times 12.34 &= (+1, 1, 0) \times (+1, 1234, -2) \text{ yields } (+1, 1234, -2) = 12.34 \\ 1.0 \times 12.34 &= (+1, 10, -1) \times (+1, 1234, -2) \text{ yields } (+1, 12340, -3) = 12.340 \end{aligned}$$

In the second case, the factor 12.34 and the result 12.340 have different quantum exponents, demonstrating that $1.0 \times x$ and x are not equivalent expressions.