`units.sty` – `nicefrac.sty`

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Abstract

`units.sty` is a package for setting units in a typographically correct way. It is based upon `nicefrac.sty`, a package for nice fractions. See the files `README` and `COPYING` for additional information.

1 Loading

Only nice fractions: `\usepackage{nicefrac}`
Only units or both: `\usepackage{units}`

2 Options

Tight spacing for units (default):	`\usepackage[tight]{units}`
Loose spacing for units:	`\usepackage[loose]{units}`
"Nice" fractions (default):	`\usepackage[nice]{nicefrac}`
"Ugly" fractions:	`\usepackage[ugly]{nicefrac}`

The options `nice` and `ugly` can also be used for the `units` package, they will simply be passed to the `nicefrac` package, so you can combine the options, e. g.: `\usepackage[loose,ugly]{units}`

Tight spacing means `\,` for the space between the value and the dimension, loose spacing uses `~`, like $1\,\mathrm{m}$ and $1~\mathrm{m}$. Nice fractions look like ${}^{\mathrm{m}}\!/\!{}_{\mathrm{s}}$, ugly fractions look like m/s in text mode and $\frac{\mathrm{m}}{\mathrm{s}}$ in math mode.

3 Commands

Units:	`\unit[⟨val⟩]{⟨dim⟩}`
Fractions of units:	`\unitfrac[⟨val⟩]{⟨num⟩}{⟨denom⟩}`
Nice fractions:	`\nicefrac[⟨fontcmd⟩]{⟨num⟩}{⟨denom⟩}`

In these list, ⟨*val*⟩ and ⟨*dim*⟩ denote the value and the dimension of the unit, respectively. ⟨*num*⟩ and ⟨*denom*⟩ are the numerator and denominator of the fraction, and ⟨*fontcmd*⟩ can be an author command for fonts or a math alphabet, see `fntguide.dvi`.

Typically, ⟨*val*⟩ is only a number and ⟨*num*⟩ and ⟨*denom*⟩ are relatively simple LaTeX expressions. If you really feel the need for putting whole paragraphs or complex formula into such a fraction, you have misunderstood the purpose of this package. `(-;`

A common mistake is to forget the enclosing braces when using the optional argument of the commands inside another optional argument. This is no package bug, but a LaTeX feature. Correct example: `\section[{\unit[1]{m}}]{...}`.[1]

It is very important to be aware of the fact that all these commands distinguish between text mode and math mode. Within text mode, the font of the surrounding text will be used by default, for math mode `\mathrm` is the default.

This is quite sensible, because you would not want your collection of delicious recipes (typeset in a mega-cool ultra condensed bold italic calligraphical font) contain those spindle Computer Modern Roman just for half a litre of milk. `(-;`

Otherwise, when working on scientific papers, strict and consistent notation is really a virtue, and, like it or not, units are typeset with upright fonts. So take great care when deciding about math mode or not.

4 Examples

`\sffamily\bfseries\unit{m}`	**m**
`\sffamily\bfseries$\unit{m}$`	m
`\sffamily\itshape\unit[1]{m}`	*1 m*
`\sffamily\itshape$\unit[1]{m}$`	1 m
`\sffamily\bfseries\unitfrac{m}{s}`	**$^{\mathrm{m}}/_{\mathrm{s}}$**
`\sffamily\bfseries$\unitfrac{m}{s}$`	$^{\mathrm{m}}/_{\mathrm{s}}$

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[1] Credits go to Frank Knappe for suggesting this documentation update.

`\sffamily\itshape\unitfrac[1]{m}{s}`	*1 ${}^{m}\!/{}_{s}$*
`\sffamily\itshape$\unitfrac[1]{m}{s}$`	$1\,{}^{\mathrm{m}}\!/{}_{\mathrm{s}}$

As you can see, font changes are ignored in math mode . . .

`\scriptsize\sffamily\itshape\unitfrac[1]{m}{s}`	*1 ${}^{m}\!/{}_{s}$*
`\scriptsize\sffamily\itshape$\unitfrac[1]{m}{s}$`	$1\,{}^{\mathrm{m}}\!/{}_{\mathrm{s}}$

. . . except for the fontsize.

`\bfseries\itshape\nicefrac{1}{2}`	***${}^{1}\!/{}_{2}$***
`\bfseries\itshape$\nicefrac{1}{2}$`	${}^{1}\!/{}_{2}$
`\nicefrac[\texttt]{1}{2}`	${}^{\mathtt{1}}\!/{}_{\mathtt{2}}$
`\nicefrac[\texttt]{\textit{1}}{2}`	${}^{\mathit{1}}\!/{}_{\mathtt{2}}$
`$\nicefrac[\mathcal]{A}{B}$`	${}^{\mathcal{A}}\!/{}_{\mathcal{B}}$

The `\nicefrac` command can deal even with quite strange font changing commands.

5 Typography

Why should units be typeset in upright fonts, not in italics? Because they have to be distinguished from normal variables: "m" is meter, "m" is a variable, for example a mass.

Why should the space between the value and the dimension be non-breakable? Because the reader is disturbed by linebreaks like 1
m.

Why should the space between the value and the dimension be a half word space only? Because things belonging together are typeset tighter. Compare $1\,\mathrm{m}$ with 1 m and the normal word spacing, which can vary from line to line.

Why should nice fractions be typeset so that the numerator does not extend above the height of the letter "M" and the denominator does not extend below the baseline? Because otherwise a stretching of the baselineskip could be necessary due to descenders.

By the way, a very common mistake is to place units into brackets, like [N]. The correct notation is $[F] = \mathrm{N}$. The brackets indeed are a function with a variable as an argument. The value returned is the unit. If you need to specify units in table headings, then use a single row for the units, where you put them into *parentheses* instead.

6 Bugs

None, are you kidding?

7 Features

- Consistent and logical markup of units is enhanced instead of fiddling around with spacing and fonts.
- The same command works in text mode *and* math mode, font and size are adjusted automatically for nice integration within text mode while forcing strict notation in math mode.
- Basic requirements of typography are fulfilled: Forbidden line-breaks, correct spacing and the numerator automatically aligning with the height of an “M”.
- Easy configuration by use of package options.

8 Bugs again `(-;`

Ok, ok, you got me.

- Fonts without “M” do not work correctly. Do you know one?
- Fractions in `\scriptscriptstyle` look ugly because they exceed the height of an “M”. As far as I know this is a LaTeX problem, because there are no smaller math fonts available.
- The kerning between numerator and slash or denominator and slash is bad. In fact, there is none.
- The combination of the `ugly` option with text mode can lead to ambiguous fractions. Be happy that a warning is issued. Why do you use this option? Your boss? Ah, I see.

9 Implementation

9.1 Documentation Driver

```
⟨*driver⟩
\documentclass[12pt,a4paper]{ltxdoc}
```

```
\usepackage{units}
\begin{document}
  \DocInput{units.dtx}
\end{document}
⟨/driver⟩
```

References

[1] Goossens, M.; Mittelbach, F.; Samarin, A.: *Der LaTeX-Begleiter*. Addison-Wesley, Bonn, 1st edn., 1994.

[2] Kopka, H.: *Einführung*, vol. 1 of *LaTeX*. Addison-Wesley, Bonn, 1st edn., 1994.

[3] Kopka, H.: *Ergänzungen – mit einer Einführung in METAFONT*, vol. 2 of *LaTeX*. Addison-Wesley, Bonn, 1st edn., 1995.

[4] Kopka, H.: *Erweiterungen*, vol. 3 of *LaTeX*. Addison-Wesley-Longman, Bonn, 1997.

[5] Willberg, H. P.; Forssman, F.: *Lesetypographie.* Schmidt, Mainz, 1997.