

unitsdef – Typesetting units with L^AT_EX 2 _{ε} ^{*}

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Abstract

There are a lot of packages for typesetting units in L^AT_EX 2 _{ε} . Some define macros to typeset a lot of units but do not suit to the actual font settings, some make the characters needed available but do not predefined any unit.

This package tries to comply with both requirements. It predefines common units, defines an easy to use interface to define new units and changes the output concerning to the surrounding font settings.

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Changes

| | | |
|--------|---|----|
| v0.1 | | |
| | General: First public release | 1 |
| v0.11 | | |
| | General: Added electronvolt | 1 |
| v0.12 | | |
| | General: Fixed some bugs relating to <code>gensymb</code> | 1 |
| v0.13 | | |
| | General: Some bugfixes and some units added. | 1 |
| v0.13a | | |
| | General: More bugfixes. <code>\utimes</code> is now called <code>\unittimes</code> | 1 |
| v0.2 | | |
| | <code>\newnosepunit</code> : Added <code>\newnosepunit</code> and <code>\renewnosepunit</code> for units without any space be- tween value and unitsign . . . | 19 |
| | <code>\newunit</code> : <code>\newunit</code> now uses <code>\DeclareRobustCommand</code> in- | |
| | stead of <code>\newcommand</code> | 18 |
| | Added code for the use of <code>xspace</code> | 18 |
| | Now <code>unitsdef</code> uses <code>\unitvaluesep</code> instead of <code>\,</code> , thereby the in- terface is more flexible and allows the users to commit changes. | 19 |
| | <code>\renewunit</code> : Added code for the use of <code>xspace</code> . <code>\DeclareRobustCommand</code> is used instead of <code>\renewcommand</code> | 19 |
| | <code>\SI</code> : Added <code>\SI</code> to typeset units and values obeying the SI- rules. | 24 |
| | <code>\unitSIdef</code> : Added <code>\unitSIdef</code> to define units typeset by <code>\SI</code> . 24 | |
| | <code>\unitsignonly</code> : Now defined by <code>\DeclareRobustCommand</code> . . . | 18 |

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1 Packages loaded by `unitsdef`

`unitsdef` loads (and so needs) the following packages with the given options:

- [T1]fontenc
- textcomp
- amsmath
- units
- xspace (as long as `noxspace`, see section 3.2, isn't specified)

The first two packages are needed for different characters in the encodings set by these packages, `amsmath` provides the very useful `\text` macro and `units` is used for typesetting the units. `xpsace` is included to obtain the facility to write `5\mm` and `some text` instead of `5\mm\ and some text`.

2 General usage

To use `unitsdef` simply specify

```
\usepackage[<options>]{unitsdef}
```

in the preamble of your document.

3 Options

3.1 Options related to `gensymb`

`unitsdef` knows three options to avoid conflicts with the `gensymb`-package that also predefines macros for typesetting » μ «, » Ω « and » $^{\circ}\text{C}$ «. Some macros are defined both by `gensymb` and `unitsdef`. To solve this problem three different options exist:

OHM makes `unitsdef` use uppercase macros (`\Ohm`, `\Celsius`, `\Micro` and `\Degree`). The predefined units with prefixes still appear lowercase (`\kiloohm`).

ohm is the opposite to **OHM** and is the default setting.

redef-gensymb This option copies `\ohm`, `\celsius`, `\micro` and `\degree` from `gensymb` to `\gensymbohm`, `\gensymbcelsius`, `\gensymbmicro` and `\gensymbdegree`. `unitsdef` then redefines this four commands so that they have the same meaning as without `gensymb`. **Important:** To use this option `gensymb` has to be loaded *before* `unitsdef`!

3.2 More options

`unitsdef` knows some other options to change its behaviour:

LITER Makes `unitsdef` use the *uppercase* L as the sign produced by `\liter`.
This is default behaviour.

liter Makes `unitsdef` use the *lowercase* l as the sign produced by `\liter`.

noxspace Maybe some problems occur due to the `xspace` functionality of `unitsdef`. This option forces `unitsdef` to do without `xspace`.

noconfig Tells `unitsdef` not to look for a local `unitsdef` configuration file `unitsdef.cfg` (see section 6 for details).

noabbrv Is an abbreviation for *no abbreviations*. `unitsdef` does not define any short commands for a unit. This might be helpfull if another package defines a command with the same name and L^AT_EX exits with an error.

ugly Applies the option `ugly` to `units`, thus all units containing fraction will be typeset like `m/s` in text mode and `$\frac{m}{s}$` in mathmode.

skipping only particular abbreviations Usually only one macro causes conflict between a definition made by `unitsdef` and another package. There are some options to avoid loading only particular abbreviations to avoid the definition that causes the conflict:

noamperageabbr Avoids defining the abbreviations for units of amperage (`\pA`, `\nA`, `\micA`, `\mA`, `\kA`).

nofrequencyabbr Avoids defining `\kHz`, `\MHz` and `\GHz`.

nomolabbr Avoids defining `\fmol`, `\pmol`, `\nmol`, `\micmol` and `\mmol`.

novoltageabbr Avoids defining `\kV` and `\mv`.

novolumeabbr Avoids defining `\fL`, `\pL`, `\nL`, `\micL`, `\mL`, `\cL` and `\dL`.

noweighthabbr Avoids defining `\kg`, `\fg`, `\pg`, `\nanog`, `\micg` and `\mg`.

noenergyabbr Avoids defining `\kJ`, `\eV`, `\meV`, `\keV`, `\MeV`, `\GeV` and `\TeV`.

nolengthabbr Avoids defining `\picom`, `\nm`, `\micm`, `\mm`, `\cm`, `\dm` and `\km`.

notimeabbr Avoids defining `\sek`, `\fs`, `\ps`, `\ns`, `\mics` and `\ms`.

4 Typesetting units

`unitsdef` includes a large set of predefined units. They are listed in section 7. These units, as well as units defined by you with `\newunit` (see below), can be used as follows:

```
\langle unitmacro \rangle [\langle value \rangle]
```

As you see, the value is an optional argument. Thus you can write `5\kg` (instead of `\kg[5]`), this may simplify the writing process. The distance in both cases is `\unitvaluesep`.

If the optional argument is not used you still can write `5\kg and some text` due to the `xspace` functionality of `unitsdef`.

`\unitvaluesep` If you want another distance between value and unit you simply have to redefine `\unitvaluesep`:

```
\renewcommand{\unitvaluesep}{\hspace*{\langle distance \rangle}}
```

`\unitsignonly` If you want to typeset the sign of a unit without any value (for introducing a new unit-sign f.e.) `\unitvaluesep` must not be set. This is provided by the macro `\unitsignonly{\<unitmacro>}`.

Important! If you want to specify a unit with a prefix, never use something like `\milli\hour`. This will lead to problems. Always define the units first using `\newunit` or use the command `\ilu` to typeset an unit without defining it first!

4.1 Inline units

`\ilu` Some packages for typesetting units provide the possibility to write things like `\micro\meter` to obtain μm . With `unitsdef` this will cause some problems due to the toggling of some internal switches. If you want to use prefixes without defining a new unit you have to use the command `\ilu`. It has one optional and one mandatory argument. The first contains the value to be typeset, the

latter contains the unit:

```
A force of  
\ilu[17]{\micro\newton}  
is applied.  
$F=17\ilu{\micro\newton}$  
\textsf{17\ilu{\micro\newton}}
```

A force of $17 \mu\text{N}$ is applied. $F =$
 $17 \mu\text{N}$ $17 \mu\text{N}$

4.2 Typesetting angles and arcs

If you type $5\degree 10'\ 12''$ you will get the following result:
» $5^\circ 10' 12''$ «. There are full spaces between the single values and the preceding unit-symbol. This is due to the `xspace` functionality of `unitsdef`. The correct output you will obtain by using the macro `\arc`¹. Using it in this way `\arc{5;10;12}` will lead to » $5^\circ 10' 12''$ «. There are some more features of this macro, best understood if you look at this example:

```
\begin{enumerate}  
  \item \arc{1}    % 1  
  \item \arc{1;2}  % 2  
  \item \arc{1;2;3} % 3  
  \item \arc{;2;3} % 4  
  \item \arc{;;3}   % 5  
  \item \arc{1;;2}  % 6  
  \item \arc{1;;}   % 7  
  \item \arc{;;;}   % 8  
\end{enumerate}
```

1. 1°
2. $1^\circ 2'$
3. $1^\circ 2' 3''$
4. $0^\circ 2' 3''$
5. $0^\circ 0' 3''$
6. $1^\circ 0' 2''$
7. 1°
- 8.

4.3 Logical markup for units

One advantage of `unitsdef` is that it typesets the units suiting to the surrounding font settings. But some people (magazines, universities, ...) want units always to be typeset in a special way. There is a checklist available at <http://physics.nist.gov/cuu/Units/checklist.html>. `unitsdef` does not fit to all these requirements by default. But there are some macros for figuring out the output. First, there is the command `\SI` which typesets (by default) all units in upright shape, but doesn't change anything else according to the font settings. The command `\SI` has two mandatory arguments, the

¹It is expected to have (nearly?) the same usage and results as `\ang` from the `S!style` package.

first has to contain the value, the latter contains the unit:

```
\textbf{\textit{A force of  
SI{17}{\newton}  
was applied.}}
```

A force of 17 N was applied.

If you want to customize the output of `\SI`, you can redefine the macro `\unitSIdef`. By default it contains `\upright`, but if you want units to be typeset upright in serif family, you can achieve this by redefining it to `\upshape\rmfamily`:

```
\renewcommand{\unitSIdef}{  
  \upshape\rmfamily  
  \textsf{\textbf{\textit{  
    A force of  
    SI{17}{\newton}  
    was applied.}}}}
```

A force of 17 N was applied.

5 The interface

5.1 Defining new units

`\newunit` Besides the predefined unit-macros (see section 7) `unitsdef` offers the possibility to define new units. This is done with the macro `\newunit`:

```
\newunit{\<unitmacro>}{\<unitsign>}
```

To typeset a unit *Newton* (represented by `N`) you have to define² it as follows:

```
\newunit{\newton}{N}
```

After this you can use the macro `\newton`:

```
5\newton plus \newton[3] is 8\newton.
```

This will give the following output:

5 N plus 3 N is 8 N.

To define a unit *millinewton* (`mN`) simply define:

```
\newunit{\millinewton}{\milli\newton}
```

| | |
|-------------------------------|--|
| <code>\renewunit</code> | For redefining units, the macro <code>\renewunit</code> can be used with the same syntax as <code>\newunit</code> (on the lines of <code>\newcommand</code> and <code>\renewcommand</code>). |
| <code>\newnosepunit</code> | As an additional facility to define new units the macro <code>\newnosepunit</code> exists with the same syntax as <code>\newunit</code> . It allows you to define a unit without any space between the value and the unit-symbol. The only unit I know typeset without leading space is <i>degree</i> . You typeset 5° instead of 5° . But maybe there are other units that must not have leading space, so I included this command in the user interface. |
| <code>\renewnosepunit</code> | If you want to redefine a unit to be typeset without leading space, use <code>\renewnosepunit</code> . |
| <code>\per</code> | To typeset units containing a fraction the macro <code>\per</code> is defined. The usage is: |
| | <code>\per{\langle numerator \rangle}{\langle denominator \rangle}</code> |
| | To define <i>newton per squaremeter</i> you have to say: |
| | <code>\newunit{\newtonpersmeter}{\per{\newton}{\squaremeter}}</code> |
| <code>\unittimes</code> | To typeset a multiplication sign between two units the macro <code>\unittimes</code> is used: |
| | <code>\newunit{\newtonmeter}{\newton\unittimes\meter}</code> <code>\newunit{\newtonmeterpersec}{\per{\newton\unittimes\meter}{\second}}</code> |
| <code>\unitsep</code> | To typeset additional space (instead of <code>\unittimes</code>) between two units you can use <code>\unitsep</code> (do NOT use <code>\,</code>): |
| | <code>\newunit{\newtonmeter}{\newton\unitsep\meter}</code> |
| | The default is <code>\,</code> , but if you want different amount of space you can simply <code>\renewcommand{\unitsep}{\langle distance \rangle}</code> . |
| <code>\unitsuperscript</code> | To typeset superscripts use <code>\unitsuperscript</code> : |
| | <code>\newunit{\squaremeter}{\meter\unitsuperscript{2}}</code> |

5.2 Typesetting μ , Ω , $^\circ$ and $^\circ\text{C}$

`\setTextOmega` Typesetting units would be quite easy without *Ohm* and *micro* (*degree* and *de-*

`\setMathOmega` ²You do not really have to define *newton*, it is already defined by `unitsdef`. This is just an example.

`\setTextmu`

`\setMathmu`

`\setTextCelsius` 8

`\setMathCelsius`

`\setMathDegree`

`\setTextDegree`

gree Celsius as well). The representing characters μ and Ω have to exist in three variants: One for use in math-mode (suiting to `\mathrm`) the latter two for use in `\rmfamily` and `\sffamily`. Most fonts have a suiting μ but very few fonts own a Ω . The fonts from BITSTREAM (delivered with some versions of COREL DRAW) have an italic non-suiting μ , so you have to take care of a μ when using such fonts, too. Also the μ in Latin Modern fonts isn't very good looking yet (but LM is still in beta-state). Because of nearly infinite combinations of different fonts it is impossible to choose the correct characters for μ , Ω and $^{\circ}\text{C}$ automatically. To define these characters use the macros `\setTextOmega`, `\setMathOmega`, `\setTextmu`, `\setMathmu`, `\setTextCelsius`, `\setMathCelsius`, `\setMathDegree` and `\setTextDegree`:

```
\setTextOmega{\langle serif-definition\rangle}{\langle sans-serif-definition\rangle}
\setMathOmega{\langle definition\rangle}

\setTextmu{\langle serif-definition\rangle}{\langle sans-serif-definition\rangle}
\setMathmu{\langle definition\rangle}

\setTextCelsius{\langle serif-definition\rangle}{\langle sans-serif-definition\rangle}
\setMathCelsius{\langle definition\rangle}

\setTextDegree{\langle serif-definition\rangle}{\langle sans-serif-definition\rangle}
\setMathDegree{\langle definition\rangle}
```

Important! The macros concerning typesetting in math-mode use `amsamth`'s `\text-macro`. So you have to switch to math-mode to use a character out of the math alphabet. The reason for this is `units`. `units` uses `\mathrm` to typeset in math-mode. But only few mathfonts have a suitable Ω , for example:

```
\documentclass{article}  
  
\usepackage[T1]{fontenc}  
\usepackage{textcomp}  
\usepackage{mathpazo}  
  
\begin{document}  
 $ \Omega \qquad \mathrm{\Omega} $  
\end{document}
```

`unitsdef` sets the defaults in a way suitable to the CM-family:

```
\setMathOmega{\mathrm{\Omega}}
\setMathmu{\textmu}
\setTextOmega{\textohm}{\textohm}
```

```
\setTextmu{\textmu}{\textmu}
\setMathCelsius{\textcelsius}
\setTextCelsius{\textcelsius}{\textcelsius}
\setMathDegree{\textdegree}
\setTextDegree{\textdegree}{\textdegree}
```

To find a suitable Ω for different fonts use WALTER SCHMIDT's `gensymb`-package³ and read the documentation of this package.

6 Local configuration file

Since version 0.2 `unitsdef` by default looks for a file `unitsdef.cfg` and inputs its contents. This is useful if you frequently use a similar set of units in your documents. You put your definitions in `unitsdef.cfg` and they are included automatically in your document⁴

A configuration file may look like this:

```
\ProvidesFile{unitsdef.cfg}%
[2004/12/09 v1.0 some definitions for unitsdef]

\newunit{\molar}{\per{\mole}{\liter}}
\newunit{\millimolar}{\per{\millimole}{\liter}}

\endinput
```

If, by some reason, you don't want your local config file to be loaded specify the option `noconfig` in the `\usepackage` command.

7 Predefined units and prefixes

Table 1: predefined prefixes

| <i>name</i> | <i>prefix</i> | <i>macro</i> | <i>value</i> | <i>name</i> | <i>prefix</i> | <i>macro</i> | <i>value</i> |
|-------------|---------------|--------------|--------------|-------------|---------------|--------------|--------------|
| yocto | y | \yocto | 10^{-24} | zepto | z | \zepto | 10^{-21} |

³CTAN:macros/latex/contrib/was/

⁴Keep in mind that TeX has to find the file, so follow the instructions given by your TeX-distribution. On *nix-like systems and a TDS compliant distribution it might be possible to put `unitsdef.cfg` in `~/texmf/tex/latex/unitsdef/config/` and update the filename database.

Table 1: predefined prefixes

| <i>name</i> | <i>prefix</i> | <i>macro</i> | <i>value</i> | <i>name</i> | <i>prefix</i> | <i>macro</i> | <i>value</i> |
|-------------|---------------|--------------|--------------|-------------|---------------|--------------|--------------|
| atto | a | \attono | 10^{-18} | femto | f | \femtono | 10^{-15} |
| pico | p | \picono | 10^{-12} | nano | n | \nanono | 10^{-9} |
| micro | μ | \microno | 10^{-6} | milli | m | \millino | 10^{-3} |
| centi | c | \centino | 10^{-2} | deci | d | \decino | 10^{-1} |
| deca | da | \decano | 10^{+1} | hecto | h | \hectono | 10^{+2} |
| kilo | k | \kilono | 10^{+3} | mega | M | \megano | 10^{+6} |
| giga | G | \giganono | 10^{+9} | tera | T | \terano | 10^{+12} |
| peta | P | \petano | 10^{+15} | exa | E | \exano | 10^{+18} |
| zetta | Z | \zettano | 10^{+21} | yotta | Y | \yottano | 10^{+24} |

Table 2: predefined units

| <i>name</i> | <i>sign</i> | <i>macro</i> | <i>alias</i> |
|------------------------|-------------|--------------|--------------|
| <i>base units</i> | | | |
| meter | m | \meter | |
| kilogram | kg | \kilogram | \kg |
| mole | mol | \mole | |
| second | s | \second | \sek |
| ampere | A | \ampere | |
| K | \kelvin | | |
| candela | cd | \candela | |
| <i>units of length</i> | | | |
| picometer | pm | \picometer | \picom |
| nanometer | nm | \nanometer | \nm |
| micrometer | μm | \micrometer | \micm |
| millimeter | mm | \millimeter | \mm |
| centimeter | cm | \centimeter | \cm |
| decimeter | dm | \decimeter | \dm |
| kilometer | km | \kilometer | \km |
| <i>units of weight</i> | | | |
| gram | g | \gram | |
| femtogram | fg | \femtogram | \fg |
| picogram | pg | \picogram | \pg |

Table 2: predefined units

| <i>name</i> | <i>sign</i> | <i>macro</i> | <i>alias</i> |
|-------------------------------------|-----------------|------------------|--------------|
| nanogram | ng | \nanogram | \nanog |
| microgram | μg | \microgram | \micg |
| milligram | mg | \milligram | \mg |
| <i>units of amount of substance</i> | | | |
| femtomole | fmol | \femtomole | \fmol |
| picomole | pmol | \picomole | \pmol |
| nanomole | nmol | \nanomole | \nmol |
| micromole | μmol | \micromole | \micmol |
| millimole | mmol | \millimole | \mmol |
| <i>units of time</i> | | | |
| attosecond | as | \attosecond | |
| femtosecond | fs | \femtosecond | \fs |
| pikosecond | ps | \picosecond | \ps |
| nanosecond | ns | \nanosecond | \ns |
| microsecond | μs | \microsecond | \mics |
| millisecond | ms | \millisecond | \ms |
| <i>units of amperage</i> | | | |
| picoampere | pA | \picoampere | \pA |
| nanoampere | nA | \nanoampere | \nA |
| microampere | μA | \microampere | \micA |
| milliampere | mA | \milliampere | \mA |
| kiloampere | kA | \kiloampere | \kA |
| <i>units of volume</i> | | | |
| liter | L | \liter | |
| femtoliter | fL | \femtoliter | \fl |
| picoliter | pL | \picoliter | \pl |
| nanoliter | nL | \nanoliter | \nl |
| microliter | μL | \microliter | \micl |
| milliliter | mL | \milliliter | \ml |
| centiliter | cL | \centiliter | \cl |
| deciliter | dL | \deciliter | \dl |
| hectoliter | hL | \hectoliter | \hl |
| cubicmeter | m^3 | \cubicmeter | |
| cubicmicrometer | μm^3 | \cubicmicrometer | |
| cubicmillimeter | mm^3 | \cubicmillimeter | |

Table 2: predefined units

| <i>name</i> | <i>sign</i> | <i>macro</i> | <i>alias</i> |
|-------------------------------------|-------------|-------------------|--------------|
| <i>units of area</i> | | | |
| squaremeter | m^2 | \squaremeter | |
| ar | a | \ar | |
| Hektar | ha | \hektar | |
| squarecentimeter | cm^2 | \squarecentimeter | |
| squaremillimeter | mm^2 | \squaremillimeter | |
| squarekilometer | km^2 | \squarekilometer | |
| <i>more units of weight</i> | | | |
| ton | t | \ton | |
| <i>derived units of electricity</i> | | | |
| volt | V | \volt | |
| millivolt | mV | \millivolt | \mV |
| kilovolt | kV | \kilovolt | \kv |
| Watt | W | \watt | |
| milliwatt | mW | \milliwatt | |
| kilowatt | kW | \kilowatt | |
| megawatt | MW | \megawatt | |
| coulomb | C | \coulomb | |
| ohm | Ω | \ohm or \Ohm | |
| kiloohm | $k\Omega$ | \kiloohm | |
| megaohm | $M\Omega$ | \megaohm | |
| gigaohm | $G\Omega$ | \gigaohm | |
| siemens | S | \siemens | |
| millisiemens | mS | \millisiemens | |
| farad | F | \farad | |
| femtofarad | fF | \femtofarad | |
| picofarad | pF | \picofarad | |
| nanofarad | nF | \nanofarad | |
| microfarad | μF | \microfarad | |
| millifarad | mF | \millifarad | |
| <i>units of energy</i> | | | |
| joule | J | \joule | |
| millijoule | mJ | \millijoule | |
| kilojoule | kJ | \kilojoule | \kJ |
| megajoule | MJ | \megajoule | |

Table 2: predefined units

| <i>name</i> | <i>sign</i> | <i>macro</i> | <i>alias</i> |
|-----------------------------|-------------|----------------------|--------------|
| calorie | cal | \calory | |
| kilocalorie | kcal | \kilocalory | |
| electronvolt | eV | \electronvolt | \eV |
| millielectronvolt | meV | \millielectronvolt | \meV |
| kiloelectronvolt | keV | \kiloelectronvolt | \keV |
| megaelectronvolt | MeV | \megaelectronvolt | \MeV |
| gigaelectronvolt | GeV | \gigaelectronvolt | \GeV |
| teraelectronvolt | TeV | \teraelectronvolt | \TeV |
| <i>more units of time</i> | | | |
| minute | min | \minute | |
| hour | h | \hour | |
| days | d | \days | |
| <i>units of temperature</i> | | | |
| degree Celsius | °C | \celsius or \Celsius | |
| <i>units of angle</i> | | | |
| radian | rad | \radian | |
| steradian | sr | \steradian | |
| degree | ° | \degree or \Degree | |
| arc minute | ' | \arcmin | |
| arc second | " | \arcsec | |
| <i>units of frequencies</i> | | | |
| hertz | Hz | \hertz | |
| kilohertz | kHz | \kilohertz | \kHz |
| megahertz | MHz | \megahertz | \MHz |
| gigahertz | GHz | \gigahertz | \GHz |
| <i>units of force</i> | | | |
| newton | N | \newton | |
| millinewton | mN | \millinewton | |
| kilonewton | kN | \kilonewton | |
| <i>units of pressure</i> | | | |
| pascal | Pa | \pascal | |
| hectopascal | hPa | \hectopascal | |
| bar | bar | \uBar | |
| millibar | mbar | \millibar | |

Table 2: predefined units

| <i>name</i> | <i>sign</i> | <i>macro</i> | <i>alias</i> |
|-------------------------------|-------------|----------------|--------------|
| <i>units of magnetism</i> | | | |
| weber | Wb | \weber | |
| tesla | T | \tesla | |
| henry | H | \henry | |
| <i>units of light</i> | | | |
| lumen | lm | \lumen | |
| lux | lx | \lux | |
| <i>units of radioactivity</i> | | | |
| becquerel | Bq | \becquerel | |
| megabecquerel | MBq | \megabecquerel | |
| curie | Cu | \curie | |
| sievert | Sv | \sievert | |
| millisievert | mSv | \millisievert | |
| <i>percent</i> | | | |
| percent | % | \percent | |

8 To Do

There are a lot of things to be done. Some are mentioned here:

- Add some more macros to figure out the ouput (something similar to \SI). Provide the possibility to typeset all units in math mode.
- Improve the documentation.
- Adding interfaces units for Å, % and °F

9 Code

1 <*package>

9.1 switches

\if@setunitsep This switch is used internally to decide, whether a distance is to be typesetted or not.
 2 \newif\if@setunitsep
 3 \@@setunitseptrue

\ifunit@@ohm This switch decides whether \ohm or \Ohm and \celsius or \Celsius is defined (according to gensymb).

4 \newif\ifunit@@ohm%
5 \unit@@ohmfalse

\ifunit@@redefgensymb This switch makes gensymb's macros \ohm and \celsius available as \gensymbohm and \gensymbcelsius. unitsdef uses \ohm and \celsius.

6 \newif\ifunit@@redefgensymb
7 \unit@@redefgensymbfalse

\ifunit@@liter This switch decides whether the output of the unit \iter is typeset as l or L

8 \newif\ifunit@@liter
9 \unit@@literfalse

\ifunit@@xspace This switch decides whether xspace is used.

10 \newif\ifunit@@xspace
11 \unit@@xspacetru

\ifunit@@xspace This switch decides whether abbreviations are loaded.

12 \newif\ifunit@@useabbrv
13 \unit@@useabbrvtrue

The following switches decide whether to load a .cfg file containing some abbreviations or not.

14 \newif\ifunit@@useampabbrv
15 \unit@@useampabbrvtrue
16 \newif\ifunit@@usefreqabbrv
17 \unit@@usefreqabbrvtrue
18 \newif\ifunit@@usemolabbrv
19 \unit@@usemolabbrvtrue
20 \newif\ifunit@@usevoltabbrv
21 \unit@@usevoltabbrvtrue
22 \newif\ifunit@@usevolabbrv
23 \unit@@usevolabbrvtrue
24 \newif\ifunit@@useweightabbrv
25 \unit@@useweightabbrvtrue
26 \newif\ifunit@@useenergyabbrv
27 \unit@@useenergyabbrvtrue
28 \newif\ifunit@@uselengthabbrv
29 \unit@@uselengthabbrvtrue
30 \newif\ifunit@@usetimeabbrv
31 \unit@@usetimeabbrvtrue

```
\ifunit@@useconfigfile This switch stores whether the option noconfig is given.
```

```
32 \newif\ifunit@@useconfigfile  
33 \unit@@useconfigfiletrue
```

9.2 Options

```
34 \DeclareOption{OHM}{\unit@@Ohmtrue}  
35 \DeclareOption{ohm}{\unit@@Ohmfalse}  
36 \DeclareOption{redef-gensymb}{%  
37   \@ifpackageloaded{gensymb}{%  
38     \unit@@redefgensymbtrue%  
39     \AtBeginDocument{  
40       \let\gensymbohm\ohm%  
41       \let\gensymbcelsius\celsius%  
42       \let\gensymbmicro\micro%  
43       \renewunit{\ohm}{\unitOmega}%  
44       \renewunit{\celsius}{\unitCelsius}%  
45       \renewcommand{\micro}{\unitmu\@setunitsepfalse}%  
46     }  
47   }%  
48   \PackageError{unitsdef}{  
49     You requestet me to save some macros from the\MessageBreak  
50     gensymb-package. This package is not loaded.\MessageBreak  
51     If you load it later, tell me to use uppercase\MessageBreak  
52     macronames where conflicts appear by giving me\MessageBreak  
53     the option OHM.  
54   }  
55 }  
56 }  
57 \DeclareOption{liter}{\unit@@litertrue}  
58 \DeclareOption{LITER}{\unit@@literfalse}  
59 \DeclareOption{noxspace}{\unit@@xspacefalse}  
60 \DeclareOption{noabbrv}{\unit@@useabbrvfalse}  
61 \DeclareOption{ugly}{\PassOptionsToPackage{ugly}{units}}  
62 \DeclareOption{noampageabbr}{\unit@@useampabbrvfalse}  
63 \DeclareOption{nofreqencyabbr}{\unit@@usefreqabbrvfalse}  
64 \DeclareOption{nomolabbr}{\unit@@usemolabbrvfalse}  
65 \DeclareOption{novoltageabbr}{\unit@@usevoltabbrvfalse}  
66 \DeclareOption{novolumeabbr}{\unit@@usevolabbrvfalse}  
67 \DeclareOption{noweighthabbr}{\unit@@useweightabbrvfalse}  
68 \DeclareOption{noenergyabbr}{\unit@@useenergyabbrvfalse}  
69 \DeclareOption{nolengthabbr}{\unit@@uselengthabbrvfalse}  
70 \DeclareOption{notimeabbr}{\unit@@usetimeabbrvfalse}  
71 \DeclareOption{noconfig}{\unit@@useconfigfilefalse}
```

```

72 \ProcessOptions

73 \RequirePackage[T1]{fontenc}
74 \RequirePackage{amsmath}
75 \RequirePackage{textcomp}
76 \RequirePackage{units}
77 \ifunit@xspace
78   \RequirePackage{xspace}%
79   \let\unit@xspace\xspace%
80 \else
81   \let\unit@xspace\relax
82 \fi

```

9.4 The interface

\unitsignonly This macro is used to typeset a unit without leading spacing. To achieve this \@@setunitsep is set to **false**. \unitsignonly has an mandatory argument containig the unit to typeset: \unitsignonly{\(unit\)}.

```

83 \DeclareRobustCommand{\unitsignonly}[1]{%
84   \@@setunitsepfalse%
85   \begingroup%
86   \let\unit@xspace\relax%
87   #1%
88   \endgroup}

```

\unitvaluesep This Macro specifies the distance between value and unit, default value is \,.
 89 \newcommand{\unitvaluesep}{}
 90 \let\unitvaluesep\,%

\newunit This macro is the interface to define new units. Usage is:

```
\newunit{\(unitmacro\)}{\(unitsign\)}.
```

```
91 \newcommand{\newunit}[2]{%
```

First there is a check whether the macro already exists:

```
92   \newcommand{#1}{}%
```

then its definition is performed.

```
93   \DeclareRobustCommand{#1}[1][]{##1}%
```

The redefinition of \unitvaluesep has to stay local:

```
94   \begingroup%
```

\xpsace must not do anything when invoked inside a unit. So it is set to \relax inside this group.

```

95      \let\unit@@xspace\relax%
96      \if@setunitsep%
97          \unitvaluesep%

```

Once a spacing is typeset there must no further spacing be typeset. To avoid typesetting more spacings I redefine \unitvaluesep to \relax.

```

98      \let\unitvaluesep\relax%
99      \fi%
100     \unit{\#2}\global\@setunitseptrue%
101     \endgroup%

```

Now \xspace has to be invoked, as long as `noxspace` is not set.

```

102     \unit@@xspace%
103     }%
104 }

```

`\renewunit` This macro is to redefine existing units.

```

105 \newcommand{\renewunit}[2]{%
106     \renewcommand{\#1}{\%}
107     \DeclareRobustCommand{\#1}[1][]{\#\#1%
108         \begingroup%
109         \let\unit@@xspace\relax%
110         \if@setunitsep%
111             \unitvaluesep%
112             \let,\relax%
113         \fi%
114         \unit{\#2}\global\@setunitseptrue%
115         \endgroup%
116         \unit@@xspace%
117     }%
118 }
119

```

`\newnosepunit`

```

120 \newcommand{\newnosepunit}[2]{%
121     \newcommand{\#1}{\%}
122     \DeclareRobustCommand{\#1}[1][]{\#\#1%
123         \begingroup%
124         \let\xspace\relax%
125         \if@setunitsep%
126             \let,\relax%
127         \fi%

```

```

128      \unit{\#2}\global\@@setunitseptrue%
129      \endgroup%
130      \unit@xspace%
131  }%
132 }
133 \newcommand{\renewnosepunit}[2]{%
134   \renewcommand{\#1}{\%}
135   \DeclareRobustCommand{\#1}[1][]{\#\#1%
136   \begingroup%
137   \let\unit@xspace\relax%
138   \if@@setunitsep%
139   \let,\relax%
140   \fi%
141   \unit{\#2}\global\@@setunitseptrue%
142   \endgroup%
143   \unit@xspace%
144 }%
145 }

\per
146 \newcommand{\per}[2]{%
147   \@@setunitsepfalse%
148   \unitfrac{\#1}{\#2}%
149 }

\ilu The command \ilu provides the possibility to typeset inline-units that are not
defined by a previous \newunit command.
150 \newcommand{\ilu}[2][]{%
151   \begingroup%
152   \@@setunitsepfalse%
153   \let\unit@xspace\relax%
154   #1,\unit{\#2}%
155   \endgroup%
156 }

\unittimes
157 \newcommand{\unittimes}{\@@setunitsepfalse\ensuremath{\cdot} }

\unitsep
158 \let\unitsep\relax

\unitsuperscript
159 \newcommand{\unitsuperscript}[1]{%
160   \ifmmode^{\#1}\else\textsuperscript{\#1}\fi%
161 }

```

```

\unitMathOmega
162 \newcommand{\unitMathOmega} {}

\unitTextOmega
163 \newcommand{\unitTextOmega} {}

\unittextmu
164 \newcommand{\unitTextmu} {}

\unitmathmu
165 \newcommand{\unitMathmu} {}

\unitMathCelsius
166 \newcommand{\unitMathCelsius} {}

\unitTextCelsius
167 \newcommand{\unitTextCelsius} {}

\unitTextDegree
168 \newcommand{\unitTextDegree} {}

\unitMathDegree
169 \newcommand{\unitMathDegree} {}

\unitCelsius
170 \newcommand{\unitCelsius}{%
171   \ifmmode\unitMathCelsius\else\unitTextCelsius\fi%
172 }

\unitmu
173 \newcommand{\unitmu}{%
174   \ifmmode\unitMathmu\else\unitTextmu\fi%
175 }

\unitOmega
176 \newcommand{\unitOmega}{%
177   \ifmmode\unitMathOmega\else\unitTextOmega\fi%
178 }

\unitDegree
179 \newcommand{\unitDegree}{%
180   \ifmmode\unitMathDegree\else\unitTextDegree\fi%
181 }

```

```

\setMathOmega
182 \newcommand{\setMathOmega}[1]{%
183   \renewcommand{\unitMathOmega}{\text{#1}}%
184 }
185 \setMathOmega{$\mathrm{\Omega}$}

\setMathmu
186 \newcommand{\setMathmu}[1]{%
187   \renewcommand{\unitMathmu}{\text{#1}}%
188 }
189 \setMathmu{\textmu}

\setMathCelsius
190 \newcommand{\setMathCelsius}[1]{%
191   \renewcommand{\unitMathCelsius}{\text{#1}}%
192 }
193 \setMathCelsius{\textcelsius}

\setMathDegree
194 \newcommand{\setMathDegree}[1]{%
195   \renewcommand{\unitMathDegree}{\text{#1}}%
196 }
197 \setMathDegree{\textdegree}

\setTextOmega
198 \newcommand{\setTextOmega}[2]{%
199   \renewcommand{\unitTextOmega}{%
200     \begingroup%
201       \edef\@tempa{\sfdefault}%
202       \ifx\f@family\@tempa%
203         #2%
204       \else%
205         #1%
206       \fi%
207     \endgroup%
208   }%
209 }
210 \setTextOmega{\textohm}{\textohm}

\setTextmu
211 \newcommand{\setTextmu}[2]{%

```

```

212 \renewcommand{\unitTextmu}{%
213   \begingroup%
214     \edef\@tempa{\sfdefault}%
215     \ifx\f@family\@tempa%
216       #2%
217     \else%
218       #1%
219     \fi%
220   \endgroup%
221 }%
222 }%
223 \setTextmu{\textmu}{\textmu}

```

\setTextCelsius This macro is to define the »°C« that is used in text mode. The first argument is used when `\rmfamily` is active, the latter when `\sffamily` is active.

```

224 \newcommand{\setTextCelsius}[2]{%
225   \renewcommand{\unitTextCelsius}{%
226     \begingroup%
227       \edef\@tempa{\sfdefault}%
228       \ifx\f@family\@tempa%
229         #2%
230       \else%
231         #1%
232       \fi%
233     \endgroup%
234 }%
235 }%
236 \setTextCelsius{\textcelsius}{\textcelsius}

```

\setTextDegree This macro is to define the »°« that is used in text mode. The first argument is used when `\rmfamily` is active, the latter when `\sffamily` is active.

```

237 \newcommand{\setTextDegree}[2]{%
238   \renewcommand{\unitTextDegree}{%
239     \begingroup%
240       \edef\@tempa{\sfdefault}%
241       \ifx\f@family\@tempa%
242         #2%
243       \else%
244         #1%
245       \fi%
246     \endgroup%
247 }%
248 }%
249 \setTextDegree{\textdegree}{\textdegree}

```

```

\unitSIdef
250 \newcommand{\unitSIdef}{\upshape}

\SI
251 \newcommand{\SI}={}
252 \DeclareRobustCommand{\SI}[2]{%
253   \begingroup%
254     \let\unit@xspace\relax%
255     \unitSIdef\selectfont%
256     #1#2%
257   \endgroup%
258 }

```

9.5 Definition of prefixes

| | |
|--|-------|
| 259 \newcommand{\yocto}{y\@@setunitsepfalse} | % -24 |
| 260 \newcommand{\zepto}{z\@@setunitsepfalse} | % -21 |
| 261 \newcommand{\atto}{a\@@setunitsepfalse} | % -18 |
| 262 \newcommand{\femto}{f\@@setunitsepfalse} | % -15 |
| 263 \newcommand{\pico}{p\@@setunitsepfalse} | % -12 |
| 264 \newcommand{\nano}{n\@@setunitsepfalse} | % -9 |
| 265 \ifunit@@Ohm | |
| 266 \newcommand{\Micro}{\unitmu\@@setunitsepfalse} | |
| 267 \let\@unit@micro\Micro | |
| 268 \else | |
| 269 \ifunit@@redefgensymb\else | |
| 270 \newcommand{\micro}{\unitmu\@@setunitsepfalse} | |
| 271 \let\@unit@micro\micro | |
| 272 \fi | |
| 273 \fi | |
| 274 \newcommand{\milli}{m\@@setunitsepfalse} | % -3 |
| 275 \newcommand{\centi}{c\@@setunitsepfalse} | % -2 |
| 276 \newcommand{\deci}{d\@@setunitsepfalse} | % -1 |
| 277 | |
| 278 \newcommand{\deca}{da\@@setunitsepfalse} | % +1 |
| 279 \newcommand{\hecto}{h\@@setunitsepfalse} | % +2 |
| 280 | |
| 281 \newcommand{\kilo}{k\@@setunitsepfalse} | % +3 |
| 282 \newcommand{\mega}{M\@@setunitsepfalse} | % +6 |
| 283 \newcommand{\giga}{G\@@setunitsepfalse} | % +9 |
| 284 \newcommand{\tera}{T\@@setunitsepfalse} | % +12 |
| 285 \newcommand{\peta}{P\@@setunitsepfalse} | % +15 |
| 286 \newcommand{\exa}{E\@@setunitsepfalse} | % +18 |
| 287 \newcommand{\zetta}{Z\@@setunitsepfalse} | % +21 |

```
288 \newcommand{\yotta}{Y\@@setunitsepfalse} % +24
289
```

9.6 Definitions of units

9.6.1 base units

```
290 \newunit{\meter}{m}
291     \newunit{\gram}{g}
292 \newunit{\kilogram}{\kilo\gram}
293 \newunit{\mole}{mol}
294 \newunit{\second}{s}
295 \newunit{\ampere}{A}
296 \newunit{\kelvin}{K}
297 \newunit{\candela}{cd}
298
```

9.6.2 Units of length

```
299
300 \newunit{\picometer}{\pico\meter}
301 \newunit{\nanometer}{\nano\meter}
302 \newunit{\micrometer}{\@unit@micro\meter}
303 \newunit{\millimeter}{\milli\meter}
304 \newunit{\centimeter}{\centi\meter}
305 \newunit{\decimeter}{\deci\meter}
306 \newunit{\kilometer}{\kilo\meter}
307
```

9.6.3 Units of weight

```
308
309 \newunit{\femtogram}{\femto\gram}
310 \newunit{\picogram}{\pico\gram}
311 \newunit{\nanogram}{\nano\gram}
312 \newunit{\microgram}{\@unit@micro\gram}
313 \newunit{\milligram}{\milli\gram}
314
```

9.6.4 Units of quantity

```
315
316 \newunit{\femtomole}{\femto\mole}
317 \newunit{\picomole}{\pico\mole}
318 \newunit{\nanomole}{\nano\mole}
319 \newunit{\micromole}{\@unit@micro\mole}
320 \newunit{\millimole}{\milli\mole}
321
```

322

9.6.5 Units of time

```
323  
324 \newunit{\attosecond}{\atto\sek}  
325 \newunit{\femtosecond}{\femto\sek}  
326 \newunit{\picosecond}{\pico\sek}  
327 \newunit{\nanosecond}{\nano\sek}  
328 \newunit{\microsecond}{\@unit@micro\sek}  
329 \newunit{\millisecond}{\milli\sek}  
330  
331
```

9.6.6 amperage

```
332  
333 \newunit{\picoampere}{\pico\ampere}  
334 \newunit{\nanoampere}{\nano\ampere}  
335 \newunit{\microampere}{\@unit@micro\ampere}  
336 \newunit{\milliampere}{\milli\ampere}  
337 \newunit{\kiloampere}{\kilo\ampere}  
338
```

9.6.7 Percent

```
339  
340 \newunit{\percent}{\%}  
341
```

9.6.8 Volumes

```
342  
343 \ifunit@@liter  
344   \newunit{\liter}{l}  
345 \else  
346   \newunit{\liter}{L}  
347 \fi  
348  
349 \newunit{\femtoliter}{\femto\liter}  
350 \newunit{\picoliter}{\pico\liter}  
351 \newunit{\nanoliter}{\nano\liter}  
352 \newunit{\microliter}{\@unit@micro\liter}  
353 \newunit{\milliliter}{\milli\liter}  
354 \newunit{\centiliter}{\centi\liter}  
355 \newunit{\deciliter}{\deci\liter}  
356 \newunit{\hectoliter}{\hecto\liter}  
357
```

```
358 \newunit{\cubicmeter}{\meter\unitsuperscript{3}}
359 \newunit{\cubicmicrometer}{\micrometer\unitsuperscript{3}}
360 \newunit{\cubicmillimeter}{\millimeter\unitsuperscript{3}}
361
362
```

9.6.9 Areas

```
363
364 \newunit{\squaremeter}{\meter\unitsuperscript{2}}
365
366 \newunit{\ar}{a}
367 \newunit{\hektar}{\hecto\ar}
368
369 \newunit{\squarecentimeter}{\centimeter\unitsuperscript{2}}
370 \newunit{\squaremillimeter}{\millimeter\unitsuperscript{2}}
371 \newunit{\squarekilometer}{\kilometer\unitsuperscript{2}}
```

9.6.10 more units of weight

```
372
373 \newunit{\ton}{t}
374
```

9.6.11 Derived electrical units

```
375
376 \newunit{\volt}{V}
377 \newunit{\millivolt}{\milli\volt}
378
379 \newunit{\kilovolt}{\kilo\volt}
380
381 \newunit{\watt}{W}
382 \newunit{\milliwatt}{\milli\watt}
383 \newunit{\kilowatt}{\kilo\watt}
384 \newunit{\megawatt}{\mega\watt}
385
386 \newunit{\coulomb}{C}
```

Don't forget the options when typesetting Ω !

```
387 \ifunit@@Ohm
388   \newunit{\Ohm}{\unitOmega}
389   \newunit{\kiloohm}{\kilo\Ohm}
390   \newunit{\megaohm}{\mega\Ohm}
391   \newunit{\gigaohm}{\giga\Ohm}
392 \else
393   \ifunit@@redefgensymb\else
394     \newunit{\ohm}{\unitOmega}
```

```

395  \fi
396  \newunit{\kiloohm}{\kilo\ohm}
397  \newunit{\megaohm}{\mega\ohm}
398  \newunit{\gigaohm}{\giga\ohm}
399 \fi
400 \newunit{\siemens}{S}
401 \newunit{\millisiemens}{\milli\siemens}
402 \newunit{\farad}{F}
403 \newunit{\femtofarad}{\femto\farad}
404 \newunit{\picofarad}{\pico\farad}
405 \newunit{\nanofarad}{\nano\farad}
406 \newunit{\microfarad}{\@unit@micro\farad}
407 \newunit{\millifarad}{\milli\farad}

```

9.6.12 Units of energy

```

408 \newunit{\joule}{J}
409 \newunit{\millijoule}{\milli\joule}
410 \newunit{\kilojoule}{\kilo\joule}
411 \newunit{\megajoule}{\mega\joule}
412
413 \newunit{\calory}{cal}
414 \newunit{\kilocalory}{\kilo\calory}
415 \newunit{\electronvolt}{eV}
416 \newunit{\millielectronvolt}{\milli\electronvolt}
417 \newunit{\kilolectronvolt}{\kilo\electronvolt}
418 \newunit{\megaelectronvolt}{\mega\electronvolt}
419 \newunit{\gigaelectronvolt}{\giga\electronvolt}
420 \newunit{\teraelectronvolt}{\tera\electronvolt}
421

```

9.6.13 more units of time

```

422 \newunit{\minute}{min}
423 \newunit{\hour}{h}
424 \newunit{\days}{d}

```

9.6.14 more units of temperature

Don't forget `gensymb` when typesetting degree Celsius.

```

425 \ifunit@@Ohm
426   \newunit{\Celsius}{\unitCelsius}
427 \else
428   \ifunit@@redefgensymb\else
429     \newunit{\celsius}{\unitCelsius}
430   \fi
431 \fi

```

9.6.15 Angles and arcs

```

432 \newunit{\radian}{rad}
433 \newunit{\steradian}{sr}
434 \ifunit@@@Ohm
435   \newnosepunit{\Degree}{\unitDegree}
436 \else
437   \ifunit@@@redefgensymb\else
438     \newnosepunit{\degree}{\unitDegree}
439   \fi
440 \fi
441
442 \newunit{\arcmin}{\ensuremath{{}^{\prime}}}
443 \newunit{\arcsec}{\ensuremath{{}^{\prime\prime}}}

```

Some TeX to realize the syntax using ; as separator.

```

444 \DeclareRobustCommand{\arc}[1]{\expandafter\unit@arc#1; !}
445
446 \def\unit@arc#1;#2;#3!{%
447   \ifx\\#1\\\def\unit@arcdegreevalue{0}%
448   \else\def\unit@arcdegreevalue{#1}\fi%
449   \ifx\\#2\\\def\unit@arcminvalue{0}%
450   \else\def\unit@arcminvalue{#2}\fi%
451   \ifx\\#3\\\def\unit@arcsecvalue{0}%
452   \else\edef\unit@arcsecvalue{\expandafter\unit@strip#3;!}\fi%
453   \begingroup%
454     \let\unit@@xspace\relax%
455     \ifnum\unit@arcsecvalue=0\relax%
456       \ifnum\unit@arcminvalue=0\relax%
457         \ifnum\unit@arcdegreevalue=0\relax\else%
458           \unit@arcdegreevalue\degree%
459         \fi%
460       \else%
461         \unit@arcdegreevalue\degree%
462         \unitvaluesep%
463         \unit@arcminvalue\arcmin%
464       \fi%
465     \else%
466       \unit@arcdegreevalue\degree%
467       \unitvaluesep%
468       \unit@arcminvalue\arcmin%
469       \unitvaluesep%
470       \unit@arcsecvalue\arcsec%
471     \fi%
472   \endgroup%

```

```

473 }
474
475 \def\unit@strip#1;#2!{%
476   \ifx\#1\O\else#1\fi%
477 }
478

9.6.16 Frequencies

479 \newunit{\hertz}{Hz}
480   \newunit{\kilo\hertz}{\kilo\hertz}
481   \newunit{\megahertz}{\mega\hertz}
482   \newunit{\gigahertz}{\giga\hertz}
483

9.6.17 Force

484 \newunit{\newton}{N}
485   \newunit{\millinewton}{\milli\newton}
486   \newunit{\kilonewton}{\kilo\newton}

9.6.18 Pressure

487 \newunit{\pascal}{Pa}
488   \newunit{\hectopascal}{\hecto\pascal}
489 \newunit{\uBar}{bar}
490   \newunit{\millibar}{\milli\uBar}

9.6.19 magnetic field strength

491 \newunit{\weber}{Wb}

9.6.20 magnetic flux density

492 \newunit{\tesla}{T}

9.6.21 Induction

493 \newunit{\henry}{H}

9.6.22 Lumen

494 \newunit{\lumen}{lm}

9.6.23 Illuminance

495 \newunit{\lux}{lx}

9.6.24 Radioactivity

496 \newunit{\becquerel}{Bq}
497   \newunit{\megabecquerel}{\mega\becquerel}
498 \newunit{\curie}{Cu}

```

9.6.25 Sievert

```
499 \newunit{\sievert}{Sv}
500   \newunit{\millisievert}{\milli\sievert}
```

9.7 Loading abbreviations

Now the abbreviations are loaded if no option is specified to withhold some abbreviations.

```
501 \ifunit@@useabbrv
502   \ifunit@@useampabbrv
503     \InputIfFileExists{ampabbrv.cfg}%
504       {\PackageInfo{unitsdef}{Abbreviations for units of amperage loaded.}}%
505       {\PackageWarning{unitsdef}{ampabbrv.cfg not found!}}%
506   \fi
507   \ifunit@@usefreqabbrv
508     \InputIfFileExists{freqabbr.cfg}%
509       {\PackageInfo{unitsdef}{Abbreviations for units of frequency loaded.}}%
510       {\PackageWarning{unitsdef}{freqabbr.cfg not found!}}%
511   \fi
512   \ifunit@@usemolabbrv
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515       {\PackageWarning{unitsdef}{molabbrv.cfg not found!}}%
516   \fi
517   \ifunit@@usevoltabbrv
518     \InputIfFileExists{voltabbr.cfg}%
519       {\PackageInfo{unitsdef}{Abbreviations for units of voltage loaded.}}%
520       {\PackageWarning{unitsdef}{voltabbr.cfg not found!}}%
521   \fi
522   \ifunit@@usevolabbrv
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524       {\PackageInfo{unitsdef}{Abbreviations for units of volume loaded.}}%
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526   \fi
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531   \fi
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533     \InputIfFileExists{enerabbr.cfg}%
534       {\PackageInfo{unitsdef}{Abbreviations for units of energy loaded.}}%
535       {\PackageWarning{unitsdef}{enerabbr.cfg not found!}}%
536   \fi
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537 \ifunit@@uselengthabbrv
538   \InputIfFileExists{lengabbr.cfg}%
539     {\PackageInfo{unitsdef}{Abbreviations for units of length loaded.}}%
540     {\PackageWarning{unitsdef}{lengabbr.cfg not found!}}}%
541 \fi
542 \ifunit@@usetimeabbrv
543   \InputIfFileExists{timeabbr.cfg}%
544     {\PackageInfo{unitsdef}{Abbreviations for units of time loaded.}}%
545     {\PackageWarning{unitsdef}{timeabbr.cfg not found!}}}%
546 \fi
547 \fi
548 \ifunit@@useconfigfile
549   \InputIfFileExists{unitsdef.cfg}%
550     {\PackageInfo{unitsdef}{Local config file loaded.}}%
551     {\PackageInfo{unitsdef}{No local config file found.}}}%
552 \else
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554 \fi
555 %
556 
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