The me-tools Package

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Introduction

The me-tools package provides a number of macro definitions useful for mechanical engineers.

Currently, the package provides macros for the following:

1. Convenient typesetting of non-dimensional numbers such as Re and Pr.
2. Macros to streamline the typsetting of many fraction-like items like total and partial derivatives.

1 Non-dimensional Numbers

The me-tools package provides a number of macros for typesetting non-dimensional numbers, listed in table 1

All of these macros are defined so that they work both inside and outside of math mode (i.e. `\RE` and `$\RE$` both produce Re) so you can refer to these numbers in a sentence without needing to enter math mode.

Additionally, the user can create their own macros using the `\newnondim` command, with the first argument being the macro name and the second the (math-mode) definition for the label, without formatting. For example, to create a "Fred Number", Fr, accessed with `\FR`, you'd use the command:

```
\newnondim{\FR}{Fr}
```

If you would like the nondimensional numbers to appear in a format other than `\mathit`, simply use `\renewcommand` to change the `\nondimstyle` macro to another formatting command. For example, to have non-dimensional numbers appear in roman style, use

```
\renewcommand{\nondimstyle}{\mathrm}
```

Let me know if there are other non-dimensional numbers you would like added.

Table 1. Defined Non-dimensional numbers

Number	*Macro*	*Result*
Biot	`\BI`	*Bi*
Eckert	`\EC`	*Ec*
Fourier	`\FO`	*Fo*
Görtler	`\GO`	*Gö*
Grashof	`\GR`	*Gr*
Nusselt	`\NU`	*Nu*
Peclet	`\PE`	*Pe*
Prandtl	`\PR`	*Pr*
Rayleigh	`\RA`	*Ra*
Reynolds	`\RE`	*Re*
Schmidt	`\SC`	*Sc*
Sherwood	`\SH`	*Sh*
Stanton	`\ST`	*St*
Weber	`\WE`	*We*

2 Typesetting units

The me-tools package used to provide the `\unit` and `\unitfrac` macros for typesetting units. I now recommend the rather nice units package for this instead.

However, for backwards compatibility with older versions of the me-tools package, the me-units package is provided which supplied the `\unit` and `\unitfrac` macros.

3 Degree Symbols

The macros `\degreesC`, `\degreesF`, and `\degreesR` are provided for typesetting °C, °F, and °R, respectively. The are defined such that if an existing package has already defined them, the existing definition is not changed.

Table 2. Defined Fraction-like macros

Macro	*Results*
`$\abs{x}$`	$\lvert x \rvert$
`$\absfrac{x}{y}$`	$\left\lvert \dfrac{x}{y} \right\rvert$
`$\ddfrac{T}{x}$`	$\dfrac{dT}{dx}$
`$\ddfrac[2]{T}{x}$`	$\dfrac{d^2T}{dx^2}$
`$\ppfrac{T}{z}$`	$\dfrac{\partial T}{\partial z}$
`$\ppfrac[2]{T}{z}$`	$\dfrac{\partial^2 T}{\partial z^2}$

4 Fraction Macros

The package provides a number of macros for conveniently processing fraction-like constructs. Table 2 shows some examples (note the optional arguments in some of the examples which raise the derivatives to an arbitrary power).

Questions? Recommendations?

Mail questions, bugs, and recommendations to `kaszeta@me.umn.edu`.