

# The engsymbols package\*

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## 1 Introduction

This document describes the `engsymbols` package, a collection of macros to facilitate the writing of common engineering symbols.

The following packages are prerequisites:

- `siunitx`

This package follows the conventions specified by ISO standards of typesetting mathematics [1].

`engsymbols` is actually just a collection of commands I, as a Ph.D. student in Mechanical Engineering, find useful, and I hope other can find it to. There isn't any special design principles.

## 2 Implementation

### 2.1 Basic operations

`\ped` These macros by [1] typesets the argument in math roman font, to indicate a  
`\ap` object. Italic subscripts should be used only to refer to another variables, for example,  $c_P$  is the specific heat obtained by maintaining the pressure, a physical parameter, fixes. By contrast,  $h_L$  (produced by `\h\ped{L}`) is the liquid enthalpy; liquid is not a variable. The command `\ap{<index>}` does the same to superscripts, like  $T^I$  for the interface temperature.

```
1 \newcommand{\ped}[1]{\ensuremath_{\mathrm{#1}}}\n
```

```
2 \newcommand{\ap}[1]{\ensuremath^{\mathrm{#1}}}\n
```

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\*This document corresponds to `engsymbols` v0.1, dated 2014/12/02.

## 2.2 Special individual symbols

`\volume` This macro produces a calligraphic  $V$  to indicate volume, as  $\mathcal{V}$ . This is usually done to avoid confusion with velocity.

```
3 \newcommand{\volume}{\mathcal{V}}
```

`\diffd` This macro produces the differential  $d$  operator, as in  $dx$ . The definition is fairly complex because it tries to do an optimal spacing, and is described by [1].

```
4 \newcommand{\diffd}{\@ifnextchar^{\DifF}{\DifF~{}}}
5 \def\DifF~#1{%
6   \mathop{\mathrm{\mathstrut d}}%
7     \nolimits^{#1}\gobblespace}
8 \def\gobblespace{%
9   \futurelet\diffarg\ospace}
10 \def\ospace{%
11   \let\DiffSpace\!%
12   \ifx\diffarg%
13     \let\DiffSpace\relax
14   \else
15     \ifx\diffarg[%
16       \let\DiffSpace\relax
17     \else
18       \ifx\diffarg\{%
19         \let\DiffSpace\relax
20       \fi\fi\fi\DiffSpace}
```

`\hheat` These macros produces a “crossed”  $h$  as in  $\hbar$ . This is done in some texts to denote the convection heat transfer coefficient and differentiate it from enthalpy  $h$ . This is actually just an alias to the existing command `\hbar`, to give a more meaningful name. There is also `\hmass` to produce  $\hbar_m$ , used to indicate a mass transfer coefficient.

```
21 \newcommand{\hheat}{\hbar}
22 \newcommand{\hmass}{\hbar\ped{m}}
```

`\universalgasconstant` A simple command to produce  $R_u$

```
23 \newcommand{\universalgasconstant}{R\ped{u}}
```

`\diffusivitybinary` This is a shorthand for the diffusivity of a binary mixture,  $\mathcal{D}_{12}$ .

```
24 \newcommand{\diffusivitybinary}{\mathcal{D}_{12}}
```

## 2.3 Common operations

`\average` This command puts a line above the argument (like  $\bar{x}$ ), a notation widely used to indicate some type of average.

```
25 \newcommand{\average}[1]{\overline{#1}}
```

## References

- [1] Claudio Beccari. Typesetting mathematics for science and technology according to iso 31/xi. *TUGboat*, 18(1):39–48, 1997.