# The magref package*

Fábio Fortkamp
fabio@fabiofortkamp.com

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## 1 Introduction

This document describes the magref package, a collection of macros to facilitate the writing of papers and reports on magnetic refrigeration. It just defines common macros and loads packages that are normally used:

- engsymbols
- sinuitx
- mhchem
- ifthen

Please notice that the user should refer to other references such as papers and textbooks to get the meaning of the symbols I describe here.

## 2 Implementation

The use of the conditional commands to define these custom macro is because some packages and classes that I use in conjuntion with magref provide some obscure commands that clash with them. A normal user should not have any problems with that.

### 2.1 Specfic heats

```
\newcommand{\cpo}{c_{p,0}}
\newcommand{\cvo}{c_{v,0}}
```

### 2.2 Common refrigeration parameters

```
\newcommand{\qe}{\rate{Q}\ped{e}}
\newcommand{\dtspan}{\Delta{}T\ped{span}}
```

*This document corresponds to magref v0.2?, dated 2016/03/21.

```
\newcommand{\wpump}{\rate{W}\ped{p}}
\newcommand{\wmag}{\rate{W}\ped{m}}
\newcommand{\cop}{\mathrm{COP}}
\newcommand{\dtad}{\Delta{}T\ped{ad}}
\newcommand{\dsm}{\Delta{}s\ped{m}}
\newcommand{\tc}{T\ped{C}}
\ifthenelse{\isundefined{\th}}{\newcommand{\th}{T\ped{H}}}{\renewcommand{\th}{T\ped{H}}}
\newcommand{\qc}{\rate{Q}\ped{C}}
\newcommand{\qh}{\rate{Q}\ped{H}}
\newcommand{\ths}{T\ped{H,s}}
\newcommand{\tcs}{T\ped{C,s}}
\newcommand{\w}{\rate{W}}
\newcommand{\lcool}{\Lambda\ped{cool}}
```

## 2.3 Common vector fields

```
\newcommand{\rvec}{\nvector{r}}
\newcommand{\nvh}{\nvector{H}}
\newcommand{\nvb}{\nvector{B}}
\newcommand{\nvrem}{\nvector{B}\ped{rem}}
\newcommand{\nvbrem}{\nvrem}
\newcommand{\nvm}{\nvector{M}}
\newcommand{\nvdip}{\nvector{m}}
\newcommand{\nvnetdip}{\nvector{\mathcal{M}}}
\newcommand{\nvbremhat}{\hat{\nvector{B}}\ped{rem}}
\newcommand{\nvbi}{\nvector{B}_i}
\newcommand{\nvhi}{\nvector{H}_i}
\newcommand{\nvremi}{\nvector{B}_{\mathrm{rem},i}}
\newcommand{\nvai}{\nvector{A}_i}
```

## 2.4 Common other scalar parameters

```
\newcommand{\mur}{\mu\ped{r}}
\newcommand{\bl}{B\ped{l}}
\newcommand{\bh}{B\ped{h}}
\newcommand{\brem}{B\ped{rem}}
\newcommand{\muri}{\mu_{\mathrm{r},i}}
\newcommand{\bremi}{B_{\mathrm{rem},i}}
```

## 2.5 Geometric parameters

```
\newcommand{\ri}{R\ped{i}}
\ifthenelse{\isundefined{\ro}}{\newcommand{\ro}{R\ped{o}}}{\renewcommand{\ro}{R\ped{o}}}
\newcommand{\rg}{R\ped{g}}
\newcommand{\rs}{R\ped{s}}
\newcommand{\rc}{R\ped{c}}
\newcommand{\re}{R\ped{e}}
\newcommand{\hgap}{h\ped{gap}}
```

## 2.6 Coefficients for the analytical solution

```
\newcommand{\acoef}[2]{a_{{#1},\mathrm{#2}}}
\newcommand{\bcoef}[2]{b_{{#1},\mathrm{#2}}}
```

```
\newcommand{\Azexpr}[1]{A_{\mathrm{#1}\, ,z}}
\newcommand{\bremii}{B_{\mathrm{rem,II}}}
\newcommand{\bremiv}{B_{\mathrm{rem,IV}}}
\newcommand{\murn}[1]{\mu\ped{r,#1}}
\newcommand{\aIII}{\acoef{1}{III}}
\newcommand{\bIII}{\bcoef{1}{III}}
\newcommand{\nvbIII}{\nvector{B}\ped{III}}
\newcommand{\BIII}{B\ped{III}}
```