

Calculation with L^AT_EX by means of CalcT_EX

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Contents

1	Calculation with L^AT_EX	1
1.1	Stress – a simply example	1
1.1.1	Calculation	2
1.1.2	Source – str-calc.tex	2

1 Calculation with L^AT_EX

This folder consider couples of examples – all files `*-calc.tex` in L^AT_EX input format with defined operations that are included in a single pdf document with calculated operations by means of CalcT_EX package.

For received a final calculation of all `*-calc.tex` files please use a LINUX prompt command: `sh go`.

For more info please visit a web page on: <http://sg.bzip.pl/CalcTeX> or contact me by e-mail: CalcTeX (at) onet (dot) eu

I am open for any kind of questions or commands.

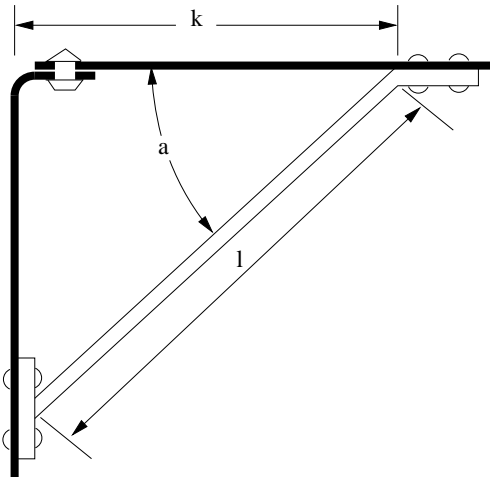
The file `"1st-example-ke-eng-calc.tex"` is the simplest and I recommend this file for study of CalcT_EX used at first.

The file `"http://sg.bzip.pl/CalcTeX/example/all-in-one.tgz"` consider all necessary files for calculation of this example if you have installed a L^AT_EX compiler and python language as well it's checked for LINUX system.

All files which suits to mask `*-iso-calc.tex` are autamaticlly calculated and included into single pdf format document in order to `ls *-calc.tex` comment and for calulation are included all `python` files available on `bin/py` folder. This following example based on Internationa Library of Technology book printed 1908 – page 50

1.1 Stress – a simply example

Find the diameter of a diagonal stay that supports an area $a_1 := 6.5 \cdot \text{inches}$ by $a_2 := 8 \cdot \text{inches}$ against a steam pressure of $p := 90 \cdot \text{pound/inch}^2$, the angle between the stay and the shell being $a := 25 \cdot \text{degrees}$ and the safe tensile stress being $T_s := 7000 \cdot \text{pound/inch}^2$.



1.1.1 Calculation

$A_s := a_1 \cdot a_2$ – area $A_s \cdot (\text{inch})^{-2} = 52.0$

By the foregoing formula

$$d := 1.13 \cdot \sqrt{\frac{A_s \cdot p}{T_s \cdot \cos(a)}}; \quad d \cdot \text{inch}^{-1} = 0.970542357867$$

Roughly this diameter is $d \cdot \text{inch}^{-1} = 1.0$ or $d \cdot \text{mm}^{-1} = 25.4$ and this diameter in millimeters roughly is $d \cdot (\text{mm})^{-1} = 25.0$.

1.1.2 Source – str-calc.tex

This following example based on
<http://books.google.com/books?id=Nh9WAAAAMAAJ&pg=RA4-PA57&dq=hand+calculation+rod#v=onepage&q=example&f=false>
 Internationa Library of Technology book printed 1908 -- page 50

```
\Task{Stress -- a simply example}
```

```
Find the diameter of a diagonal stay that supports an area
$a_1:=6.5\cdot \text{inch}\text{\rm es}"$ by $a_2:=8\cdot \text{inch}\text{\rm es}"$
against a steam pressure of $p:=90\cdot \text{pound}/\text{inch}^2$, "$
the angle between the stay and the shell being $a:=25\cdot \text{degrees}$
and the safe tensile stress being $T_s:=7\ 000\cdot \text{pound}/\text{inch}^2$."
```

```
\Calculation{}
```

```
;%k:=24\cdot \text{inch}$ $l:=k\cdot \cos(a)$ $l:=21.75\cdot \text{inch}$
```

```
\begin{figure}[htp] \centering
\includegraphics[width=0.4\textwidth, angle=-90]{figs/diagonal}
\end{figure}
```

```
\noindent
```

```
$A_s:=a_1\cdot a_2$ -- area \dotfill $A_s\cdot \left( \text{inch}\text{\rm right} \right)^{-2}$\
```

```
By the foregoing formula
```

```
\[ d:=1.13\cdot \sqrt{\frac{A_s\cdot p}{T_s\cdot \cos(a)}}
```

```
";\;\;\;"
```

```
d\cdot \text{inch}^{-1} \]
```

```
Roughly this diameter is
```

```
%begin enviroment that is not printed in \CalcTeX\ but is calculated by \CalcTeX\
```

```
\texblanche{
```

```
;%d_{base}:=d$
```

```
$d:=\text{round}(d\cdot \text{inch}^{-1},0)\cdot \text{inch}$ % round d value up to 1 times 10^{0} of inch
```

```
% \hfill $d_{\inch}\cdot \inch^{-1}$
}
%end of texblanche enviroment
$d \cdot \inch^{-1}$ or
$d \cdot \mm^{-1}$
\texblanche{%begin of \texblanche enviroment
$d:=round(d,3)$ %<-- round of d value
}% end of \texblanche enviroment
and this diameter in milimeters roughly is
\texblanche{%begin of \texblanche enviroment
$d:=round(d,3)$ %<-- round of d value up to 10^{-3} \times meter
}% end of
$d\cdot \left( \mm\right)^{-1}$."
```