

# Paroc TOP

## Thermal optimizer Programme for Insulation

### Instruction manual

## Installing the program

1. **Open** the zip-file attachment
2. **Extract** the zip-file on to your computer, e.g. in folder C: \. The program creates a folder C:\PAROC TOP 2008.3
3. **Start the installation** by selecting **setup.exe** from the folder
4. Go on (select **next ..**) follow the instructions of the installing program
  - o The installing program proposes C:\Program Files\PAROC TOP 2007.11, as the target folder.  
If you want to install the program to this folder, select **next**,  
If you want to install the program to another folder, select **browse** and select the folder you want
5. Select **finish** to complete the installation



## Using the program

The installed program will **start** by clicking the **Paroc TOP.exe** -icon.



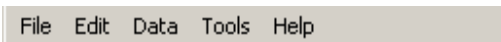
Select language (if needed): **Tools / Setup** /drop-down; **User interface language, Printout language**  
(Työkaluja /Asetukset / drop-down; Käyttöliittymäkieli, Tulostuskieli)

## Dialogue of the program

The **opening page** provides the general information about the program, read it through. To move forward from the page, click **OK**.

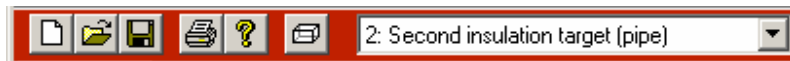


- **The Header** (blue) shows the program's version number/ identifier of the database-\ File, in which the program is saved in



On the **Action bar** are File-, Edit-, Data-, Tools-, and Help- drop-down menus.

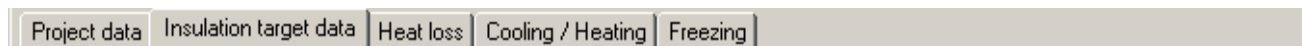
The screenshot shows the main window of the Paroc TOP software. The title bar reads "PAROC TOP Version 2007.11 / data PG - C:\Program Files\PAROC TOP\PAROC TOP ALL asennettu\Project\demo.PCI". The menu bar includes "File", "Edit", "Data", "Tools", and "Help". Below the menu bar is a toolbar with icons for file operations and a dropdown menu currently showing "2: Second insulation target (pipe)". To the right of the toolbar, the standards "ISO 12241" and "SFS 3977" are displayed. The main area has tabs for "Project data", "Insulation target data", "Heat loss", "Cooling / Heating", and "Freezing". The "Project data" tab is active, showing fields for "Last saved", "Project" (filled with "Demo Project"), "Customer" (filled with "Demo Company"), "Address" (filled with "Demoland"), "Reference", "Originated by", and "Information". At the bottom, there is a logo with red and white diagonal stripes, the text "Paroc TOP Thermal Optimizer Programme for Insulation", and the "PAROC" logo.



- On the **Tool bar** are the opening buttons for the Project-folder, Save-button for the Calculation-file, the Print-button, the Information-button, as well as the insulation target's drop-down menu and selection.

### Selection Windows ("tabs")

For the purpose of executing and processing the calculations, the program's dialogue contains a header row, toolbar, five selection windows ("tabs"), into which data can be inserted, as well as fields for the products and/or values.



### Project's starting value -window

The calculation can be processed as a project involving several insulation targets (e.g. different pipe sections, ducts, level surface insulation targets etc.), if so wanted. In this window the project can be named and all related information can be fed (customer, address, reference, etc.) These do not need to be filled out.

The insulation target is named in the Insulation target's starting value -window.

This information will show in the printouts.

Project	Demo Project
Customer	Demo Company
Address	Demoland
Reference	
Originated by	
Information	

In the **Insulation target's starting value** -window the target can be named and the type chosen.

Description	Second insulation target (pipe)
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Different insulation targets can be incorporated into the project (such as pipe sections, ducts, etc.)

If the different targets share the same starting values, it is advisable to copy the insulation target by choosing **Edit/Copy target**. Then, you need to rename the copied target and change only the values that differ from the original ones.

Insulation target -panel

Choose the type of insulation target:

- **Plane surface/vessel**
- **Pipe** and its diameter
- **Circular duct** and its diameter
- **Rectangular duct** and its dimensions

Choose the measurement for surface temperature;  
**outer-/inner- surface**

Indata panel		
Temperature of contents	<input type="text" value="300.0"/>	°C
Relative humidity	<input type="text" value="0.0"/>	%
Ambient air state		
Location	<input type="text" value="Undefined"/>	
Ambient temperature	<input type="text" value="20.0"/>	°C
Relative humidity	<input type="text" value="50.0"/>	%
Ambient air velocity	<input type="text" value="0.00"/>	m/s

Indata-panel  
target's starting values and  
**annual costs**

For the **location** you can choose the location defined in the weather data-dialogue or alternatively the undefined option, where you fill in the **ambient temperature** and the **ambient air velocity** of the insulation target.

Annual costs

The **Annual cost**-button takes you into the annual cost-dialogue, where the necessary values for calculating the economic insulation thickness is filled into the fields:

- **The implicit price increase of energy** % / a
- Investment's **lifetime** a
- **Energy price** EUR/ MWh
- **Annual usage** h/a
- **Imputed rate of interest** %

## Heat Loss -selection window

In this view, the heat loss and surface temperature is calculated for the insulation target.

**PAROC TOP Version 2007.11 / data PG - C:\Program Files\PAROC TOP\PAROC TOP ALL asennettu\Project\demo.PCI \***

File Edit Data Tools Help

2: Second insulation target (pipe) ISO 12241 SFS 3977

Project data | Insulation target data | Heat loss | Cooling / Heating | Freezing

Pipe, Outer diameter 273 mm

**Calculation case**

☒ Heat loss, surface temperature  
☐ Economic insulation thickness

☐ Allowed heat loss 0.0 W/m  
☐ Allowed inner/outer surface temperature 0.0 °C

☐ Perspiration stop inner/outer surface

**Insulation data**

Insulation	Nominal thickness [mm]	Thickness [mm]	Inner diameter [mm]	Outer diameter [mm]	Thermal conductance [W/m²C]	Price [€/m]
PAROC Section 140	50	51	273	375	0.0657	0.00
PAROC Section	80	82	406	570	0.0443	0.00
No insulation		0	0	0	0.0000	0.00

Insulation thickness summary [mm] 133

Surface material: Hot galvanized steel Emissivity: 0.30

Calculate Copy to clipboard Print Look table

**Results panel**

Heat loss: 129.0 W/m Dewpoint of air: 9.4 °C  
 External surface temperature: 35.5 °C Annual costs in total: 42.31 €/m (including labour cost)

The window is divided into panels: Calculation case, Insulation data and Results panel.

Project data | Insulation target data

Pipe, Outer diameter 273 mm

Calculation case

The diameter of the chosen pipe or duct is visible on the left above the Calculation case panel.

**Insulation data**

Insulation	Nominal thickness [mm]	Thickness [mm]
PAROC Section 140	50	51
PAROC Section	80	82
No insulation		0

Insulation thickness summary [mm] 133

## Heat loss -selection window

There can be between 0-3 insulation layers.

The innermost insulation is picked in the first field and the rest of the layers will follow downwards.

The program automatically picks a suitable size insulation from Paroc-(pipe section)insulations to fit each pipe's outer diameter. The user may choose either Paroc Oy -insulation to be used or define some other insulation (other than Paroc-insulation)

In case a suitable size is not available, the user may define the size themselves. In this case, also a heat conductivity value must be given (Note: the value must be the average temperature of the required insulation in the calculation in question). The user may define the insulations themselves in the section: data/insulation data/other insulations.

The 'Insulation data' dialog box contains a list of insulation products. The selected product is 'sPAROC Wired Mat 100'. Other products in the list include PAROC Mat 35 AluCoat, PAROC Wired Mat 100, PAROC Wired Mat 100 AL1, PAROC Wired Mat 100 AluCoat, PAROC Wired Mat 35 AluCoat, PAROC Wired Mat 80, PAROC Wired Mat 80 AluCoat, sPAROC Lamella Mat 50 AL7, sPAROC Mat 30, sPAROC Mat 30 N10, sPAROC Mat 35 AluCoat, sPAROC Wired Mat 100 AL1, sPAROC Wired Mat 100 AluCoat, sPAROC Wired Mat 35 AluCoat, sPAROC Wired Mat 80, sPAROC Wired Mat 80 AluCoat, PAROC Lock, PAROC Lock 140, PAROC Section, PAROC Section 140, PAROC Section 140 F3, PAROC Section AluCoat, PAROC Section F3, and PAROC Section G1.

**s in front of the product name:**

(e.g. **sParoc Wired Mat 100**)

For **Mat products** two alternative expenditure specifications have been placed in the data base:  
1) Expenditure taking into account the product's **price list-price**

2) Expenditure taking into account the product's **price list-price** and **support rings** (= **s** in front of the product name )

If a pipe is insulated by mat, the support rings of the coating are necessary. Pipe sections do not need the support rings.

For the **surface material** you can pick the outermost insulation's own surface material or some other option from the selection window.

The 'Surface material' dialog box includes a 'Surface material' dropdown menu (currently showing 'Hot galvanized steel'), an 'Emissivity' field (showing '0.30'), and a 'Calculate' button.

**Calculate**-button starts the calculation process.

## Heating/Cooling-window

Heat loss must be calculated before the cooling/heating calculation.

In this dialogue the values of the insulation's contents are given;

- the substance flowing within the pipe/duct, if a pipe or duct has been chosen as the insulation target
- the substance in the vessel/tank, if a vessel or plane surface has been chosen as the insulation target

Substance flowing in the pipe

The program **calculates the temperature change °C/meter** according to given starting values. The results will also show the final temperature at a meter's distance.

Stationary substance (tank/vessel)

The program calculates **cooling/heating time** according to given starting values.

## Freezing

Before calculating the cooling, the heat loss must be calculated. The freezing times of the contents of the pipe is calculated in the window:

- Time until the substance **begins to freeze**
- Time until the substance **is completely frozen**

The values in the window can not be changed.

The calculations are executed in separate windows of the program by clicking the **Calculate**-button.