

Technical Insulation

ISOVER TechCalc 2.0
Thermal Calculation Software

For personal safety, process security and energy efficiency in Industry, HVAC and Marine applications

SAINT-GOBAIN 350

ISOVER SAINT-GOBAIN


GLAVA®

TechCalc 2.0 –
The professional thermal insulation calculation sofware

Thermal calculation @ ISOVER

Inside TechCalc 2.0 Saint-Gobain ISOVER brings together decades of theoretical and practical experiences in thermal insulation calculation and design.

For more than 125 years ISOVER has offered insulation systems, standards and guidelines for the optimisation of technical installations. Since the 1990's ISOVER has introduced innovative calculation software tools.

TechCalc 2.0 is the latest step of this long-term development to offer to you the most up-to-date, easy to handle, reliable and efficient tool for all kind of thermal calculations in technical insulation related applications such as HVAC piping and ducting, industry process equipments or even Marine and Offshore installations.

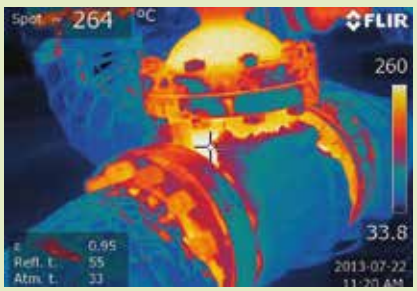


www.eiif.org

ISOVER is proud to be a founding member of the EiiF – the European Industrial Insulation Foundation promoting sustainability through industrial insulation.

Industrial insulation can be a more powerful contributor to a sustainable future considering that 26% of worlds energy is consumed and 50% of all CO_2 emissions are produced by the industry. Despite this, reduction of heat loss by better thermal insulation is still often not considered. EiiF certified TIPCHECK engineers of ISOVER can through thermal performance audits detect these losses and with tools like TechCalc easily calculate benefits and cost reductions for better insulation in industrial plants.





for technical applications

How TechCalc supports your work

With TechCalc 2.0, the international thermal calculation tool of ISOVER, planers, designers, insulation contractors and anyone else involved in thermal design of technical equipments in HVAC, Industry or Marine can calculate thermal-efficient constructions quickly, easily and with reliable results.

TechCalc 2.0 uses calculation procedures according to ISO standard 12241 and other supporting engineering rules and guidelines such as VDI 2055.

With its intuitive, easy to use interface and supporting databases, TechCalc helps to perform these calculations in the most efficient way.

What's new in TechCalc 2.0

TechCalc 2.0 – Mobile, fast and more advanced!

With its second release TechCalc 2.0 comes now in a completely new design and with a guided step-by-step menu structure. The interface is adapted to mobile devices – so that you can use TechCalc also directly at the jobsite if necessary with your Android or iOS tablet.

The supporting databases have been increased and further functions added.

To enable you to design installations with best economic and environmental fit you can now easily calculate operational costs, CO_2-savings, amortisation of insulation work and economic thickness calculations.









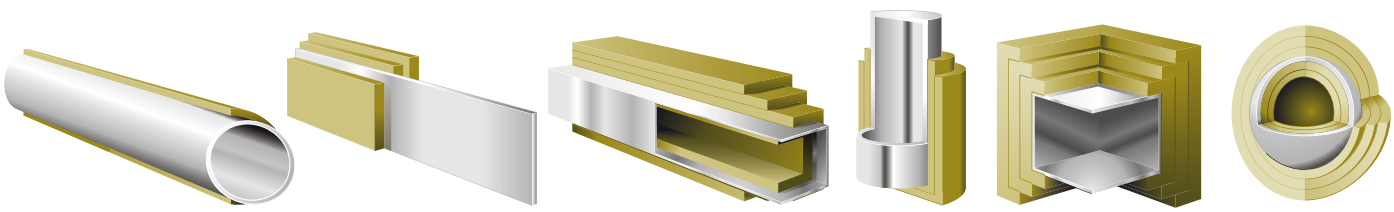


Calculation methods – All included in TechCalc 2.0

For each task you have concerning thermal insulation design, TechCalc 2.0 provides you with the right calculation method and the right solution.

	Thermal **heat flow** and **surface temperature** – to check if you are in line with the specification requirements		**Temperature drop** over time for inactive/ stored media
	Required insulation thickness depending on thermal heat flow and/or surface temperature given in the specification for a chosen insulation design		Temperature drop **along pipe lines**
	Calculation of **operating costs, CO_2 savings and amortisation of insulation work**		Calculation of **heat loss of buried pipes**
	Calculation of **economic insulation thickness that can be** compared to uninsulated or alternative insulation design		**Prevention of freezing** in water pipes
	Minimum insulation levels required to **prevent condensation avoiding risks of corrosion**		**Multiple-layer** insulation constructions with up to 2 layers of internal and up to 10 different layers of outer insulation
U R	Calculation of **U-values and R-values**		**Thermal bridges** database and function for even more precise thermal calculations

6 profiles that allow to cover all shapes such as pipes, ducts, walls, spheric, cylindrical or cubical tanks/equipments



Supporting open databases – Customize your TechCalc 2.0

TechCalc 2.0 integrates several open databases. Helping you to save time for your calculations. Allowing you to expand and structure them with your own data.



Insulation
- open product database, catalogue structure
- preset of all ISOVER technical insulation products as well as market and/or country-adapted product ranges
- additional standard values of all typical insulation materials used in technical insulation

Climate
- preset of various local climate data such as average temperatures and humidity-index
- easy to extend and to customize



Medium
- preset of thermal characteristics of frequently used media such as air, water, steam, oil depending on temperature and pressure

Thermal bridges
- extensive catalogue on thermal bridges and their thermal effects
- differentiation of thermal bridges in the installation (e.g. joints) and structures (supports, spacers)

Cladding
- predefined set of different cladding materials and their emissivity values
- ability to add own cladding materials or free values e.g. given by specification



Extensive help
- help function provides background information on calculation principals, calculation methods used and user input required
- software checks input automatically, indicates errors or irregular input



TechCalc – from theory to practice

5 steps, that‘s all what it takes to get the best result!

1 2 3







1. Choose your components

- All standards profiles: pipes, walls, ducts or tanks (cylinder, cube or sphere)
- As many components as you want to calculate

2. For each component, choose a standard calculation method

- Heat loss/gain and surface temperature
- Minimum insulation thickness
- Condensation prevention or freezing prevention
- Temperature drop (in a tank or along a pipe)
- Buried underground pipes
- Operational costs

3. Choose the media

A preset of standard media characteristics depending on temperature and/or pressure is available as a supporting database.
Alternatively it is also possible to use free or predefined values given by the specification.



Inputs

Just a few data is necessary to start calculating within TechCalc.
Most of your possible choices for this inputs are supported by databases so you can introduce them directly or you can choose them from a list of possible values offered by the software.
VDI and CINI list of materials are e.g. included.

More options for the professional user...

1. Thermal Bridges

Thermal bridges are discontinuities in any thermal barrier and are even more pronounced when the material creating the bridge is highly conductive. In addition to the heat loss and gain that can occur at thermal bridges, condensation problems may also occur. In many cases, heat losses caused by thermal bridges represent a real **important percentage of total losses** and they must always be taken into account.

TechCalc 2.0 is a tool where **thermal bridges calculations** are **fully integrated** within the calculation methods.

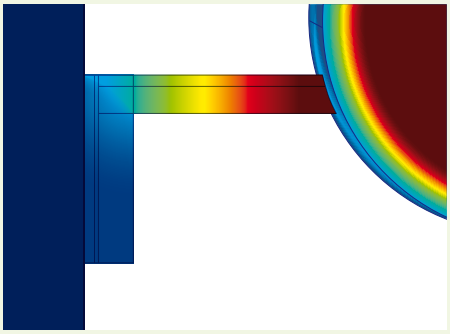
It not only includes the values that affect the declared value of conductivity ($\lambda_{declared}$) and its correction through $\Delta\lambda$ value as it's referred in **ISO 23993** for spacers, but also those values affecting other elements commonly used in industrial installations as valves, flanges and any other fittings.

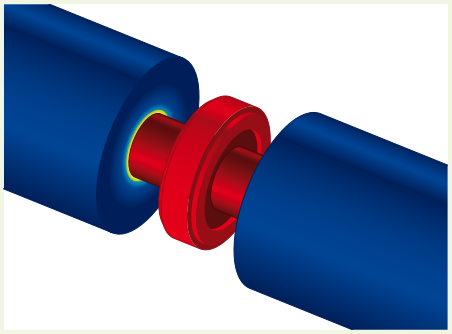


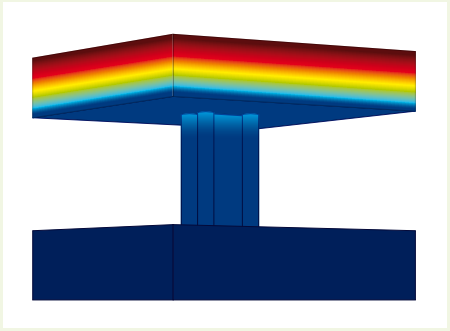
Two different methods are offered to the user to perform the calculations:

- Pipe equivalent length
- Free input of global factor z_x

An **extended database** with different kind of fittings is included in the software and using them is as easy as doing just one click. The full content is supported by **ISO 12241** and **VDI 2055**. Nevertheless, as it is our philosophy regarding TechCalc 2.0, the database is opened and user can add new values.
In coming versions **VDI 4610** values will be available inside the database as well.







2. Operational costs

Energy costs are becoming a real issue in industrial installations since energy costs are increasing and the tendency for the coming years will be increasing even more. Any heat loss can be translated immediately in money or even in CO_2 emissions. As it's been demonstrated by ECOFYS report done for EiiF (European Industrial Insulation Foundation), there is still a large potential in European Industry to save a huge amount of energy and CO_2 emissions.

Many times energy losses are not exactly perceived as an opportunity for money savings and for improving environmental aspects that concerns the entire society. In TechCalc 2.0 a new module for calculating operating costs, CO_2 savings and amortization of insulation cost has been incorporated.

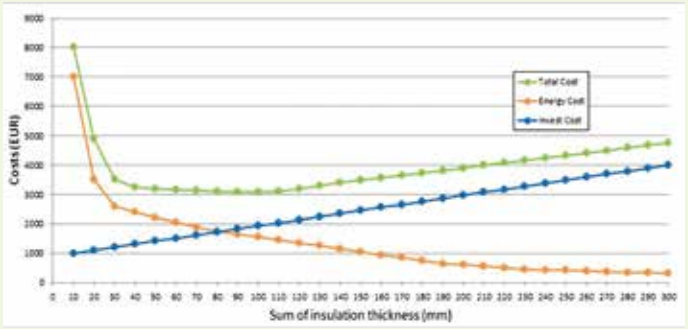
Most of times, pay-back for insulation investments is less than one year but it is something not really well known. Through this new software functionality it is easy for user to test in advance how fast the money he is investing in insulation of plants will be back into his pocket and how much CO_2 emissions he will be avoiding.



There is a database incorporated with the most common energy sources. As everything in TechCalc 2.0, it is easy and intuitive.

Just some data, one click and ready!

Summary	Uninsulated	Version 1	Savings
Heat loss	15806.38 W/m	233.08 W/m	15573.3 W/m
Heat loss (Area insulated)	8385.35 W/m^3	41.22 W/m^3	8344.13 W/m^3
Total heat loss	15806.38 W	233.08 W	15573.3 W
T-Surface	499.58 ºC	11.42 ºC	
Energy consumption (6600h)	104322.1 kW	1583.3 kW	102783.8 kW
Operational cost	4172.88 EUR/a	61.53 EUR/a	4111.35 EUR/a
Insulation costs	0 EUR	4000 EUR	-4000 EUR
Payback period	--	--	0.97 a
CO2 Emission	49103.79	724.07	49379.72



4 5 Results



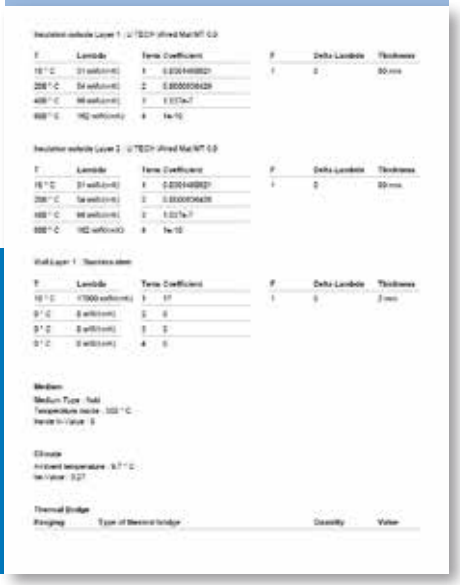


4. Choose your ambient conditions
TechCalc offers a supporting database with climatic data for various regions and locations.
Alternatively it is also possible to use free or predefined values given by the specification.

5. Choose your insulation
TechCalc includes all ISOVER technical insulation standard products as well as a range of other insulation materials with general values of thermal conductivity and other key performance data.

With an open product database the user can easily customize and add other insulation products from a manufacturer's technical datasheet with only a few simple clicks.





Outputs

All previous calculations of different profiles and up to 5 different versions of insulating solutions can be easily and rapidly compared and optimized on thermal efficiency, space requirements and economic criteria.
The final result can be extracted either as a PDF file, graphical display and/or an unformatted text file which can be easily copied into a quotation letter.

www.verhaert-design.de

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