

## Thermal Energy Auditor

Become an EiiF certified TIPCHECK Expert



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Offer thermal energy audits in line with EN 16247/ISO 50002

Become an expert in analysing the performance of insulation systems

Help industry to save money, energy and reduce emissions

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**WE POWER SUSTAINABILITY**

“

You don't know  
what you don't know,  
until you know.

”

Typical reaction of a client realising  
how much money and energy he is wasting  
when reading the results of a TIPCHECK  
thermal energy audit report.

# Get yourself certified as a TIPCHECK Expert

EiiF-trained Thermal Energy Auditors help industry to save energy and reduce CO<sub>2</sub> emissions and production costs

The European Union has set itself an ambitious goal: to be climate-neutral by 2050, with net zero CO<sub>2</sub> emissions. Decarbonising EU industry is one of the major challenges to reach this target.

Considering the current annual level of CO<sub>2</sub> emissions in the EU 27 (EEA 2017: 3.853 Mt), it is clear that this goal can only be achieved with the support and participation of all key sectors including the EU's industry and energy supply, accounting for 49% (EEA 2017) of the EU's emissions.

The EiiF Study 2021 analyses that 14 Mtoe of energy can be saved by improving insulation standards in industry, offering the potential to reduce the EU's CO<sub>2</sub> emissions by 40 Mt every year.

Within the framework of its TIPCHECK (Technical Insulation Performance Check) Programme, the EiiF organizes qualification and training courses for insulation engineers to become EiiF-certified thermal energy auditors, so called TIPCHECK Experts. TIPCHECK Experts are trained to ensure high quality thermal energy audits focusing on the thermal performance of insulation systems, and are able to calculate - through the TIPCHECK and TBI tools - a facility's savings potential in terms of money, energy, and CO<sub>2</sub> emissions.

The TIPCHECK Programme has already resulted in EU-wide annual energy savings of more than **70 ktoe** or **814.000 MWh** - equivalent of the energy consumption of more than **50.000** European households\*

## EVALUATE

The amount of money and energy a facility is losing in its current state

## QUANTIFY

The multiple benefits of a cost-effective and sustainable insulation system

## DEMONSTRATE

All the benefits of a more efficient insulation system

Over 100 experts are already certified TIPCHECK Experts. See the list here: [www.eiif.org/tipcheck/certified-experts](http://www.eiif.org/tipcheck/certified-experts)

\*1.36 toe/household average energy consumption in the EU  
Source: [www.odyssee-mure.eu](http://www.odyssee-mure.eu)



# Why TIPCHECKs offer multiple benefits to industry

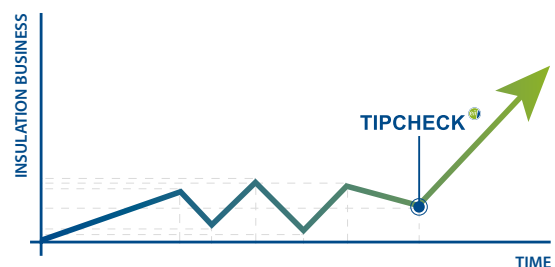
The TIPCHECK Programme is a non-invasive investigative tool that delivers multiple energy and non-energy benefits to the energy user, supply system and the economy

In any industry, the three top operating expenses are often found to be energy (both electrical and thermal), labour and materials. If one were to assess the manageability of the cost or potential cost savings in each of the above components, energy would invariably emerge as a top ranker, and thus energy management function constitutes a strategic area for cost reduction. However, clients are not necessarily and not always aware how much energy they are wasting, as they usually are not aware how easy and quick it is to stop the energy waste with properly insulated systems/installations.

Industrial insulation is a proven technology delivering multiple benefits:

- › reduces energy and production costs
- › increases energy efficiency
- › reduces CO<sub>2</sub> emissions
- › improves process efficiency
- › reduces safety risks for personnel and equipment
- › increases competitiveness

The aim of the TIPCHECK Programme is to provide industry with a standardized, high quality thermal energy audit tool in line with EN 16247 and ISO 50002 focusing on the thermal performance of technical insulation systems.



**75%** of the TIPCHECKs lead to insulation investments

**50 million EUR** was the total insulation contract volume generated by 2020 from about 2.500 TIPCHECKs\*

The payback periods for the initiated TIPCHECK insulation projects were in most cases **2 years or even less**



**"Decarbonising industry with rapid payback"**

Eiif White Paper 2021

[www.eiif.org/publications](http://www.eiif.org/publications)



**Eiif National Fact Sheets**

Country-specific total energy saving and emissions reduction potential after consequently improving insulation solutions in industry

[www.eiif.org/publications](http://www.eiif.org/publications)

*\*estimation based on investments with an average payback of 2 years and an energy price of 0,03 €/kWh*



# The proof: Case Studies

## # 1. The TESLA example

Insulating ONE valve drives an electric car 20.000 km

### Industrial processes are energy intensive

To keep process temperatures in industry at high levels (up to 600 °C and more), an intensive energy input to the system is needed. High temperatures lead to high heat losses on uninsulated equipment adding to an intensive energy consumption of the system.

### Typically uninsulated equipment

The TIPCHECK thermal energy audit experience shows that valves and flanges in industrial plants are typically uninsulated. The energy loss can be detected and illustrated with infrared thermography.



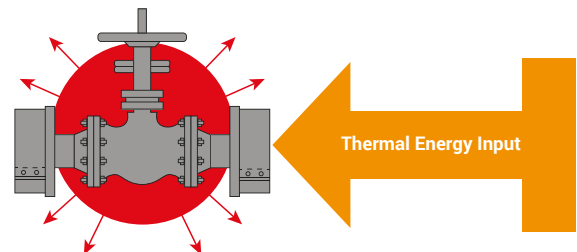
One uninsulated valve:

Size: DN 150/6 inch

Temperature: 150 °C / 302 °F

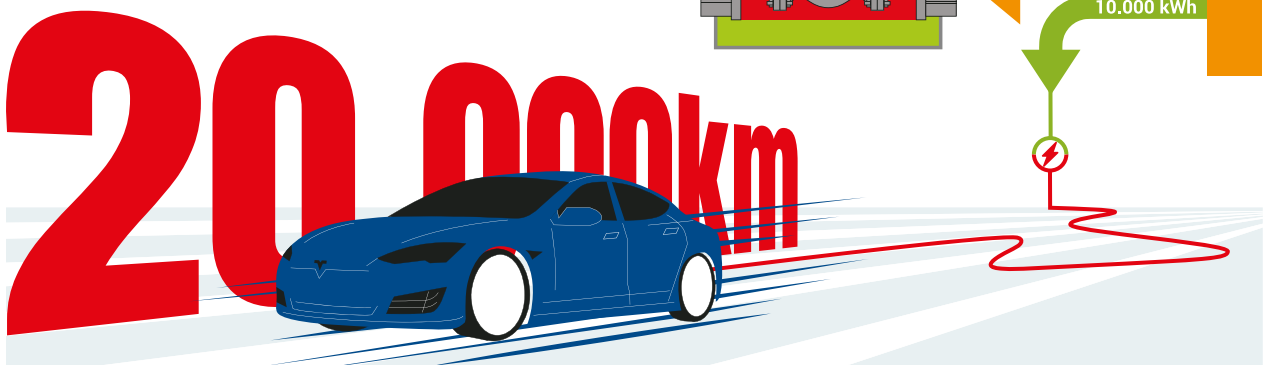
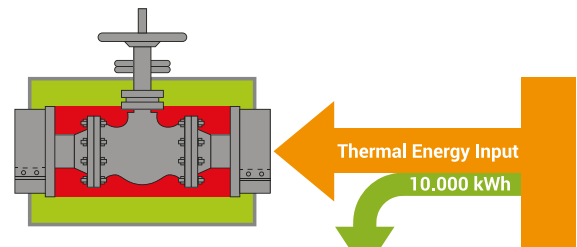
Operational time: all year (8.760 hours)

**Annual energy loss: 10.600 kWh**



### By insulating the valve 10.000 kWh can be saved

Transforming the saved 10.000 kWh thermal energy with a 40% thermodynamic efficiency into 4.000 kWh electric energy and using this to charge the battery of a TESLA Model S, one could drive more than 20.000 km.





## # 2. Refinery | Oil storage tank roof

Storage temperature: 60 °C / 140 °F

### Before

Old and damaged insulation on the roof

CUI problems: roof sheets heavily corroded

The roof had to be replaced

### After the TIPCHECK

Saved **7.500 MWh** of energy / year

Saved **€185.0000** per year

Payback time less than **2,5 years**

CO<sub>2</sub> emission reduction potential **1.500 t/year**

*Results against uninsulated with an optimised insulation applied with a technical solution avoiding CUI problems*

## # 3. Chemical Plant

Process temperature: from 75 °C/ 167 °F to 150 °C/ 302 °F

### Before

650 m of piping with missing or damaged insulation

300 uninsulated pairs of flanges

160 uninsulated valves

3 uninsulated tanks

### After the TIPCHECK

Saved **11.100 MWh** of energy / year

Saved **€200.000** per year

Payback time less than **1 year**

CO<sub>2</sub> emission reduction potential **2.240 t/year**

## # 4. Sugar Beet Processing Plant

Process temperature: 100 °C/ 212 °F

### Before

198 infrared pictures taken

419 hot spots/pieces of uninsulated equipment identified, e.g. boilers, evaporation and cooking pans, heat exchangers, pumps and valves

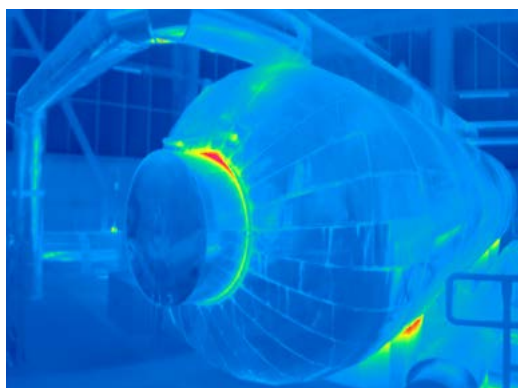
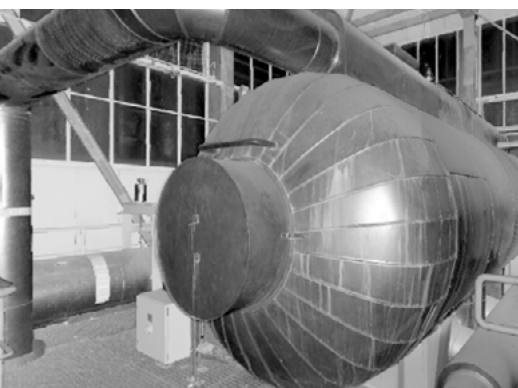
### After the TIPCHECK

Saved **8.200 MWh** of energy per year

Saved **€37.000** per year

Payback time about **2 years**

CO<sub>2</sub> emission reduction potential **1.400 t/year**



# Structure and contents TIPCHECK Training Package

Since 2010 Eiif has trained more than 200 professionals from some of Europe's most successful insulation related companies.

Our courses are designed to give a competitive advantage: attendees gain the skills, knowledge, and insights to better understand the principles of heat loss calculations and the organisation of an EN 16247/ISO 50002 aligned and standardized thermal energy audit.

Besides the training offers an inspiring and fruitful interaction with some of the best experts and technical insulation professionals: all courses are practical, and 'hands-on', taught by industry experts, in a collaborative and open environment enabling industry peers to exchange ideas and knowledge.

## COURSE CURRICULUM

### 1. About Eiif and TIPCHECK

### 2. TIPCHECK training & simulation

- » TIPCHECK marketing & sales
- » TIPCHECK execution and project management (EN 16247/ISO 50002)
- » How to measure (incl. an introduction to thermography)
- » How to calculate heat losses with the TIPCHECK calculator software
- » Rules of Thumb to quickly estimate saving potentials
- » How to write and present a TIPCHECK report

### 3. TIPCHECK insulation theory

- » Thermal conductivity and basic principles of heat loss calculations
- » Insulation materials and their application (overview)
- » Processes & components offering saving potentials

### 4. TBI introduction

- » TBI-App introduction
- » How to perform a TBI Inspection
- » How to generate and present a TBI-Report

### 5. Guided tour: FIW München laboratories

## TRAINING COURSE FEATURES

- » Face-to-face interactive training
- » Complete simulation of a TIPCHECK
- » Practical workshops
- » Small class sizes
- » Industry professionals as trainers
- » Checklists, guidelines and templates

## BENEFITS FOR TIPCHECK EXPERTS

- » TIPCHECK Calculator licence
- » TIPCHECK Creator & Viewer
- » TBI-App annual licence
- » Post-training technical support
- » Regular online refresher trainings



Candidates who successfully complete the programme and pass the final exam also receive the **TIPCHECK Expert certificate**



## WHO CAN ATTEND?

Our training is open to all industrial businesses - from small businesses to large corporations - and are designed for:

- insulation experts with at least 2 years of experience in industrial insulation projects
- asset owners and their senior management, their sustainability and environmental staff, operations and facilities managers
- certified energy auditors and energy managers
- consultants

Our courses are also suitable for energy efficiency service providers, industry associations, business groups, local councils and non-profit organisations. The courses are exclusive to Eiif members; however, the TIPCHECK Corporate Expert training course is open to non-members as well, provided that special conditions are met.

## REQUIREMENTS

TIPCHECK Corporate Expert	TIPCHECK Expert Level 1	TIPCHECK Expert Level 2	TIPCHECK Expert Level 3
<ul style="list-style-type: none"> <li>• Employee of an insulation using company (e.g. asset owner)</li> </ul>	<ul style="list-style-type: none"> <li>• Employee of an Eiif Member company</li> </ul>	<ul style="list-style-type: none"> <li>• Holder of TIPCHECK Expert level 1 certificate</li> </ul>	<ul style="list-style-type: none"> <li>• Holder of a TIPCHECK Expert level 2 certificate</li> </ul>
<ul style="list-style-type: none"> <li>• ≥ 1 year of experience in industrial insulation with general understanding of the thermal calculations and the designing of technical insulation systems</li> </ul>	<ul style="list-style-type: none"> <li>• ≥ 1 year of experience with general understanding of thermal calculations and the designing of technical insulation systems</li> </ul>	<ul style="list-style-type: none"> <li>• ≥ 2 years of experience in calculating and designing technical insulation systems</li> </ul>	<ul style="list-style-type: none"> <li>• ≥ 7 years of experience in calculating and designing technical insulation systems</li> </ul>
<ul style="list-style-type: none"> <li>• Attendance at TIPCHECK training course (5 days) with passing the exam</li> </ul>	<ul style="list-style-type: none"> <li>• Attendance at TIPCHECK training (5 days) with passing the exam</li> </ul>	<ul style="list-style-type: none"> <li>• TIPCHECK Reports (≥ 5 big or ≥ 15 small TIPCHECKs**) submitted to, and quality-approved by Eiif</li> </ul>	<ul style="list-style-type: none"> <li>• Qualified candidates are nominated by Eiif</li> </ul>
<ul style="list-style-type: none"> <li>• Limited to corporate use only (TIPCHECKs at own production facilities)</li> </ul>	<ul style="list-style-type: none"> <li>• TIPCHECKs with supervision* by Eiif or a TIPCHECK Expert Level 2 or 3</li> </ul>		
<ul style="list-style-type: none"> <li>• Participation in quarterly TIPCHECK online refresher trainings recommended</li> </ul>	<ul style="list-style-type: none"> <li>• Regular participation in quarterly TIPCHECK online refresher trainings (≥ 2 per year)</li> </ul>		
<ul style="list-style-type: none"> <li>• Reporting to Eiif is optional (e.g. to get support)</li> </ul>	<ul style="list-style-type: none"> <li>• Annual reporting of TIPCHECK activities to Eiif</li> </ul>		
<ul style="list-style-type: none"> <li>• Payment of the annual TIPCHECK licence fee</li> </ul>	<ul style="list-style-type: none"> <li>• Payment of the annual TIPCHECK licence fee</li> </ul>		

\*A person certified at Level 1 has demonstrated the ability to perform a TIPCHECK under the supervision of Eiif and/or a TIPCHECK Expert Level 2 or 3.

\*\*Based on the number of inspected equipment. A big TIPCHECK equals >100 inspected components and an investment of >50,000 EUR or ≥5 pieces of equipment (such as large ovens), with an insulation investment of >50,000 EUR. All other TIPCHECKs fall into the category of "small TIPCHECKs"

We also offer tailored Eiif Sustainability Workshops, either online or on-site. The workshops are ideal for up to 12 participants. The participants receive a TIPCHECK Ambassador certificate and there is no final exam. Please contact us for more details.





## TIMETABLE EXAMPLE: DAY # 4

TIME	SUBJECT	DESCRIPTION
08.00-08.45	<b>Theory</b>	Economics
08.45-09.45	<b>Theory</b>	Insulation materials
09.45-10.00	Coffee Break	
10.00-11.00	<b>Practice</b>	FIW laboratory: Materials and testing
11.00-12.00	<b>How to TIPCHECK</b>	Step 5: Analysis, solutions and costs
12.00-12.45	Lunch Break	
12.45-13.30	<b>How to TIPCHECK</b>	AGI Q 07 Inspection intervals
13.30-14.30	<b>How to TIPCHECK</b>	TIPCHECK Calculator
14.30-14.45	Coffee Break	
14.45-15.30	<b>How to TIPCHECK</b>	TIPCHECK Creator & Viewer
15.30-16.30	<b>How to TIPCHECK</b>	Steps 6 and 7: Writing the TIPCHECK Report and presentation
16.30-17.00	<b>General</b>	Open questions

## TRAINING

### 5-day training schedule

Monday to Friday

### Location

FIW München Laboratories  
Lochhamer Schlag 4  
D-82166 Gräfelfing, GERMANY

### Training fee

**2.500 EUR** (TIPCHECK engineer, assistant, Expert, auditor)

**1.500 EUR** (TIPCHECK Ambassador)\*

\* The TIPCHECK ambassador participation is designed for sales and marketing specialists of EiiF Member companies who are joining the training together with one or more engineers from the same department / company.



### Upcoming courses

Check the dates of the next  
TIPCHECK Training courses  
[www.eiif.org/agenda](http://www.eiif.org/agenda)



### Book your place

Email [tipcheck@eiif.org](mailto:tipcheck@eiif.org)





# WE POWER SUSTAINABILITY

The European Industrial Insulation Foundation (EiiF) is an international Foundation headquartered in Switzerland.

As a neutral and non-profit institution, it promotes insulation as a top-of-mind method of enhancing sustainability and profitability.

Since its foundation, the EiiF has established itself as a resource for industries that need to reduce CO<sub>2</sub> emissions and save energy. Its programme raises awareness of the growing, much needed multiple benefits of insulation.

The EiiF was established in 2009 by 12 Founding Partners. Nowadays, it comprises more than 60 leading industrial insulation companies from global player size to small and medium-sized companies.



## EiiF Membership

See here which companies have already joined the EiiF network:

[www.eiif.org/members](http://www.eiif.org/members)



## EiiF Deed of Foundation

Read here about the purpose and the primary task of the Foundation:

[www.eiif.org/deed-of-foundation](http://www.eiif.org/deed-of-foundation)

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Visit: [www.eiif.org](http://www.eiif.org)



## ► TIPCHECK

EiiF's energy auditing programme to evaluate the performance of industrial insulation systems:

[www.eiif.org/tipcheck](http://www.eiif.org/tipcheck)

## ► TBI Tools

EiiF's insulation self-inspection and reporting tools to quickly check technical insulation systems:

[www.eiif.org/tbi](http://www.eiif.org/tbi)