ORDER: 387

PATH: Z:\1 COMMESSE\2023\387. Consulenza HEATILE\certificazione UNI EN 1264

CODE: Certification UNI 1264

HEATILE RADIANT SYSTEM "TECH-i"

TECHNICAL CONSULTING

Certification UNI EN 1264-2

Finite Element Analysis (FEA) 4.2

Client:	Heatile-H S.r.l. Via Arrigo Boito, 8 20121 - Milano (MI)
Professional:	Dott. Ing. Scrivanti Luca Vercelli's Order of Engineers N. 1223/A
Professional:	Ing. Mottalini Matteo EGE UNI CEI 11339 n°0094-SC-EGE-2016
Issue date:	February 02, 2025
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Document review:	00

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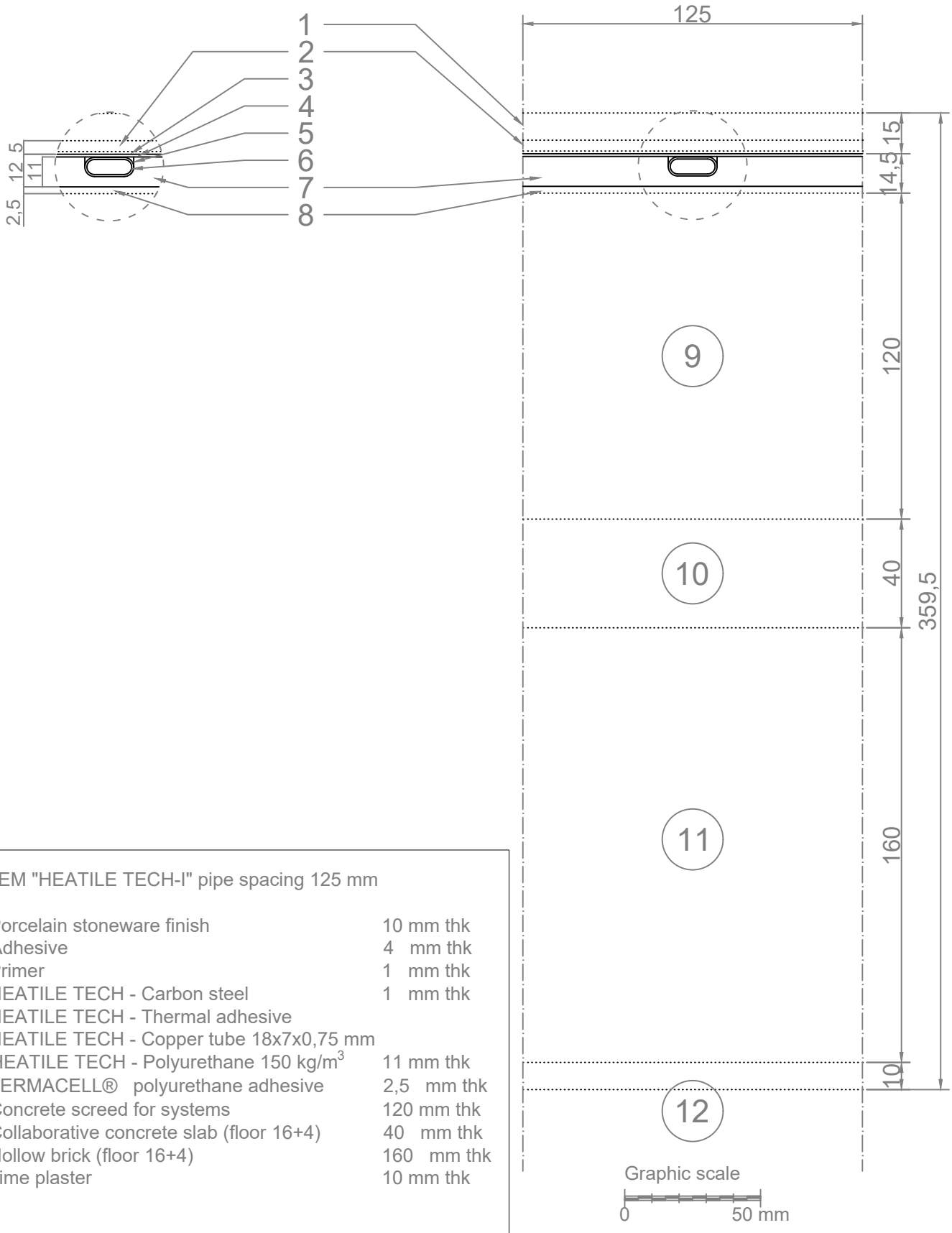
HEATILE TECH-I (1) SIMULATION
Input Data



SYSTEM "HEATILE TECH-I" pipe spacing 125 mm

1.	Porcelain stoneware finish	10 mm thk
2.	Adhesive	4 mm thk
3.	Primer	1 mm thk
4.	HEATILE TECH - Carbon steel	1 mm thk
5.	HEATILE TECH - Thermal adhesive	
6.	HEATILE TECH - Copper tube 18x7x0,75 mm	
7.	HEATILE TECH - Polyurethane 150 kg/m^3	11 mm thk
8.	FERMACELL® polyurethane adhesive	2,5 mm thk
9.	Concrete screed for systems	120 mm thk
10.	Collaborative concrete slab (floor 16+4)	40 mm thk
11.	Hollow brick (floor 16+4)	160 mm thk
12.	Lime plaster	10 mm thk

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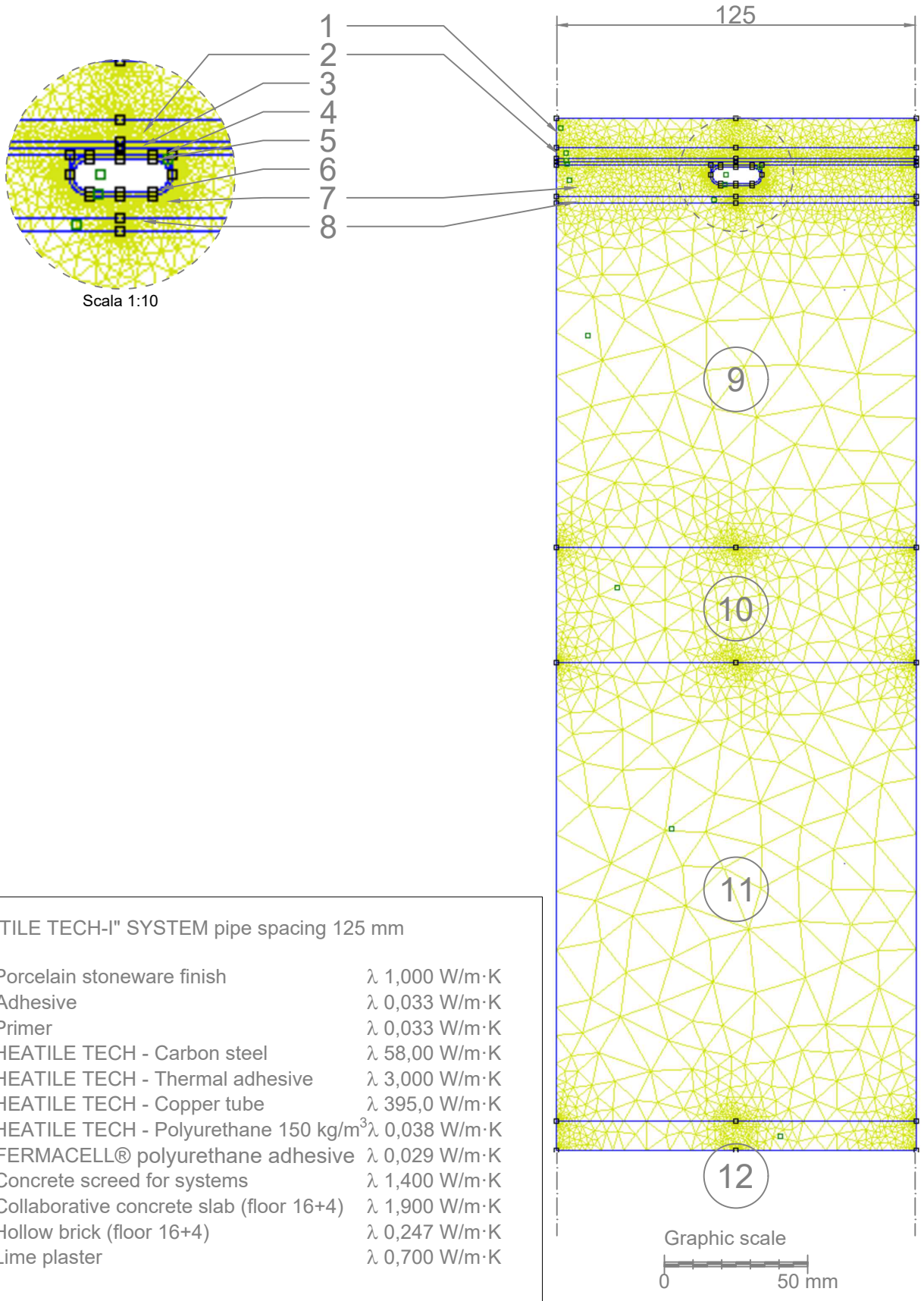
HEATILE TECH-I (1) SIMULATION
Mesh

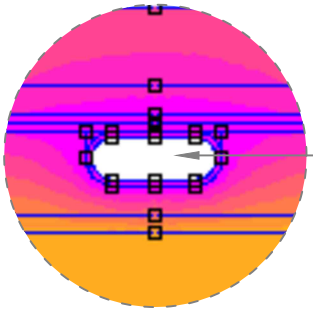


Scala 1:10

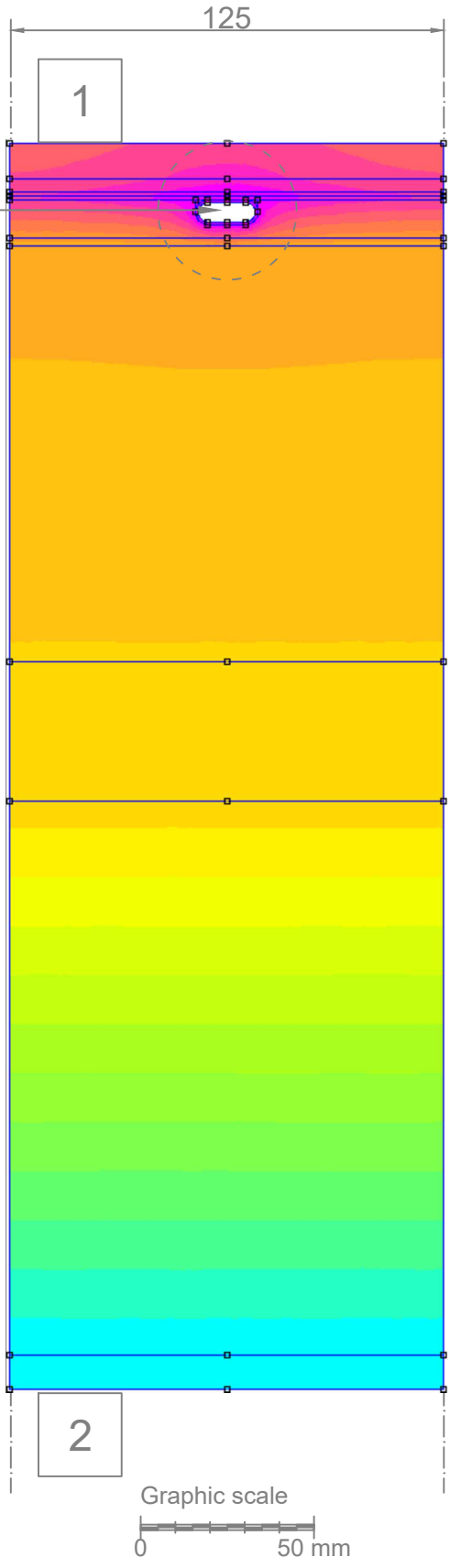
"HEATILE TECH-I" SYSTEM pipe spacing 125 mm

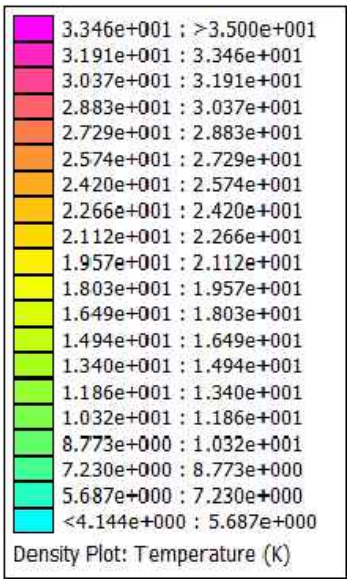
1.	Porcelain stoneware finish	λ 1,000 W/m·K
2.	Adhesive	λ 0,033 W/m·K
3.	Primer	λ 0,033 W/m·K
4.	HEATILE TECH - Carbon steel	λ 58,00 W/m·K
5.	HEATILE TECH - Thermal adhesive	λ 3,000 W/m·K
6.	HEATILE TECH - Copper tube	λ 395,0 W/m·K
7.	HEATILE TECH - Polyurethane 150 kg/m^3	λ 0,038 W/m·K
8.	FERMACELL® polyurethane adhesive	λ 0,029 W/m·K
9.	Concrete screed for systems	λ 1,400 W/m·K
10.	Collaborative concrete slab (floor 16+4)	λ 1,900 W/m·K
11.	Hollow brick (floor 16+4)	λ 0,247 W/m·K
12.	Lime plaster	λ 0,700 W/m·K

HEATILE TECH-I (1) SIMULATION
Results



Scala 1:10





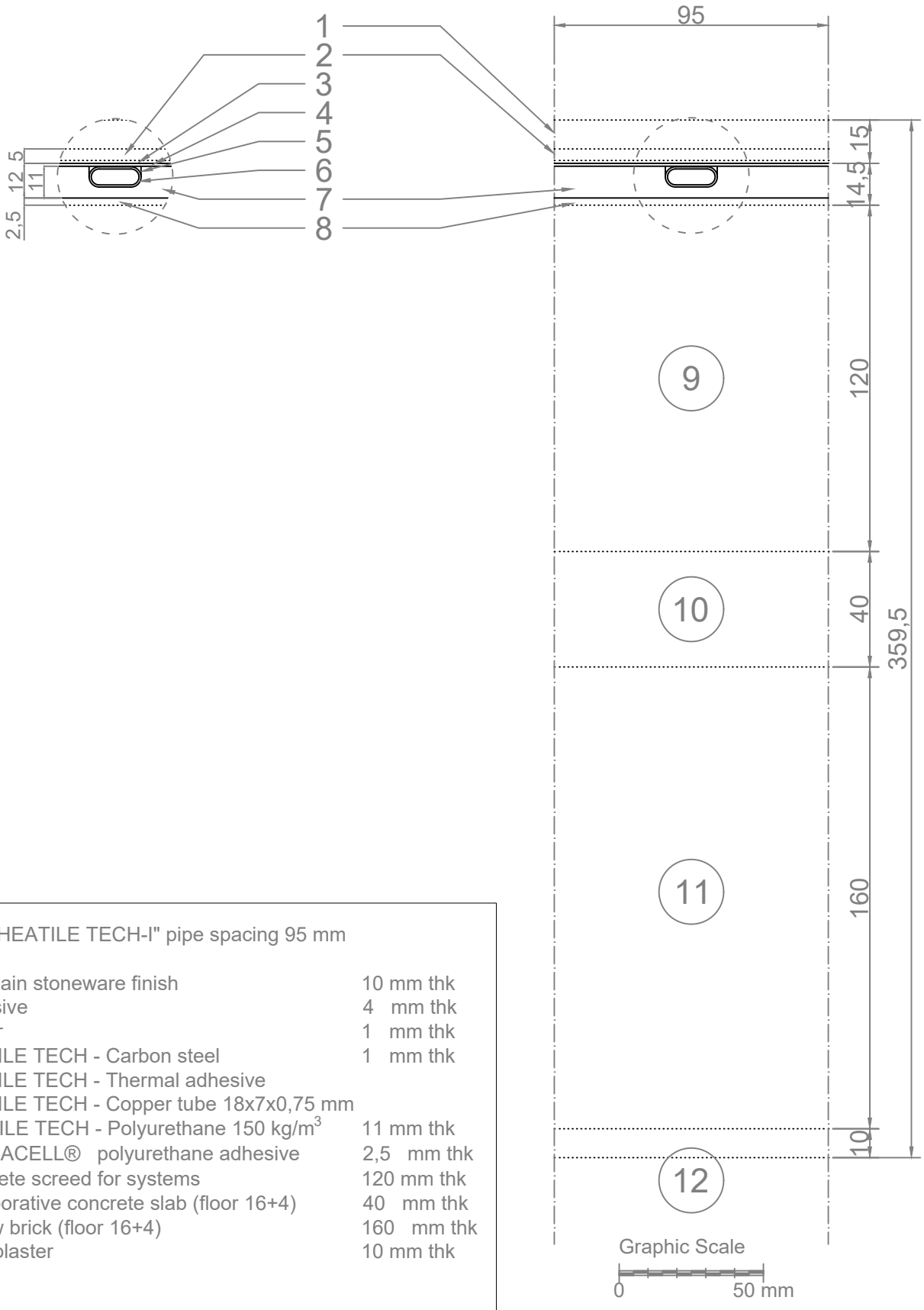
SYSTEM "HEATILE TECH-I" pipe spacing 125 mm

Thermal data:
1. Floor ambient temperature: 20 °C
2. Ceiling ambient temperature: 0 °C
3. Water pipe temperature 35°C

Results:
1. Average heat flow: 110,3 $\frac{W}{m^2}$
   Average temperature: 30,2 °C

2. Average heat flow: 26,9 $\frac{W}{m^2}$
   Average temperature: 4,1 °C

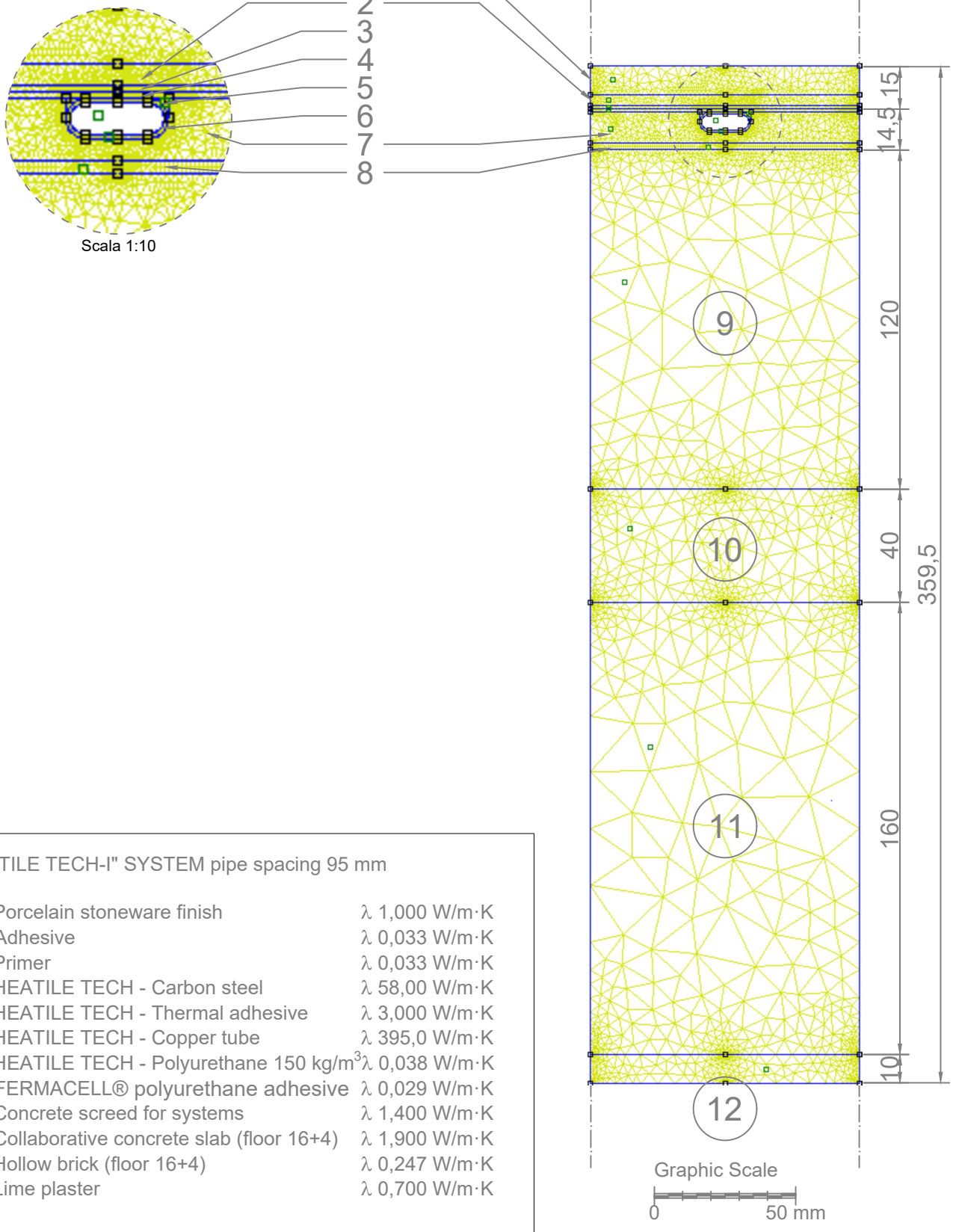
HEATILE TECH-I SIMULATION (2)
Input Data



SYSTEM "HEATILE TECH-I" pipe spacing 95 mm

1.	Porcelain stoneware finish	10 mm thk
2.	Adhesive	4 mm thk
3.	Primer	1 mm thk
4.	HEATILE TECH - Carbon steel	1 mm thk
5.	HEATILE TECH - Thermal adhesive	
6.	HEATILE TECH - Copper tube 18x7x0,75 mm	
7.	HEATILE TECH - Polyurethane 150 kg/m^3	11 mm thk
8.	FERMACELL® polyurethane adhesive	2,5 mm thk
9.	Concrete screed for systems	120 mm thk
10.	Collaborative concrete slab (floor 16+4)	40 mm thk
11.	Hollow brick (floor 16+4)	160 mm thk
12.	Lime plaster	10 mm thk

HEATILE TECH-I SIMULATION (2)
Mesh

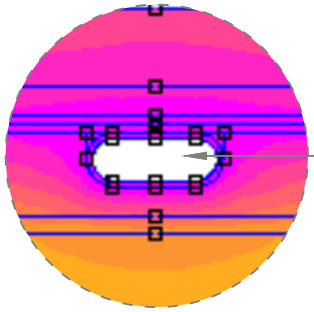


Scala 1:10

"HEATILE TECH-I" SYSTEM pipe spacing 95 mm

1.	Porcelain stoneware finish	λ 1,000 W/m·K
2.	Adhesive	λ 0,033 W/m·K
3.	Primer	λ 0,033 W/m·K
4.	HEATILE TECH - Carbon steel	λ 58,00 W/m·K
5.	HEATILE TECH - Thermal adhesive	λ 3,000 W/m·K
6.	HEATILE TECH - Copper tube	λ 395,0 W/m·K
7.	HEATILE TECH - Polyurethane 150 kg/m^3	λ 0,038 W/m·K
8.	FERMACELL® polyurethane adhesive	λ 0,029 W/m·K
9.	Concrete screed for systems	λ 1,400 W/m·K
10.	Collaborative concrete slab (floor 16+4)	λ 1,900 W/m·K
11.	Hollow brick (floor 16+4)	λ 0,247 W/m·K
12.	Lime plaster	λ 0,700 W/m·K

HEATILE TECH-I SIMULATION (2)
Results



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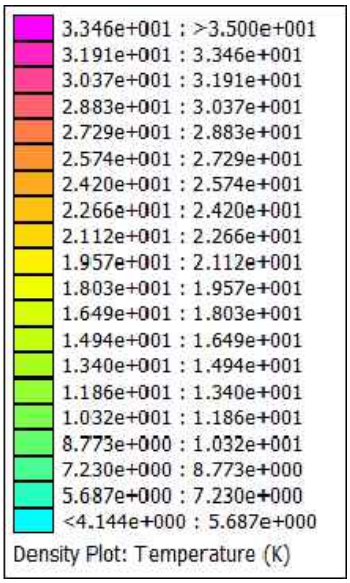

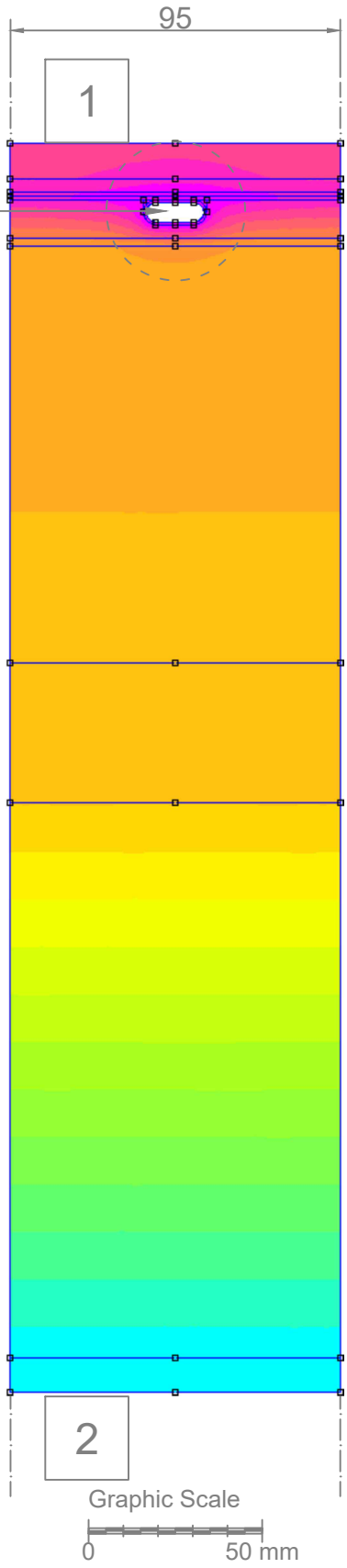

SYSTEM "HEATILE TECH-I" pipe spacing 95 mm

Thermal data:
1. Floor ambient temperature: 20 °C
2. Ceiling ambient temperature: 0 °C
3. Water pipe temperature 35°C

Results:
1. Average heat flow: 117,5 $\frac{W}{m^2}$
   Average temperature: 30,9 °C

2. Average heat flow: 27,9 $\frac{W}{m^2}$
   Average temperature: 4,3 °C

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CERTIFICATE

In reference to the European standard UNI EN 1264-2:

"Water based surface embedded heating and cooling systems - Part 2: Floor heating: Methods for the determination of the thermal output using calculations and experimental tests"

In consideration of the following boundary conditions:

- finish: porcelain stoneware10mm
- supporting structure: hollow concrete slab 16 + 4
- ambient temperature: 20°C
- external temperature: 0°C
- average water temperature: 35°C

From the finite element analysis conducted in the FEA 4.2 environment

IT IS HEREBY DECLARED THAT

The Heatile system TECH-i has the following specific thermal output:

PIPE SPACING 125mm: **110,3** $\frac{W}{m^2}$

PIPE SPACING 95mm: **117,5** $\frac{W}{m^2}$

This document bears a certain date of February 17, 2025.

Progettista:
Dott. Ing. Luca Scrivanti

Progettista:
Ing. Matteo Mottalini

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