TECHNOTRON
METAL

ZT-TM Substructure System

The ZT-TM system is a unique substructure design that combines easy installation with good thermal insulation.

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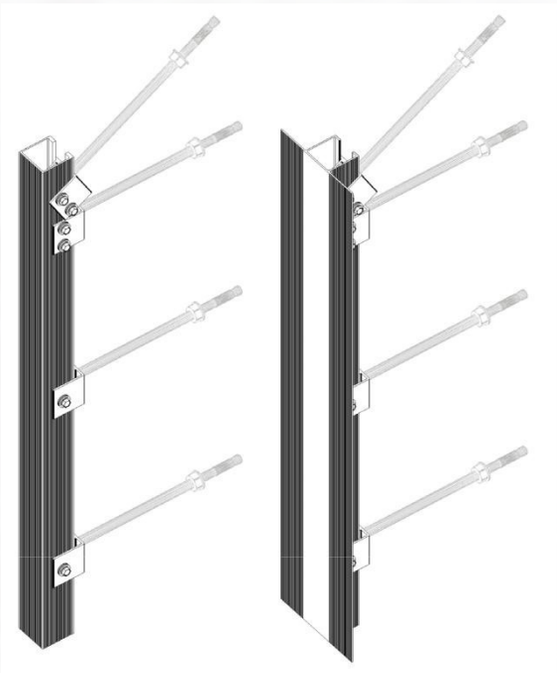
The system can be mounted onto the building construction directly through insulation. It provides for a much faster and easier installation.

The ZT-TM system can be used not only in standard reinforcement of ventilated façade, but also as a suspended system for regular and suspended ceilings.
Unlike the standard method of all-area anchoring, the anchorage points in the form of threaded rods provide a low point heat transfer coefficient.

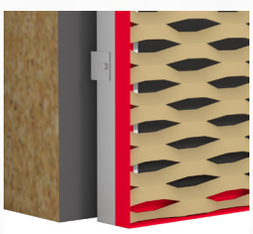


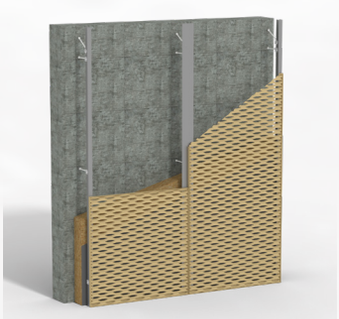
The system's advantage is that it only requires the use of several types of sections and standard connecting material. Also, the anchoring resists the wind force both on the construction and from below the construction, which has a positive effect on overall stability.

The system is suitable for all types of expanded metal for facades. It can be mounted on the substructure as follows:

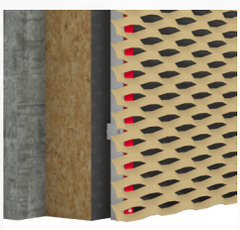
1. Expanded metal in frame
2. Expanded metal with back strips
3. Expanded metal anchored through supports

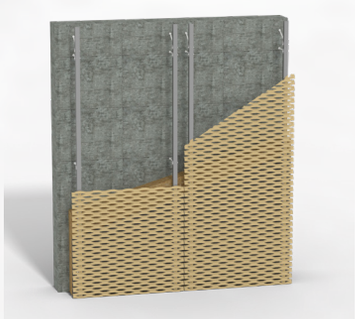
Expanded metal in frame



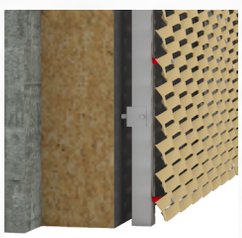


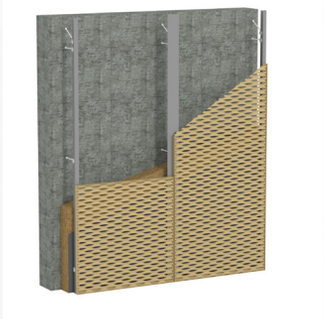
Expanded metal on strips





Expanded metal on supports





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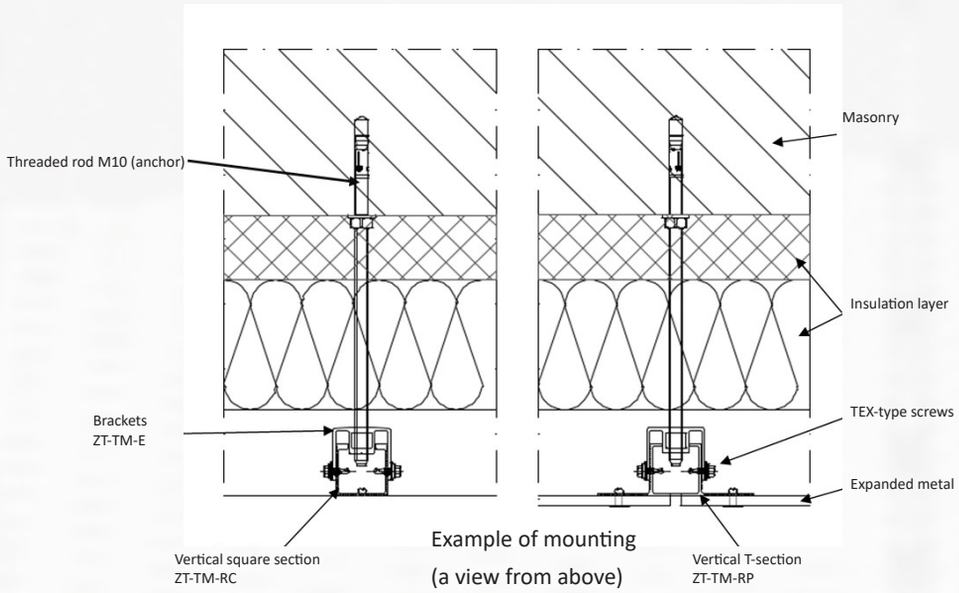
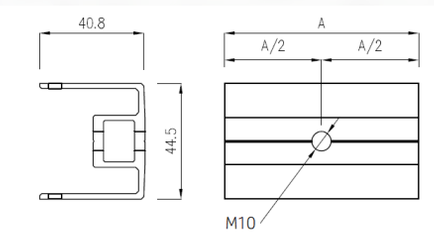


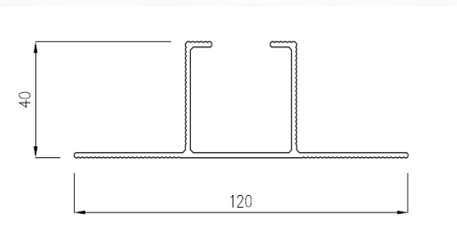
Example of mounting
(a view from above)

ZT-E brackets



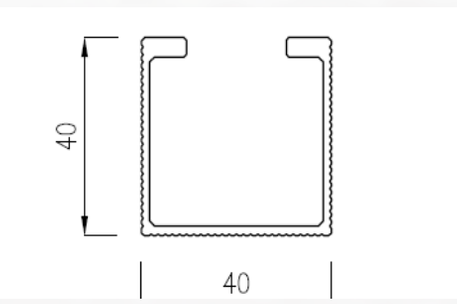
Designation:	A	Weight:
ZT-TM-E-40	40	0,044 kg/m
ZT-TM-E-75	75	0,083 kg/m

ZT-RP Vertical T-section



Designation:	Section length:	Weight:
ZT-TM-RP	**3100 mm**	0,944 kg/m

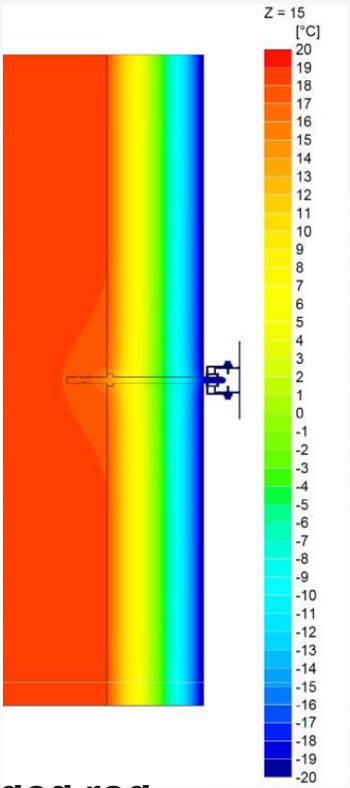
ZT-RC Vertical square section



Designation:	Section length:	Weight:
ZT-TM-RC	**3100 mm**	0,699 kg/m

ZT-TM SUBSTRUCTURE SYSTEM

Heat calculations for an example facade with ZT-TM substructure



	Layer	d[m]	λ [W/(m*K)]	Ri=d/λ [m2*K/W]
-	Interior transmittance resistance, Rsi	-	-	0,13
1	Reinforced concrete 240 mm	0,24	2,3	0,1043
2	Wool with non-woven textile 150 mm	0,15	0,034	4,4118
3	Plaster (lime cement)	0,015	0,82	0,0183
-	Exterior transmittance resistance, Rsi	-	-	0,04
	Resistance sum ΣRi			4,7044
	U=1/ΣRi [W/m2*K]			0,2126

Coefficient x calculation for the AISI304 threaded rod (stainless) M10
Modelled wall area of 1 m2

TRISCO - Calculation Results

TRISCO data file: reinforced concrete 1% (240mm)+wool(150mm)+M10_180.trc

Number of nodes = 38250

Heat flow divergence for total object = 1.53369e-005 %

Heat flow divergence for worst node = 0.488023 %

Col.	Type	Name	tmin [°C]	X	Y	Z	tmax [°C]	X	Y	Z
11	MATERIAL	stainless_steel	-13.74	19	60	12	17.96	23	11	12
120	MATERIAL	concrete_densit	15.64	24	33	10	18.87	35	1	0
151	MATERIAL	insulation_0.03	-19.66	4	50	18	18.12	35	33	0
170	BC_SIMPL	exterior	-19.66	4	50	18	-11.26	23	50	10
174	BC_SIMPL	interior_(norma	18.78	18	1	10	18.87	35	1	0

Col.	Type	Name	ta [°C]	Flow in [W]	Flow out [W]
170	BC_SIMPL	exterior		0.00	8.79
174	BC_SIMPL	interior_(norma		8.79	0.00

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$X = \frac{8{,}79/40}{1} - 0{,}2126 = 0{,}0072 \ \frac{W}{m_2 K}$

The standard façade area anchored to one vertical substructure section suspended on four M10 rods is:

3.1 m x 0.6 m = 1.86 m2

The coefficient U for the example area is:

$UC = U + \Delta U$;gdzie $\Delta U = \frac{^4X}{A}$ $UC = 0{,}2126 + 0{,}0154 = 0{,}228 \ \frac{W}{m_2 K}$ $\leq UC_{(max)} = 0{,}23 \ \frac{W}{m_2 K}$

Condition met!

The calculation indicates that using the ZT-TM substructure system meets the thermal requirements with an insulation layer of 150 mm.

$UC_{(max)} = 0{,}23 \ \frac{W}{m_2 K}$ For external walls according to the regulation of the Minister for Infrastructure on technical conditions that buildings and their estimated installations must meet from 01/01/2017

EN 15085-2

ISO 9001

ISO 3834-2

EN 1090-1

EN 1090-2

EN 1090-3

TECHNOTRON
METAL

+420 601 365 730

info@eplechy.cz

technotron-metal.cz/en

Technotron-Metal, s.r.o.

Priborska 1494

738 01 Frydek-Mistek, Czech Republic

IČ: 02299160, DIČ: CZ02299160