



ALPINA GRATE EUROPE s.r.o

Ul. Širiava č. 460/25, Hanušovce nad Topľou 094 31, Slovak Republic

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Account No., IBAN: SK66 1100 0000 0029 4703 1685, Swift Code: TATRSKBX

COMPARATIVE ANALYSIS OF STANDARD STAIR TREADS

(dimensions 1000mm × 270mm, max. load 1500 kg), manufactured from:

- steel checkered plate;
- expanded metal sheet (EMS);
- composite panels ECO - FR.

No.	Parameter	Unit	Steel checkered plate (diamond) GOST 8568-77, thickness 5mm	EMS-608 TU36.26.11-5-8.1. (cell/thickness, mm) 16×64/17	Composite panel (cell/thickness, mm) 38×38/26
1	Weight of tread surface	kg	11.29	6.86	3.29
2	Weight of framing (steel angle 50×50×5)	kg	9.58	9.58	2.04
3	Weight of additional fastening elements	kg	0.7	0.7	0.4
4	Weight of one tread incl. additional load-bearing elements and fasteners	kg	21.57	17.14	5.73
5	Cost of tread surface	rub	268.7	163.4	692.6
6	Cost of angle for framing	rub	370.15	370.15	75.6
7	Cost of fasteners per 1 tread (welding materials for steel and bolt connections for composite)	rub	220	220	260
8	Total material cost per 1 tread	rub	858.9	753.6	1028.2
9	Manufacturing and installation cost per 1 tread	rub	2068.7	1643.8	549.5
10	Cost of 1 tread incl. materials, manufacturing and installation	rub	2927.6	2397.4	1577.7
11	Type of protective coating		primer+paint	primer+paint	ophthalmic resin
12	Service life	years	15	15	50
13	Durability of protective coating	years	4	4	50
14	Protective coating costs per 1 tread (metal cleaning from oxides to SA 2.5, priming and 2-layer painting: 200 microns)	rub	166.1	166.1	none
15	Total commissioning costs per 1 tread (items 10+14)	rub	3093.7	2563.5	1577.7
16	Ongoing maintenance costs for restoring coating of 1 tread (metal cleaning from old coating to SA 2.5, priming and 2-layer painting: 150 microns) every 4 years	rub	185.1	185.1	none
17	Costs after 15 years (dismantling old surface, installing new with protective coating)	rub	5259.6	4361.2	1577.7



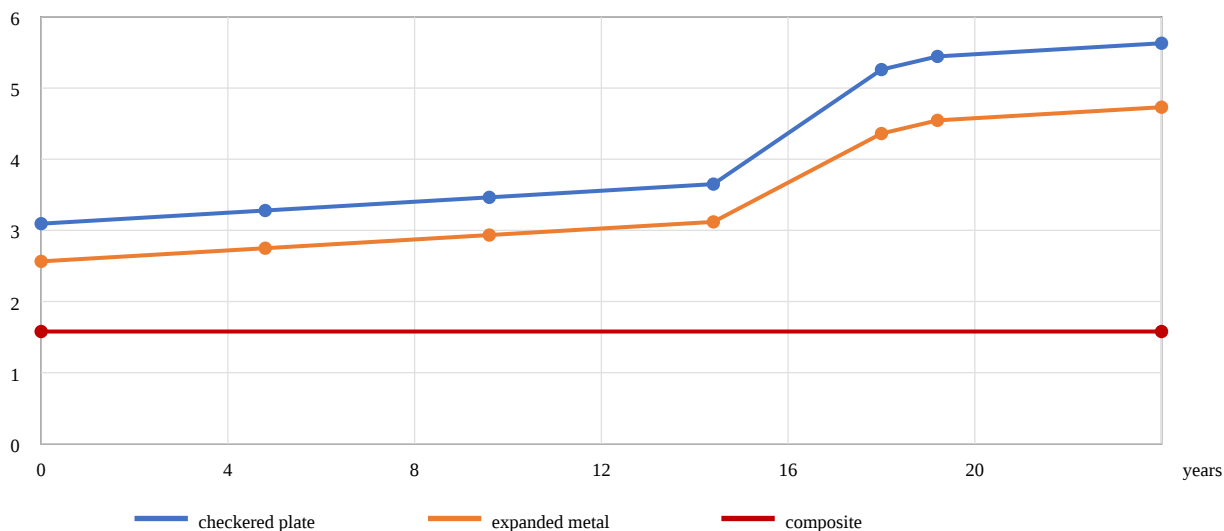
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Total operating costs over the service life period (thousand rub./1 tread).

Notes:

- 1.) When using steel sheets, costs for restoring the protective coating are included (metal cleaning from old coating to SA 2.5, priming and 2-layer painting: 150 microns) every 4 years.
- 2.) Upon expiry of the service life of metal products (15 years), costs are required for dismantling the old surface (70% of initial cost) and installing new tread surface with subsequent application of protective coating, including all materials and labor costs.



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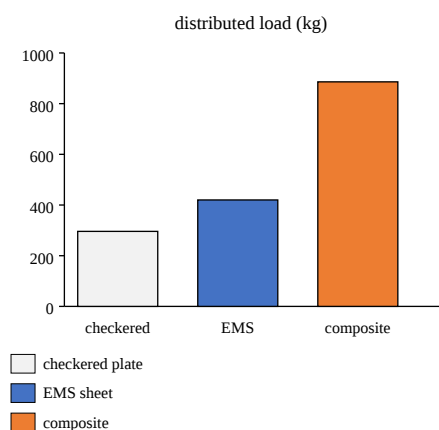
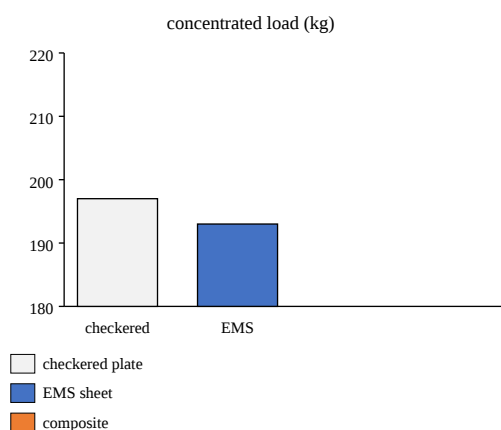
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Comparative characteristics and economic indicators when using:

- steel checkered plate;
- expanded metal sheet (EMS);
- composite panels ECO-FR.

1. Physical and mechanical properties

No.	Parameter	Unit	Steel checkered plate (diamond) GOST 8568-77, thickness 5mm	EMS-608 TU36.26.11-5-8.1. (cell/thickness, mm) 16×64/17	Composite panel (cell/thickness, mm) 38×38/26
1	Weight per 1 sq.m of sheet	kg	41.8	25.41	12.2
2	Maximum uniformly distributed load on 900mm span	kg/m ²	296	420	886
3	Deflection from max. uniformly distributed load on 900mm span	mm	1%	1%	1%
4	Maximum concentrated load on 900mm span	kg	197	193	700
5	Deflection from max. concentrated load on 900mm span	mm	1%	1%	1%
6	Weight of additional load-bearing elements and fasteners per 1 sq.m	kg	2	2	0.2
7	Weight per 1 sq.m of sheet incl. additional load-bearing elements and fasteners	kg	43.8	27.41	12.4
8	Ratio of closed/open surfaces for snow load calculation	%	100/0	40/60	30/70





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2. Price indicators

2.1. Material price indicators (excl. VAT)

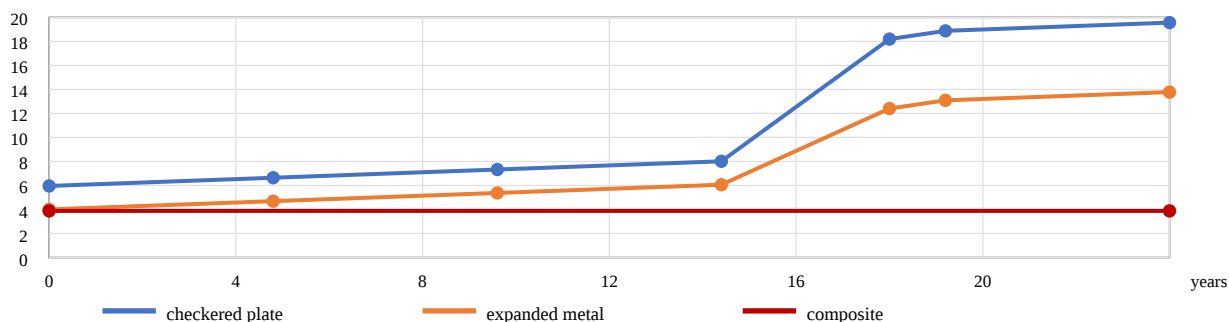
N o.	Parameter	Unit	Checkered plate	EMS sheet	Composite
9	Cost per 1 sq.m of sheet	rub./m ²	995	605	2565
10	Cost of fasteners per 1 sq.m. (welding materials / bolt connections)	rub.	150	160	130
11	Total cost of sheet with fasteners	rub.	1145	765	2695

2.2. Installation work price indicators (excl. VAT)

N o.	Parameter	Unit	Checkered plate	EMS sheet	Composite
12	Installation work productivity	m ² /day	45	50	200
13	Installation work cost per 1 sq.m	rub/m ²	4201	2629	1189

2.3. Protective coating work price indicators (excl. VAT)

N o.	Parameter	Unit	Checkered plate	EMS sheet	Composite
14	Type of surface protective coating		Primer + paint	Primer + paint	Ophthalmic resin
15	Service life	years	15	15	50
16	Coating durability	years	4	4	50
17	Protective coating costs during installation (SA 2.5 cleaning, primer, 2-layer paint: 200 µm)	rub./m ²	615	615	none
18	Total commissioning costs per 1 sq.m. (items 11+13+17)	rub.	5961	4009	3884
19	Ongoing costs for restoring 1 sq.m. coating (SA 2.5 clean, primer, 2-layer paint: 150 µm) every 4 years	rub./m ²	685	685	none
20	Costs after 15 years (dismantle old + install new with coating)	rub	18197	12408	3884



Total operating costs over service life (thousand rub./1 sq.m.).

Notes: 1.) Steel sheets: coating restoration (SA 2.5 clean, primer, 2-layer paint 150 µm) every 4 years.

2.) After 15 years: dismantle old surface (70% of initial cost) + install new surface with protective coating.