

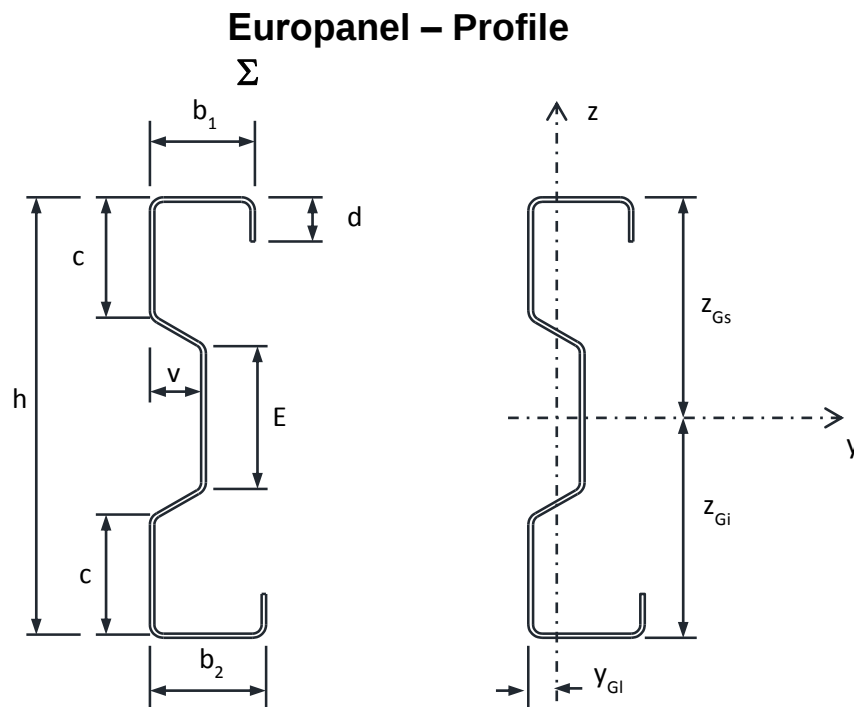


Figura 1. Notatii dimensiuni profile Σ si caracteristici geometrice pentru sectiunea bruta

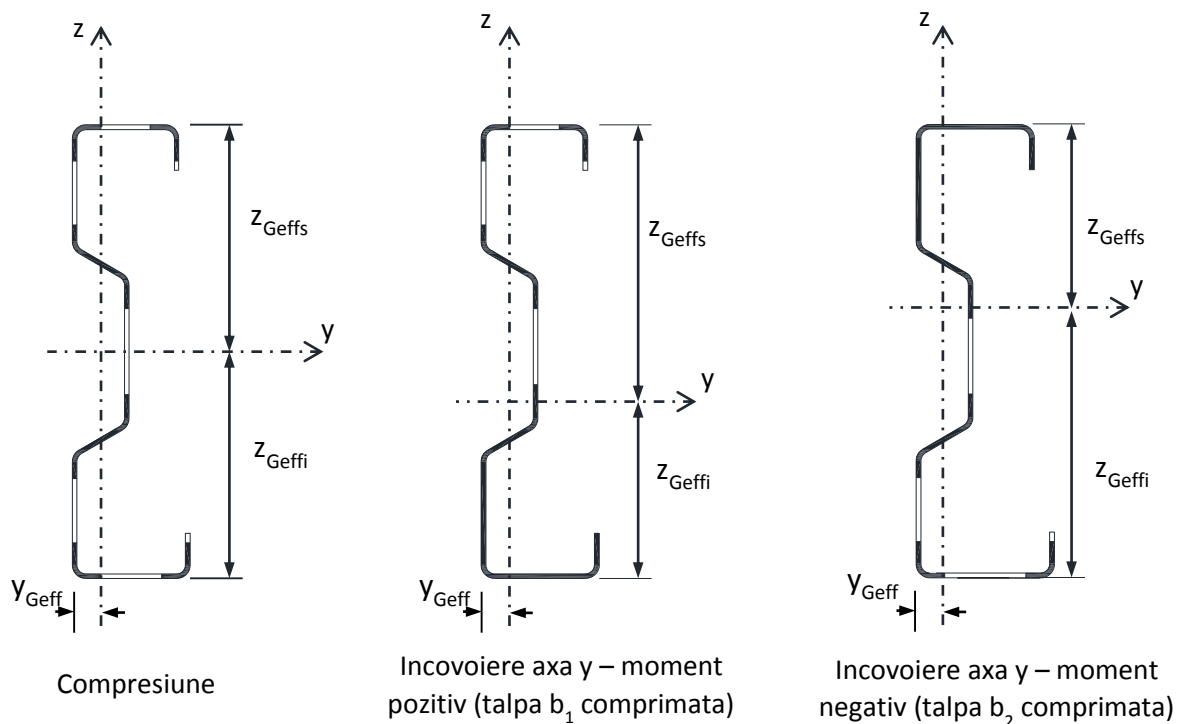


Figura 2 Notatii caracteristici geometrice pentru sectiunile efective de calcul

“Europanel Group” S.R.L.

Oficiu: R. Moldova, or. Chisinau, str. Florilor 4/3

Depozit: or. Vatra, str. Plopilor 49

www.europanel.md

Telefon: +373.795.13.700

: +373.767.17.799

Fax : + 373.22.999.560

E-mail : europanel.group@gmail.com



Dimensiuni profile Σ												
Profil		h(mm)	b ₁ (mm)	b ₂ (mm)	c(mm)	v(mm)	d(mm)	E(mm)	t(mm)	t _{eff} (mm)	r(mm)	G(kg)
$\Sigma 200$	$\Sigma 200-1.5$	200	45	52	56	23	21	63.2	1.5	1.46	4	4.16
	$\Sigma 200-2.0$	200	45	52	56	23	21	63.8	2	1.96	4	5.5
	$\Sigma 200-2.5$	200	45	52	56	23	21	64.3	2.5	2.46	4	6.83
	$\Sigma 200-3$	200	45	52	56	23	21	65.1	3	2.96	4	8.1
$\Sigma 250$	$\Sigma 250-1.5$	250	65	72	56	23	22.6	113.2	1.5	1.46	4	5.25
	$\Sigma 250-2.0$	250	65	72	56	23	23.8	113.8	2	1.96	4	7
	$\Sigma 250-2.5$	250	65	72	56	23	25	114.3	2.5	2.46	4	8.75
	$\Sigma 250-3$	250	65	72	56	23	25	115.1	3	2.96	4	10.41
$\Sigma 300$	$\Sigma 300-1.5$	300	81	88	56	23	24	163.2	1.5	1.46	4	6.25
	$\Sigma 300-2.0$	300	81	88	56	23	25	163.8	2	1.96	4	8.32
	$\Sigma 300-2.5$	300	81	88	56	23	25	164.3	2.5	2.46	4	10.36
	$\Sigma 300-3$	300	81	88	56	23	25	165.1	3	2.96	4	12.34
$\Sigma 350$	$\Sigma 350-1.5$	350	93	100	56	23	24	213.2	1.5	1.46	4	7.12
	$\Sigma 350-2.0$	350	93	100	56	23	25	213.8	2	1.96	4	9.48
	$\Sigma 350-2.5$	350	93	100	56	23	25	214.3	2.5	2.46	4	11.81
	$\Sigma 350-3$	350	93	100	56	23	25	215.1	3	2.96	4	14.08
$\Sigma 400$	$\Sigma 400-2.0$	400	93	100	56	23	25	263.8	2	1.96	4	10.27
	$\Sigma 400-2.5$	400	93	100	56	23	25	264.3	2.5	2.46	4	12.8
	$\Sigma 400-3$	400	93	100	56	23	25	265.1	3	2.96	4	15.26

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www.europanel.md

Telefon: +373.795.13.700
 : +373.767.17.799
 Fax : + 373.22.999.560
 E-mail : europanel.group@gmail.com



Caracteristici geometrice ale secțiunii brute - Profile Σ												
Profil		$A_g(\text{mm}^2)$	$y_G(\text{mm})$	$z_{Gs}(\text{mm})$	$z_{Gi}(\text{mm})$	$I_y(\text{mm}^4)$	$W_{ys}(\text{mm}^3)$	$W_{yi}(\text{mm}^3)$	$I_z(\text{mm}^4)$	$W_{zs}(\text{mm}^3)$	$W_{zd}(\text{mm}^3)$	$I_t(\text{mm}^4)$
$\Sigma 200$	$\Sigma 200-1.5$	509.3	17.7	102.1	97.9	2,699,923.2	26,442.0	27,591.8	132,855.2	7,492.3	3,877.0	362.4
	$\Sigma 200-2.0$	679.1	17.9	102.1	97.9	3,572,113.6	34,993.5	36,494.6	172,920.3	9,687.1	5,063.6	870.4
	$\Sigma 200-2.5$	846.3	18.0	102.1	97.9	4,416,877.6	43,274.5	45,119.2	210,332.2	11,707.3	6,180.0	1,708.4
	$\Sigma 200-3$	1,011.0	18.1	102.1	97.9	5,234,557.2	51,288.3	53,469.2	245,226.8	13,563.3	7,229.6	2,954.3
$\Sigma 250$	$\Sigma 250-1.5$	645.4	24.0	127.1	122.9	5,652,137.1	44,471.6	46,003.0	301,577.4	12,559.3	6,284.5	459.1
	$\Sigma 250-2.0$	866.4	24.4	127.1	122.9	7,551,636.9	59,435.2	61,443.7	403,362.4	16,563.9	8,465.5	1,110.4
	$\Sigma 250-2.5$	1,087.2	24.7	127.0	122.9	9,430,116.7	74,234.1	76,712.6	503,995.7	20,417.9	10,651.7	2,194.7
	$\Sigma 250-3$	1,300.9	24.8	127.0	122.9	11,217,428.1	88,310.8	91,244.7	590,781.9	23,838.2	12,512.1	3,801.4
$\Sigma 300$	$\Sigma 300-1.5$	769.1	28.6	152.1	147.8	9,912,964.0	65,163.7	67,053.8	520,574.2	18,184.8	8,767.8	547.1
	$\Sigma 300-2.0$	1,031.7	28.9	152.1	147.9	13,246,090.1	87,097.6	89,575.2	695,203.3	24,026.9	11,770.0	1,322.2
	$\Sigma 300-2.5$	1,288.9	29.0	152.1	147.9	16,468,751.1	108,302.5	111,352.5	853,097.3	29,386.9	14,466.6	2,601.6
	$\Sigma 300-3$	1,543.6	29.1	152.1	147.9	19,626,820.1	129,080.6	132,695.2	1,003,247.1	34,449.0	17,039.6	4,510.3
$\Sigma 350$	$\Sigma 350-1.5$	877.1	31.5	177.2	172.8	15,436,072.3	87,122.4	89,337.9	736,333.0	23,378.9	10,748.7	623.8
	$\Sigma 350-2.0$	1,176.8	31.8	177.1	172.8	20,642,812.1	116,537.1	119,443.5	984,670.2	30,958.1	14,439.4	1,507.9
	$\Sigma 350-2.5$	1,471.0	31.9	177.1	172.8	25,695,307.5	145,078.8	148,659.0	1,210,767.8	37,954.5	17,779.4	2,968.8
	$\Sigma 350-3$	1,762.7	32.0	177.1	172.9	30,659,385.3	173,119.1	177,365.4	1,426,783.6	44,598.7	20,979.5	5,150.0
$\Sigma 400$	$\Sigma 400-2.0$	1,274.8	31.2	202.3	197.7	28,465,912.0	140,741.6	143,982.8	990,243.0	31,733.7	14,394.1	1,633.4
	$\Sigma 400-2.5$	1,594.0	31.3	202.2	197.7	35,453,920.0	175,312.8	179,306.9	1,217,508.3	38,887.4	17,724.3	3,216.9
	$\Sigma 400-3$	1,910.7	31.4	202.2	197.7	42,328,283.6	209,319.7	214,058.5	1,434,595.6	45,673.6	20,915.4	5,582.3

“Europanel Group” S.R.L.
 Oficiu: R. Moldova, or. Chisinau, str. Florilor 4/3
 Depozit: or. Vatra, str. Plopilor 49
www.europanel.md

Telefon: +373.795.13.700
 : +373.767.17.799
 Fax : + 373.22.999.560
 E-mail : europanel.group@gmail.com



Caracteristici geometrice ale sectiunii efective - profile Σ															
Compresiune						Incovoiere axa Y - moment pozitiv (talpa b ₁ comprimata)					Incovoiere axa Y - moment negativ (talpa b ₂ comprimata)				
Profil		A _{eff} (mm ²)	Y _{Geff} (mm)	Z _{Geffs} (mm)	Z _{Geffi} (mm)	Z _{Geffs} (mm)	Z _{Geffi} (mm)	I _{yeff} (mm ⁴)	W _{yeffs} (mm ³)	W _{yeffi} (mm ³)	Z _{Geffs} (mm)	Z _{Geffi} (mm)	I _{yeff} (mm ⁴)	W _{yeffs} (mm ³)	W _{yeffi} (mm ³)
Σ200	Σ200-1.5	484.8	15.8	100.0	98.5	102.1	97.9	2,699,923.2	26,442.0	27,591.8	96.8	101.7	2,654,187.5	27,405.8	26,110.5
	Σ200-2.0	679.1	17.9	102.1	97.9	102.1	97.9	3,572,113.6	34,993.5	36,494.6	101.9	98.1	3,572,652.3	35,066.9	36,426.3
	Σ200-2.5	846.3	18.0	102.1	97.9	102.1	97.9	4,416,877.6	43,274.5	45,119.2	101.9	98.0	4,417,403.1	43,345.3	45,053.5
	Σ200-3	1,011.0	18.1	102.1	97.9	102.1	97.9	5,234,557.2	51,288.3	53,469.2	101.9	98.0	5,235,069.5	51,356.4	53,406.0
Σ250	Σ250-1.5	496.3	19.0	124.0	124.5	140.4	108.1	4,909,505.4	34,964.7	45,421.9	109.6	138.9	4,755,897.8	43,373.6	34,251.9
	Σ250-2.0	756.0	21.2	124.5	123.5	132.3	115.7	7,305,880.8	55,229.6	63,135.2	118.1	129.9	7,165,494.8	60,663.0	55,170.0
	Σ250-2.5	1,015.8	22.3	125.1	122.4	129.5	118.0	9,417,508.4	72,750.0	79,775.7	121.3	126.2	9,349,572.7	77,066.4	74,096.1
	Σ250-3	1,269.9	22.7	124.8	122.2	127.0	122.9	11,217,428.1	88,310.8	91,244.7	126.9	123.1	11,218,197.4	88,421.5	91,139.6
Σ300	Σ300-1.5	492.1	20.4	149.2	149.3	180.4	118.1	7,500,353.1	41,587.0	63,483.3	120.3	178.2	7,351,975.0	61,127.9	41,250.4
	Σ300-2.0	763.1	23.4	148.8	149.2	166.7	131.3	11,679,850.3	70,058.8	88,965.6	133.0	165.0	11,401,896.3	85,708.4	69,115.5
	Σ300-2.5	1,057.1	25.1	149.1	148.4	160.4	137.1	15,541,732.1	96,890.1	113,365.3	139.4	158.1	15,264,609.9	109,528.6	96,529.9
	Σ300-3	1,346.7	25.9	149.8	147.2	157.5	139.5	19,030,368.7	120,797.2	136,457.3	142.7	154.3	18,908,920.5	132,472.3	122,577.2
Σ350	Σ350-1.5	490.5	21.4	174.2	174.3	218.8	129.7	10,751,147.3	49,140.5	82,882.2	131.9	216.6	10,572,305.4	80,133.9	48,817.7
	Σ350-2.0	753.1	23.9	173.8	174.2	204.3	143.7	16,530,205.1	80,903.0	115,049.7	146.9	201.1	16,286,575.0	110,854.8	80,994.7
	Σ350-2.5	1,057.4	26.2	173.7	173.8	194.5	153.0	22,556,544.9	115,997.6	147,386.9	155.0	192.5	22,115,834.0	142,700.1	114,876.2
	Σ350-3	1,382.1	27.7	174.2	172.8	188.7	158.3	28,373,191.7	150,337.2	179,271.2	161.0	186.0	28,041,970.5	174,175.8	150,761.7
Σ400	Σ400-2.0	751.9	23.5	199.2	198.8	238.2	159.8	21,995,921.3	92,327.7	137,678.9	161.5	236.5	21,510,512.2	133,156.6	90,970.0
	Σ400-2.5	1,056.5	25.8	198.6	198.9	225.5	172.0	30,186,478.0	133,892.5	175,455.0	174.0	223.5	29,599,656.8	170,112.5	132,437.2
	Σ400-3	1,385.3	27.4	199.3	197.7	219.7	177.3	37,889,361.5	172,423.7	213,757.0	180.2	216.8	37,484,619.1	208,047.7	172,878.2

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www.europanel.md

Telefon: +373.795.13.700

: +373.767.17.799

Fax : + 373.22.999.560

E-mail : europanel.group@gmail.com



Eforturi capabile - profile Σ					
Profil		$N_{trd}(kN)$	$N_{crd}(kN)$	$M_{Rd}^+(kNm)$	$M_{Rd}^-(kNm)$
$\Sigma 200$	$\Sigma 200-1.5$	178.27	169.70	9.25	9.14
	$\Sigma 200-2.0$	237.68	237.68	12.25	12.27
	$\Sigma 200-2.5$	296.21	296.21	15.15	15.17
	$\Sigma 200-3$	353.84	353.84	17.95	17.97
$\Sigma 250$	$\Sigma 250-1.5$	225.87	173.72	12.24	11.99
	$\Sigma 250-2.0$	303.23	264.62	19.33	19.31
	$\Sigma 250-2.5$	380.53	355.54	25.46	25.93
	$\Sigma 250-3$	455.32	444.48	30.91	30.95
$\Sigma 300$	$\Sigma 300-1.5$	269.19	172.23	14.56	14.44
	$\Sigma 300-2.0$	361.11	267.10	24.52	24.19
	$\Sigma 300-2.5$	451.13	370.00	33.91	33.79
	$\Sigma 300-3$	540.27	471.36	42.28	42.90
$\Sigma 350$	$\Sigma 350-1.5$	307.00	171.66	17.20	17.09
	$\Sigma 350-2.0$	411.87	263.58	28.32	28.35
	$\Sigma 350-2.5$	514.85	370.10	40.60	40.21
	$\Sigma 350-3$	616.93	483.73	52.62	52.77
$\Sigma 400$	$\Sigma 400-2.0$	446.17	263.18	32.31	31.84
	$\Sigma 400-2.5$	557.90	369.77	46.86	46.35
	$\Sigma 400-3$	668.73	484.87	60.35	60.51

Valorile incarcarii prezentate in tabelele urmatoare sunt determinate pentru trei scheme statice:

- schema statica de tip grinda simplu rezemata cu o deschidere;
- schema statica de tip grinda continua cu doua deschideri;
- schema statica de tip grinda continua cu trei deschideri.

Incarcarea a fost considerata ca o incarcare uniform distribuita pe toata lungimea grinzii.

S-au considerat 5 cazuri de incaracree: trei cazuri asociate starii limita ultime si doua cazuri asociate starii limita de serviciu:

- cazul 1 corespunde situatiei in care la talpa superioara si talpa inferioara sunt dispuse table cutate care impiedica aparitia fenomenelor de pierdere a stabilitatii;
- cazul 2 corespunde situatiei in care la talpa superioara exista o tabla cutata iar incaracrea actioneaza de sus in jos;
- cazul 3 corespunde situatiei in care la talpa superioara exista o tabla cutata iar incaracrea actioneaza de jos in sus;
- cazul 4 corespunde starii limita de serviciu considerand o sageata maxima admisa de $L/200$;
- cazul 5 corespunde starii limita de serviciu considerand o sageata maxima admisa de $L/300$;

Valorile determinate in acest document se bazeaza pe o valoare a resortului lateral k determinata cu expresia 10.13 (10.1.5.1 (4)) din SR EN 1993-1-3, in care s-a considerat o valoare a rigiditatii la rotire a resortului C_D (vezi 10.1.5.2) egala cu 800Nmm/mm.

La stabilirea valorilor nu a fost considerata verificarea efortului capabil la deformare (SR EN 1993-1-3, 6.1.7) a inimii si interactiunea dintre acesta si momentul capabil.

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Telefon: +373.795.13.700

: +373.767.17.799

Fax : + 373.22.999.560

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Grinda continua cu o deschidere											
Profil	Caz	L (m)									
		3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50
Σ200-1.5	1	7.48	5.49	4.21	3.32	2.69	2.23	1.87	1.59	1.37	1.20
	2	4.44	3.64	3.08	2.65	2.29	1.99	1.73	1.51	1.33	1.17
	3	3.15	2.67	2.38	2.11	1.77	1.46	1.20	0.83	0.62	0.48
	4	7.93	5.01	3.36	2.36	1.72	1.30	1.00	0.79	0.63	0.51
	5	5.32	3.35	2.25	1.58	1.15	0.87	0.67	0.53	0.42	0.34
Σ200-2.0	1	9.90	7.27	5.57	4.40	3.56	2.94	2.47	2.11	1.82	1.58
	2	6.02	4.93	4.17	3.57	3.07	2.66	2.31	2.01	1.76	1.56
	3	4.32	3.70	3.29	2.93	2.43	2.00	1.64	1.13	0.85	0.65
	4	10.67	6.72	4.50	3.16	2.30	1.73	1.33	1.05	0.84	0.68
	5	7.11	4.48	3.00	2.11	1.54	1.15	0.89	0.70	0.56	0.46
Σ200-2.5	1	12.24	8.99	6.88	5.44	4.41	3.64	3.06	2.61	2.25	1.96
	2	7.48	6.10	5.15	4.41	3.80	3.28	2.85	2.49	2.18	1.92
	3	5.39	4.60	4.09	3.65	3.03	2.49	2.04	1.43	1.06	0.81
	4	13.19	8.31	5.57	3.91	2.85	2.14	1.65	1.30	1.04	0.84
	5	8.79	5.54	3.71	2.61	1.90	1.43	1.10	0.86	0.69	0.56
Σ200-3	1	14.51	10.66	8.16	6.45	5.22	4.32	3.63	3.09	2.66	2.32
	2	8.85	7.20	6.06	5.19	4.47	3.87	3.36	2.93	2.58	2.27
	3	6.36	5.42	4.80	4.30	3.58	2.94	2.41	1.71	1.27	0.97
	4	15.63	9.85	6.60	4.63	3.38	2.54	1.95	1.54	1.23	1.00
	5	10.42	6.56	4.40	3.09	2.25	1.69	1.30	1.02	0.82	0.67
Σ250-1.5	1	9.89	7.27	5.56	4.40	3.56	2.94	2.47	2.11	1.82	1.58
	2	5.25	4.05	3.29	2.78	2.42	2.14	1.91	1.72	1.54	1.39
	3	3.53	2.75	2.27	1.96	1.75	1.60	1.48	1.31	1.15	1.00
	4	14.14	9.12	6.22	4.43	3.27	2.48	1.92	1.52	1.23	1.00
	5	9.97	6.38	4.33	3.07	2.26	1.71	1.32	1.04	0.84	0.68
Σ250-2.0	1	15.62	11.48	8.79	6.94	5.62	4.65	3.91	3.33	2.87	2.50
	2	7.75	6.02	4.94	4.22	3.71	3.30	2.97	2.68	2.42	2.19
	3	5.12	4.03	3.37	2.96	2.69	2.49	2.32	2.08	1.83	1.61
	4	21.23	13.48	9.09	6.42	4.70	3.54	2.73	2.16	1.73	1.41
	5	14.44	9.14	6.15	4.33	3.17	2.39	1.84	1.45	1.16	0.95
Σ250-2.5	1	20.58	15.12	11.57	9.14	7.41	6.12	5.14	4.38	3.78	3.29
	2	9.98	7.75	6.36	5.44	4.78	4.27	3.85	3.48	3.15	2.85
	3	6.59	5.19	4.35	3.83	3.48	3.23	3.02	2.73	2.42	2.13
	4	27.87	17.58	11.79	8.29	6.05	4.54	3.50	2.76	2.21	1.80
	5	18.65	11.75	7.88	5.54	4.04	3.04	2.34	1.84	1.47	1.20
Σ250-3	1	24.98	18.35	14.05	11.10	8.99	7.43	6.24	5.32	4.59	4.00
	2	12.03	9.32	7.63	6.51	5.72	5.11	4.60	4.17	3.78	3.43
	3	7.91	6.22	5.20	4.57	4.15	3.84	3.60	3.28	2.92	2.57

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	4	33.50	21.10	14.13	9.93	7.24	5.44	4.19	3.29	2.64	2.14
	5	22.34	14.07	9.42	6.62	4.82	3.62	2.79	2.20	1.76	1.43
Σ300-1.5	1	11.76	8.64	6.62	5.23	4.23	3.50	2.94	2.51	2.16	1.88
	2	6.35	4.75	3.74	3.06	2.58	2.24	1.98	1.77	1.60	1.46
	3	4.28	3.22	2.54	2.10	1.79	1.57	1.42	1.30	1.21	1.10
	4	21.50	14.09	9.74	7.01	5.21	3.98	3.11	2.48	2.01	1.65
	5	15.77	10.23	7.01	5.01	3.70	2.82	2.19	1.74	1.40	1.15
Σ300-2.0	1	19.81	14.56	11.15	8.81	7.13	5.90	4.95	4.22	3.64	3.17
	2	9.64	7.25	5.74	4.74	4.05	3.54	3.16	2.86	2.61	2.40
	3	6.29	4.76	3.79	3.16	2.74	2.45	2.24	2.08	1.95	1.82
	4	32.88	21.22	14.48	10.32	7.62	5.78	4.49	3.56	2.86	2.34
	5	23.23	14.88	10.10	7.17	5.27	3.99	3.09	2.44	1.96	1.60
Σ300-2.5	1	27.40	20.13	15.41	12.18	9.87	8.15	6.85	5.84	5.03	4.38
	2	12.68	9.56	7.58	6.27	5.37	4.72	4.23	3.84	3.52	3.24
	3	8.13	6.16	4.93	4.13	3.59	3.22	2.96	2.77	2.62	2.47
	4	44.44	28.38	19.21	13.61	9.98	7.54	5.84	4.61	3.70	3.02
	5	30.61	19.46	13.13	9.28	6.79	5.12	3.96	3.12	2.50	2.04
Σ300-3	1	34.16	25.10	19.22	15.18	12.30	10.16	8.54	7.28	6.28	5.47
	2	15.51	11.67	9.25	7.65	6.54	5.74	5.15	4.68	4.29	3.96
	3	9.85	7.46	5.97	5.00	4.34	3.90	3.58	3.35	3.17	3.01
	4	55.65	35.30	23.78	16.77	12.27	9.24	7.14	5.62	4.51	3.67
	5	37.74	23.88	16.06	11.31	8.26	6.22	4.80	3.78	3.03	2.47
Σ350-1.5	1	10.26	8.79	7.69	6.18	5.00	4.14	3.47	2.96	2.55	2.22
	2	7.68	5.69	4.42	3.55	2.95	2.51	2.18	1.92	1.72	1.56
	3	5.17	3.84	2.99	2.41	2.01	1.72	1.51	1.35	1.23	1.13
	4	30.02	19.89	13.87	10.06	7.54	5.79	4.54	3.63	2.95	2.43
	5	22.64	14.82	10.23	7.35	5.47	4.17	3.26	2.59	2.10	1.72
Σ350-2.0	1	22.80	16.81	12.87	10.17	8.24	6.81	5.72	4.87	4.20	3.66
	2	11.54	8.58	6.68	5.40	4.51	3.87	3.39	3.02	2.73	2.49
	3	7.53	5.61	4.38	3.56	3.00	2.59	2.30	2.08	1.92	1.79
	4	45.37	29.69	20.49	14.74	10.96	8.37	6.53	5.20	4.21	3.45
	5	33.17	21.48	14.70	10.50	7.76	5.90	4.59	3.64	2.93	2.40
Σ350-2.5	1	32.81	24.10	18.45	14.58	11.81	9.76	8.20	6.99	6.03	5.25
	2	15.47	11.51	8.98	7.28	6.09	5.24	4.61	4.13	3.75	3.44
	3	9.84	7.34	5.75	4.69	3.96	3.45	3.07	2.80	2.60	2.44
	4	62.05	40.17	27.49	19.64	14.51	11.03	8.58	6.80	5.48	4.49
	5	44.19	28.38	19.30	13.72	10.09	7.64	5.93	4.69	3.77	3.08
Σ350-3	1	42.52	31.24	23.92	18.90	15.31	12.65	10.63	9.06	7.81	6.80
	2	19.27	14.34	11.19	9.07	7.59	6.53	5.74	5.15	4.68	4.30
	3	12.06	9.00	7.05	5.76	4.86	4.23	3.78	3.45	3.21	3.02
	4	79.96	51.28	34.84	24.74	18.19	13.77	10.67	8.44	6.79	5.54

“Europanel Group” S.R.L.

Oficiu: R. Moldova, or. Chisinau, str. Florilor 4/3

Depozit: or. Vatra, str. Plopilor 49

www.europanel.md

Telefon: +373.795.13.700

: +373.767.17.799

Fax : + 373.22.999.560

E-mail : europanel.group@gmail.com



	5	55.66	35.50	24.01	16.99	12.46	9.41	7.28	5.75	4.61	3.76
Σ400-2.0	1	19.95	17.10	14.69	11.61	9.40	7.77	6.53	5.56	4.80	4.18
	2	13.94	10.32	7.99	6.42	5.31	4.50	3.90	3.44	3.08	2.79
	3	8.94	6.63	5.15	4.15	3.45	2.95	2.59	2.31	2.10	1.94
	4	57.66	38.06	26.45	19.14	14.29	10.96	8.59	6.86	5.56	4.57
	5	43.06	28.08	19.33	13.87	10.29	7.84	6.12	4.86	3.93	3.22
Σ400-2.5	1	37.25	27.82	21.30	16.83	13.63	11.27	9.47	8.07	6.96	6.06
	2	18.88	13.99	10.85	8.73	7.24	6.16	5.35	4.74	4.26	3.88
	3	11.74	8.72	6.79	5.49	4.58	3.94	3.46	3.12	2.85	2.65
	4	80.18	52.31	36.01	25.85	19.18	14.63	11.41	9.07	7.33	6.01
	5	58.16	37.57	25.67	18.31	13.51	10.26	7.97	6.32	5.09	4.16
Σ400-3	1	48.77	35.83	27.43	21.67	17.56	14.51	12.19	10.39	8.96	7.80
	2	23.50	17.42	13.51	10.87	9.01	7.67	6.67	5.91	5.32	4.85
	3	14.39	10.69	8.32	6.73	5.62	4.83	4.26	3.83	3.52	3.27
	4	103.44	66.88	45.72	32.63	24.10	18.30	14.22	11.27	9.09	7.43
	5	73.41	47.10	32.00	22.73	16.72	12.66	9.81	7.76	6.24	5.09

Grinda continua cu doua deschideri											
Profil	Caz	L (m)									
		3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50
Σ200-1.5	1	7.48	5.49	4.21	3.32	2.69	2.23	1.87	1.59	1.37	1.20
	2	3.91	3.06	2.51	2.14	1.86	1.63	1.43	1.19	0.99	0.83
	3	2.68	2.12	1.79	1.56	1.40	1.27	1.15	1.05	0.95	0.86
	4	19.00	12.00	8.06	5.67	4.14	3.11	2.40	1.89	1.51	1.23
	5	12.76	8.05	5.40	3.80	2.77	2.08	1.61	1.26	1.01	0.82
Σ200-2.0	1	9.90	7.27	5.57	4.40	3.56	2.94	2.47	2.11	1.82	1.58
	2	5.27	4.13	3.40	2.90	2.51	2.19	1.93	1.60	1.33	1.11
	3	3.63	2.90	2.45	2.15	1.93	1.74	1.58	1.43	1.29	1.17
	4	25.70	16.18	10.84	7.61	5.55	4.17	3.21	2.53	2.02	1.64
	5	17.13	10.79	7.23	5.08	3.70	2.78	2.14	1.68	1.35	1.10
Σ200-2.5	1	12.24	8.99	6.88	5.44	4.41	3.64	3.06	2.61	2.25	1.96
	2	6.58	5.14	4.23	3.59	3.11	2.72	2.39	1.99	1.66	1.38
	3	4.53	3.61	3.05	2.68	2.39	2.16	1.96	1.77	1.60	1.45
	4	31.78	20.01	13.41	9.42	6.86	5.16	3.97	3.12	2.50	2.03
	5	21.18	13.34	8.94	6.28	4.58	3.44	2.65	2.08	1.67	1.36
Σ200-3	1	14.51	10.66	8.16	6.45	5.22	4.32	3.63	3.09	2.66	2.32
	2	7.85	6.11	5.01	4.24	3.67	3.21	2.82	2.36	1.97	1.64
	3	5.39	4.29	3.61	3.16	2.82	2.55	2.31	2.09	1.89	1.71
	4	37.66	23.72	15.89	11.16	8.13	6.11	4.71	3.70	2.96	2.41
	5	25.11	15.81	10.59	7.44	5.42	4.07	3.14	2.47	1.98	1.61
Σ250-1.5	1	9.89	7.27	5.56	4.40	3.56	2.94	2.47	2.11	1.82	1.58
	2	5.04	3.78	2.97	2.43	2.06	1.78	1.57	1.41	1.27	1.15
	3	3.37	2.53	2.00	1.65	1.41	1.24	1.11	1.01	0.94	0.87
	4	32.22	20.91	14.34	10.26	7.59	5.77	4.49	3.57	2.88	2.36
	5	23.08	14.85	10.11	7.19	5.30	4.02	3.12	2.47	1.99	1.62
Σ250-2.0	1	15.62	11.48	8.79	6.94	5.62	4.65	3.91	3.33	2.87	2.50
	2	7.38	5.55	4.39	3.61	3.08	2.68	2.38	2.14	1.94	1.77
	3	4.83	3.65	2.91	2.42	2.08	1.85	1.68	1.54	1.43	1.34
	4	50.10	31.90	21.55	15.24	11.17	8.43	6.52	5.14	4.13	3.36
	5	34.29	21.76	14.66	10.34	7.57	5.70	4.40	3.47	2.78	2.27
Σ250-2.5	1	20.58	15.12	11.57	9.14	7.41	6.12	5.14	4.38	3.78	3.29
	2	9.51	7.15	5.65	4.65	3.96	3.45	3.07	2.76	2.51	2.29
	3	6.21	4.69	3.74	3.11	2.69	2.39	2.17	1.99	1.86	1.74
	4	66.90	42.21	28.32	19.91	14.53	10.93	8.42	6.63	5.31	4.32
	5	44.81	28.25	18.95	13.32	9.71	7.30	5.63	4.43	3.55	2.88
Σ250-3	1	24.98	18.35	14.05	11.10	8.99	7.43	6.24	5.32	4.59	4.00
	2	11.49	8.63	6.81	5.60	4.75	4.14	3.68	3.31	3.01	2.75
	3	7.47	5.64	4.49	3.73	3.21	2.85	2.59	2.38	2.22	2.07

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Oficiu: R. Moldova, or. Chisinau, str. Florilor 4/3

Depozit: or. Vatra, str. Plopilor 49

www.europanel.md

Telefon: +373.795.13.700

: +373.767.17.799

Fax : + 373.22.999.560

E-mail : europanel.group@gmail.com



	4	80.70	50.82	34.05	23.91	17.43	13.10	10.09	7.93	6.35	5.17
	5	53.80	33.88	22.70	15.94	11.62	8.73	6.73	5.29	4.24	3.44
Σ300-1.5	1	9.57	8.20	6.62	5.23	4.23	3.50	2.94	2.51	2.16	1.88
	2	6.25	4.63	3.58	2.87	2.37	2.00	1.73	1.52	1.36	1.22
	3	4.21	3.12	2.42	1.94	1.61	1.37	1.19	1.05	0.95	0.87
	4	47.19	31.23	21.75	15.76	11.79	9.05	7.10	5.67	4.61	3.79
	5	35.46	23.17	15.97	11.48	8.53	6.51	5.08	4.04	3.27	2.68
	6	23.17	15.97	11.48	8.53	6.51	5.08	4.04	3.27	2.68	2.16
Σ300-2.0	1	19.81	14.56	11.15	8.81	7.13	5.90	4.95	4.22	3.64	3.17
	2	9.45	7.01	5.44	4.38	3.63	3.09	2.69	2.38	2.14	1.94
	3	6.15	4.57	3.55	2.87	2.39	2.05	1.80	1.61	1.47	1.35
	4	74.72	48.55	33.32	23.86	17.67	13.45	10.47	8.31	6.71	5.49
	5	53.68	34.57	23.56	16.77	12.36	9.37	7.27	5.76	4.64	3.79
Σ300-2.5	1	27.40	20.13	15.41	12.18	9.87	8.15	6.85	5.84	5.03	4.38
	2	12.43	9.22	7.16	5.77	4.79	4.08	3.56	3.16	2.84	2.59
	3	7.93	5.89	4.59	3.71	3.10	2.67	2.35	2.11	1.93	1.78
	4	103.51	66.38	45.09	32.02	23.55	17.82	13.81	10.92	8.78	7.17
	5	72.04	45.95	31.08	21.99	16.13	12.18	9.42	7.44	5.97	4.87
Σ300-3	1	34.16	25.10	19.22	15.18	12.30	10.16	8.54	7.28	6.28	5.47
	2	15.21	11.27	8.75	7.04	5.85	4.98	4.34	3.85	3.46	3.15
	3	9.62	7.15	5.56	4.50	3.76	3.23	2.84	2.55	2.33	2.16
	4	131.68	83.73	56.50	39.91	29.23	22.05	17.03	13.43	10.78	8.78
	5	89.80	56.93	38.33	27.02	19.76	14.89	11.49	9.05	7.26	5.91
Σ350-1.5	1	8.21	7.03	6.16	5.47	4.92	4.14	3.47	2.96	2.55	2.22
	2	7.63	5.62	4.33	3.44	2.81	2.35	2.01	1.74	1.53	1.37
	3	5.13	3.79	2.91	2.32	1.90	1.59	1.36	1.19	1.05	0.94
	4	64.33	43.10	30.33	22.17	16.71	12.91	10.18	8.18	6.67	5.51
	5	49.89	32.95	22.91	16.58	12.39	9.50	7.45	5.95	4.83	3.97
Σ350-2.0	1	18.24	15.64	12.87	10.17	8.24	6.81	5.72	4.87	4.20	3.66
	2	11.43	8.44	6.50	5.18	4.25	3.57	3.06	2.67	2.36	2.12
	3	7.44	5.50	4.24	3.39	2.78	2.35	2.02	1.77	1.58	1.43
	4	99.93	66.01	45.91	33.23	24.83	19.05	14.93	11.93	9.67	7.96
	5	74.77	48.79	33.60	24.12	17.90	13.65	10.65	8.47	6.84	5.61
Σ350-2.5	1	32.81	24.10	18.45	14.58	11.81	9.76	8.20	6.99	6.03	5.25
	2	15.32	11.31	8.72	6.96	5.71	4.80	4.12	3.60	3.19	2.87
	3	9.72	7.18	5.54	4.43	3.65	3.08	2.66	2.34	2.09	1.90
	4	139.95	91.30	62.86	45.12	33.48	25.53	19.91	15.83	12.79	10.49
	5	101.52	65.58	44.80	31.96	23.59	17.91	13.92	11.03	8.89	7.27
Σ350-3	1	42.52	31.24	23.92	18.90	15.31	12.65	10.63	9.06	7.81	6.80
	2	19.08	14.08	10.86	8.66	7.11	5.98	5.13	4.48	3.98	3.58
	3	11.92	8.80	6.80	5.44	4.48	3.78	3.26	2.87	2.57	2.34
	4	184.33	118.87	81.09	57.78	42.62	32.33	25.10	19.88	16.01	13.09

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Oficiu: R. Moldova, or. Chisinau, str. Florilor 4/3
Depozit: or. Vatra, str. Plopilor 49
www.europanel.md

Telefon: +373.795.13.700
 : +373.767.17.799
 Fax : + 373.22.999.560
 E-mail : europanel.group@gmail.com



	5	130.01	83.25	56.48	40.07	29.45	22.27	17.25	13.63	10.96	8.94
Σ400-2.0	1	15.96	13.68	11.97	10.64	9.40	7.77	6.53	5.56	4.80	4.18
	2	13.85	10.21	7.85	6.24	5.09	4.25	3.62	3.14	2.76	2.45
	3	8.87	6.54	5.03	4.01	3.28	2.75	2.35	2.04	1.81	1.62
	4	124.66	83.15	58.29	42.48	31.92	24.61	19.37	15.53	12.64	10.43
	5	95.57	62.88	43.59	31.46	23.46	17.96	14.05	11.21	9.08	7.46
Σ400-2.5	1	29.80	25.54	21.30	16.83	13.63	11.27	9.47	8.07	6.96	6.06
	2	18.75	13.82	10.63	8.46	6.91	5.78	4.93	4.28	3.77	3.36
	3	11.64	8.59	6.61	5.27	4.32	3.63	3.11	2.71	2.40	2.16
	4	177.83	117.05	81.17	58.61	43.70	33.47	26.19	20.89	16.93	13.91
	5	131.86	85.79	58.94	42.23	31.29	23.83	18.57	14.75	11.91	9.75
Σ400-3	1	48.77	35.83	27.43	21.67	17.56	14.51	12.19	10.39	8.96	7.80
	2	23.35	17.21	13.24	10.53	8.61	7.20	6.14	5.33	4.69	4.19
	3	14.27	10.52	8.11	6.46	5.30	4.45	3.81	3.33	2.95	2.66
	4	234.07	152.44	104.81	75.15	55.72	42.45	33.09	26.29	21.23	17.40
	5	169.09	109.09	74.44	53.06	39.14	29.70	23.06	18.27	14.72	12.03

Grinda continua cu trei deschideri											
Profil	Caz	L (m)									
		3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50
Σ200-1.5	1	11.69	8.59	6.57	5.19	4.21	3.48	2.92	2.49	2.15	1.87
	2	4.36	3.44	2.86	2.46	2.15	1.91	1.69	1.42	1.19	1.01
	3	2.88	2.30	1.95	1.72	1.56	1.43	1.31	1.20	1.10	0.88
	4	14.92	9.42	6.32	4.45	3.25	2.44	1.88	1.48	1.19	0.97
	5	10.01	6.32	4.24	2.98	2.17	1.63	1.26	0.99	0.79	0.65
Σ200-2.0	1	15.46	11.36	8.70	6.87	5.57	4.60	3.87	3.29	2.84	2.47
	2	5.90	4.66	3.88	3.33	2.92	2.58	2.29	1.92	1.61	1.35
	3	3.92	3.15	2.69	2.38	2.16	1.97	1.81	1.65	1.51	1.20
	4	20.13	12.68	8.49	5.97	4.35	3.27	2.52	1.98	1.58	1.29
	5	13.42	8.45	5.66	3.98	2.90	2.18	1.68	1.32	1.06	0.86
Σ200-2.5	1	19.12	14.05	10.76	8.50	6.88	5.69	4.78	4.07	3.51	3.06
	2	7.37	5.80	4.82	4.14	3.62	3.19	2.83	2.38	2.00	1.68
	3	4.89	3.93	3.35	2.97	2.69	2.45	2.24	2.05	1.87	1.49
	4	24.89	15.68	10.50	7.38	5.38	4.04	3.11	2.45	1.96	1.59
	5	16.60	10.45	7.00	4.92	3.58	2.69	2.07	1.63	1.31	1.06
Σ200-3	1	22.67	16.65	12.75	10.07	8.16	6.74	5.67	4.83	4.16	3.63
	2	8.80	6.90	5.71	4.89	4.27	3.77	3.34	2.82	2.37	1.99
	3	5.83	4.66	3.96	3.50	3.16	2.89	2.64	2.42	2.21	1.78
	4	29.50	18.58	12.45	8.74	6.37	4.79	3.69	2.90	2.32	1.89
	5	19.67	12.39	8.30	5.83	4.25	3.19	2.46	1.93	1.55	1.26
Σ250-1.5	1	11.91	10.21	8.69	6.87	5.56	4.60	3.86	3.29	2.84	2.47
	2	5.61	4.21	3.33	2.74	2.32	2.03	1.80	1.62	1.47	1.35
	3	3.61	2.72	2.16	1.78	1.53	1.35	1.22	1.12	1.04	0.98
	4	25.82	16.71	11.44	8.17	6.03	4.59	3.57	2.83	2.28	1.86
	5	18.37	11.80	8.02	5.70	4.20	3.18	2.46	1.95	1.57	1.28
Σ250-2.0	1	24.41	17.93	13.73	10.85	8.79	7.26	6.10	5.20	4.48	3.91
	2	8.15	6.14	4.88	4.03	3.45	3.03	2.71	2.46	2.25	2.06
	3	5.15	3.90	3.11	2.60	2.25	2.01	1.83	1.70	1.59	1.50
	4	39.58	25.18	17.00	12.01	8.80	6.63	5.13	4.04	3.25	2.64
	5	27.02	17.13	11.54	8.13	5.95	4.48	3.46	2.73	2.19	1.78
Σ250-2.5	1	32.15	23.62	18.08	14.29	11.57	9.57	8.04	6.85	5.91	5.14
	2	10.47	7.89	6.26	5.18	4.43	3.89	3.48	3.16	2.89	2.66
	3	6.61	5.00	4.00	3.34	2.90	2.59	2.36	2.19	2.06	1.94
	4	52.49	33.11	22.21	15.62	11.39	8.57	6.60	5.20	4.16	3.38
	5	35.14	22.15	14.85	10.44	7.62	5.72	4.41	3.47	2.78	2.26
Σ250-3	1	39.03	28.67	21.95	17.34	14.05	11.61	9.76	8.31	7.17	6.24
	2	12.66	9.52	7.54	6.22	5.31	4.66	4.17	3.78	3.46	3.18
	3	7.95	6.01	4.79	4.00	3.46	3.09	2.82	2.62	2.45	2.31

	4	63.22	39.81	26.67	18.73	13.66	10.26	7.90	6.22	4.98	4.05
	5	42.15	26.54	17.78	12.49	9.10	6.84	5.27	4.14	3.32	2.70
Σ300-1.5	1	9.97	8.55	7.48	6.65	5.98	5.44	4.59	3.91	3.38	2.94
	2	6.99	5.18	4.01	3.22	2.67	2.26	1.96	1.73	1.55	1.41
	3	4.54	3.36	2.61	2.10	1.74	1.48	1.29	1.15	1.04	0.96
	4	38.38	25.30	17.57	12.70	9.48	7.26	5.69	4.54	3.68	3.02
	5	28.57	18.61	12.80	9.18	6.80	5.19	4.04	3.21	2.59	2.13
Σ300-2.0	1	22.11	18.95	16.58	13.76	11.15	9.21	7.74	6.60	5.69	4.95
	2	10.45	7.75	6.03	4.86	4.04	3.45	3.02	2.68	2.42	2.21
	3	6.56	4.87	3.79	3.07	2.56	2.20	1.94	1.74	1.59	1.48
	4	59.94	38.84	26.60	19.01	14.06	10.68	8.31	6.59	5.32	4.35
	5	42.77	27.49	18.70	13.30	9.79	7.42	5.75	4.55	3.66	2.99
Σ300-2.5	1	41.17	31.46	24.08	19.03	15.41	12.74	10.70	9.12	7.86	6.85
	2	13.67	10.15	7.89	6.37	5.31	4.54	3.97	3.54	3.20	2.93
	3	8.42	6.26	4.88	3.96	3.31	2.85	2.52	2.27	2.09	1.94
	4	82.22	52.64	35.71	25.33	18.61	14.07	10.90	8.61	6.92	5.65
	5	56.98	36.29	24.52	17.34	12.71	9.59	7.42	5.85	4.70	3.83
Σ300-3	1	53.38	39.22	30.03	23.73	19.22	15.88	13.35	11.37	9.80	8.54
	2	16.69	12.39	9.63	7.76	6.46	5.52	4.83	4.30	3.89	3.56
	3	10.19	7.58	5.90	4.78	4.00	3.45	3.04	2.74	2.52	2.34
	4	103.92	66.01	44.51	31.42	23.00	17.34	13.40	10.56	8.47	6.90
	5	70.71	44.79	30.14	21.24	15.53	11.69	9.02	7.11	5.70	4.64
Σ350-1.5	1	8.55	7.33	6.41	5.70	5.13	4.66	4.27	3.95	3.66	3.42
	2	8.55	6.32	4.86	3.87	3.17	2.66	2.27	1.97	1.74	1.56
	3	5.54	4.09	3.15	2.51	2.06	1.73	1.48	1.29	1.14	1.03
	4	52.81	35.24	24.71	18.01	13.54	10.43	8.22	6.59	5.36	4.42
	5	40.52	26.66	18.49	13.35	9.95	7.62	5.96	4.76	3.85	3.17
Σ350-2.0	1	19.00	16.29	14.25	12.67	11.40	10.36	8.94	7.62	6.57	5.72
	2	12.70	9.38	7.23	5.77	4.74	3.99	3.42	2.99	2.66	2.39
	3	7.96	5.88	4.54	3.63	2.99	2.52	2.17	1.91	1.71	1.55
	4	81.17	53.42	37.04	26.74	19.94	15.27	11.95	9.53	7.72	6.35
	5	60.18	39.15	26.89	19.27	14.28	10.87	8.47	6.73	5.43	4.45
Σ350-2.5	1	35.43	30.37	26.57	22.78	18.45	15.25	12.82	10.92	9.42	8.20
	2	16.90	12.48	9.63	7.69	6.32	5.33	4.58	4.01	3.57	3.23
	3	10.33	7.64	5.90	4.72	3.89	3.29	2.84	2.51	2.25	2.05
	4	112.61	73.24	50.30	36.04	26.70	20.33	15.84	12.58	10.15	8.32
	5	81.08	52.26	35.63	25.38	18.71	14.19	11.02	8.72	7.03	5.74
Σ350-3	1	59.09	48.81	37.37	29.53	23.92	19.77	16.61	14.15	12.20	10.63
	2	20.96	15.48	11.94	9.54	7.84	6.60	5.68	4.98	4.43	4.00
	3	12.62	9.33	7.21	5.77	4.76	4.02	3.48	3.07	2.75	2.51
	4	147.03	94.60	64.43	45.84	33.77	25.60	19.86	15.72	12.65	10.33

“Europanel Group” S.R.L.
Oficiu: R. Moldova, or. Chisinau, str. Florilor 4/3
Depozit: or. Vatra, str. Plopilor 49
www.europanel.md

Telefon: +373.795.13.700
: +373.767.17.799
Fax : + 373.22.999.560
E-mail : europanel.group@gmail.com



	5	103.15	65.94	44.68	31.67	23.25	17.57	13.60	10.75	8.64	7.04
Σ400-2.0	1	16.63	14.25	12.47	11.08	9.98	9.07	8.31	7.67	7.13	6.53
	2	15.50	11.42	8.79	6.99	5.71	4.78	4.08	3.54	3.12	2.78
	3	9.52	7.02	5.40	4.30	3.52	2.96	2.53	2.20	1.95	1.75
	4	101.99	67.76	47.34	34.40	25.79	19.84	15.59	12.47	10.14	8.35
	5	77.39	50.74	35.07	25.26	18.80	14.36	11.23	8.94	7.23	5.94
Σ400-2.5	1	31.04	26.61	23.28	20.69	18.62	16.93	14.79	12.60	10.87	9.47
	2	20.81	15.34	11.81	9.40	7.69	6.44	5.50	4.79	4.23	3.78
	3	12.41	9.15	7.05	5.62	4.61	3.87	3.32	2.90	2.58	2.33
	4	144.05	94.48	65.33	47.06	35.02	26.77	20.93	16.67	13.49	11.07
	5	105.88	68.69	47.08	33.68	24.92	18.95	14.75	11.70	9.44	7.73
Σ400-3	1	51.83	44.42	38.87	33.87	27.43	22.67	19.05	16.23	14.00	12.19
	2	25.82	19.04	14.65	11.66	9.54	7.99	6.83	5.94	5.24	4.69
	3	15.15	11.18	8.62	6.87	5.64	4.74	4.06	3.55	3.16	2.85
	4	188.10	122.14	83.79	59.96	44.39	33.77	26.29	20.87	16.84	13.79
	5	134.91	86.84	59.16	42.10	31.02	23.52	18.25	14.44	11.63	9.50