

ŚREDNIONAPIĘCIOWY SYSTEM PAS
WZDŁUŻNIE USZCZELNIANE PRZEWODY
SAX-W 20 i 30kV



PPHU TRANZEX S-ka z o.o.
44-100 Gliwice, ul. Daszyńskiego 56
tel.: 32.231-26-17, 32.231-41-64
fax automatyczny 32.331-36-06
www.tranzex.pl
tranzex@tranzex.pl

ENERGETAB 2000 - BRĄZOWY MEDAL za technologię budowy linii średnich napięć w systemie SAXKA
ENERGETAB 2007 - SREBRNY MEDAL PSE S.A. za opracowanie i wdrożenie technologii projektowania i budowy
KABLOWYCH LINII UNIWERSALNYCH SN z przewodami w pełnej izolacji i stalową linką nośną



UWAGA!! UWAGA!! UWAGA!! UWAGA!! UWAGA!!

NOWA GENERACJA
oryginalnych fińskich przewodów systemu
PAS typu SAX-W
WZDŁUŻNIE USZCZELNIANYCH
Do nabycia w dostawach fabrycznych lub z magazynu w Gliwicach

GWARANTUJEMY:

- * najwyższą jakość
- * najkrótsze terminy dostaw
- * najniższe ceny
- * wsparcie techniczne
- * możliwość kompletacji dostaw wraz z tłumikami i fińskimi żerdziami drewnianymi wykonanymi wg, norm BS, SFS, SS



NOKIA
CABLES

Przewód (PAS) SAX-W 20 kV 50 mm²
Przewód (PAS) SAX-W 20 kV 70 mm²
Przewód (PAS) SAX-W 20 kV 120 mm²
Przewód (PAS) SAX-W 30 kV 70 mm²
Przewód (PAS) SAX-W 30 kV 120 mm²



Pokrywane stopowe przewody systemu PAS ze wzdłużnym przeciwwodnym uszczelnieniem spełniają wymagania norm: SFS 5791, EN 10 002-1, HD 605 S1, IEC 104, IEC 228, IEC 881.
Max. temperatura pracy +90 °C, montaż do (-20)°C, max. temp. dla zwarć do 5s +200°C



PRZEDSIĘBIORSTWO PRODUKCYJNO-
HANDLOWO-USŁUGOWE SPOŁKA z O.O.
44-100 GLIWICE ul. Ligonia 27 tel. 372617

PPHU TRANZEX S-ka z o.o.
44-100 Gliwice, ul. Daszyńskiego 56
tel 32.231 26 17, 32.231 41 64
fax automat 32-331 36 06
www.tranzex.pl
tranzex@tranzex.pl

5. Parametry napowietrznych przewodów SAX-W 20kV

Oznaczenie przewodu	SAX-W 50mm ²	SAX-W 70mm ²	SAX-W 95mm ²	SAX-W 120mm ²
Producent przewodu	PRYSMIAN			
Napięcie znamionowe U ₀ /U/maksymalne U _m	12/20/24 kV			
Dopuszczalna temperatura pracy żyły	80°C			
Obciążalność długotrwała przewodu (przy temperaturze żyły 80°C) w przestrzeniach zewnętrznych:				
a) w okresie od kwietnia do października	220 A	270 A	325 A	375 A
b) w okresie od listopada do marca	245 A	310 A	370 A	430 A
Dopuszczalny 1- sekundowy prąd zwarcia, temperatura żyły na początku zwarcia 40°C, na końcu 200°C	4,3 kA	6,4 kA	8,6 kA	11,0 kA
Rezystancja 1 km żyły (AC) w temp. 80°C	0,89 Ω	0,61 Ω	0,45 Ω	0,36 Ω
Rezystancja 1 km żyły (DC) w temp. 20°C	0,720 Ω	0,493 Ω	0,363 Ω	0,288 Ω
Przekrój znamionowy przewodu	50 mm ²	70 mm ²	95 mm ²	120 mm ²
Przekrój rzeczywisty przewodu	50,3 mm ²	73,9 mm ²	100 mm ²	128,7 mm ²
Średnica przewodu	12,7 mm	14,3 mm	16,1 mm	17,6 mm
Średnica żyły przewodu	8,0 mm	9,7 mm	11,3 mm	12,8 mm
Masa 1 km przewodu	200 kg	270 kg	350 kg	425 kg
Materiał żyły	stop AlMgSi			
Materiał powłoki	wodoszczelny czarny XLPE			
Minimalna siła zrywająca żyłę	15,5	22,5	30,4	38,0
Współczynnik wydłużenia cieplnego α	0,000023 1/°K			
Współczynnik wydłużenia sprężystego β	0,0000164 1/MPa			
Dopuszczalne naprężenie żyły:				
normalne	110 MPa			
zmniejszone	75 MPa			
katastrofalne:				
normalne	220 MPa			
zmniejszone	150 MPa			

Dla przeciwdziałania skutkom pełzania przewodów, które powodują powiększenie się zwisów z biegiem lat pracy linii, a w konsekwencji zmniejszenie pionowych odległości przewodów od ziemi i od krzyżowanych obiektów, należy w czasie naciągu przewodu wykonać ich przepiężenie. Przepiężenie wykonać przyjmując zwis mniejszy od określonego w tablicy zwisów dla danego pręta i temperatury przewodu, odpowiadający zwisowi dla temperatury o 10°C niższej od temperatury montowanego przewodu.

Przewód pokrywany 20 kV

ZASTOSOWANIE

Instalacja na słupach – system SAX

Najwyższa dopuszczalna temperatura przewodu:

- praca ciągła (temp dopuszczalna długotrwale) : 80°C

- przy zwarciu (do 5 s) : 200°C

Najniższa zalecana temperatura podczas układania : -20°C

KONSTRUKCJA

Żyła Okrągła, skomparowana, stopowa (alloy),
ze wzdłużną barierą wodną

Osłona izolacyjna Wodoszczelny czarny XLPE

ZNAKOWANIE

PAS, Pirelli, nazwa produktu, rok produkcji

NORMY

SFS 5791

CERTYFIKAT

FI (FIMKO)

NAPIĘCIE ZMIENNE

$U_0/U = 12/20$ kV, $U_m = 24$ kV



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Nazwa produktu		SAX-W 50	SAX-W 70	SAX-W 95	SAX-W 120	SAX-W 150
Dane konstrukcyjne						
Średnica żyły (1)	mm	8,0	9,7	11,3	12,8	14,2
Średnica przewodu (1)	mm	12,7	14,3	16,1	17,6	18,9
Waga (1):						
aluminium	kg/km	120	180	245	310	385
przewód	kg/km	200	270	350	425	510
Parametry mechaniczne						
Minimalny dozwolony promień gięcia przewodu podczas układania		0,18	0,20	0,22	0,25	0,27
Minimalna siła zrywająca przewód (1)	kN	15,5	22,5	30,4	38,0	47,3
Moduł Younga przewodu	N/mm ²	61.000				
Temperaturowy współczynnik wydłużenia	1/K	23 x 10 ⁻⁶				
Parametry elektryczne						
Rezystancja jednostkowa w temperaturze 20°C (DC)	Ω/km	0,720	0,493	0,363	0,288	0,236
Rezystancja jednostkowa (AC) w temperaturze 80°C	Ω/km	0,89	0,61	0,45	0,36	0,29
Obciążalność prądowa w powietrzu (temp. żyły 80°C)	A	245	310	370	430	485
Termiczny prąd zwarciový (czas trwania zwarcia 1 s) (2)	kA	4,3	6,4	8,6	11,0	13,5

(1) Wartość przybliżona

(2) Temperatura żyły na początku zwarcia 40°C, a na końcu 200°C

Type designation: SAX-W 50/3.3

Medium voltage covered conductor

General

Rated voltage	10-30 kV
Standard	Construction and tests i.a.w. EN 50397 and SFS 5791
Reference standards	EATS 43-122, IEC 60104, IEC 60228, IEC 60811, SFS 5790
Temperature rating	Max. conductor operating temperature: 80°C

Construction

Wire *All aluminium alloy wire i.a.w. IEC 60104 Type A.*

Properties of wire before stranding:

Tensile strength (min.)	N/mm ²	325
Elongation at break on 250mm (min.)	%	3.0
Resistivity (max.)	nohm m	32.840

Conductor *Round, stranded and compacted longitudinally water-tight conductor.*

Approximate diameter	mm	8.0
DC resistance at 20°C (max.)	ohm/km	0.720
Breaking load (min.)	kN	15.5
Final modulus of elasticity	N/mm ²	62500
Coefficient of linear expansion	1/°C	23.0×10 ⁻⁶
Direction of laying of the external layer: right handed 'Z'		

Covering *Black XLPE compound*

Nominal thickness	mm	3.3
-------------------	----	-----

Complete cable

Approximate diameter	mm	15.0
Approximate weight	kg/km	250
Bending radius	m	0.23
Current carrying capacity ¹⁾	A	245
Thermal short circuit current for 1 s (max.) ²⁾	kA	4.3

Marking

Marks of origin Embossed on the covering at max. intervals of 1 m: type, manufacturer, trademark and cross-sectional area, year of manufacturing. For example: PRYSMIAN FINLAND CCX 50-AL2 WK 30kV 2006 EN 50397 - PAS - SAX-W 50/3.3 - >PE-X< - Danger of Death - Do Not Touch

¹⁾ Ambient temperature 20°C, conductor temperature 80°C, wind velocity 0.6 m/s and angle 90°C, intensity of solar radiation 1000 W/m².

²⁾ Conductor temperature at the beginning of the short circuit 40°C, at the end of the short circuit 200°C.

Type designation: **SAX-W 120/3.3**

Medium voltage covered conductor

General

Rated voltage	10-30 kV
Standard	Construction and tests i.a.w. EN 50397 and SFS 5791
Reference standards	EATS 43-122, IEC 60104, IEC 60228, IEC 60811, SFS 5790
Temperature rating	Max. conductor operating temperature: 80°C

Construction

Wire *All aluminium alloy wire i.a.w. IEC 104 Type A.*

Properties of wire before stranding:

Tensile strength (min.)	N/mm ²	325
Elongation at break on 250mm (min.)	%	3.0
Resistivity (max.)	nohm m	32.840

Conductor *Round, stranded and compacted longitudinally water-tight conductor.*

Approximate diameter	mm	12.8
DC resistance at 20°C (max.)	ohm/km	0.288
Breaking load (min.)	kN	38.0
Final modulus of elasticity	N/mm ²	62500
Coefficient of linear expansion	1/°C	23.0×10 ⁻⁶
Direction of laying of the external layer: right handed 'Z'		

Covering *Black XLPE compound*

Nominal thickness	mm	3.3
-------------------	----	-----

Complete cable

Approximate diameter	mm	19.8
Approximate weight	kg/km	490
Bending radius	m	0.30
Current carrying capacity ¹⁾	A	335
Thermal short circuit current for 1 s (max.) ²⁾	kA	11.0

Marking

Marks of origin Embossed on the covering at max. intervals of 1 m: type, manufacturer, trademark and cross-sectional area, year of manufacturing. For example: PRYSMIAN FINLAND CCX 120-AL2 WK 30kV 2006 EN 50397 - PAS - SAX-W 120/3.3 - >PE-X< - Danger of Death - Do Not Touch

¹⁾ Ambient temperature 40°C, conductor temperature 80°C, wind velocity 1m/s and angle 90°C, intensity of solar radiation 1000 W/m² and height from sea level 1200m.

²⁾ Conductor temperature at the beginning of the short circuit 40°C, at the end of the short circuit 200°C.

MECHANICAL PROPERTIES OF SAX-W CONDUCTORS FOR 30 (36) kV					ELECTRICAL PROPERTIES		
Cross section in mm ²	Nominal diameter of the conductor in mm	Diameter of the covered ¹⁾ conductor in mm (approx.)	Weight of the covered conductor in kg / km (approx.)	Minimum breaking load in kN	Maximum DC resistance in ohm / km at +20° C	Nominal current carrying capacity in amperes at +20 / 80° C ²⁾	Maximum permissible thermal short circuit current in kA for 1s
70	9.7	16.6	320	22.5	0.493	310	6.4
95	11.3	18.3	410	30.4	0.363	370	8.6
120	12.8	19.8	490	38.0	0.288	430	11.0
150	14.2	21.2	580	47.3	0.236	485	13.5
185	15.8	22.8	700	59.2	0.188	560	17.0
240	18.1	25.1	880	73.5	0.145	625	22.3

¹⁾ Nominal thickness of the covering 3.3 mm.

²⁾ Air temperature +20° C, operating temperature +80° C, solar radiation 1000 W/m², wind 0,6 m/s.



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PPHU TRANZEX S-ka z o.o.
 44-100 Gliwice, ul. Daszyńskiego 56
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TABLICE ZWISÓW I NAPRĘŻEŃ

SAX - W

wzdłużnie uszczelniane napowietrzne przewody
elektroenergetyczne do systemu PAS
ze stopu aluminium w osłonie izolacyjnej

Przewody

SAX-W 50, 70 i 120 mm²

20kV i 30 kV

Strefy klimatyczne obciążenia sadią

SI , SIa, SII, SIIa

Poznań, październik 2010 r.

OPRACOWANIE, WYDAWNICTWO I ROZPOWSZECHNIANIE TABLIC

ENERGOLINIA® Sp. z o.o.

ul. Kramarska 26
61-765 Poznań
tel./fax. 61 852 46 63, 61 852 00 03, 61 853 03 21
e-mail: biuro@energolinia.poznan.pl

PRODUCENT PRZEWODÓW SAX – W

PRYSMIAN – FINLANDIA

DYSTRYBUTORZY

SAE Sp. z o.o.

02-697 Warszawa, ul. Narbutta 83 lok. U1
tel. 22 853 86 01, fax. 22 853 86 02
e-mail: j.nowakowski@sae.com.pl
www.sae.com.pl

TRANZEX Sp. z o.o.

44-100 Gliwice ul. Daszyńskiego 56
tel. 32 231 26 17, fax 32 331 36 06
e-mail: jerzy.malitoski@tranzex.pl
www.tranzex.pl

SPIS ZAWARTOŚCI

1. Przedmiot i przeznaczenie opracowania.
2. Zakres opracowania.
3. Podstawa opracowania.
4. Zestawienie tablic zwisów i naprężeń.

1. Przedmiot i przeznaczenie opracowania

Przedmiotem opracowania są tablice zwisów i naprężeń wzdłużnie uszczelnianych napowietrznych przewodów ze stopu aluminium (AlMgSi) w osłonie izolacyjnej z polietylenu usieciowanego, typu SAX-W.

Tablice przeznaczone są do projektowania napowietrznych linii elektroenergetycznych o napięciu 20kV i 30 kV w strefach klimatycznych obciążenia sadią SI, SIa, SII, SIIa.

Tablice mogą być także wykorzystywane przy montażu nowych przewodów pod warunkiem uwzględnienia przepięcia przewodów, które należy wykonać przyjmując zwis mniejszy od określonego w tablicy zwisów dla danego przęsła temperatury przewodu odpowiadający zwisowi dla temperatury o 15 °C niższej od temperatury montowanego przewodu.

2. Zakres opracowania

Tablice zwisów i naprężeń zawarte w niniejszym opracowaniu są obliczone dla przewodów typu SAX-W przy uwzględnieniu warunków stref klimatycznych obciążenia sadią SI, SIa, SII, SIIa wg PN-E-05100-1:1998.

W opracowaniu uwzględniono ww. przewody o przekrojach: 50 mm², 70 mm² i 120 mm², dla których przyjęto naprężenia podstawowe: 60 MPa, 70 MPa, 75 MPa i 80 MPa .

Założono stopniowanie rozpiętości przęseł co 10 m. Zwisy i naprężenia dla rozpiętości pośrednich należy określić przez interpolację.

Temperatury obliczeniowe przewodu uwzględniono dla szczególnych warunków określonych w normie PN-E-05100-1:1998 i przyjęto następujące wartości: -25°C, -15°C, -5°C, 0°C, +10°C, +20°C, +30°C, +40°C.

3. Podstawa opracowania

Podstawę opracowania tablic stanowią:

- PN-E-05100-1:1998 Elektroenergetyczne linie napowietrzne. Projektowanie i budowa.
- Dane techniczne przewodów wg kart katalogowych producenta.

4. Zestawienie tablic zwisów i naprężeń

Lp.	Typ przewodu	Naprężenie podstawowe [MPa]	Strefa klimatyczna obciążenia sadią	Nr strony tablic zwisów i naprężeń
1	SAX-W 50 mm ² 20 kV	60	SI, Sla	1
2		70		2
3		75		3
4		80		4
5	SAX-W 70 mm ² 20 kV	60		5
6		70		6
7		75		7
8		80		8
9	SAX-W 120 mm ² 20 kV	60		9
10		70		10
11		75		11
12		80		12
13	SAX-W 50 mm ² 30 kV	60		13
14		70		14
15		75		15
16		80		16
17	SAX-W 70 mm ² 30 kV	60		17
18		70		18
19		75		19
20		80		20
21	SAX-W 120 mm ² 30 kV	60		21
22		70		22
23		75		23
24		80		24
25	SAX-W 50 mm ² 20 kV	60	SII, SIIa	25
26		70		26
27		75		27
28		80		28
29	SAX-W 70 mm ² 20 kV	60		29
30		70		30
31		75		31
32		80		32
33	SAX-W 120 mm ² 20 kV	60		33
34		70		34
35		75		35
36		80		36
37	SAX-W 50 mm ² 30 kV	60		37
38		70		38
39		75		39
40		80		40
41	SAX-W 70 mm ² 30 kV	60		41
42		70		42
43		75		43
44		80		44
45	SAX-W 120 mm ² 30 kV	60		45
46		70		46
47		75		47
48		80		48



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W POZNANIU

SAE

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SAX-W

EN - 506

Tablice zwisów i naprężeń
przewodów

SAX-W 50, 70 i 120 mm²
20 i 30 kV

Strefy klimatyczne obciążenia sadyą

SI, SIa

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia							Napreżenie podstawowe		Strona	
	SI SIa							60.0 [MPa]		1	
WIKROL	Typ przewodu							Naciąg podstawowy			
	SAX-W 50mm ² 20kV							3.02 [kN]			
	q= 50.3 [mm ²]	d= 12.7 [mm]	ap= 39.8 [m]	α=0.0000230 1/°K			β=0.0000167 1/MPa				
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.02	0.02	0.04	0.07	0.11	0.14	0.05	0.08
20.0	0.03	0.04	0.06	0.07	0.09	0.12	0.18	0.25	0.30	0.18	0.25
30.0	0.07	0.09	0.13	0.15	0.18	0.22	0.31	0.40	0.47	0.35	0.46
40.0	0.13	0.17	0.22	0.26	0.30	0.35	0.46	0.56	0.66	0.54	0.71
50.0	0.26	0.35	0.45	0.51	0.57	0.64	0.76	0.87	0.97	0.85	1.06
60.0	0.52	0.66	0.80	0.87	0.94	1.00	1.13	1.24	1.35	1.22	1.46
70.0	0.93	1.09	1.23	1.31	1.37	1.44	1.57	1.69	1.80	1.67	1.93
80.0	1.44	1.60	1.74	1.81	1.88	1.95	2.08	2.20	2.31	2.18	2.47
90.0	2.03	2.18	2.32	2.39	2.46	2.53	2.65	2.78	2.90	2.76	3.06
100.0	2.68	2.83	2.97	3.04	3.11	3.17	3.30	3.42	3.55	3.40	3.73
110.0	3.41	3.55	3.69	3.75	3.82	3.89	4.02	4.14	4.26	4.12	4.46
120.0	4.19	4.33	4.47	4.54	4.61	4.67	4.80	4.93	5.05	4.90	5.25
130.0	5.05	5.19	5.33	5.39	5.46	5.52	5.65	5.78	5.90	5.76	6.11
140.0	5.97	6.11	6.25	6.31	6.38	6.45	6.57	6.70	6.83	6.68	7.05
150.0	6.97	7.10	7.24	7.31	7.37	7.44	7.57	7.69	7.82	7.67	8.05
160.0	8.03	8.17	8.30	8.37	8.43	8.50	8.63	8.75	8.88	8.73	9.11
170.0	9.16	9.30	9.43	9.50	9.56	9.63	9.76	9.88	10.01	9.86	10.25
180.0	10.36	10.50	10.63	10.69	10.76	10.83	10.96	11.08	11.21	11.06	11.46
190.0	11.63	11.76	11.90	11.96	12.03	12.10	12.23	12.35	12.48	12.33	12.73
200.0	12.97	13.10	13.24	13.30	13.37	13.43	13.57	13.69	13.82	13.68	14.08
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	60.00	46.28	32.67	25.98	19.53	13.67	6.60	4.33	3.39	37.14	43.29
20.0	60.00	46.49	33.36	27.16	21.50	16.75	10.74	7.94	6.46	45.10	57.20
30.0	60.00	46.82	34.37	28.72	23.75	19.65	14.14	11.09	9.28	52.91	69.72
40.0	59.80	47.05	35.37	30.26	25.84	22.19	17.04	13.89	11.86	60.09	80.99
50.0	46.00	35.33	26.99	23.81	21.24	19.17	16.12	14.05	12.55	60.14	85.25
60.0	33.47	26.69	22.00	20.25	18.78	17.55	15.61	14.15	13.01	60.20	88.72
70.0	25.66	22.02	19.40	18.36	17.45	16.65	15.31	14.23	13.34	60.27	91.55
80.0	21.68	19.59	17.97	17.28	16.66	16.10	15.12	14.29	13.58	60.36	93.87
90.0	19.55	18.21	17.10	16.61	16.16	15.74	15.00	14.34	13.76	60.45	95.81
100.0	18.28	17.35	16.54	16.17	15.83	15.51	14.92	14.39	13.91	60.56	97.44
110.0	17.48	16.78	16.16	15.88	15.61	15.35	14.87	14.43	14.03	60.67	98.83
120.0	16.93	16.39	15.90	15.67	15.45	15.24	14.84	14.47	14.13	60.80	100.04
130.0	16.54	16.11	15.71	15.52	15.34	15.16	14.83	14.52	14.22	60.94	101.11
140.0	16.26	15.91	15.58	15.42	15.26	15.11	14.83	14.56	14.31	61.09	102.06
150.0	16.06	15.76	15.48	15.34	15.21	15.09	14.84	14.61	14.38	61.25	102.94
160.0	15.91	15.65	15.41	15.30	15.18	15.07	14.86	14.65	14.46	61.42	103.74
170.0	15.79	15.58	15.37	15.27	15.17	15.07	14.88	14.70	14.53	61.61	104.49
180.0	15.71	15.52	15.34	15.25	15.16	15.08	14.91	14.75	14.60	61.80	105.21
190.0	15.66	15.49	15.33	15.25	15.17	15.10	14.95	14.80	14.66	62.01	105.89
200.0	15.62	15.47	15.33	15.26	15.19	15.12	14.99	14.86	14.73	62.23	106.56

ENERGOLINIA w Poznaniu	Strefa obciazenia sadzia								Naprezenie podstawowe		Strona
	SI SIa								70.0 [MPa]		2
WIKROL	Typ przewodu								Naciag podstawowy		
	SAX-W 50mm2 20kV								3.52 [kN]		
	q= 50.3 [mm ²]	d= 12.7 [mm]	ap= 46.4 [m]	$\alpha=0.0000230$ 1/°K				$\beta=0.0000167$ 1/MPa			
Rozp. a [m]	Temperatura [°C]										
	-25	-15	-5	0	5	10	20	30	40	sn -5	sk -5
	T A B L I C A Z W I S O W [m]										
10.0	0.01	0.01	0.01	0.01	0.02	0.02	0.04	0.09	0.12	0.04	0.07
20.0	0.03	0.03	0.05	0.05	0.06	0.08	0.13	0.20	0.26	0.16	0.23
30.0	0.06	0.08	0.10	0.12	0.14	0.17	0.24	0.33	0.42	0.31	0.43
40.0	0.11	0.14	0.18	0.20	0.24	0.28	0.38	0.48	0.59	0.50	0.67
50.0	0.18	0.23	0.29	0.33	0.38	0.44	0.56	0.68	0.80	0.73	0.95
60.0	0.33	0.41	0.52	0.59	0.66	0.73	0.87	1.00	1.13	1.05	1.32
70.0	0.57	0.71	0.86	0.94	1.02	1.09	1.24	1.38	1.51	1.43	1.73
80.0	0.94	1.11	1.28	1.36	1.44	1.52	1.67	1.81	1.95	1.87	2.20
90.0	1.42	1.60	1.77	1.86	1.94	2.01	2.17	2.31	2.45	2.36	2.73
100.0	1.98	2.16	2.33	2.41	2.49	2.57	2.72	2.86	3.00	2.92	3.31
110.0	2.60	2.77	2.94	3.02	3.10	3.18	3.33	3.48	3.62	3.53	3.94
120.0	3.28	3.45	3.61	3.69	3.77	3.85	4.00	4.15	4.29	4.20	4.63
130.0	4.01	4.18	4.34	4.42	4.50	4.58	4.73	4.88	5.02	4.93	5.38
140.0	4.80	4.97	5.13	5.21	5.29	5.37	5.52	5.67	5.81	5.72	6.18
150.0	5.66	5.82	5.98	6.06	6.14	6.21	6.37	6.51	6.66	6.57	7.04
160.0	6.57	6.73	6.89	6.97	7.04	7.12	7.27	7.42	7.57	7.48	7.96
170.0	7.54	7.70	7.85	7.93	8.01	8.09	8.24	8.39	8.53	8.44	8.94
180.0	8.56	8.72	8.88	8.96	9.04	9.11	9.26	9.41	9.56	9.47	9.97
190.0	9.65	9.81	9.97	10.04	10.12	10.20	10.35	10.50	10.65	10.56	11.07
200.0	10.80	10.95	11.11	11.19	11.27	11.34	11.49	11.64	11.79	11.70	12.22
	T A B L I C A N A P R E Z E N przy słupie [MPa]										
10.0	70.00	56.25	42.55	35.74	29.00	22.42	11.02	5.72	4.01	45.54	50.43
20.0	70.00	56.37	42.93	36.36	30.01	24.06	14.69	9.78	7.46	51.97	62.93
30.0	70.00	56.58	43.52	37.29	31.40	26.07	17.92	13.19	10.54	58.97	74.87
40.0	70.00	56.85	44.28	38.41	32.98	28.17	20.80	16.19	13.36	65.82	85.96
50.0	65.92	53.29	41.64	36.42	31.78	27.79	21.77	17.84	15.23	70.12	94.34
60.0	53.61	42.60	33.48	29.80	26.70	24.13	20.25	17.56	15.62	70.17	98.42
70.0	41.88	33.79	27.81	25.50	23.55	21.91	19.32	17.39	15.89	70.23	101.88
80.0	33.14	28.09	24.39	22.93	21.66	20.56	18.72	17.27	16.09	70.30	104.82
90.0	27.83	24.73	22.35	21.36	20.48	19.69	18.33	17.20	16.25	70.39	107.33
100.0	24.73	22.70	21.06	20.35	19.70	19.11	18.06	17.15	16.37	70.48	109.49
110.0	22.83	21.40	20.20	19.66	19.16	18.70	17.87	17.13	16.47	70.58	111.36
120.0	21.58	20.52	19.60	19.18	18.78	18.41	17.73	17.12	16.56	70.69	112.99
130.0	20.72	19.90	19.17	18.83	18.51	18.20	17.63	17.11	16.64	70.80	114.43
140.0	20.10	19.44	18.85	18.57	18.30	18.05	17.56	17.12	16.71	70.93	115.72
150.0	19.64	19.11	18.61	18.37	18.15	17.93	17.52	17.13	16.77	71.07	116.87
160.0	19.30	18.85	18.43	18.23	18.03	17.85	17.49	17.15	16.83	71.22	117.92
170.0	19.04	18.65	18.29	18.12	17.95	17.79	17.47	17.18	16.89	71.38	118.88
180.0	18.83	18.50	18.19	18.04	17.89	17.74	17.47	17.20	16.95	71.54	119.78
190.0	18.67	18.38	18.11	17.98	17.85	17.72	17.47	17.24	17.01	71.72	120.61
200.0	18.55	18.30	18.05	17.93	17.82	17.71	17.49	17.27	17.07	71.91	121.41

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia						Napreżenie podstawowe			Strona	
	SI SIa						75.0 [MPa]			3	
WIKROL	Typ przewodu						Naciąg podstawowy				
	SAX-W 50mm ² 20kV						3.77 [kN]				
	q= 50.3 [mm ²]	d= 12.7 [mm]	ap= 49.8 [m]	$\alpha=0.0000230$ 1/°K			$\beta=0.0000167$ 1/MPa				
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
	T A B L I C A Z W I S O W [m]										
10.0	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.07	0.11	0.04	0.07
20.0	0.03	0.03	0.04	0.05	0.06	0.07	0.11	0.17	0.24	0.15	0.22
30.0	0.06	0.07	0.09	0.10	0.12	0.15	0.21	0.30	0.39	0.29	0.42
40.0	0.10	0.13	0.16	0.18	0.21	0.25	0.34	0.44	0.55	0.47	0.65
50.0	0.16	0.20	0.25	0.28	0.32	0.37	0.48	0.60	0.72	0.68	0.91
60.0	0.28	0.34	0.43	0.49	0.55	0.61	0.75	0.89	1.03	0.98	1.26
70.0	0.46	0.57	0.71	0.79	0.86	0.94	1.09	1.24	1.38	1.33	1.65
80.0	0.75	0.91	1.08	1.17	1.25	1.34	1.50	1.65	1.79	1.74	2.10
90.0	1.17	1.35	1.53	1.62	1.71	1.79	1.95	2.11	2.25	2.20	2.60
100.0	1.67	1.86	2.05	2.13	2.22	2.30	2.47	2.62	2.77	2.72	3.14
110.0	2.24	2.43	2.62	2.70	2.79	2.87	3.04	3.19	3.35	3.29	3.74
120.0	2.88	3.06	3.24	3.33	3.42	3.50	3.66	3.82	3.97	3.92	4.39
130.0	3.56	3.75	3.92	4.01	4.10	4.18	4.34	4.50	4.65	4.60	5.09
140.0	4.31	4.49	4.66	4.75	4.83	4.91	5.08	5.24	5.39	5.34	5.84
150.0	5.10	5.28	5.45	5.54	5.62	5.71	5.87	6.03	6.18	6.13	6.65
160.0	5.95	6.13	6.30	6.38	6.47	6.55	6.71	6.87	7.03	6.98	7.51
170.0	6.86	7.03	7.20	7.29	7.37	7.45	7.61	7.77	7.93	7.88	8.43
180.0	7.81	7.99	8.16	8.24	8.33	8.41	8.57	8.73	8.89	8.84	9.39
190.0	8.83	9.00	9.17	9.25	9.34	9.42	9.58	9.74	9.90	9.85	10.42
200.0	9.90	10.07	10.24	10.32	10.40	10.49	10.65	10.81	10.97	10.92	11.49
	T A B L I C A N A P R E Ż E N przy słupie [MPa]										
10.0	75.00	61.24	47.51	40.68	33.89	27.18	14.66	6.96	4.46	50.01	54.32
20.0	75.00	61.34	47.81	41.15	34.62	28.36	17.60	11.15	8.14	55.72	66.05
30.0	75.00	61.50	48.27	41.86	35.70	29.94	20.50	14.61	11.36	62.28	77.64
40.0	75.00	61.72	48.88	42.77	36.99	31.71	23.19	17.65	14.27	68.85	88.54
50.0	74.80	61.80	49.41	43.62	38.23	33.37	25.59	20.32	16.89	75.11	98.69
60.0	63.52	51.50	40.78	36.14	32.07	28.61	23.31	19.69	17.16	75.16	102.98
70.0	51.76	41.72	33.67	30.45	27.72	25.42	21.86	19.28	17.36	75.22	106.70
80.0	41.36	34.18	28.85	26.75	24.95	23.41	20.92	19.01	17.50	75.28	109.91
90.0	33.92	29.29	25.83	24.43	23.20	22.12	20.30	18.83	17.62	75.36	112.69
100.0	29.26	26.27	23.92	22.94	22.05	21.25	19.86	18.70	17.71	75.44	115.10
110.0	26.39	24.34	22.66	21.93	21.26	20.65	19.55	18.61	17.78	75.54	117.21
120.0	24.54	23.05	21.79	21.23	20.70	20.22	19.33	18.55	17.85	75.64	119.06
130.0	23.28	22.15	21.17	20.72	20.30	19.90	19.17	18.51	17.91	75.75	120.70
140.0	22.39	21.50	20.70	20.34	19.99	19.66	19.04	18.48	17.97	75.87	122.16
150.0	21.73	21.01	20.36	20.05	19.76	19.48	18.96	18.47	18.02	76.00	123.47
160.0	21.24	20.64	20.09	19.83	19.58	19.35	18.89	18.47	18.07	76.14	124.66
170.0	20.86	20.36	19.89	19.67	19.45	19.24	18.85	18.47	18.12	76.28	125.76
180.0	20.56	20.13	19.73	19.53	19.35	19.17	18.82	18.49	18.17	76.44	126.76
190.0	20.33	19.96	19.60	19.43	19.27	19.11	18.80	18.50	18.22	76.61	127.70
200.0	20.15	19.82	19.51	19.36	19.21	19.07	18.79	18.53	18.27	76.78	128.58

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia						Napreżenie podstawowe			Strona	
	SI SIa						80.0 [MPa]			4	
WIKROL	Typ przewodu						Naciąg podstawowy				
	SAX-W 50mm2 20kV						4.02 [kN]				
q= 50.3 [mm ²]		d= 12.7 [mm]		ap= 53.1 [m]		α=0.0000230 1/°K			β=0.0000167 1/MPa		
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.05	0.10	0.04	0.06
20.0	0.02	0.03	0.04	0.04	0.05	0.06	0.09	0.15	0.22	0.14	0.21
30.0	0.05	0.07	0.08	0.09	0.11	0.13	0.19	0.27	0.36	0.28	0.40
40.0	0.10	0.12	0.15	0.16	0.19	0.22	0.30	0.40	0.51	0.45	0.63
50.0	0.15	0.18	0.22	0.25	0.29	0.33	0.43	0.55	0.68	0.65	0.89
60.0	0.24	0.29	0.36	0.41	0.46	0.52	0.65	0.79	0.93	0.92	1.21
70.0	0.39	0.47	0.59	0.66	0.73	0.81	0.96	1.11	1.26	1.25	1.58
80.0	0.62	0.75	0.91	0.99	1.08	1.16	1.33	1.49	1.64	1.63	2.01
90.0	0.95	1.13	1.31	1.41	1.50	1.59	1.76	1.92	2.08	2.07	2.48
100.0	1.39	1.59	1.79	1.88	1.97	2.06	2.24	2.40	2.56	2.55	3.00
110.0	1.92	2.12	2.32	2.41	2.51	2.60	2.77	2.94	3.10	3.09	3.57
120.0	2.51	2.71	2.90	3.00	3.09	3.18	3.36	3.52	3.69	3.67	4.18
130.0	3.15	3.35	3.54	3.64	3.73	3.82	3.99	4.16	4.32	4.31	4.84
140.0	3.85	4.04	4.23	4.33	4.42	4.51	4.68	4.85	5.01	5.00	5.55
150.0	4.59	4.79	4.97	5.07	5.16	5.25	5.42	5.59	5.76	5.75	6.31
160.0	5.39	5.58	5.77	5.86	5.95	6.04	6.21	6.38	6.55	6.54	7.12
170.0	6.24	6.43	6.61	6.70	6.79	6.88	7.06	7.23	7.39	7.38	7.98
180.0	7.14	7.33	7.51	7.60	7.69	7.78	7.95	8.12	8.29	8.28	8.89
190.0	8.09	8.28	8.46	8.55	8.64	8.72	8.90	9.07	9.24	9.23	9.86
200.0	9.09	9.28	9.46	9.55	9.64	9.72	9.90	10.07	10.24	10.23	10.87
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	80.00	66.23	52.49	45.64	38.82	32.04	18.95	8.91	5.08	54.58	58.39
20.0	80.00	66.31	52.72	46.00	39.37	32.90	21.12	12.97	8.99	59.66	69.33
30.0	80.00	66.44	53.09	46.56	40.21	34.13	23.58	16.39	12.35	65.75	80.53
40.0	80.00	66.63	53.58	47.29	41.25	35.59	26.00	19.40	15.34	72.04	91.22
50.0	80.01	66.85	54.17	48.14	42.42	37.14	28.32	22.13	18.07	78.22	101.34
60.0	72.85	60.25	48.51	43.15	38.26	33.92	27.01	22.22	18.94	80.15	107.41
70.0	61.70	50.36	40.55	36.40	32.78	29.70	24.89	21.48	19.00	80.20	111.34
80.0	50.72	41.56	34.34	31.44	28.96	26.85	23.49	20.98	19.06	80.27	114.79
90.0	41.53	35.02	30.12	28.15	26.45	24.97	22.54	20.63	19.10	80.34	117.81
100.0	35.03	30.69	27.37	26.00	24.79	23.71	21.88	20.39	19.14	80.42	120.46
110.0	30.83	27.89	25.55	24.56	23.66	22.84	21.41	20.21	19.18	80.50	122.80
120.0	28.11	26.03	24.30	23.55	22.85	22.21	21.07	20.08	19.21	80.60	124.86
130.0	26.29	24.74	23.41	22.82	22.27	21.75	20.82	19.99	19.24	80.70	126.70
140.0	25.01	23.81	22.76	22.28	21.83	21.41	20.62	19.92	19.28	80.82	128.35
150.0	24.08	23.13	22.27	21.88	21.50	21.14	20.48	19.87	19.31	80.94	129.83
160.0	23.39	22.61	21.89	21.56	21.24	20.94	20.37	19.84	19.35	81.07	131.18
170.0	22.86	22.20	21.60	21.32	21.04	20.78	20.28	19.82	19.39	81.20	132.41
180.0	22.45	21.89	21.37	21.13	20.89	20.66	20.22	19.81	19.43	81.35	133.54
190.0	22.12	21.64	21.19	20.97	20.77	20.56	20.18	19.81	19.47	81.51	134.58
200.0	21.86	21.44	21.04	20.86	20.67	20.49	20.15	19.82	19.51	81.67	135.56

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia				Napreżenie podstawowe				Strona		
	SI SIa				60.0 [MPa]				5		
WIKROL	Typ przewodu				Naciąg podstawowy						
	SAX-W 70mm ² 20kV				4.43 [kN]						
q= 73.9 [mm ²]		d= 14.3 [mm]		ap= 52.1 [m]		$\alpha=0.0000230$ 1/°K		$\beta=0.0000167$ 1/MPa			
Rozp.	Temperatura [°C]									sn	sk
a [m]	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.02	0.02	0.03	0.07	0.11	0.14	0.04	0.07
20.0	0.03	0.04	0.05	0.07	0.08	0.11	0.18	0.24	0.30	0.15	0.21
30.0	0.07	0.09	0.12	0.14	0.17	0.21	0.30	0.39	0.47	0.30	0.40
40.0	0.12	0.15	0.20	0.24	0.28	0.33	0.44	0.55	0.65	0.47	0.62
50.0	0.19	0.24	0.31	0.36	0.41	0.47	0.60	0.72	0.84	0.67	0.87
60.0	0.31	0.39	0.51	0.58	0.65	0.72	0.86	1.00	1.12	0.95	1.18
70.0	0.52	0.65	0.81	0.89	0.97	1.05	1.20	1.34	1.48	1.29	1.56
80.0	0.84	1.01	1.18	1.27	1.35	1.43	1.59	1.74	1.88	1.68	1.98
90.0	1.25	1.44	1.62	1.71	1.79	1.88	2.04	2.19	2.33	2.13	2.46
100.0	1.74	1.94	2.12	2.21	2.29	2.38	2.54	2.69	2.84	2.63	2.98
110.0	2.30	2.49	2.67	2.76	2.84	2.93	3.09	3.24	3.39	3.19	3.55
120.0	2.91	3.09	3.27	3.36	3.45	3.53	3.69	3.85	4.00	3.79	4.17
130.0	3.57	3.76	3.93	4.02	4.11	4.19	4.35	4.51	4.66	4.45	4.85
140.0	4.29	4.47	4.65	4.73	4.82	4.90	5.06	5.22	5.38	5.16	5.57
150.0	5.05	5.23	5.41	5.50	5.58	5.66	5.83	5.99	6.15	5.93	6.35
160.0	5.87	6.05	6.23	6.31	6.40	6.48	6.65	6.81	6.97	6.75	7.18
170.0	6.75	6.93	7.10	7.19	7.27	7.35	7.52	7.68	7.84	7.62	8.06
180.0	7.68	7.85	8.03	8.11	8.20	8.28	8.44	8.61	8.77	8.55	8.99
190.0	8.66	8.83	9.00	9.09	9.17	9.26	9.42	9.59	9.75	9.53	9.98
200.0	9.69	9.86	10.04	10.12	10.21	10.29	10.46	10.62	10.78	10.56	11.02
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	60.00	46.27	32.63	25.92	19.40	13.44	6.21	4.02	3.13	35.49	39.74
20.0	60.00	46.45	33.22	26.94	21.15	16.25	10.13	7.39	5.99	41.38	50.47
30.0	60.00	46.73	34.10	28.33	23.20	18.97	13.36	10.36	8.62	47.53	60.50
40.0	60.00	47.10	35.15	29.86	25.26	21.47	16.18	13.04	11.07	53.41	69.71
50.0	60.01	47.54	36.29	31.43	27.23	23.75	18.71	15.49	13.35	58.96	78.26
60.0	52.09	40.93	31.73	28.05	24.99	22.48	18.75	16.20	14.38	60.12	82.55
70.0	42.28	33.61	27.19	24.74	22.70	21.00	18.35	16.40	14.92	60.16	85.35
80.0	34.35	28.49	24.28	22.64	21.24	20.04	18.08	16.55	15.34	60.21	87.73
90.0	29.04	25.26	22.44	21.29	20.29	19.40	17.89	16.67	15.65	60.27	89.77
100.0	25.76	23.22	21.23	20.40	19.64	18.96	17.77	16.76	15.91	60.33	91.51
110.0	23.68	21.89	20.41	19.77	19.18	18.64	17.68	16.84	16.11	60.40	93.02
120.0	22.31	20.97	19.83	19.33	18.85	18.41	17.61	16.91	16.28	60.48	94.33
130.0	21.35	20.31	19.41	19.00	18.61	18.24	17.57	16.97	16.42	60.56	95.49
140.0	20.66	19.83	19.09	18.75	18.43	18.12	17.55	17.02	16.55	60.65	96.51
150.0	20.15	19.47	18.85	18.56	18.29	18.03	17.53	17.08	16.65	60.75	97.42
160.0	19.76	19.19	18.67	18.42	18.19	17.96	17.53	17.12	16.75	60.85	98.25
170.0	19.46	18.98	18.53	18.31	18.11	17.91	17.53	17.17	16.84	60.96	99.00
180.0	19.23	18.81	18.42	18.23	18.05	17.87	17.54	17.22	16.92	61.08	99.69
190.0	19.04	18.68	18.33	18.17	18.01	17.85	17.55	17.27	17.00	61.20	100.34
200.0	18.90	18.57	18.27	18.12	17.98	17.84	17.57	17.31	17.07	61.33	100.95

ENERGOLINIA w Poznaniu	Strefa obciążenia sędzia						Napężenie podstawowe			Strona	
	SI SIa						70.0 [MPa]			6	
	Typ przewodu						Naciąg podstawowy				
WIKROL	SAX-W 70mm ² 20kV						5.17 [kN]				
q= 73.9 [mm ²]		d= 14.3 [mm]		ap= 60.8 [m]		$\alpha=0.0000230$ 1/°K			$\beta=0.0000167$ 1/MPa		
Rozp.	Temperatura [°C]									sn	sk
a [m]	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.02	0.02	0.04	0.08	0.12	0.04	0.06
20.0	0.03	0.03	0.04	0.05	0.06	0.08	0.13	0.20	0.26	0.13	0.19
30.0	0.06	0.07	0.09	0.11	0.13	0.16	0.23	0.33	0.41	0.26	0.37
40.0	0.10	0.13	0.16	0.19	0.22	0.26	0.36	0.47	0.58	0.43	0.58
50.0	0.16	0.20	0.25	0.29	0.33	0.38	0.50	0.63	0.75	0.61	0.81
60.0	0.23	0.28	0.35	0.40	0.45	0.52	0.65	0.80	0.94	0.82	1.07
70.0	0.35	0.44	0.55	0.62	0.69	0.77	0.93	1.08	1.23	1.11	1.40
80.0	0.54	0.67	0.82	0.91	0.99	1.08	1.25	1.42	1.58	1.44	1.78
90.0	0.81	0.98	1.17	1.26	1.36	1.45	1.63	1.80	1.97	1.83	2.20
100.0	1.17	1.37	1.57	1.67	1.77	1.87	2.06	2.23	2.40	2.26	2.66
110.0	1.61	1.83	2.04	2.14	2.24	2.34	2.53	2.71	2.88	2.73	3.16
120.0	2.12	2.34	2.55	2.65	2.75	2.85	3.04	3.22	3.40	3.25	3.71
130.0	2.68	2.90	3.11	3.22	3.32	3.41	3.60	3.79	3.97	3.81	4.30
140.0	3.29	3.51	3.72	3.82	3.92	4.02	4.21	4.40	4.58	4.42	4.93
150.0	3.95	4.17	4.37	4.48	4.58	4.68	4.87	5.05	5.23	5.08	5.60
160.0	4.65	4.87	5.07	5.18	5.28	5.37	5.57	5.75	5.94	5.78	6.32
170.0	5.40	5.61	5.82	5.92	6.02	6.12	6.31	6.50	6.68	6.53	7.08
180.0	6.20	6.41	6.61	6.71	6.81	6.91	7.10	7.29	7.48	7.32	7.88
190.0	7.04	7.24	7.45	7.55	7.65	7.75	7.94	8.13	8.32	8.16	8.73
200.0	7.92	8.13	8.33	8.43	8.53	8.63	8.82	9.01	9.20	9.04	9.63
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	70.00	56.24	42.53	35.71	28.95	22.32	10.70	5.35	3.71	44.37	47.53
20.0	70.00	56.35	42.85	36.24	29.81	23.75	14.13	9.18	6.93	48.84	56.73
30.0	70.00	56.52	43.36	37.04	31.04	25.57	17.17	12.40	9.82	54.10	66.05
40.0	70.00	56.75	44.02	38.03	32.46	27.49	19.90	15.25	12.47	59.45	74.90
50.0	70.01	57.04	44.78	39.13	33.96	29.40	22.37	17.83	14.92	64.68	83.25
60.0	70.01	57.37	45.62	40.29	35.47	31.24	24.65	20.20	17.21	69.71	91.14
70.0	61.93	50.27	40.06	35.70	31.92	28.70	23.74	20.30	17.84	70.14	94.71
80.0	52.99	42.99	34.94	31.68	28.91	26.57	22.90	20.23	18.23	70.18	97.56
90.0	44.83	37.05	31.15	28.81	26.80	25.08	22.31	20.19	18.53	70.23	100.06
100.0	38.34	32.73	28.51	26.81	25.33	24.04	21.88	20.16	18.77	70.28	102.27
110.0	33.71	29.74	26.68	25.42	24.29	23.28	21.56	20.15	18.96	70.34	104.22
120.0	30.55	27.68	25.39	24.41	23.53	22.73	21.33	20.14	19.12	70.41	105.94
130.0	28.36	26.22	24.45	23.68	22.97	22.31	21.15	20.14	19.25	70.48	107.48
140.0	26.82	25.16	23.75	23.12	22.54	22.00	21.01	20.14	19.37	70.56	108.85
150.0	25.69	24.37	23.22	22.70	22.21	21.75	20.91	20.15	19.47	70.64	110.09
160.0	24.84	23.76	22.81	22.37	21.95	21.56	20.83	20.17	19.56	70.73	111.20
170.0	24.19	23.29	22.48	22.11	21.75	21.41	20.77	20.18	19.65	70.82	112.22
180.0	23.68	22.92	22.22	21.90	21.59	21.29	20.72	20.20	19.72	70.92	113.14
190.0	23.28	22.62	22.02	21.73	21.46	21.19	20.69	20.23	19.79	71.03	114.00
200.0	22.95	22.38	21.85	21.60	21.35	21.12	20.67	20.25	19.86	71.14	114.79

ENERGOLINIA w Poznaniu	Strefa obciazenia sadzia		SI		SIa		Naprezenie podstawowe		75.0 [MPa]		Strona	7
	Typ przewodu		SAX-W 70mm2 20kV				Naciag podstawowy		5.54 [kN]			
WIKROL												
q= 73.9 [mm ²]		d= 14.3 [mm]		ap= 65.1 [m]		$\alpha=0.0000230$ 1/°K		$\beta=0.0000167$ 1/MPa				
Rozp.	Temperatura [°C]									sn	sk	
a [m]	-25	-15	-5	0	5	10	20	30	40	-5	-5	
T A B L I C A Z W I S O W [m]												
10.0	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.07	0.11	0.03	0.05	
20.0	0.02	0.03	0.04	0.04	0.05	0.06	0.10	0.17	0.24	0.12	0.18	
30.0	0.05	0.07	0.08	0.10	0.11	0.14	0.20	0.29	0.38	0.25	0.35	
40.0	0.10	0.12	0.15	0.17	0.20	0.23	0.32	0.43	0.54	0.40	0.56	
50.0	0.15	0.18	0.23	0.26	0.30	0.34	0.45	0.58	0.71	0.58	0.79	
60.0	0.21	0.26	0.32	0.36	0.41	0.47	0.60	0.74	0.89	0.78	1.04	
70.0	0.31	0.37	0.46	0.52	0.58	0.65	0.81	0.97	1.12	1.03	1.34	
80.0	0.46	0.56	0.69	0.76	0.85	0.93	1.11	1.28	1.45	1.35	1.70	
90.0	0.67	0.81	0.98	1.08	1.17	1.27	1.45	1.64	1.81	1.71	2.10	
100.0	0.96	1.15	1.35	1.45	1.55	1.65	1.85	2.03	2.21	2.11	2.54	
110.0	1.34	1.55	1.77	1.87	1.98	2.08	2.28	2.47	2.66	2.55	3.01	
120.0	1.78	2.01	2.24	2.35	2.46	2.56	2.76	2.96	3.14	3.03	3.53	
130.0	2.30	2.53	2.76	2.87	2.98	3.08	3.29	3.48	3.67	3.56	4.08	
140.0	2.86	3.10	3.32	3.43	3.54	3.65	3.85	4.05	4.24	4.13	4.67	
150.0	3.47	3.71	3.93	4.04	4.15	4.26	4.46	4.66	4.85	4.74	5.31	
160.0	4.13	4.36	4.59	4.69	4.80	4.91	5.11	5.31	5.51	5.40	5.98	
170.0	4.83	5.06	5.28	5.39	5.50	5.60	5.81	6.01	6.21	6.09	6.69	
180.0	5.57	5.80	6.02	6.13	6.23	6.34	6.55	6.75	6.95	6.83	7.45	
190.0	6.35	6.58	6.80	6.91	7.01	7.12	7.33	7.53	7.73	7.61	8.25	
200.0	7.18	7.40	7.62	7.73	7.84	7.94	8.15	8.35	8.55	8.44	9.08	
T A B L I C A N A P R E Z E N przy słupie [MPa]												
10.0	75.00	61.23	47.50	40.66	33.85	27.12	14.44	6.57	4.14	49.01	51.73	
20.0	75.00	61.32	47.75	41.05	34.48	28.13	17.11	10.53	7.58	52.89	60.15	
30.0	75.00	61.46	48.15	41.67	35.42	29.53	19.81	13.81	10.61	57.69	69.06	
40.0	75.00	61.64	48.67	42.46	36.56	31.13	22.34	16.70	13.35	62.74	77.68	
50.0	75.01	61.88	49.29	43.36	37.82	32.78	24.70	19.31	15.88	67.76	85.88	
60.0	75.01	62.15	49.99	44.35	39.13	34.44	26.90	21.70	18.23	72.65	93.69	
70.0	71.07	58.72	47.38	42.28	37.67	33.62	27.20	22.71	19.57	75.13	99.16	
80.0	62.60	51.36	41.64	37.50	33.89	30.79	25.93	22.45	19.89	75.17	102.18	
90.0	54.20	44.62	36.89	33.75	31.03	28.71	25.01	22.26	20.15	75.22	104.88	
100.0	46.68	39.13	33.32	30.98	28.96	27.20	24.34	22.11	20.35	75.27	107.29	
110.0	40.65	35.03	30.75	29.00	27.46	26.11	23.83	22.01	20.52	75.32	109.43	
120.0	36.21	32.10	28.90	27.56	26.37	25.30	23.46	21.94	20.66	75.38	111.35	
130.0	33.06	30.00	27.55	26.50	25.55	24.68	23.17	21.88	20.77	75.45	113.07	
140.0	30.81	28.48	26.55	25.70	24.93	24.22	22.94	21.84	20.87	75.52	114.62	
150.0	29.17	27.34	25.79	25.09	24.45	23.85	22.77	21.81	20.96	75.60	116.02	
160.0	27.95	26.48	25.20	24.62	24.07	23.56	22.63	21.79	21.04	75.68	117.29	
170.0	27.02	25.81	24.73	24.24	23.78	23.34	22.52	21.78	21.11	75.77	118.45	
180.0	26.30	25.28	24.36	23.94	23.54	23.15	22.44	21.78	21.18	75.86	119.51	
190.0	25.72	24.85	24.06	23.69	23.34	23.00	22.37	21.79	21.24	75.96	120.48	
200.0	25.26	24.51	23.82	23.50	23.19	22.89	22.32	21.79	21.30	76.07	121.39	

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia						Napreżenie podstawowe		Strona		
	SI SIa						80.0 [MPa]		8		
MIKROL	Typ przewodu						Naciąg podstawowy				
	SAX-W 70mm ² 20kV						5.91 [kN]				
	q= 73.9 [mm ²]	d= 14.3 [mm]	ap= 69.4 [m]	$\alpha=0.0000230$ 1/°K		$\beta=0.0000167$ 1/MPa					
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.05	0.09	0.03	0.05
20.0	0.02	0.03	0.03	0.04	0.05	0.05	0.09	0.14	0.21	0.11	0.17
30.0	0.05	0.06	0.08	0.09	0.10	0.12	0.18	0.26	0.35	0.23	0.34
40.0	0.09	0.11	0.13	0.15	0.18	0.20	0.28	0.39	0.50	0.38	0.54
50.0	0.14	0.17	0.21	0.23	0.27	0.31	0.41	0.53	0.66	0.56	0.76
60.0	0.20	0.24	0.30	0.33	0.37	0.42	0.55	0.69	0.83	0.75	1.01
70.0	0.28	0.33	0.40	0.45	0.50	0.56	0.70	0.86	1.02	0.97	1.28
80.0	0.40	0.48	0.59	0.65	0.72	0.80	0.97	1.15	1.32	1.26	1.63
90.0	0.57	0.69	0.84	0.92	1.01	1.10	1.29	1.48	1.66	1.60	2.01
100.0	0.80	0.96	1.15	1.25	1.35	1.45	1.65	1.85	2.04	1.97	2.43
110.0	1.11	1.31	1.53	1.63	1.74	1.85	2.06	2.26	2.45	2.39	2.88
120.0	1.50	1.73	1.96	2.07	2.18	2.29	2.51	2.71	2.91	2.84	3.37
130.0	1.95	2.20	2.44	2.55	2.67	2.78	3.00	3.20	3.40	3.34	3.89
140.0	2.47	2.72	2.96	3.08	3.19	3.31	3.53	3.74	3.94	3.87	4.45
150.0	3.04	3.29	3.53	3.65	3.76	3.88	4.10	4.31	4.51	4.44	5.05
160.0	3.65	3.90	4.14	4.26	4.37	4.48	4.71	4.92	5.12	5.06	5.69
170.0	4.30	4.55	4.79	4.91	5.02	5.13	5.36	5.57	5.78	5.71	6.36
180.0	4.99	5.24	5.48	5.60	5.71	5.82	6.05	6.26	6.47	6.40	7.07
190.0	5.73	5.97	6.21	6.33	6.44	6.56	6.78	6.99	7.20	7.13	7.83
200.0	6.50	6.75	6.98	7.10	7.21	7.33	7.55	7.76	7.98	7.91	8.61
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	80.00	66.22	52.48	45.62	38.79	32.00	18.81	8.54	4.73	53.74	56.08
20.0	80.00	66.29	52.67	45.92	39.26	32.73	20.74	12.37	8.40	57.10	63.75
30.0	80.00	66.41	52.99	46.41	39.98	33.81	22.98	15.60	11.57	61.47	72.22
40.0	80.00	66.56	53.41	47.04	40.89	35.10	25.23	18.46	14.40	66.20	80.58
50.0	80.01	66.75	53.92	47.78	41.94	36.50	27.40	21.05	16.99	70.99	88.62
60.0	80.01	66.98	54.50	48.61	43.06	37.96	29.47	23.44	19.39	75.73	96.32
70.0	79.64	66.87	54.80	49.18	43.93	39.15	31.24	25.52	21.54	80.12	103.51
80.0	71.82	59.79	48.86	43.98	39.59	35.71	29.48	24.99	21.76	80.16	106.67
90.0	63.69	52.81	43.47	39.49	36.00	32.97	28.15	24.59	21.94	80.20	109.53
100.0	55.80	46.53	39.02	35.93	33.24	30.91	27.15	24.30	22.08	80.25	112.11
110.0	48.79	41.38	35.60	33.24	31.18	29.37	26.40	24.07	22.20	80.30	114.44
120.0	43.10	37.44	33.05	31.24	29.64	28.23	25.83	23.89	22.30	80.36	116.54
130.0	38.80	34.53	31.17	29.76	28.50	27.36	25.39	23.76	22.39	80.42	118.44
140.0	35.64	32.39	29.77	28.64	27.62	26.69	25.05	23.66	22.46	80.49	120.16
150.0	33.32	30.80	28.70	27.79	26.94	26.17	24.78	23.58	22.53	80.56	121.72
160.0	31.60	29.58	27.88	27.12	26.41	25.75	24.56	23.52	22.59	80.64	123.14
170.0	30.29	28.65	27.23	26.59	25.99	25.42	24.39	23.47	22.64	80.72	124.44
180.0	29.27	27.91	26.71	26.16	25.64	25.15	24.25	23.44	22.70	80.81	125.63
190.0	28.47	27.32	26.29	25.82	25.37	24.94	24.14	23.41	22.75	80.90	126.74
200.0	27.83	26.84	25.95	25.53	25.14	24.76	24.05	23.40	22.79	81.00	127.76

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia						Napreżenie podstawowe			Strona		
	SI SIa						60.0 [MPa]			9		
	Typ przewodu						Naciąg podstawowy					
	SAX-W 120mm ² 20kV						7.72 [kN]					
WIKROL	q=128.7 [mm ²]		d= 17.6 [mm]		ap= 73.8 [m]		α=0.0000230 1/°K		β=0.0000167 1/MPa			
Rozp. a [m]	Temperatura [°C]										sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5	
T A B L I C A Z W I S O W [m]												
10.0	0.01	0.01	0.01	0.02	0.02	0.03	0.07	0.11	0.14	0.03	0.05	
20.0	0.03	0.03	0.05	0.06	0.08	0.10	0.17	0.24	0.30	0.12	0.17	
30.0	0.06	0.08	0.11	0.13	0.16	0.20	0.29	0.38	0.46	0.24	0.33	
40.0	0.11	0.14	0.19	0.22	0.26	0.32	0.43	0.54	0.64	0.39	0.52	
50.0	0.17	0.21	0.28	0.33	0.39	0.45	0.58	0.71	0.83	0.56	0.73	
60.0	0.24	0.31	0.40	0.45	0.52	0.59	0.74	0.89	1.02	0.75	0.96	
70.0	0.33	0.41	0.52	0.59	0.67	0.75	0.92	1.08	1.23	0.96	1.21	
80.0	0.46	0.58	0.72	0.80	0.89	0.98	1.16	1.34	1.50	1.22	1.51	
90.0	0.66	0.82	1.00	1.10	1.19	1.29	1.48	1.67	1.84	1.54	1.86	
100.0	0.93	1.12	1.33	1.44	1.54	1.64	1.84	2.03	2.21	1.90	2.26	
110.0	1.26	1.49	1.71	1.82	1.93	2.04	2.24	2.44	2.62	2.30	2.68	
120.0	1.66	1.90	2.14	2.25	2.36	2.47	2.68	2.88	3.07	2.74	3.14	
130.0	2.12	2.37	2.60	2.72	2.83	2.94	3.15	3.36	3.55	3.22	3.64	
140.0	2.62	2.87	3.11	3.23	3.34	3.45	3.67	3.87	4.07	3.73	4.17	
150.0	3.17	3.42	3.66	3.78	3.89	4.00	4.22	4.43	4.63	4.29	4.74	
160.0	3.76	4.01	4.25	4.37	4.48	4.59	4.81	5.02	5.23	4.88	5.35	
170.0	4.39	4.64	4.88	4.99	5.11	5.22	5.44	5.65	5.86	5.51	5.99	
180.0	5.05	5.30	5.54	5.66	5.77	5.89	6.11	6.32	6.53	6.18	6.68	
190.0	5.76	6.01	6.25	6.36	6.48	6.59	6.81	7.03	7.24	6.88	7.39	
200.0	6.51	6.75	6.99	7.11	7.22	7.33	7.56	7.77	7.99	7.63	8.15	
T A B L I C A N A P R E Ż E N przy słupie [MPa]												
10.0	60.00	46.26	32.59	25.85	19.27	13.18	5.77	3.66	2.84	34.14	36.56	
20.0	60.00	46.40	33.09	26.71	20.77	15.71	9.44	6.78	5.45	37.93	43.86	
30.0	60.00	46.64	33.83	27.90	22.60	18.21	12.48	9.53	7.88	42.28	51.17	
40.0	60.00	46.95	34.73	29.26	24.48	20.53	15.13	12.04	10.14	46.63	58.07	
50.0	60.01	47.32	35.74	30.68	26.30	22.68	17.52	14.34	12.27	50.83	64.55	
60.0	60.01	47.74	36.78	32.08	28.04	24.66	19.70	16.47	14.28	54.85	70.65	
70.0	60.01	48.18	37.84	33.45	29.68	26.50	21.71	18.46	16.17	58.67	76.42	
80.0	55.94	45.06	35.97	32.25	29.08	26.41	22.32	19.42	17.30	60.11	79.89	
90.0	49.44	40.15	32.86	29.97	27.51	25.43	22.15	19.73	17.89	60.14	81.85	
100.0	43.58	36.11	30.48	28.25	26.33	24.69	22.03	19.98	18.37	60.17	83.59	
110.0	38.77	33.01	28.70	26.96	25.45	24.13	21.93	20.19	18.77	60.21	85.13	
120.0	35.09	30.71	27.37	26.00	24.78	23.70	21.86	20.36	19.11	60.25	86.50	
130.0	32.36	29.01	26.37	25.26	24.27	23.37	21.81	20.50	19.39	60.29	87.73	
140.0	30.35	27.73	25.61	24.70	23.87	23.11	21.77	20.63	19.64	60.34	88.83	
150.0	28.85	26.76	25.02	24.26	23.55	22.90	21.74	20.73	19.84	60.39	89.81	
160.0	27.71	26.00	24.55	23.90	23.30	22.74	21.72	20.83	20.03	60.45	90.70	
170.0	26.83	25.41	24.18	23.62	23.10	22.61	21.71	20.91	20.19	60.50	91.51	
180.0	26.14	24.94	23.88	23.39	22.94	22.50	21.71	20.99	20.33	60.56	92.25	
190.0	25.58	24.55	23.63	23.21	22.80	22.42	21.71	21.06	20.46	60.63	92.92	
200.0	25.13	24.24	23.43	23.05	22.70	22.35	21.71	21.12	20.57	60.70	93.54	

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia		SI		SIa		Napreżenie podstawowe		70.0 [MPa]		Strona	10	
	Typ przewodu		SAX-W 120mm ² 20kV		Naciąg podstawowy		9.01 [kN]						
	WIKROL												
q=128.7 [mm ²]		d= 17.6 [mm]		ap= 86.1 [m]		α=0.0000230 1/°K		β=0.0000167 1/MPa					
Rozp.	Temperatura [°C]										sn	sk	
a [m]	-25	-15	-5	0	5	10	20	30	40	-5	-5		
T A B L I C A Z W I S O W [m]													
10.0	0.01	0.01	0.01	0.01	0.01	0.02	0.04	0.08	0.12	0.03	0.04		
20.0	0.02	0.03	0.04	0.04	0.05	0.07	0.12	0.19	0.26	0.10	0.15		
30.0	0.05	0.06	0.08	0.10	0.12	0.15	0.22	0.32	0.40	0.21	0.29		
40.0	0.09	0.11	0.15	0.17	0.20	0.24	0.34	0.46	0.57	0.34	0.47		
50.0	0.14	0.18	0.23	0.26	0.30	0.36	0.48	0.61	0.74	0.50	0.67		
60.0	0.21	0.25	0.32	0.37	0.42	0.48	0.62	0.77	0.92	0.68	0.89		
70.0	0.28	0.35	0.43	0.49	0.55	0.62	0.78	0.95	1.11	0.87	1.13		
80.0	0.37	0.45	0.56	0.62	0.70	0.78	0.95	1.13	1.31	1.08	1.38		
90.0	0.48	0.58	0.72	0.80	0.88	0.97	1.17	1.36	1.55	1.32	1.67		
100.0	0.65	0.79	0.96	1.05	1.16	1.26	1.47	1.68	1.87	1.63	2.02		
110.0	0.87	1.05	1.25	1.36	1.47	1.58	1.81	2.02	2.23	1.97	2.40		
120.0	1.14	1.36	1.59	1.71	1.82	1.94	2.18	2.40	2.61	2.35	2.81		
130.0	1.48	1.72	1.97	2.09	2.22	2.34	2.58	2.81	3.03	2.76	3.25		
140.0	1.86	2.13	2.39	2.52	2.65	2.77	3.02	3.25	3.47	3.20	3.72		
150.0	2.30	2.58	2.85	2.98	3.11	3.24	3.49	3.72	3.95	3.67	4.22		
160.0	2.79	3.07	3.35	3.48	3.61	3.74	3.99	4.23	4.46	4.18	4.75		
170.0	3.31	3.60	3.88	4.01	4.14	4.27	4.53	4.77	5.01	4.72	5.31		
180.0	3.87	4.16	4.44	4.58	4.71	4.84	5.10	5.34	5.58	5.29	5.90		
190.0	4.47	4.76	5.04	5.18	5.31	5.44	5.70	5.95	6.19	5.90	6.52		
200.0	5.11	5.40	5.68	5.81	5.95	6.08	6.34	6.59	6.83	6.53	7.18		
T A B L I C A N A P R E Ż E N przy słupie [MPa]													
10.0	70.00	56.23	42.51	35.67	28.89	22.22	10.35	4.93	3.38	43.46	45.13		
20.0	70.00	56.32	42.77	36.11	29.61	23.43	13.50	8.50	6.34	46.13	50.91		
30.0	70.00	56.46	43.20	36.78	30.66	25.03	16.33	11.52	9.02	49.58	57.37		
40.0	70.00	56.66	43.75	37.63	31.90	26.75	18.88	14.19	11.48	53.32	63.79		
50.0	70.00	56.90	44.40	38.59	33.23	28.49	21.21	16.62	13.76	57.11	69.97		
60.0	70.01	57.17	45.13	39.62	34.60	30.18	23.36	18.86	15.91	60.84	75.89		
70.0	70.01	57.48	45.90	40.68	35.96	31.82	25.36	20.94	17.92	64.48	81.55		
80.0	70.01	57.81	46.70	41.74	37.29	33.39	27.22	22.89	19.83	68.00	86.98		
90.0	67.80	56.13	45.75	41.21	37.19	33.67	28.10	24.08	21.17	70.12	91.05		
100.0	61.95	51.29	42.24	38.42	35.08	32.20	27.60	24.21	21.66	70.15	93.09		
110.0	56.23	46.86	39.24	36.10	33.37	31.01	27.20	24.31	22.07	70.18	94.95		
120.0	50.97	43.04	36.80	34.24	32.01	30.07	26.88	24.40	22.42	70.21	96.64		
130.0	46.42	39.91	34.84	32.76	30.93	29.32	26.63	24.47	22.72	70.25	98.18		
140.0	42.66	37.40	33.30	31.59	30.08	28.72	26.42	24.54	22.98	70.29	99.58		
150.0	39.66	35.43	32.08	30.66	29.39	28.24	26.25	24.60	23.20	70.34	100.86		
160.0	37.31	33.88	31.11	29.92	28.84	27.85	26.12	24.65	23.39	70.38	102.03		
170.0	35.46	32.65	30.32	29.31	28.38	27.53	26.01	24.70	23.56	70.43	103.11		
180.0	34.00	31.66	29.69	28.82	28.01	27.26	25.92	24.75	23.71	70.48	104.09		
190.0	32.83	30.86	29.17	28.41	27.70	27.04	25.85	24.79	23.84	70.54	105.00		
200.0	31.89	30.20	28.73	28.07	27.45	26.86	25.79	24.83	23.97	70.60	105.84		

ENERGOLINIA w Poznaniu	Strefa obciążenia sędzia						Napężenie podstawowe			Strona	
	SI SIa						75.0 [MPa]			11	
WIKROL	Typ przewodu						Naciąg podstawowy				
	SAX-W 120mm ² 20kV						9.65 [kN]				
q=128.7 [mm ²]		d= 17.6 [mm]		ap= 92.2 [m]		α=0.000230 1/°K		β=0.000167 1/MPa			
Rozp.	Temperatura [°C]									sn	sk
a [m]	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.07	0.11	0.02	0.04
20.0	0.02	0.03	0.03	0.04	0.05	0.06	0.10	0.16	0.23	0.09	0.14
30.0	0.05	0.06	0.08	0.09	0.10	0.13	0.19	0.28	0.37	0.19	0.28
40.0	0.09	0.11	0.13	0.15	0.18	0.21	0.30	0.41	0.53	0.32	0.45
50.0	0.13	0.16	0.21	0.24	0.27	0.32	0.43	0.56	0.69	0.47	0.64
60.0	0.19	0.24	0.29	0.33	0.38	0.44	0.57	0.72	0.86	0.64	0.86
70.0	0.26	0.32	0.40	0.44	0.50	0.57	0.72	0.88	1.05	0.83	1.09
80.0	0.35	0.41	0.51	0.57	0.64	0.71	0.88	1.06	1.24	1.03	1.34
90.0	0.44	0.52	0.64	0.70	0.78	0.87	1.05	1.25	1.44	1.25	1.61
100.0	0.57	0.68	0.83	0.91	1.00	1.10	1.31	1.52	1.73	1.52	1.93
110.0	0.75	0.90	1.08	1.18	1.28	1.39	1.62	1.84	2.05	1.84	2.29
120.0	0.97	1.16	1.37	1.48	1.60	1.72	1.96	2.19	2.41	2.19	2.68
130.0	1.25	1.47	1.71	1.83	1.96	2.08	2.33	2.57	2.80	2.57	3.09
140.0	1.58	1.83	2.09	2.22	2.35	2.48	2.74	2.98	3.22	2.99	3.54
150.0	1.96	2.23	2.51	2.64	2.78	2.91	3.17	3.42	3.66	3.43	4.01
160.0	2.39	2.68	2.96	3.10	3.24	3.38	3.64	3.90	4.14	3.90	4.51
170.0	2.86	3.16	3.45	3.60	3.74	3.87	4.14	4.40	4.65	4.40	5.04
180.0	3.38	3.68	3.98	4.12	4.26	4.40	4.67	4.93	5.18	4.94	5.59
190.0	3.93	4.24	4.53	4.68	4.82	4.96	5.23	5.50	5.75	5.50	6.18
200.0	4.51	4.82	5.12	5.27	5.41	5.55	5.83	6.09	6.35	6.10	6.80
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	75.00	61.23	47.48	40.63	33.81	27.05	14.21	6.13	3.78	48.26	49.65
20.0	75.00	61.30	47.69	40.96	34.33	27.90	16.58	9.84	6.95	50.50	54.75
30.0	75.00	61.41	48.02	41.47	35.12	29.10	19.04	12.92	9.77	53.55	60.76
40.0	75.00	61.57	48.45	42.14	36.10	30.50	21.39	15.63	12.33	56.97	66.88
50.0	75.00	61.76	48.98	42.92	37.20	31.98	23.58	18.08	14.69	60.52	72.88
60.0	75.01	61.99	49.58	43.77	38.37	33.48	25.65	20.35	16.89	64.08	78.67
70.0	75.01	62.24	50.23	44.68	39.56	34.97	27.58	22.45	18.96	67.59	84.25
80.0	75.01	62.52	50.92	45.61	40.76	36.42	29.41	24.42	20.91	71.02	89.62
90.0	75.01	62.82	51.62	46.56	41.95	37.83	31.14	26.27	22.76	74.35	94.80
100.0	70.82	59.26	48.95	44.41	40.34	36.76	30.96	26.69	23.53	75.14	97.61
110.0	65.27	54.65	45.55	41.65	38.21	35.21	30.34	26.69	23.92	75.17	99.59
120.0	59.86	50.40	42.58	39.31	36.44	33.93	29.84	26.70	24.26	75.20	101.41
130.0	54.82	46.66	40.10	37.38	34.99	32.90	29.43	26.71	24.54	75.24	103.08
140.0	50.37	43.50	38.07	35.81	33.82	32.05	29.09	26.72	24.78	75.27	104.62
150.0	46.59	40.91	36.42	34.54	32.87	31.37	28.82	26.73	25.00	75.31	106.04
160.0	43.49	38.82	35.09	33.51	32.09	30.81	28.59	26.74	25.18	75.36	107.34
170.0	40.99	37.13	34.01	32.67	31.45	30.35	28.40	26.76	25.35	75.40	108.54
180.0	38.97	35.77	33.13	31.98	30.93	29.96	28.25	26.77	25.49	75.45	109.65
190.0	37.35	34.66	32.40	31.41	30.49	29.64	28.12	26.79	25.62	75.50	110.68
200.0	36.04	33.75	31.80	30.93	30.12	29.37	28.01	26.81	25.74	75.56	111.63

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia						Napreżenie podstawowe			Strona	
	SI SIa						80.0 [MPa]			12	
WIKROL	Typ przewodu						Naciąg podstawowy				
	SAX-W 120mm ² 20kV						10.30 [kN]				
q=128.7 [mm ²]		d= 17.6 [mm]		ap= 98.4 [m]		α=0.0000230 1/°K			β=0.0000167 1/MPa		
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.05	0.09	0.02	0.03
20.0	0.02	0.02	0.03	0.04	0.04	0.05	0.08	0.14	0.21	0.08	0.13
30.0	0.05	0.05	0.07	0.08	0.09	0.11	0.16	0.25	0.34	0.18	0.26
40.0	0.08	0.10	0.12	0.14	0.16	0.19	0.27	0.37	0.49	0.30	0.43
50.0	0.13	0.15	0.19	0.21	0.24	0.28	0.38	0.51	0.64	0.45	0.62
60.0	0.18	0.22	0.27	0.30	0.34	0.39	0.52	0.66	0.81	0.61	0.83
70.0	0.25	0.30	0.36	0.41	0.46	0.52	0.66	0.82	0.99	0.79	1.06
80.0	0.32	0.39	0.47	0.52	0.58	0.65	0.81	0.99	1.17	0.99	1.30
90.0	0.41	0.49	0.59	0.65	0.72	0.80	0.98	1.17	1.37	1.20	1.56
100.0	0.51	0.60	0.72	0.80	0.88	0.97	1.17	1.38	1.58	1.43	1.85
110.0	0.66	0.78	0.94	1.03	1.12	1.23	1.45	1.67	1.89	1.73	2.19
120.0	0.85	1.00	1.19	1.30	1.41	1.52	1.76	2.00	2.23	2.06	2.56
130.0	1.08	1.27	1.49	1.61	1.73	1.86	2.11	2.35	2.59	2.41	2.96
140.0	1.35	1.58	1.83	1.96	2.09	2.22	2.48	2.74	2.98	2.80	3.38
150.0	1.68	1.93	2.20	2.34	2.48	2.62	2.89	3.15	3.40	3.21	3.83
160.0	2.05	2.33	2.62	2.76	2.91	3.05	3.32	3.59	3.85	3.66	4.30
170.0	2.47	2.77	3.07	3.22	3.37	3.51	3.79	4.06	4.32	4.13	4.80
180.0	2.94	3.25	3.56	3.71	3.86	4.00	4.29	4.56	4.83	4.63	5.33
190.0	3.44	3.76	4.07	4.23	4.38	4.52	4.81	5.09	5.36	5.16	5.89
200.0	3.98	4.30	4.62	4.77	4.93	5.08	5.37	5.65	5.92	5.72	6.47
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	80.00	66.22	52.46	45.60	38.76	31.95	18.67	8.12	4.33	53.11	54.28
20.0	80.00	66.28	52.62	45.85	39.14	32.56	20.33	11.69	7.74	55.01	58.78
30.0	80.00	66.37	52.89	46.25	39.75	33.47	22.32	14.71	10.69	57.69	64.32
40.0	80.00	66.50	53.24	46.78	40.52	34.59	24.37	17.40	13.34	60.80	70.14
50.0	80.00	66.66	53.67	47.41	41.42	35.82	26.37	19.83	15.77	64.11	75.92
60.0	80.01	66.85	54.16	48.12	42.40	37.12	28.29	22.08	18.03	67.48	81.57
70.0	80.01	67.06	54.70	48.89	43.44	38.43	30.12	24.18	20.14	70.85	87.04
80.0	80.01	67.30	55.29	49.70	44.49	39.75	31.87	26.15	22.13	74.17	92.35
90.0	80.01	67.55	55.90	50.53	45.56	41.04	33.55	28.00	24.02	77.42	97.47
100.0	79.25	67.10	55.88	50.77	46.06	41.82	34.76	29.48	25.60	80.13	102.03
110.0	74.03	62.56	52.28	47.71	43.59	39.92	33.89	29.35	25.95	80.16	104.10
120.0	68.76	58.15	48.95	44.98	41.43	38.30	33.16	29.25	26.24	80.19	106.03
130.0	63.60	54.04	46.02	42.61	39.60	36.94	32.56	29.16	26.50	80.22	107.82
140.0	58.76	50.36	43.50	40.62	38.07	35.81	32.05	29.09	26.72	80.26	109.48
150.0	54.40	47.19	41.39	38.96	36.80	34.88	31.64	29.04	26.91	80.29	111.02
160.0	50.62	44.53	39.65	37.59	35.75	34.11	31.29	28.99	27.08	80.33	112.44
170.0	47.43	42.32	38.21	36.46	34.89	33.46	31.00	28.95	27.23	80.38	113.76
180.0	44.78	40.50	37.02	35.52	34.17	32.93	30.76	28.93	27.36	80.42	114.99
190.0	42.62	39.01	36.04	34.75	33.56	32.48	30.55	28.91	27.48	80.47	116.13
200.0	40.84	37.78	35.22	34.09	33.06	32.10	30.38	28.89	27.59	80.52	117.19

ENERGOLINIA w Poznaniu	Strefa obciazenia sadzia		SI		SIa		Naprezenie podstawowe		60.0 [MPa]		Strona	13
	Typ przewodu		SAX-W 50mm2 30kV		Naciag podstawowy		3.02 [kN]					
WIKROL	q= 50.3 [mm ²]	d= 15.0 [mm]	ap= 35.2 [m]	$\alpha=0.0000230$ 1/°K		$\beta=0.0000160$ 1/MPa						
Rozp. a [m]	Temperatura [°C]										sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5	
T A B L I C A Z W I S O W [m]												
10.0	0.01	0.01	0.02	0.02	0.03	0.05	0.09	0.12	0.15	0.06	0.09	
20.0	0.04	0.05	0.07	0.09	0.11	0.14	0.20	0.26	0.32	0.20	0.27	
30.0	0.09	0.12	0.16	0.19	0.22	0.26	0.35	0.43	0.50	0.37	0.49	
40.0	0.19	0.24	0.32	0.36	0.41	0.46	0.56	0.66	0.74	0.62	0.78	
50.0	0.41	0.51	0.63	0.69	0.74	0.80	0.91	1.01	1.10	0.97	1.16	
60.0	0.79	0.92	1.04	1.11	1.16	1.22	1.33	1.43	1.53	1.39	1.61	
70.0	1.29	1.42	1.55	1.61	1.66	1.72	1.83	1.94	2.04	1.89	2.13	
80.0	1.87	2.00	2.13	2.19	2.24	2.30	2.41	2.52	2.62	2.48	2.73	
90.0	2.54	2.66	2.78	2.84	2.90	2.96	3.07	3.18	3.28	3.13	3.40	
100.0	3.28	3.40	3.52	3.58	3.64	3.69	3.81	3.92	4.02	3.87	4.15	
110.0	4.09	4.22	4.33	4.39	4.45	4.51	4.62	4.73	4.84	4.69	4.98	
120.0	4.99	5.11	5.23	5.29	5.34	5.40	5.51	5.62	5.73	5.58	5.88	
130.0	5.96	6.08	6.20	6.26	6.31	6.37	6.48	6.60	6.70	6.55	6.86	
140.0	7.01	7.13	7.25	7.31	7.36	7.42	7.53	7.65	7.76	7.60	7.91	
150.0	8.14	8.26	8.38	8.43	8.49	8.55	8.66	8.77	8.89	8.73	9.05	
160.0	9.35	9.47	9.58	9.64	9.70	9.76	9.87	9.98	10.10	9.94	10.26	
170.0	10.64	10.76	10.87	10.93	10.99	11.05	11.16	11.27	11.38	11.23	11.55	
180.0	12.00	12.12	12.24	12.30	12.36	12.41	12.53	12.64	12.75	12.60	12.93	
190.0	13.45	13.57	13.69	13.74	13.80	13.86	13.98	14.09	14.20	14.05	14.38	
200.0	14.98	15.10	15.21	15.27	15.33	15.39	15.50	15.62	15.73	15.58	15.91	
T A B L I C A N A P R E Z E N przy slupie [MPa]												
10.0	60.00	45.73	31.66	24.85	18.47	13.08	7.16	5.05	4.06	37.44	44.62	
20.0	60.00	46.08	32.83	26.79	21.50	17.27	11.95	9.25	7.70	46.88	60.31	
30.0	60.00	46.62	34.39	29.07	24.54	20.89	15.87	12.90	11.02	55.73	74.12	
40.0	52.60	40.63	30.73	26.82	23.63	21.05	17.34	14.87	13.15	60.11	83.15	
50.0	37.61	29.76	24.25	22.19	20.49	19.06	16.83	15.18	13.90	60.18	87.29	
60.0	27.94	23.95	21.06	19.91	18.90	18.02	16.55	15.37	14.40	60.26	90.55	
70.0	23.29	21.12	19.41	18.68	18.03	17.43	16.39	15.51	14.75	60.35	93.14	
80.0	20.94	19.60	18.47	17.97	17.51	17.08	16.30	15.62	15.01	60.46	95.23	
90.0	19.61	18.69	17.89	17.52	17.18	16.85	16.25	15.71	15.22	60.58	96.94	
100.0	18.79	18.11	17.51	17.23	16.96	16.70	16.22	15.78	15.38	60.72	98.38	
110.0	18.24	17.73	17.25	17.03	16.82	16.61	16.22	15.85	15.51	60.87	99.62	
120.0	17.87	17.46	17.08	16.90	16.72	16.55	16.23	15.92	15.63	61.03	100.70	
130.0	17.61	17.28	16.96	16.81	16.67	16.52	16.25	15.99	15.74	61.21	101.66	
140.0	17.43	17.15	16.89	16.76	16.64	16.51	16.28	16.05	15.84	61.41	102.54	
150.0	17.30	17.07	16.84	16.73	16.62	16.52	16.32	16.12	15.93	61.62	103.36	
160.0	17.21	17.01	16.82	16.72	16.63	16.54	16.36	16.19	16.02	61.84	104.14	
170.0	17.16	16.98	16.81	16.73	16.65	16.57	16.41	16.26	16.11	62.08	104.88	
180.0	17.13	16.97	16.82	16.75	16.68	16.61	16.47	16.33	16.20	62.34	105.60	
190.0	17.11	16.98	16.85	16.78	16.72	16.66	16.53	16.41	16.29	62.60	106.31	
200.0	17.12	17.00	16.88	16.82	16.77	16.71	16.60	16.49	16.38	62.89	107.01	

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia						Napreżenie podstawowe			Strona	
	SI SIa						70.0 [MPa]			14	
WIKROL	Typ przewodu						Naciąg podstawowy				
	SAX-W 50mm2 30kV						3.52 [kN]				
q= 50.3 [mm ²]	d= 15.0 [mm]	ap= 41.1 [m]	α=0.0000230 1/°K			β=0.0000160 1/MPa					
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.02	0.02	0.03	0.06	0.10	0.13	0.05	0.08
20.0	0.03	0.04	0.06	0.07	0.08	0.10	0.16	0.22	0.28	0.17	0.24
30.0	0.08	0.10	0.13	0.15	0.17	0.21	0.29	0.37	0.45	0.34	0.46
40.0	0.14	0.17	0.22	0.25	0.29	0.33	0.43	0.53	0.63	0.54	0.71
50.0	0.26	0.33	0.42	0.47	0.53	0.59	0.71	0.82	0.92	0.83	1.04
60.0	0.49	0.61	0.74	0.81	0.87	0.94	1.06	1.18	1.29	1.19	1.44
70.0	0.86	1.01	1.15	1.23	1.29	1.36	1.49	1.61	1.73	1.62	1.90
80.0	1.34	1.50	1.65	1.72	1.79	1.85	1.99	2.11	2.23	2.12	2.43
90.0	1.91	2.06	2.21	2.28	2.35	2.42	2.55	2.67	2.79	2.69	3.01
100.0	2.54	2.69	2.84	2.91	2.98	3.05	3.18	3.30	3.43	3.32	3.66
110.0	3.25	3.39	3.54	3.61	3.67	3.74	3.87	4.00	4.13	4.01	4.38
120.0	4.01	4.16	4.30	4.37	4.44	4.50	4.64	4.77	4.89	4.78	5.15
130.0	4.85	4.99	5.13	5.20	5.27	5.33	5.47	5.60	5.72	5.61	6.00
140.0	5.75	5.89	6.03	6.10	6.17	6.23	6.36	6.49	6.62	6.51	6.91
150.0	6.72	6.86	6.99	7.06	7.13	7.20	7.33	7.46	7.59	7.47	7.88
160.0	7.75	7.89	8.03	8.10	8.16	8.23	8.36	8.49	8.62	8.51	8.92
170.0	8.85	8.99	9.13	9.20	9.26	9.33	9.46	9.59	9.72	9.61	10.03
180.0	10.02	10.16	10.30	10.36	10.43	10.50	10.63	10.76	10.89	10.78	11.21
190.0	11.26	11.40	11.53	11.60	11.67	11.73	11.87	12.00	12.13	12.02	12.45
200.0	12.56	12.70	12.84	12.90	12.97	13.04	13.17	13.30	13.44	13.32	13.76
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	70.00	55.67	41.44	34.41	27.51	20.92	10.62	6.31	4.68	45.43	51.34
20.0	70.00	55.89	42.10	35.48	29.22	23.58	15.32	10.97	8.71	53.34	65.75
30.0	70.00	56.23	43.08	36.96	31.36	26.46	19.22	14.90	12.30	61.49	79.10
40.0	70.01	56.67	44.26	38.64	33.59	29.23	22.63	18.35	15.56	69.24	91.32
50.0	57.78	46.05	36.19	32.15	28.74	25.90	21.62	18.66	16.54	70.15	96.87
60.0	44.38	35.95	29.67	27.23	25.18	23.44	20.68	18.62	17.03	70.22	100.85
70.0	34.66	29.63	25.92	24.43	23.14	22.01	20.11	18.60	17.37	70.30	104.14
80.0	29.07	26.09	23.77	22.80	21.92	21.13	19.75	18.60	17.62	70.39	106.88
90.0	25.95	24.04	22.47	21.78	21.15	20.56	19.52	18.61	17.82	70.50	109.17
100.0	24.09	22.76	21.62	21.11	20.63	20.18	19.36	18.63	17.97	70.61	111.12
110.0	22.89	21.92	21.05	20.65	20.27	19.92	19.25	18.65	18.10	70.74	112.79
120.0	22.08	21.33	20.65	20.33	20.02	19.73	19.19	18.68	18.22	70.89	114.25
130.0	21.51	20.91	20.36	20.10	19.85	19.60	19.14	18.72	18.32	71.04	115.53
140.0	21.10	20.61	20.15	19.93	19.72	19.51	19.12	18.76	18.41	71.21	116.68
150.0	20.79	20.38	20.00	19.81	19.63	19.45	19.12	18.80	18.50	71.39	117.72
160.0	20.57	20.22	19.89	19.73	19.57	19.42	19.13	18.85	18.58	71.58	118.68
170.0	20.40	20.10	19.81	19.67	19.53	19.40	19.14	18.90	18.66	71.78	119.58
180.0	20.27	20.01	19.76	19.64	19.52	19.40	19.17	18.95	18.74	72.00	120.42
190.0	20.18	19.95	19.73	19.62	19.51	19.41	19.21	19.01	18.82	72.23	121.23
200.0	20.11	19.91	19.71	19.62	19.52	19.43	19.25	19.07	18.90	72.47	122.01

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia							Napreżenie podstawowe		Strona	
	SI SIa							75.0 [MPa]		15	
	Typ przewodu							Naciąg podstawowy			
WIKROL	SAX-W 50mm2 30kV							3.77 [kN]			
	q= 50.3 [mm ²]	d= 15.0 [mm]	ap= 44.0 [m]	α=0.0000230 1/°K			β=0.0000160 1/MPa				
Rozp. a [m]	Temperatura [°C]										
	-25	-15	-5	0	5	10	20	30	40	sn -5	sk -5
	T A B L I C A Z W I S O W [m]										
10.0	0.01	0.01	0.01	0.02	0.02	0.02	0.05	0.08	0.12	0.05	0.07
20.0	0.03	0.04	0.05	0.06	0.07	0.09	0.14	0.20	0.26	0.16	0.23
30.0	0.07	0.09	0.12	0.13	0.16	0.18	0.26	0.34	0.42	0.32	0.44
40.0	0.13	0.16	0.20	0.23	0.26	0.30	0.39	0.50	0.59	0.51	0.69
50.0	0.23	0.28	0.35	0.40	0.45	0.50	0.62	0.73	0.84	0.77	0.99
60.0	0.41	0.50	0.62	0.68	0.75	0.82	0.95	1.07	1.19	1.11	1.38
70.0	0.70	0.84	0.99	1.06	1.13	1.20	1.34	1.47	1.59	1.52	1.81
80.0	1.12	1.28	1.44	1.52	1.59	1.66	1.80	1.93	2.06	1.98	2.31
90.0	1.64	1.80	1.96	2.04	2.11	2.18	2.32	2.46	2.59	2.51	2.86
100.0	2.23	2.39	2.55	2.62	2.70	2.77	2.91	3.05	3.18	3.09	3.47
110.0	2.88	3.04	3.20	3.27	3.35	3.42	3.56	3.70	3.83	3.75	4.14
120.0	3.60	3.76	3.91	3.98	4.06	4.13	4.27	4.41	4.54	4.46	4.87
130.0	4.38	4.53	4.69	4.76	4.83	4.90	5.05	5.18	5.32	5.23	5.66
140.0	5.22	5.37	5.52	5.60	5.67	5.74	5.88	6.02	6.16	6.07	6.51
150.0	6.12	6.27	6.42	6.50	6.57	6.64	6.78	6.92	7.06	6.97	7.43
160.0	7.09	7.24	7.39	7.46	7.53	7.60	7.75	7.89	8.02	7.94	8.40
170.0	8.11	8.26	8.41	8.49	8.56	8.63	8.77	8.91	9.05	8.96	9.43
180.0	9.20	9.35	9.50	9.57	9.65	9.72	9.86	10.00	10.14	10.05	10.53
190.0	10.36	10.51	10.65	10.73	10.80	10.87	11.01	11.15	11.29	11.21	11.69
200.0	11.57	11.72	11.87	11.94	12.01	12.09	12.23	12.37	12.51	12.42	12.92
	T A B L I C A N A P R E Ż E N przy słupie [MPa]										
10.0	75.00	60.66	46.38	39.30	32.30	25.47	13.53	7.32	5.11	49.73	55.02
20.0	75.00	60.83	46.89	40.11	33.58	27.47	17.71	12.17	9.37	56.88	68.71
30.0	75.00	61.11	47.67	41.29	35.31	29.88	21.42	16.19	13.10	64.61	81.75
40.0	75.01	61.47	48.64	42.70	37.22	32.35	24.73	19.70	16.46	72.14	93.83
50.0	67.43	54.79	43.44	38.50	34.14	30.42	24.70	20.80	18.08	75.14	101.40
60.0	54.14	43.78	35.48	32.16	29.33	26.95	23.24	20.54	18.51	75.21	105.67
70.0	42.60	35.54	30.28	28.19	26.40	24.85	22.33	20.37	18.81	75.28	109.26
80.0	34.82	30.47	27.18	25.82	24.62	23.56	21.75	20.27	19.04	75.37	112.30
90.0	30.22	27.48	25.28	24.34	23.49	22.72	21.36	20.20	19.21	75.46	114.87
100.0	27.48	25.62	24.06	23.38	22.74	22.15	21.09	20.17	19.35	75.57	117.08
110.0	25.74	24.40	23.24	22.71	22.22	21.76	20.91	20.15	19.46	75.69	118.98
120.0	24.58	23.57	22.66	22.25	21.85	21.48	20.78	20.15	19.57	75.83	120.64
130.0	23.77	22.97	22.24	21.91	21.58	21.27	20.69	20.15	19.66	75.97	122.11
140.0	23.18	22.53	21.94	21.66	21.38	21.12	20.63	20.17	19.74	76.13	123.42
150.0	22.74	22.21	21.71	21.47	21.24	21.02	20.59	20.19	19.82	76.29	124.60
160.0	22.41	21.96	21.54	21.33	21.14	20.94	20.58	20.23	19.89	76.47	125.68
170.0	22.16	21.78	21.41	21.23	21.06	20.89	20.57	20.26	19.97	76.66	126.68
180.0	21.97	21.64	21.32	21.16	21.01	20.86	20.58	20.30	20.04	76.86	127.61
190.0	21.82	21.53	21.25	21.11	20.98	20.85	20.60	20.35	20.12	77.08	128.49
200.0	21.71	21.46	21.21	21.09	20.97	20.85	20.62	20.40	20.19	77.30	129.33

ENERGOLINIA w Poznaniu	Strefa obciazenia sadzia							Naprezenie podstawowe		Strona	
	SI SIa							80.0 [MPa]		16	
	Typ przewodu							Naciag podstawowy			
WIKROL	SAX-W 50mm ² 30kV							4.02 [kN]			
q= 50.3 [mm ²]		d= 15.0 [mm]		ap= 47.0 [m]		$\alpha=0.0000230$ 1/°K		$\beta=0.0000160$ 1/MPa			
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.02	0.02	0.04	0.07	0.11	0.04	0.07
20.0	0.03	0.04	0.05	0.05	0.06	0.08	0.12	0.18	0.24	0.15	0.22
30.0	0.07	0.08	0.10	0.12	0.14	0.16	0.23	0.31	0.39	0.31	0.43
40.0	0.12	0.15	0.18	0.21	0.24	0.27	0.36	0.46	0.56	0.49	0.67
50.0	0.20	0.24	0.30	0.34	0.38	0.43	0.54	0.65	0.77	0.72	0.95
60.0	0.34	0.42	0.52	0.58	0.64	0.71	0.84	0.97	1.09	1.04	1.32
70.0	0.58	0.70	0.84	0.91	0.99	1.06	1.20	1.34	1.47	1.42	1.74
80.0	0.93	1.09	1.25	1.33	1.41	1.48	1.63	1.77	1.91	1.86	2.21
90.0	1.39	1.57	1.73	1.81	1.89	1.97	2.12	2.26	2.40	2.35	2.73
100.0	1.94	2.11	2.28	2.36	2.44	2.52	2.67	2.81	2.95	2.90	3.31
110.0	2.55	2.72	2.89	2.97	3.05	3.13	3.28	3.42	3.56	3.51	3.94
120.0	3.22	3.39	3.56	3.64	3.71	3.79	3.94	4.09	4.23	4.18	4.63
130.0	3.95	4.12	4.28	4.36	4.44	4.52	4.67	4.82	4.96	4.91	5.37
140.0	4.74	4.90	5.07	5.15	5.22	5.30	5.45	5.60	5.75	5.69	6.17
150.0	5.58	5.75	5.91	5.99	6.07	6.14	6.30	6.44	6.59	6.54	7.03
160.0	6.49	6.65	6.81	6.89	6.97	7.05	7.20	7.35	7.49	7.44	7.95
170.0	7.45	7.61	7.77	7.85	7.93	8.01	8.16	8.31	8.45	8.40	8.92
180.0	8.47	8.64	8.79	8.87	8.95	9.03	9.18	9.33	9.48	9.42	9.95
190.0	9.55	9.71	9.87	9.95	10.03	10.10	10.26	10.41	10.56	10.50	11.04
200.0	10.69	10.85	11.01	11.09	11.17	11.24	11.40	11.55	11.69	11.64	12.19
T A B L I C A N A P R E Z E N przy słupie [MPa]											
10.0	80.00	65.65	51.34	44.23	37.17	30.21	17.23	8.79	5.67	54.17	58.90
20.0	80.00	65.79	51.74	44.85	38.13	31.70	20.66	13.70	10.16	60.60	71.82
30.0	80.00	66.01	52.37	45.80	39.52	33.67	24.03	17.74	14.03	67.90	84.51
40.0	80.01	66.31	53.17	46.96	41.13	35.81	27.16	21.27	17.48	75.16	96.42
50.0	76.49	63.31	51.00	45.38	40.23	35.66	28.37	23.30	19.83	80.13	105.81
60.0	63.92	52.24	42.21	37.97	34.29	31.14	26.23	22.72	20.15	80.19	110.31
70.0	51.67	42.63	35.56	32.73	30.30	28.21	24.86	22.34	20.38	80.26	114.18
80.0	41.93	35.86	31.26	29.40	27.78	26.35	23.98	22.09	20.55	80.34	117.49
90.0	35.52	31.62	28.58	27.31	26.17	25.15	23.38	21.92	20.68	80.44	120.33
100.0	31.57	28.97	26.85	25.94	25.10	24.33	22.97	21.80	20.79	80.54	122.79
110.0	29.08	27.25	25.69	25.00	24.36	23.76	22.68	21.73	20.88	80.65	124.93
120.0	27.44	26.07	24.88	24.34	23.83	23.35	22.47	21.68	20.96	80.77	126.80
130.0	26.29	25.24	24.29	23.86	23.44	23.05	22.32	21.65	21.04	80.91	128.46
140.0	25.47	24.63	23.86	23.50	23.16	22.83	22.21	21.64	21.11	81.06	129.94
150.0	24.86	24.17	23.53	23.23	22.94	22.66	22.13	21.64	21.18	81.21	131.27
160.0	24.40	23.82	23.28	23.03	22.78	22.54	22.08	21.65	21.24	81.38	132.48
170.0	24.05	23.56	23.09	22.87	22.66	22.45	22.05	21.67	21.31	81.56	133.59
180.0	23.78	23.35	22.95	22.76	22.57	22.38	22.03	21.69	21.37	81.75	134.62
190.0	23.56	23.19	22.84	22.67	22.50	22.34	22.03	21.73	21.44	81.95	135.59
200.0	23.40	23.07	22.76	22.61	22.46	22.31	22.03	21.76	21.50	82.16	136.51

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia							Napreżenie podstawowe		Strona	
	SI SIa							60.0 [MPa]		17	
	Typ przewodu							Naciąg podstawowy			
WIKROL	SAX-W 70mm ² 30kV							4.43 [kN]			
q= 73.9 [mm ²]		d= 16.6 [mm]		ap= 46.7 [m]		$\alpha=0.0000230$ 1/°K		$\beta=0.0000160$ 1/MPa			
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.02	0.02	0.03	0.04	0.08	0.12	0.15	0.05	0.07
20.0	0.04	0.05	0.07	0.08	0.10	0.13	0.20	0.26	0.31	0.17	0.23
30.0	0.08	0.10	0.14	0.17	0.20	0.24	0.33	0.41	0.49	0.32	0.43
40.0	0.14	0.18	0.24	0.28	0.33	0.38	0.48	0.59	0.68	0.51	0.65
50.0	0.24	0.30	0.39	0.44	0.50	0.56	0.69	0.80	0.91	0.74	0.93
60.0	0.42	0.54	0.67	0.74	0.81	0.88	1.01	1.13	1.25	1.06	1.28
70.0	0.73	0.88	1.03	1.11	1.18	1.25	1.39	1.52	1.64	1.44	1.70
80.0	1.14	1.30	1.46	1.54	1.62	1.69	1.83	1.96	2.09	1.89	2.16
90.0	1.63	1.80	1.96	2.04	2.11	2.19	2.33	2.47	2.60	2.39	2.68
100.0	2.19	2.36	2.52	2.60	2.67	2.75	2.89	3.03	3.16	2.95	3.26
110.0	2.82	2.98	3.14	3.22	3.29	3.37	3.51	3.65	3.79	3.57	3.90
120.0	3.50	3.66	3.82	3.89	3.97	4.04	4.19	4.33	4.47	4.25	4.59
130.0	4.24	4.40	4.56	4.63	4.71	4.78	4.93	5.07	5.21	4.99	5.34
140.0	5.04	5.20	5.36	5.43	5.51	5.58	5.73	5.87	6.01	5.79	6.15
150.0	5.90	6.06	6.21	6.29	6.36	6.44	6.59	6.73	6.87	6.65	7.02
160.0	6.82	6.98	7.13	7.21	7.28	7.36	7.50	7.65	7.79	7.57	7.94
170.0	7.80	7.95	8.11	8.18	8.26	8.33	8.48	8.63	8.77	8.54	8.93
180.0	8.84	8.99	9.15	9.22	9.30	9.37	9.52	9.66	9.81	9.58	9.97
190.0	9.94	10.09	10.24	10.32	10.40	10.47	10.62	10.76	10.91	10.68	11.07
200.0	11.10	11.25	11.40	11.48	11.55	11.63	11.78	11.92	12.07	11.84	12.24
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	60.00	45.70	31.55	24.66	18.13	12.51	6.45	4.46	3.56	35.28	40.33
20.0	60.00	45.97	32.48	26.23	20.70	16.25	10.82	8.22	6.80	42.35	52.54
30.0	60.00	46.40	33.76	28.18	23.39	19.55	14.43	11.54	9.78	49.36	63.62
40.0	60.01	46.94	35.20	30.19	25.94	22.47	17.58	14.53	12.53	55.92	73.68
50.0	56.33	44.24	34.01	29.85	26.37	23.53	19.35	16.55	14.59	60.10	81.22
60.0	45.05	35.65	28.62	25.94	23.72	21.87	19.01	16.93	15.37	60.15	84.46
70.0	35.86	29.70	25.28	23.57	22.10	20.84	18.79	17.20	15.93	60.20	87.16
80.0	29.93	26.12	23.27	22.12	21.09	20.19	18.65	17.40	16.36	60.27	89.40
90.0	26.43	23.97	22.01	21.19	20.44	19.75	18.56	17.55	16.69	60.34	91.29
100.0	24.31	22.60	21.18	20.56	19.99	19.46	18.50	17.67	16.94	60.42	92.88
110.0	22.95	21.69	20.61	20.13	19.67	19.25	18.47	17.78	17.16	60.51	94.25
120.0	22.02	21.06	20.21	19.82	19.45	19.10	18.45	17.86	17.33	60.60	95.43
130.0	21.37	20.60	19.91	19.59	19.29	18.99	18.45	17.94	17.48	60.71	96.46
140.0	20.89	20.27	19.69	19.42	19.17	18.92	18.45	18.02	17.61	60.82	97.38
150.0	20.53	20.01	19.53	19.30	19.08	18.87	18.46	18.08	17.73	60.94	98.21
160.0	20.26	19.82	19.41	19.21	19.02	18.84	18.48	18.15	17.83	61.07	98.96
170.0	20.06	19.68	19.32	19.15	18.98	18.82	18.51	18.21	17.93	61.21	99.66
180.0	19.90	19.57	19.26	19.11	18.96	18.81	18.54	18.27	18.02	61.36	100.31
190.0	19.78	19.49	19.21	19.08	18.95	18.82	18.57	18.34	18.11	61.51	100.92
200.0	19.69	19.43	19.18	19.07	18.95	18.83	18.61	18.40	18.19	61.68	101.50

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia								Napreżenie podstawowe		Strona	
	SI SIa								70.0 [MPa]		18	
Typ przewodu								Naciąg podstawowy				
SAX-W 70mm ² 30kV								5.17 [kN]				
WIKROL												
q= 73.9 [mm ²]			d= 16.6 [mm]			ap= 54.5 [m]			$\alpha=0.0000230$ 1/°K		$\beta=0.0000160$ 1/MPa	
Rozp. a [m]	Temperatura [°C]										sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5	
T A B L I C A Z W I S O W [m]												
10.0	0.01	0.01	0.01	0.02	0.02	0.03	0.05	0.09	0.13	0.04	0.06	
20.0	0.03	0.04	0.05	0.06	0.07	0.09	0.15	0.22	0.28	0.14	0.21	
30.0	0.07	0.09	0.11	0.13	0.16	0.19	0.27	0.36	0.44	0.29	0.39	
40.0	0.12	0.15	0.19	0.22	0.26	0.31	0.41	0.51	0.61	0.46	0.61	
50.0	0.19	0.23	0.30	0.34	0.39	0.44	0.56	0.68	0.80	0.66	0.86	
60.0	0.30	0.37	0.46	0.52	0.58	0.65	0.79	0.92	1.05	0.91	1.16	
70.0	0.48	0.59	0.73	0.80	0.88	0.95	1.11	1.25	1.39	1.24	1.52	
80.0	0.75	0.90	1.07	1.15	1.24	1.32	1.48	1.63	1.77	1.62	1.94	
90.0	1.12	1.30	1.48	1.57	1.66	1.74	1.91	2.06	2.21	2.05	2.39	
100.0	1.57	1.77	1.95	2.04	2.13	2.22	2.38	2.54	2.69	2.53	2.90	
110.0	2.10	2.29	2.48	2.57	2.66	2.74	2.91	3.07	3.23	3.06	3.46	
120.0	2.68	2.87	3.06	3.15	3.24	3.32	3.49	3.66	3.81	3.64	4.06	
130.0	3.31	3.50	3.69	3.78	3.87	3.95	4.12	4.29	4.45	4.27	4.71	
140.0	4.00	4.19	4.37	4.46	4.55	4.64	4.81	4.97	5.13	4.96	5.41	
150.0	4.73	4.92	5.11	5.19	5.28	5.37	5.54	5.71	5.87	5.69	6.16	
160.0	5.52	5.71	5.89	5.98	6.07	6.16	6.33	6.49	6.66	6.48	6.95	
170.0	6.36	6.55	6.73	6.82	6.90	6.99	7.16	7.33	7.50	7.32	7.80	
180.0	7.25	7.43	7.61	7.70	7.79	7.88	8.05	8.22	8.38	8.21	8.70	
190.0	8.19	8.37	8.55	8.64	8.73	8.82	8.99	9.16	9.33	9.15	9.65	
200.0	9.18	9.36	9.54	9.63	9.72	9.81	9.98	10.15	10.32	10.14	10.65	
T A B L I C A N A P R E Ż E N przy słupie [MPa]												
10.0	70.00	55.66	41.39	34.32	27.35	20.64	9.93	5.63	4.12	43.83	47.72	
20.0	70.00	55.82	41.90	35.15	28.72	22.85	14.20	9.86	7.72	49.39	58.46	
30.0	70.00	56.09	42.67	36.36	30.51	25.36	17.78	13.45	10.96	55.58	68.94	
40.0	70.01	56.43	43.63	37.76	32.44	27.82	20.93	16.62	13.92	61.69	78.71	
50.0	70.01	56.85	44.70	39.26	34.38	30.17	23.74	19.49	16.65	67.54	87.85	
60.0	64.59	52.32	41.55	36.96	32.96	29.56	24.37	20.77	18.22	70.13	93.78	
70.0	54.48	44.15	35.87	32.54	29.71	27.32	23.58	20.85	18.80	70.18	96.99	
80.0	45.40	37.65	31.81	29.50	27.51	25.80	23.04	20.91	19.23	70.23	99.77	
90.0	38.49	33.13	29.10	27.47	26.03	24.77	22.66	20.96	19.57	70.29	102.17	
100.0	33.82	30.15	27.29	26.09	25.02	24.05	22.39	21.01	19.84	70.36	104.25	
110.0	30.75	28.15	26.04	25.13	24.30	23.54	22.20	21.05	20.06	70.43	106.06	
120.0	28.69	26.77	25.15	24.44	23.78	23.16	22.06	21.09	20.24	70.52	107.65	
130.0	27.26	25.78	24.50	23.93	23.39	22.88	21.95	21.13	20.39	70.60	109.05	
140.0	26.23	25.06	24.02	23.54	23.09	22.67	21.88	21.17	20.52	70.70	110.30	
150.0	25.47	24.51	23.65	23.25	22.87	22.51	21.83	21.21	20.64	70.81	111.41	
160.0	24.89	24.09	23.36	23.02	22.69	22.38	21.79	21.25	20.74	70.92	112.42	
170.0	24.44	23.76	23.14	22.84	22.56	22.29	21.77	21.29	20.84	71.04	113.34	
180.0	24.08	23.50	22.96	22.71	22.46	22.22	21.76	21.33	20.93	71.16	114.19	
190.0	23.80	23.30	22.83	22.60	22.38	22.17	21.76	21.38	21.01	71.29	114.97	
200.0	23.58	23.14	22.72	22.52	22.32	22.13	21.77	21.42	21.09	71.43	115.71	

ENERGOLINIA w Poznaniu	Strefa obciążenia sadyza								Napreżenie podstawowe		Strona	
	SI				SIa				75.0 [MPa]		19	
WIKROL	Typ przewodu								Naciąg podstawowy			
	SAX-W 70mm2 30kV								5.54 [kN]			
	q= 73.9 [mm ²]		d= 16.6 [mm]		ap= 58.4 [m]		$\alpha=0.0000230$ 1/°K		$\beta=0.0000160$ 1/MPa			
Rozp. a [m]	Temperatura [°C]										sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5	
T A B L I C A Z W I S O W [m]												
10.0	0.01	0.01	0.01	0.01	0.02	0.02	0.04	0.08	0.12	0.04	0.06	
20.0	0.03	0.03	0.05	0.05	0.06	0.08	0.13	0.19	0.26	0.13	0.19	
30.0	0.06	0.08	0.10	0.12	0.14	0.17	0.24	0.33	0.41	0.27	0.38	
40.0	0.11	0.14	0.18	0.20	0.23	0.27	0.37	0.47	0.58	0.44	0.59	
50.0	0.18	0.22	0.27	0.31	0.35	0.40	0.51	0.64	0.76	0.63	0.83	
60.0	0.26	0.32	0.39	0.44	0.49	0.56	0.69	0.83	0.96	0.85	1.10	
70.0	0.41	0.50	0.61	0.68	0.75	0.83	0.98	1.13	1.28	1.16	1.45	
80.0	0.62	0.76	0.91	0.99	1.08	1.16	1.33	1.49	1.64	1.51	1.84	
90.0	0.93	1.10	1.28	1.37	1.46	1.55	1.72	1.89	2.04	1.91	2.28	
100.0	1.32	1.51	1.71	1.80	1.90	1.99	2.17	2.33	2.49	2.36	2.76	
110.0	1.79	2.00	2.19	2.29	2.39	2.48	2.66	2.83	2.99	2.86	3.28	
120.0	2.32	2.53	2.73	2.83	2.92	3.02	3.20	3.37	3.54	3.40	3.85	
130.0	2.91	3.12	3.32	3.42	3.51	3.60	3.79	3.96	4.13	3.99	4.46	
140.0	3.55	3.76	3.95	4.05	4.15	4.24	4.42	4.60	4.77	4.63	5.12	
150.0	4.24	4.44	4.64	4.74	4.83	4.92	5.11	5.29	5.46	5.31	5.82	
160.0	4.97	5.17	5.37	5.47	5.56	5.66	5.84	6.02	6.19	6.05	6.57	
170.0	5.75	5.95	6.15	6.25	6.34	6.44	6.62	6.80	6.97	6.83	7.36	
180.0	6.58	6.78	6.98	7.07	7.17	7.26	7.45	7.63	7.80	7.66	8.20	
190.0	7.46	7.66	7.85	7.95	8.04	8.14	8.32	8.50	8.68	8.53	9.09	
200.0	8.39	8.58	8.78	8.87	8.97	9.06	9.25	9.43	9.61	9.46	10.03	
T A B L I C A N A P R E Ż E N przy słupie [MPa]												
10.0	75.00	60.64	46.34	39.23	32.19	25.28	12.96	6.60	4.52	48.36	51.74	
20.0	75.00	60.78	46.73	39.86	33.19	26.89	16.68	11.03	8.33	53.25	61.71	
30.0	75.00	60.99	47.34	40.80	34.60	28.93	20.04	14.71	11.71	58.99	71.80	
40.0	75.00	61.27	48.12	41.95	36.22	31.08	23.07	17.94	14.77	64.81	81.38	
50.0	75.01	61.62	49.02	43.23	37.92	33.21	25.82	20.86	17.58	70.49	90.41	
60.0	73.59	60.67	48.79	43.45	38.64	34.41	27.74	23.11	19.89	75.12	98.21	
70.0	64.05	52.42	42.45	38.23	34.57	31.43	26.53	23.01	20.43	75.16	101.63	
80.0	54.64	45.02	37.36	34.26	31.60	29.31	25.67	22.93	20.83	75.21	104.62	
90.0	46.48	39.23	33.69	31.46	29.52	27.84	25.06	22.89	21.15	75.27	107.24	
100.0	40.29	35.12	31.15	29.51	28.07	26.79	24.62	22.86	21.40	75.33	109.55	
110.0	35.97	32.29	29.37	28.14	27.04	26.04	24.30	22.84	21.60	75.40	111.57	
120.0	33.02	30.32	28.11	27.16	26.28	25.48	24.06	22.84	21.77	75.48	113.36	
130.0	30.96	28.92	27.19	26.43	25.72	25.06	23.88	22.84	21.92	75.56	114.95	
140.0	29.49	27.89	26.50	25.88	25.29	24.74	23.74	22.85	22.04	75.65	116.37	
150.0	28.40	27.11	25.98	25.46	24.96	24.50	23.64	22.86	22.15	75.75	117.65	
160.0	27.58	26.52	25.57	25.13	24.71	24.31	23.56	22.88	22.25	75.86	118.80	
170.0	26.95	26.06	25.25	24.87	24.50	24.16	23.50	22.90	22.34	75.97	119.85	
180.0	26.45	25.69	24.99	24.66	24.35	24.04	23.46	22.93	22.42	76.08	120.82	
190.0	26.05	25.40	24.79	24.50	24.22	23.95	23.44	22.96	22.50	76.21	121.71	
200.0	25.73	25.16	24.62	24.37	24.12	23.88	23.42	22.99	22.58	76.34	122.53	

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia						Napreżenie podstawowe			Strona	
	SI SIa						80.0 [MPa]			20	
WIKROL	Typ przewodu						Naciąg podstawowy				
	SAX-W 70mm ² 30kV						5.91 [kN]				
q= 73.9 [mm ²]		d= 16.6 [mm]		ap= 62.3 [m]		α=0.0000230 1/°K			β=0.0000160 1/MPa		
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.07	0.11	0.03	0.05
20.0	0.03	0.03	0.04	0.05	0.06	0.07	0.11	0.17	0.23	0.12	0.18
30.0	0.06	0.07	0.09	0.11	0.12	0.15	0.21	0.29	0.38	0.25	0.36
40.0	0.11	0.13	0.16	0.18	0.21	0.24	0.33	0.44	0.54	0.42	0.57
50.0	0.17	0.20	0.25	0.28	0.32	0.36	0.47	0.59	0.71	0.60	0.81
60.0	0.24	0.29	0.35	0.39	0.44	0.50	0.62	0.76	0.90	0.81	1.07
70.0	0.36	0.43	0.53	0.58	0.65	0.72	0.87	1.02	1.17	1.08	1.39
80.0	0.53	0.64	0.78	0.85	0.94	1.02	1.19	1.35	1.51	1.42	1.77
90.0	0.78	0.93	1.10	1.19	1.28	1.37	1.55	1.73	1.89	1.79	2.18
100.0	1.11	1.30	1.49	1.59	1.68	1.78	1.97	2.14	2.31	2.21	2.63
110.0	1.52	1.73	1.94	2.04	2.14	2.24	2.43	2.61	2.78	2.68	3.13
120.0	2.00	2.22	2.43	2.54	2.64	2.74	2.93	3.11	3.29	3.19	3.67
130.0	2.55	2.77	2.98	3.09	3.19	3.29	3.48	3.67	3.85	3.74	4.25
140.0	3.14	3.36	3.58	3.68	3.78	3.88	4.08	4.26	4.45	4.34	4.87
150.0	3.78	4.00	4.22	4.32	4.42	4.52	4.72	4.91	5.09	4.98	5.53
160.0	4.47	4.69	4.90	5.00	5.11	5.21	5.40	5.59	5.78	5.67	6.24
170.0	5.20	5.42	5.63	5.73	5.84	5.94	6.13	6.32	6.51	6.40	6.98
180.0	5.98	6.20	6.41	6.51	6.61	6.71	6.91	7.10	7.29	7.18	7.78
190.0	6.80	7.02	7.23	7.33	7.43	7.53	7.73	7.92	8.11	8.00	8.61
200.0	7.67	7.88	8.09	8.19	8.29	8.39	8.59	8.79	8.97	8.86	9.49
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	80.00	65.63	51.31	44.18	37.08	30.07	16.83	8.05	5.03	52.99	55.94
20.0	80.00	65.74	51.62	44.66	37.84	31.26	19.77	12.54	9.08	57.28	65.13
30.0	80.00	65.91	52.10	45.40	38.95	32.88	22.76	16.25	12.59	62.57	74.81
40.0	80.00	66.15	52.74	46.34	40.28	34.70	25.58	19.50	15.74	68.09	84.17
50.0	80.01	66.43	53.49	47.41	41.74	36.58	28.21	22.44	18.63	73.57	93.06
60.0	80.01	66.76	54.31	48.56	43.24	38.45	30.65	25.12	21.30	78.89	101.50
70.0	73.23	60.77	49.53	44.56	40.10	36.18	29.94	25.46	22.23	80.15	106.13
80.0	64.06	53.04	43.71	39.79	36.36	33.40	28.68	25.20	22.58	80.20	109.30
90.0	55.35	46.30	39.09	36.15	33.59	31.37	27.77	25.01	22.85	80.25	112.13
100.0	47.95	41.04	35.70	33.51	31.59	29.91	27.10	24.87	23.06	80.31	114.63
110.0	42.29	37.22	33.26	31.62	30.15	28.84	26.61	24.77	23.24	80.38	116.86
120.0	38.22	34.49	31.51	30.24	29.09	28.05	26.23	24.70	23.39	80.45	118.85
130.0	35.35	32.54	30.23	29.23	28.30	27.46	25.95	24.65	23.51	80.53	120.62
140.0	33.28	31.11	29.27	28.46	27.70	27.00	25.73	24.61	23.62	80.61	122.21
150.0	31.76	30.03	28.54	27.87	27.23	26.64	25.56	24.59	23.72	80.70	123.65
160.0	30.62	29.21	27.97	27.40	26.87	26.36	25.42	24.58	23.81	80.80	124.95
170.0	29.74	28.57	27.52	27.04	26.58	26.14	25.32	24.57	23.89	80.91	126.14
180.0	29.05	28.06	27.16	26.75	26.35	25.96	25.24	24.58	23.96	81.02	127.23
190.0	28.50	27.65	26.88	26.51	26.16	25.82	25.18	24.59	24.03	81.13	128.23
200.0	28.06	27.32	26.64	26.32	26.01	25.71	25.14	24.60	24.10	81.25	129.16

ENERGOLINIA w Poznaniu	Strefa obciążenia sędzia				Napężenie podstawowe				Strona		
	SI		SIa		60.0 [MPa]				21		
	Typ przewodu				Naciąg podstawowy						
	SAX-W 120mm ² 30kV				7.72 [kN]						
WIKROL	q=128.7 [mm ²]	d= 19.8 [mm]	ap= 67.2 [m]	α=0.0000230 1/°K	β=0.0000160 1/MPa						
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.02	0.03	0.04	0.08	0.12	0.15	0.04	0.06
20.0	0.03	0.04	0.06	0.07	0.09	0.12	0.19	0.25	0.31	0.13	0.18
30.0	0.07	0.09	0.13	0.15	0.19	0.23	0.32	0.41	0.48	0.26	0.35
40.0	0.12	0.16	0.22	0.26	0.30	0.35	0.46	0.57	0.67	0.42	0.54
50.0	0.19	0.25	0.33	0.38	0.43	0.50	0.62	0.75	0.86	0.60	0.76
60.0	0.28	0.35	0.45	0.51	0.58	0.65	0.80	0.94	1.07	0.80	1.00
70.0	0.39	0.49	0.62	0.69	0.77	0.85	1.01	1.16	1.31	1.03	1.27
80.0	0.59	0.73	0.89	0.98	1.07	1.15	1.33	1.49	1.64	1.35	1.62
90.0	0.86	1.03	1.22	1.32	1.41	1.50	1.68	1.85	2.01	1.71	2.01
100.0	1.20	1.40	1.60	1.70	1.80	1.90	2.08	2.26	2.42	2.11	2.43
110.0	1.61	1.82	2.04	2.14	2.24	2.34	2.52	2.70	2.87	2.55	2.90
120.0	2.08	2.30	2.51	2.62	2.72	2.82	3.01	3.19	3.37	3.03	3.40
130.0	2.59	2.82	3.03	3.14	3.24	3.34	3.53	3.72	3.90	3.56	3.94
140.0	3.16	3.38	3.60	3.70	3.81	3.91	4.10	4.29	4.47	4.13	4.53
150.0	3.77	3.99	4.21	4.31	4.42	4.52	4.71	4.91	5.09	4.74	5.15
160.0	4.42	4.65	4.86	4.97	5.07	5.17	5.37	5.56	5.75	5.40	5.82
170.0	5.12	5.34	5.56	5.66	5.76	5.87	6.07	6.26	6.45	6.09	6.53
180.0	5.86	6.08	6.29	6.40	6.50	6.60	6.80	7.00	7.19	6.83	7.28
190.0	6.64	6.86	7.07	7.18	7.28	7.38	7.59	7.78	7.97	7.61	8.07
200.0	7.46	7.68	7.90	8.00	8.10	8.21	8.41	8.61	8.80	8.44	8.90
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	60.00	45.68	31.48	24.52	17.87	12.04	5.84	3.96	3.15	33.49	36.43
20.0	60.00	45.89	32.21	25.80	20.04	15.38	9.85	7.36	6.04	38.14	44.86
30.0	60.00	46.23	33.26	27.45	22.43	18.40	13.19	10.38	8.73	43.17	52.99
40.0	60.00	46.66	34.49	29.22	24.73	21.10	16.11	13.12	11.23	48.07	60.53
50.0	60.01	47.17	35.79	30.98	26.89	23.54	18.72	15.64	13.57	52.71	67.54
60.0	60.01	47.73	37.10	32.67	28.90	25.76	21.10	17.96	15.77	57.09	74.10
70.0	57.95	46.49	36.93	33.02	29.70	26.92	22.67	19.68	17.51	60.10	79.26
80.0	50.65	41.02	33.53	30.56	28.05	25.93	22.59	20.13	18.26	60.14	81.43
90.0	44.16	36.63	30.99	28.76	26.85	25.21	22.54	20.49	18.87	60.17	83.33
100.0	38.99	33.37	29.16	27.46	25.98	24.68	22.51	20.78	19.36	60.21	84.98
110.0	35.19	31.03	27.83	26.51	25.33	24.28	22.49	21.01	19.77	60.26	86.44
120.0	32.47	29.34	26.86	25.80	24.85	23.98	22.47	21.20	20.11	60.31	87.72
130.0	30.52	28.10	26.13	25.27	24.48	23.76	22.47	21.36	20.39	60.36	88.84
140.0	29.09	27.18	25.57	24.85	24.19	23.58	22.47	21.50	20.64	60.42	89.85
150.0	28.03	26.47	25.13	24.53	23.97	23.44	22.48	21.62	20.85	60.48	90.74
160.0	27.21	25.92	24.79	24.28	23.79	23.33	22.49	21.73	21.03	60.55	91.55
170.0	26.57	25.49	24.52	24.08	23.65	23.25	22.50	21.82	21.20	60.62	92.28
180.0	26.07	25.14	24.30	23.91	23.54	23.19	22.52	21.91	21.34	60.69	92.95
190.0	25.67	24.86	24.13	23.78	23.46	23.14	22.54	21.99	21.48	60.77	93.56
200.0	25.34	24.63	23.99	23.68	23.39	23.10	22.57	22.06	21.60	60.85	94.12

ENERGOLINIA w Poznaniu	Strefa obciazenia sadzia				Naprezenie podstawowe		Strona
	SI SIa				70.0 [MPa]		22
WIKROL	Typ przewodu				Naciag podstawowy		
	SAX-W 120mm2 30kV				9.01 [kN]		
	q=128.7 [mm ²]	d= 19.8 [mm]	ap= 78.4 [m]	$\alpha=0.0000230$ 1/°K	$\beta=0.0000160$ 1/MPa		

Rozp.	Temperatura [°C]									sn	sk
a [m]	-25	-15	-5	0	5	10	20	30	40	-5	-5

T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.02	0.02	0.05	0.09	0.13	0.03	0.05
20.0	0.03	0.03	0.04	0.05	0.07	0.08	0.14	0.21	0.27	0.11	0.16
30.0	0.06	0.08	0.10	0.12	0.14	0.17	0.25	0.34	0.43	0.23	0.31
40.0	0.11	0.13	0.17	0.20	0.24	0.28	0.38	0.49	0.60	0.37	0.50
50.0	0.17	0.21	0.26	0.30	0.35	0.41	0.53	0.66	0.78	0.54	0.71
60.0	0.24	0.29	0.37	0.42	0.48	0.55	0.69	0.83	0.97	0.72	0.94
70.0	0.33	0.40	0.50	0.56	0.63	0.70	0.86	1.02	1.17	0.93	1.18
80.0	0.43	0.53	0.65	0.72	0.80	0.88	1.05	1.23	1.40	1.15	1.46
90.0	0.61	0.73	0.89	0.98	1.07	1.17	1.36	1.54	1.72	1.46	1.80
100.0	0.83	1.00	1.19	1.29	1.39	1.49	1.69	1.89	2.07	1.80	2.18
110.0	1.12	1.32	1.53	1.64	1.75	1.86	2.07	2.27	2.46	2.18	2.59
120.0	1.47	1.70	1.93	2.04	2.15	2.26	2.48	2.69	2.88	2.60	3.03
130.0	1.88	2.12	2.36	2.48	2.60	2.71	2.93	3.14	3.34	3.05	3.51
140.0	2.34	2.59	2.84	2.96	3.08	3.19	3.41	3.63	3.84	3.54	4.02
150.0	2.85	3.11	3.35	3.48	3.59	3.71	3.94	4.15	4.36	4.06	4.56
160.0	3.40	3.66	3.91	4.03	4.15	4.27	4.50	4.72	4.93	4.62	5.14
170.0	3.99	4.25	4.50	4.62	4.74	4.86	5.09	5.31	5.53	5.22	5.75
180.0	4.62	4.88	5.13	5.25	5.37	5.49	5.72	5.95	6.16	5.85	6.40
190.0	5.29	5.54	5.80	5.92	6.04	6.16	6.39	6.62	6.84	6.52	7.08
200.0	5.99	6.25	6.50	6.62	6.74	6.86	7.10	7.32	7.54	7.23	7.80

T A B L I C A N A P R E Z E N przy slupie [MPa]											
10.0	70.00	55.64	41.35	34.25	27.24	20.43	9.34	5.05	3.66	42.60	44.67
20.0	70.00	55.77	41.75	34.91	28.34	22.27	13.25	8.91	6.89	45.96	51.55
30.0	70.00	55.98	42.37	35.89	29.83	24.44	16.55	12.21	9.82	50.10	58.90
40.0	70.00	56.26	43.15	37.07	31.50	26.64	19.45	15.13	12.52	54.43	66.02
50.0	70.01	56.59	44.05	38.35	33.22	28.77	22.08	17.79	15.03	58.71	72.79
60.0	70.01	56.97	45.01	39.67	34.91	30.79	24.47	20.24	17.37	62.87	79.23
70.0	70.01	57.39	46.01	41.00	36.55	32.69	26.69	22.51	19.57	66.87	85.35
80.0	69.00	56.90	46.22	41.59	37.50	33.95	28.36	24.35	21.44	70.12	90.65
90.0	62.45	51.58	42.46	38.65	35.34	32.49	27.95	24.61	22.09	70.15	92.89
100.0	56.14	46.82	39.35	36.29	33.64	31.35	27.64	24.82	22.62	70.18	94.90
110.0	50.50	42.84	36.88	34.44	32.32	30.46	27.40	24.99	23.06	70.22	96.70
120.0	45.79	39.70	34.97	33.02	31.30	29.77	27.21	25.13	23.43	70.26	98.33
130.0	42.06	37.26	33.49	31.91	30.50	29.23	27.06	25.26	23.75	70.31	99.79
140.0	39.19	35.39	32.35	31.05	29.87	28.80	26.94	25.36	24.02	70.36	101.11
150.0	37.00	33.95	31.45	30.36	29.37	28.46	26.85	25.46	24.25	70.41	102.30
160.0	35.30	32.82	30.74	29.82	28.97	28.18	26.77	25.54	24.46	70.47	103.39
170.0	33.99	31.93	30.17	29.38	28.65	27.96	26.72	25.62	24.64	70.53	104.37
180.0	32.94	31.21	29.70	29.02	28.38	27.78	26.67	25.69	24.80	70.59	105.28
190.0	32.11	30.63	29.32	28.72	28.16	27.63	26.64	25.75	24.94	70.66	106.11
200.0	31.43	30.15	29.01	28.48	27.98	27.51	26.62	25.81	25.07	70.73	106.87

ENERGOLINIA w Poznaniu	Strefa obciążenia sadya						Napężenie podstawowe			Strona	
	SI SIa						75.0 [MPa]			23	
WIKROL	Typ przewodu						Naciąg podstawowy				
	SAX-W 120mm ² 30kV						9.65 [kN]				
q=128.7 [mm ²]		d= 19.8 [mm]		ap= 84.0 [m]		α=0.0000230 1/°K			β=0.0000160 1/MPa		
Rozp.	Temperatura [°C]									sn	sk
a [m]	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.01	0.02	0.04	0.08	0.12	0.03	0.04
20.0	0.02	0.03	0.04	0.05	0.06	0.07	0.12	0.19	0.25	0.10	0.15
30.0	0.06	0.07	0.09	0.10	0.12	0.15	0.22	0.31	0.40	0.21	0.30
40.0	0.10	0.12	0.16	0.18	0.21	0.25	0.35	0.46	0.56	0.35	0.48
50.0	0.16	0.19	0.24	0.27	0.32	0.37	0.48	0.61	0.73	0.51	0.68
60.0	0.22	0.27	0.34	0.39	0.44	0.50	0.63	0.78	0.92	0.69	0.91
70.0	0.30	0.37	0.46	0.51	0.57	0.64	0.80	0.96	1.11	0.89	1.15
80.0	0.40	0.48	0.59	0.65	0.72	0.80	0.97	1.15	1.32	1.10	1.41
90.0	0.53	0.64	0.77	0.85	0.94	1.03	1.21	1.40	1.59	1.36	1.71
100.0	0.72	0.86	1.03	1.12	1.22	1.32	1.53	1.73	1.92	1.68	2.07
110.0	0.95	1.13	1.33	1.44	1.55	1.66	1.87	2.08	2.28	2.04	2.46
120.0	1.25	1.46	1.69	1.80	1.92	2.03	2.25	2.47	2.68	2.43	2.88
130.0	1.60	1.84	2.08	2.20	2.32	2.44	2.67	2.89	3.10	2.85	3.33
140.0	2.01	2.26	2.52	2.64	2.77	2.89	3.12	3.35	3.57	3.30	3.81
150.0	2.47	2.73	2.99	3.12	3.25	3.37	3.61	3.84	4.06	3.79	4.33
160.0	2.97	3.24	3.51	3.64	3.76	3.89	4.13	4.36	4.59	4.31	4.87
170.0	3.51	3.79	4.06	4.19	4.31	4.44	4.68	4.92	5.15	4.87	5.45
180.0	4.09	4.37	4.64	4.77	4.90	5.03	5.27	5.51	5.74	5.46	6.06
190.0	4.71	4.99	5.26	5.39	5.52	5.65	5.89	6.13	6.37	6.09	6.70
200.0	5.37	5.65	5.91	6.05	6.17	6.30	6.55	6.79	7.03	6.74	7.38
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	75.00	60.63	46.31	39.18	32.11	25.14	12.51	5.98	4.02	47.33	49.07
20.0	75.00	60.74	46.62	39.68	32.90	26.45	15.81	10.04	7.45	50.18	55.22
30.0	75.00	60.90	47.10	40.43	34.06	28.17	18.87	13.44	10.52	53.89	62.12
40.0	75.00	61.13	47.73	41.38	35.42	30.04	21.64	16.43	13.32	57.90	68.98
50.0	75.01	61.40	48.47	42.45	36.89	31.93	24.19	19.13	15.91	61.97	75.60
60.0	75.01	61.72	49.28	43.59	38.39	33.79	26.54	21.62	18.32	65.97	81.93
70.0	75.01	62.07	50.14	44.76	39.88	35.57	28.72	23.92	20.57	69.87	87.98
80.0	75.01	62.45	51.03	45.93	41.33	37.28	30.76	26.07	22.70	73.64	93.78
90.0	71.34	59.49	49.03	44.48	40.42	36.88	31.18	26.99	23.89	75.14	97.44
100.0	65.16	54.46	45.44	41.63	38.28	35.36	30.66	27.12	24.41	75.17	99.58
110.0	59.23	49.94	42.41	39.28	36.54	34.15	30.24	27.22	24.85	75.21	101.53
120.0	53.88	46.11	39.95	37.40	35.16	33.19	29.91	27.31	25.22	75.25	103.31
130.0	49.33	42.99	37.99	35.91	34.06	32.42	29.64	27.39	25.54	75.29	104.92
140.0	45.63	40.50	36.44	34.73	33.19	31.81	29.43	27.46	25.81	75.33	106.39
150.0	42.69	38.55	35.21	33.78	32.49	31.31	29.26	27.53	26.04	75.38	107.72
160.0	40.38	37.00	34.23	33.02	31.92	30.91	29.12	27.58	26.25	75.44	108.94
170.0	38.56	35.77	33.44	32.41	31.46	30.58	29.01	27.64	26.43	75.49	110.06
180.0	37.11	34.78	32.79	31.91	31.08	30.31	28.91	27.69	26.59	75.55	111.09
190.0	35.96	33.98	32.26	31.49	30.77	30.08	28.84	27.73	26.74	75.61	112.03
200.0	35.01	33.32	31.82	31.14	30.50	29.90	28.78	27.78	26.87	75.68	112.91

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia				Napreżenie podstawowe		Strona
	SI SIa				80.0 [MPa]		24
WIKROL	Typ przewodu				Naciąg podstawowy		
	SAX-W 120mm2 30kV				10.30 [kN]		
	q=128.7 [mm ²]	d= 19.8 [mm]	ap= 89.6 [m]	α=0.000230 1/°K	β=0.0000160 1/MPa		

Rozp.	Temperatura [°C]									sn	sk
a [m]	-25	-15	-5	0	5	10	20	30	40	-5	-5

T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.06	0.10	0.02	0.04
20.0	0.02	0.03	0.04	0.04	0.05	0.06	0.10	0.16	0.23	0.09	0.14
30.0	0.05	0.06	0.08	0.09	0.11	0.13	0.19	0.28	0.37	0.20	0.28
40.0	0.09	0.11	0.14	0.16	0.19	0.22	0.31	0.42	0.52	0.33	0.46
50.0	0.15	0.18	0.22	0.25	0.29	0.33	0.44	0.56	0.69	0.48	0.66
60.0	0.21	0.25	0.31	0.35	0.40	0.45	0.58	0.73	0.87	0.66	0.88
70.0	0.29	0.34	0.42	0.47	0.53	0.59	0.74	0.90	1.06	0.85	1.11
80.0	0.37	0.45	0.54	0.60	0.67	0.74	0.91	1.08	1.25	1.06	1.37
90.0	0.47	0.56	0.68	0.75	0.82	0.91	1.09	1.28	1.47	1.28	1.64
100.0	0.63	0.75	0.90	0.98	1.08	1.17	1.37	1.58	1.78	1.58	1.98
110.0	0.83	0.98	1.17	1.27	1.37	1.48	1.69	1.91	2.12	1.91	2.35
120.0	1.08	1.26	1.48	1.59	1.70	1.82	2.05	2.27	2.49	2.27	2.75
130.0	1.38	1.60	1.83	1.96	2.08	2.20	2.44	2.67	2.89	2.67	3.18
140.0	1.73	1.98	2.23	2.36	2.49	2.61	2.86	3.09	3.32	3.10	3.64
150.0	2.14	2.40	2.67	2.80	2.93	3.06	3.31	3.55	3.78	3.55	4.12
160.0	2.59	2.87	3.14	3.28	3.41	3.54	3.80	4.04	4.28	4.04	4.64
170.0	3.09	3.37	3.65	3.79	3.92	4.06	4.31	4.56	4.80	4.57	5.19
180.0	3.62	3.91	4.20	4.33	4.47	4.60	4.86	5.12	5.36	5.12	5.76
190.0	4.20	4.49	4.77	4.91	5.05	5.18	5.45	5.70	5.95	5.70	6.37
200.0	4.80	5.10	5.39	5.53	5.66	5.80	6.06	6.32	6.57	6.32	7.01

T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	80.00	65.63	51.28	44.14	37.02	29.97	16.52	7.42	4.49	52.13	53.60
20.0	80.00	65.71	51.52	44.52	37.62	30.92	19.03	11.55	8.16	54.56	59.08
30.0	80.00	65.84	51.91	45.11	38.51	32.26	21.69	14.97	11.36	57.86	65.52
40.0	80.00	66.03	52.42	45.87	39.62	33.81	24.24	17.98	14.26	61.56	72.09
50.0	80.01	66.26	53.02	46.75	40.85	35.45	26.64	20.70	16.92	65.39	78.52
60.0	80.01	66.52	53.71	47.72	42.15	37.10	28.90	23.20	19.38	69.22	84.73
70.0	80.01	66.82	54.44	48.74	43.48	38.74	31.02	25.52	21.69	73.00	90.71
80.0	80.01	67.14	55.22	49.78	44.80	40.33	33.01	27.68	23.87	76.68	96.45
90.0	79.81	67.29	55.84	50.68	45.96	41.74	34.80	29.65	25.87	80.13	101.88
100.0	73.96	62.29	51.98	47.47	43.43	39.86	34.03	29.66	26.36	80.16	104.14
110.0	68.09	57.51	48.52	44.69	41.29	38.30	33.41	29.67	26.78	80.19	106.21
120.0	62.48	53.19	45.55	42.35	39.51	37.02	32.90	29.68	27.13	80.23	108.12
130.0	57.38	49.46	43.09	40.43	38.07	35.98	32.48	29.69	27.43	80.27	109.86
140.0	52.96	46.36	41.09	38.87	36.90	35.14	32.14	29.71	27.69	80.31	111.47
150.0	49.27	43.83	39.46	37.61	35.95	34.45	31.87	29.72	27.92	80.36	112.94
160.0	46.27	41.79	38.15	36.59	35.18	33.89	31.64	29.74	28.12	80.41	114.29
170.0	43.85	40.14	37.09	35.76	34.54	33.43	31.45	29.76	28.29	80.46	115.53
180.0	41.91	38.81	36.21	35.07	34.02	33.04	31.30	29.78	28.45	80.52	116.68
190.0	40.34	37.72	35.50	34.50	33.58	32.72	31.17	29.80	28.59	80.58	117.74
200.0	39.07	36.83	34.90	34.03	33.21	32.45	31.06	29.82	28.72	80.64	118.73



Tablice zwisów i naprężeń
przewodów

SAX-W 50, 70 i 120 mm²
20 i 30 kV

Strefy klimatyczne obciążenia sadzią

SII, SIIa

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia						Napężenie podstawowe			Strona	
	SII SIIa						60.0 [MPa]			25	
WIKROL	Typ przewodu						Naciąg podstawowy				
	SAX-W 50mm2 20kV						3.02 [kN]				
q= 50.3 [mm ²]		d= 12.7 [mm]		ap= 28.5 [m]		α=0.0000230 1/°K			β=0.0000167 1/MPa		
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.02	0.02	0.04	0.07	0.11	0.14	0.07	0.10
20.0	0.03	0.04	0.06	0.07	0.09	0.12	0.18	0.25	0.30	0.22	0.30
30.0	0.08	0.10	0.14	0.17	0.20	0.24	0.33	0.41	0.49	0.42	0.56
40.0	0.22	0.30	0.40	0.45	0.50	0.56	0.65	0.74	0.82	0.75	0.92
50.0	0.58	0.70	0.82	0.87	0.92	0.98	1.07	1.16	1.25	1.17	1.38
60.0	1.11	1.23	1.34	1.39	1.44	1.49	1.59	1.68	1.77	1.69	1.92
70.0	1.73	1.85	1.95	2.00	2.05	2.10	2.20	2.29	2.38	2.30	2.55
80.0	2.45	2.56	2.66	2.71	2.76	2.81	2.90	2.99	3.08	3.00	3.27
90.0	3.26	3.36	3.46	3.51	3.56	3.61	3.70	3.79	3.88	3.80	4.08
100.0	4.15	4.26	4.36	4.40	4.45	4.50	4.60	4.69	4.78	4.70	4.99
110.0	5.15	5.25	5.35	5.40	5.44	5.49	5.59	5.68	5.77	5.69	5.98
120.0	6.23	6.33	6.43	6.48	6.53	6.58	6.67	6.76	6.86	6.78	7.08
130.0	7.42	7.52	7.61	7.66	7.71	7.76	7.85	7.95	8.04	7.96	8.27
140.0	8.70	8.79	8.89	8.94	8.99	9.04	9.13	9.22	9.32	9.24	9.55
150.0	10.07	10.17	10.27	10.31	10.36	10.41	10.50	10.60	10.69	10.61	10.93
160.0	11.54	11.64	11.74	11.79	11.83	11.88	11.98	12.07	12.17	12.09	12.41
170.0	13.11	13.21	13.31	13.36	13.40	13.45	13.55	13.64	13.74	13.66	13.98
180.0	14.78	14.88	14.98	15.02	15.07	15.12	15.22	15.31	15.41	15.33	15.66
190.0	16.55	16.64	16.74	16.79	16.84	16.89	16.98	17.08	17.17	17.10	17.43
200.0	18.41	18.51	18.61	18.66	18.71	18.75	18.85	18.95	19.04	18.96	19.30
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	60.00	46.28	32.67	25.98	19.53	13.67	6.60	4.33	3.39	40.16	49.54
20.0	60.00	46.49	33.36	27.16	21.50	16.75	10.74	7.94	6.46	51.28	68.32
30.0	57.09	44.01	31.83	26.45	21.84	18.16	13.32	10.62	8.98	60.09	83.42
40.0	36.16	26.43	19.67	17.32	15.50	14.06	11.98	10.55	9.51	60.17	89.35
50.0	21.18	17.45	14.97	14.02	13.22	12.53	11.41	10.53	9.82	60.26	93.84
60.0	15.89	14.36	13.18	12.68	12.23	11.83	11.12	10.53	10.01	60.38	97.28
70.0	13.85	13.02	12.33	12.01	11.73	11.46	10.97	10.54	10.15	60.52	99.97
80.0	12.85	12.32	11.85	11.64	11.43	11.24	10.88	10.55	10.26	60.68	102.12
90.0	12.27	11.90	11.57	11.41	11.26	11.11	10.83	10.58	10.34	60.86	103.89
100.0	11.92	11.64	11.39	11.27	11.15	11.03	10.81	10.61	10.41	61.06	105.39
110.0	11.69	11.48	11.27	11.18	11.08	10.99	10.81	10.64	10.48	61.28	106.70
120.0	11.54	11.37	11.20	11.12	11.05	10.97	10.82	10.68	10.55	61.52	107.88
130.0	11.44	11.30	11.17	11.10	11.03	10.97	10.85	10.73	10.61	61.79	108.96
140.0	11.38	11.26	11.15	11.09	11.04	10.98	10.88	10.78	10.68	62.08	109.97
150.0	11.35	11.25	11.15	11.10	11.05	11.01	10.92	10.83	10.74	62.39	110.94
160.0	11.33	11.25	11.16	11.12	11.08	11.04	10.96	10.88	10.81	62.72	111.89
170.0	11.34	11.26	11.19	11.15	11.12	11.08	11.01	10.94	10.88	63.07	112.82
180.0	11.36	11.29	11.23	11.19	11.16	11.13	11.07	11.01	10.95	63.45	113.76
190.0	11.39	11.33	11.27	11.24	11.21	11.19	11.13	11.08	11.02	63.85	114.70
200.0	11.42	11.37	11.32	11.30	11.27	11.25	11.20	11.15	11.10	64.27	115.65

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia								Napreżenie podstawowe		Strona	
	SII SIIa								70.0 [MPa]		26	
	Typ przewodu								Naciąg podstawowy			
WIKROL	SAX-W 50mm2 20kV								3.52 [kN]			
q= 50.3 [mm ²]		d= 12.7 [mm]		ap= 33.2 [m]		$\alpha=0.0000230$ 1/°K		$\beta=0.0000167$ 1/MPa				
Rozp.	Temperatura [°C]										sn	sk
a [m]	-25	-15	-5	0	5	10	20	30	40	-5	-5	
T A B L I C A Z W I S O W [m]												
10.0	0.01	0.01	0.01	0.01	0.02	0.02	0.04	0.09	0.12	0.06	0.09	
20.0	0.03	0.03	0.05	0.05	0.06	0.08	0.13	0.20	0.26	0.20	0.28	
30.0	0.06	0.08	0.10	0.12	0.14	0.17	0.24	0.33	0.42	0.38	0.52	
40.0	0.13	0.17	0.23	0.27	0.31	0.36	0.47	0.58	0.67	0.64	0.84	
50.0	0.31	0.41	0.52	0.59	0.65	0.71	0.83	0.93	1.03	1.00	1.24	
60.0	0.68	0.82	0.96	1.03	1.09	1.15	1.27	1.37	1.48	1.45	1.72	
70.0	1.22	1.36	1.49	1.55	1.61	1.67	1.79	1.90	2.00	1.97	2.27	
80.0	1.84	1.97	2.10	2.16	2.22	2.28	2.39	2.50	2.60	2.57	2.90	
90.0	2.54	2.66	2.79	2.85	2.90	2.96	3.07	3.18	3.29	3.26	3.60	
100.0	3.31	3.43	3.55	3.61	3.67	3.73	3.84	3.95	4.05	4.03	4.38	
110.0	4.16	4.28	4.40	4.46	4.52	4.57	4.69	4.80	4.90	4.87	5.25	
120.0	5.10	5.22	5.33	5.39	5.45	5.50	5.61	5.72	5.83	5.80	6.19	
130.0	6.11	6.23	6.34	6.40	6.46	6.51	6.62	6.73	6.84	6.81	7.21	
140.0	7.20	7.32	7.44	7.49	7.55	7.61	7.72	7.83	7.93	7.91	8.31	
150.0	8.38	8.50	8.61	8.67	8.72	8.78	8.89	9.00	9.11	9.08	9.49	
160.0	9.64	9.75	9.87	9.92	9.98	10.04	10.15	10.26	10.37	10.34	10.76	
170.0	10.98	11.09	11.21	11.26	11.32	11.38	11.49	11.60	11.71	11.68	12.10	
180.0	12.40	12.52	12.63	12.69	12.74	12.80	12.91	13.02	13.13	13.10	13.54	
190.0	13.91	14.02	14.14	14.19	14.25	14.31	14.42	14.53	14.64	14.61	15.05	
200.0	15.50	15.61	15.73	15.78	15.84	15.90	16.01	16.12	16.23	16.20	16.65	
T A B L I C A N A P R E Ż E N przy słupie [MPa]												
10.0	70.00	56.25	42.55	35.74	29.00	22.42	11.02	5.72	4.01	47.86	55.88	
20.0	70.00	56.37	42.93	36.36	30.01	24.06	14.69	9.78	7.46	57.46	73.49	
30.0	70.00	56.58	43.52	37.29	31.40	26.07	17.92	13.19	10.54	67.09	89.48	
40.0	58.18	45.53	34.05	29.10	24.86	21.41	16.56	13.59	11.66	70.14	98.72	
50.0	39.36	30.00	23.25	20.78	18.80	17.19	14.79	13.09	11.84	70.23	104.12	
60.0	25.69	21.31	18.31	17.15	16.16	15.31	13.92	12.83	11.95	70.33	108.46	
70.0	19.69	17.66	16.11	15.46	14.88	14.35	13.44	12.68	12.03	70.44	111.96	
80.0	17.06	15.92	14.97	14.55	14.16	13.80	13.16	12.60	12.10	70.58	114.84	
90.0	15.69	14.95	14.30	14.00	13.73	13.46	12.98	12.55	12.15	70.73	117.22	
100.0	14.88	14.35	13.88	13.65	13.44	13.24	12.87	12.52	12.20	70.91	119.24	
110.0	14.35	13.96	13.59	13.42	13.26	13.10	12.80	12.52	12.25	71.10	120.98	
120.0	14.00	13.69	13.40	13.27	13.13	13.00	12.76	12.52	12.30	71.30	122.51	
130.0	13.76	13.51	13.27	13.16	13.05	12.94	12.74	12.54	12.35	71.53	123.88	
140.0	13.59	13.38	13.18	13.09	13.00	12.91	12.73	12.56	12.40	71.78	125.12	
150.0	13.47	13.29	13.13	13.05	12.97	12.89	12.74	12.59	12.45	72.04	126.28	
160.0	13.38	13.24	13.09	13.02	12.96	12.89	12.76	12.63	12.51	72.33	127.37	
170.0	13.33	13.20	13.08	13.02	12.96	12.90	12.78	12.67	12.56	72.63	128.41	
180.0	13.30	13.19	13.08	13.02	12.97	12.92	12.82	12.72	12.62	72.95	129.41	
190.0	13.28	13.18	13.09	13.04	12.99	12.95	12.86	12.77	12.68	73.29	130.40	
200.0	13.28	13.20	13.11	13.07	13.03	12.99	12.91	12.83	12.75	73.64	131.37	

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia		Napreżenie podstawowe		Strona						
	SII SIIa		75.0 [MPa]		27						
WIKROL	Typ przewodu		Naciąg podstawowy								
	SAX-W 50mm2 20kV		3.77 [kN]								
q= 50.3 [mm ²]		d= 12.7 [mm]	ap= 35.6 [m]	$\alpha=0.0000230$ 1/°K	$\beta=0.0000167$ 1/MPa						
Rozp. a [m]	Temperatura [°C]								sn	sk	
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.07	0.11	0.05	0.09
20.0	0.03	0.03	0.04	0.05	0.06	0.07	0.11	0.17	0.24	0.19	0.27
30.0	0.06	0.07	0.09	0.10	0.12	0.15	0.21	0.30	0.39	0.36	0.50
40.0	0.11	0.14	0.18	0.21	0.25	0.29	0.39	0.50	0.60	0.60	0.80
50.0	0.24	0.31	0.41	0.47	0.53	0.59	0.71	0.83	0.94	0.94	1.19
60.0	0.52	0.65	0.79	0.86	0.93	1.00	1.12	1.24	1.35	1.35	1.64
70.0	0.98	1.14	1.28	1.35	1.42	1.48	1.61	1.73	1.84	1.84	2.16
80.0	1.56	1.71	1.85	1.92	1.98	2.05	2.17	2.29	2.40	2.40	2.75
90.0	2.22	2.36	2.49	2.56	2.62	2.69	2.81	2.93	3.04	3.04	3.42
100.0	2.94	3.08	3.21	3.28	3.34	3.40	3.52	3.64	3.75	3.76	4.15
110.0	3.74	3.88	4.01	4.07	4.13	4.19	4.31	4.43	4.54	4.55	4.96
120.0	4.62	4.75	4.87	4.94	5.00	5.06	5.18	5.30	5.41	5.41	5.84
130.0	5.56	5.69	5.82	5.88	5.94	6.00	6.12	6.24	6.35	6.36	6.79
140.0	6.58	6.71	6.84	6.90	6.96	7.02	7.14	7.26	7.37	7.37	7.82
150.0	7.68	7.81	7.93	7.99	8.05	8.11	8.23	8.35	8.47	8.47	8.93
160.0	8.86	8.98	9.10	9.16	9.22	9.28	9.40	9.52	9.64	9.64	10.11
170.0	10.11	10.23	10.35	10.41	10.47	10.53	10.65	10.77	10.89	10.89	11.37
180.0	11.43	11.56	11.68	11.74	11.80	11.86	11.98	12.10	12.21	12.22	12.70
190.0	12.84	12.96	13.08	13.14	13.20	13.26	13.38	13.50	13.62	13.62	14.11
200.0	14.32	14.44	14.56	14.62	14.68	14.74	14.86	14.98	15.10	15.11	15.60
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	75.00	61.24	47.51	40.68	33.89	27.18	14.66	6.96	4.46	52.02	59.35
20.0	75.00	61.34	47.81	41.15	34.62	28.36	17.60	11.15	8.14	60.84	76.28
30.0	75.00	61.50	48.27	41.86	35.70	29.94	20.50	14.61	11.36	70.07	91.99
40.0	68.01	54.92	42.48	36.73	31.47	26.87	19.95	15.67	13.03	75.13	103.14
50.0	50.28	38.98	29.71	26.05	23.05	20.63	17.09	14.72	13.04	75.21	108.91
60.0	33.83	26.94	22.17	20.39	18.90	17.66	15.69	14.21	13.06	75.30	113.63
70.0	24.31	21.06	18.69	17.74	16.90	16.17	14.92	13.92	13.08	75.41	117.52
80.0	20.03	18.31	16.94	16.35	15.82	15.33	14.47	13.74	13.10	75.54	120.74
90.0	17.90	16.84	15.94	15.54	15.17	14.82	14.18	13.63	13.13	75.68	123.45
100.0	16.69	15.96	15.32	15.03	14.75	14.48	14.00	13.56	13.15	75.84	125.75
110.0	15.92	15.39	14.91	14.68	14.47	14.26	13.87	13.52	13.19	76.02	127.73
120.0	15.42	15.00	14.63	14.45	14.27	14.11	13.79	13.50	13.22	76.22	129.46
130.0	15.06	14.73	14.43	14.28	14.14	14.00	13.74	13.49	13.26	76.43	131.01
140.0	14.81	14.54	14.29	14.17	14.05	13.93	13.71	13.50	13.30	76.66	132.40
150.0	14.63	14.40	14.19	14.09	13.98	13.89	13.70	13.51	13.34	76.91	133.68
160.0	14.49	14.30	14.12	14.03	13.95	13.86	13.70	13.54	13.38	77.17	134.87
170.0	14.40	14.24	14.08	14.00	13.93	13.85	13.71	13.57	13.43	77.45	136.00
180.0	14.33	14.19	14.05	13.99	13.92	13.86	13.73	13.60	13.48	77.75	137.07
190.0	14.29	14.17	14.05	13.99	13.93	13.87	13.76	13.65	13.54	78.06	138.11
200.0	14.27	14.16	14.05	14.00	13.94	13.89	13.79	13.69	13.60	78.40	139.12

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia								Napreżenie podstawowe		Strona
	SII SIIa								80.0 [MPa]		28
WIKROL	Typ przewodu								Naciąg podstawowy		
	SAX-W 50mm ² 20kV								4.02 [kN]		
q= 50.3 [mm ²]	d= 12.7 [mm]	ap= 37.9 [m]	$\alpha=0.0000230$ 1/°K				$\beta=0.0000167$ 1/MPa				
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.05	0.10	0.05	0.08
20.0	0.02	0.03	0.04	0.04	0.05	0.06	0.09	0.15	0.22	0.17	0.26
30.0	0.05	0.07	0.08	0.09	0.11	0.13	0.19	0.27	0.36	0.35	0.49
40.0	0.10	0.12	0.15	0.17	0.20	0.23	0.32	0.43	0.53	0.56	0.77
50.0	0.20	0.25	0.33	0.37	0.43	0.49	0.61	0.73	0.85	0.88	1.14
60.0	0.40	0.51	0.64	0.71	0.78	0.85	0.99	1.11	1.23	1.27	1.57
70.0	0.78	0.93	1.09	1.16	1.24	1.31	1.44	1.57	1.69	1.72	2.07
80.0	1.30	1.47	1.62	1.69	1.76	1.83	1.97	2.09	2.22	2.25	2.63
90.0	1.92	2.08	2.22	2.30	2.37	2.43	2.57	2.69	2.81	2.85	3.25
100.0	2.60	2.75	2.90	2.97	3.04	3.10	3.23	3.36	3.48	3.52	3.95
110.0	3.36	3.50	3.64	3.71	3.78	3.84	3.97	4.10	4.22	4.26	4.71
120.0	4.18	4.32	4.46	4.52	4.59	4.66	4.78	4.91	5.03	5.07	5.54
130.0	5.07	5.21	5.34	5.41	5.47	5.54	5.67	5.79	5.92	5.96	6.44
140.0	6.03	6.16	6.30	6.36	6.43	6.49	6.62	6.75	6.87	6.91	7.41
150.0	7.05	7.19	7.32	7.39	7.45	7.52	7.65	7.77	7.90	7.94	8.44
160.0	8.15	8.29	8.42	8.49	8.55	8.62	8.74	8.87	8.99	9.04	9.55
170.0	9.33	9.46	9.59	9.66	9.72	9.78	9.91	10.04	10.16	10.21	10.73
180.0	10.57	10.70	10.83	10.90	10.96	11.03	11.15	11.28	11.40	11.45	11.98
190.0	11.88	12.01	12.15	12.21	12.28	12.34	12.47	12.59	12.72	12.76	13.31
200.0	13.27	13.40	13.53	13.60	13.66	13.73	13.85	13.98	14.11	14.15	14.70
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	80.00	66.23	52.49	45.64	38.82	32.04	18.95	8.91	5.08	56.34	63.00
20.0	80.00	66.31	52.72	46.00	39.37	32.90	21.12	12.97	8.99	64.40	79.20
30.0	80.00	66.44	53.09	46.56	40.21	34.13	23.58	16.39	12.35	73.20	94.60
40.0	77.07	63.75	50.81	44.62	38.73	33.27	24.30	18.34	14.69	80.13	107.45
50.0	60.87	48.54	37.49	32.71	28.58	25.12	20.02	16.69	14.44	80.20	113.51
60.0	43.78	34.41	27.36	24.67	22.46	20.62	17.82	15.81	14.30	80.28	118.58
70.0	30.75	25.64	22.01	20.60	19.39	18.35	16.64	15.30	14.23	80.39	122.82
80.0	23.97	21.34	19.34	18.50	17.76	17.09	15.95	14.99	14.18	80.51	126.38
90.0	20.65	19.12	17.85	17.31	16.80	16.34	15.51	14.79	14.16	80.64	129.40
100.0	18.83	17.82	16.95	16.56	16.19	15.85	15.22	14.66	14.15	80.79	131.98
110.0	17.72	17.00	16.36	16.06	15.78	15.52	15.02	14.57	14.16	80.96	134.21
120.0	16.99	16.45	15.95	15.72	15.50	15.29	14.89	14.52	14.17	81.14	136.17
130.0	16.49	16.06	15.67	15.48	15.30	15.12	14.79	14.48	14.19	81.34	137.91
140.0	16.13	15.78	15.46	15.30	15.15	15.01	14.73	14.47	14.22	81.55	139.47
150.0	15.87	15.58	15.31	15.18	15.05	14.93	14.69	14.46	14.25	81.79	140.89
160.0	15.67	15.43	15.20	15.09	14.98	14.87	14.67	14.47	14.28	82.03	142.20
170.0	15.53	15.32	15.12	15.03	14.93	14.84	14.66	14.49	14.32	82.30	143.42
180.0	15.42	15.24	15.07	14.99	14.91	14.82	14.67	14.51	14.37	82.57	144.58
190.0	15.35	15.19	15.04	14.96	14.89	14.82	14.68	14.54	14.41	82.87	145.69
200.0	15.30	15.16	15.02	14.96	14.89	14.83	14.70	14.58	14.46	83.18	146.76

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia								Napreżenie podstawowe		Strona	
	SII SIIa								60.0 [MPa]		29	
WIKROL	Typ przewodu								Naciąg podstawowy			
	SAX-W 70mm2 20kV								4.43 [kN]			
q= 73.9 [mm ²]		d= 14.3 [mm]		ap= 37.6 [m]		α=0.0000230 1/°K		β=0.0000167 1/MPa				
Rozp.	Temperatura [°C]										sn	sk
a [m]	-25	-15	-5	0	5	10	20	30	40	-5	-5	
T A B L I C A Z W I S O W [m]												
10.0	0.01	0.01	0.01	0.02	0.02	0.03	0.07	0.11	0.14	0.06	0.09	
20.0	0.03	0.04	0.05	0.07	0.08	0.11	0.18	0.24	0.30	0.19	0.26	
30.0	0.07	0.09	0.12	0.14	0.17	0.21	0.30	0.39	0.47	0.36	0.48	
40.0	0.13	0.16	0.22	0.26	0.31	0.36	0.47	0.58	0.67	0.57	0.74	
50.0	0.27	0.36	0.47	0.54	0.60	0.67	0.79	0.90	1.00	0.89	1.10	
60.0	0.56	0.71	0.85	0.92	0.99	1.05	1.18	1.29	1.40	1.29	1.53	
70.0	1.02	1.17	1.31	1.38	1.45	1.52	1.64	1.76	1.87	1.75	2.02	
80.0	1.56	1.71	1.85	1.92	1.99	2.05	2.17	2.29	2.41	2.29	2.58	
90.0	2.18	2.33	2.46	2.53	2.59	2.66	2.78	2.90	3.02	2.89	3.21	
100.0	2.87	3.01	3.14	3.21	3.27	3.34	3.46	3.58	3.70	3.57	3.90	
110.0	3.63	3.76	3.90	3.96	4.03	4.09	4.21	4.33	4.45	4.33	4.67	
120.0	4.46	4.59	4.72	4.79	4.85	4.91	5.04	5.16	5.27	5.15	5.50	
130.0	5.36	5.49	5.62	5.68	5.75	5.81	5.93	6.05	6.17	6.05	6.41	
140.0	6.33	6.46	6.59	6.65	6.72	6.78	6.90	7.02	7.14	7.02	7.39	
150.0	7.37	7.50	7.63	7.69	7.76	7.82	7.94	8.06	8.18	8.06	8.44	
160.0	8.49	8.62	8.75	8.81	8.87	8.93	9.06	9.18	9.30	9.18	9.56	
170.0	9.68	9.81	9.93	10.00	10.06	10.12	10.25	10.37	10.49	10.36	10.75	
180.0	10.94	11.07	11.19	11.26	11.32	11.38	11.51	11.63	11.75	11.63	12.02	
190.0	12.27	12.40	12.53	12.59	12.65	12.72	12.84	12.96	13.09	12.96	13.36	
200.0	13.68	13.81	13.94	14.00	14.06	14.13	14.25	14.37	14.50	14.37	14.77	
T A B L I C A N A P R E Ż E N przy słupie [MPa]												
10.0	60.00	46.27	32.63	25.92	19.40	13.44	6.21	4.02	3.13	37.54	44.32	
20.0	60.00	46.45	33.22	26.94	21.15	16.25	10.13	7.39	5.99	45.97	59.10	
30.0	60.00	46.73	34.10	28.33	23.20	18.97	13.36	10.36	8.62	54.18	72.32	
40.0	56.65	43.92	32.37	27.41	23.22	19.84	15.22	12.45	10.68	60.10	82.79	
50.0	41.43	31.21	23.60	20.82	18.61	16.84	14.27	12.50	11.22	60.15	87.22	
60.0	28.57	22.82	18.98	17.55	16.36	15.35	13.75	12.54	11.58	60.22	90.80	
70.0	21.64	18.81	16.75	15.92	15.19	14.55	13.46	12.57	11.83	60.30	93.69	
80.0	18.41	16.82	15.55	15.01	14.51	14.06	13.27	12.60	12.02	60.39	96.07	
90.0	16.72	15.70	14.83	14.45	14.09	13.76	13.16	12.63	12.16	60.50	98.03	
100.0	15.73	15.01	14.38	14.09	13.82	13.56	13.09	12.66	12.27	60.61	99.69	
110.0	15.09	14.55	14.07	13.84	13.63	13.42	13.04	12.69	12.37	60.74	101.10	
120.0	14.66	14.24	13.85	13.67	13.50	13.33	13.02	12.72	12.45	60.88	102.33	
130.0	14.35	14.02	13.70	13.56	13.41	13.27	13.01	12.76	12.52	61.04	103.42	
140.0	14.14	13.86	13.60	13.47	13.35	13.23	13.01	12.79	12.59	61.20	104.40	
150.0	13.98	13.75	13.53	13.42	13.32	13.21	13.02	12.83	12.65	61.38	105.30	
160.0	13.86	13.67	13.48	13.38	13.29	13.21	13.04	12.87	12.72	61.57	106.13	
170.0	13.78	13.61	13.45	13.37	13.29	13.21	13.06	12.92	12.78	61.78	106.92	
180.0	13.72	13.57	13.43	13.36	13.29	13.22	13.09	12.96	12.84	61.99	107.67	
190.0	13.69	13.56	13.43	13.37	13.30	13.24	13.13	13.01	12.90	62.22	108.39	
200.0	13.67	13.55	13.44	13.38	13.33	13.27	13.17	13.06	12.96	62.46	109.10	

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia						Napreżenie podstawowe			Strona	
	SII SIIa						70.0 [MPa]			30	
WIKROL	Typ przewodu						Naciąg podstawowy				
	SAX-W 70mm2 20kV						5.17 [kN]				
q= 73.9 [mm ²]		d= 14.3 [mm]		ap= 43.9 [m]		α=0.0000230 1/°K			β=0.0000167 1/MPa		
Rozp.	Temperatura [°C]									sn	sk
a [m]	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.02	0.02	0.04	0.08	0.12	0.05	0.07
20.0	0.03	0.03	0.04	0.05	0.06	0.08	0.13	0.20	0.26	0.16	0.24
30.0	0.06	0.07	0.09	0.11	0.13	0.16	0.23	0.33	0.41	0.32	0.45
40.0	0.10	0.13	0.16	0.19	0.22	0.26	0.36	0.47	0.58	0.51	0.69
50.0	0.18	0.23	0.29	0.34	0.39	0.45	0.58	0.70	0.82	0.76	1.00
60.0	0.33	0.42	0.55	0.62	0.69	0.76	0.90	1.04	1.16	1.10	1.38
70.0	0.60	0.75	0.91	0.99	1.07	1.15	1.29	1.43	1.56	1.50	1.81
80.0	1.02	1.20	1.37	1.45	1.53	1.60	1.75	1.89	2.02	1.96	2.31
90.0	1.54	1.72	1.89	1.97	2.05	2.12	2.27	2.41	2.54	2.48	2.85
100.0	2.13	2.31	2.47	2.55	2.63	2.70	2.85	2.99	3.13	3.06	3.46
110.0	2.79	2.96	3.12	3.20	3.27	3.35	3.49	3.63	3.77	3.71	4.12
120.0	3.50	3.67	3.83	3.90	3.98	4.05	4.20	4.34	4.48	4.41	4.85
130.0	4.28	4.44	4.59	4.67	4.75	4.82	4.96	5.11	5.24	5.18	5.63
140.0	5.11	5.27	5.42	5.50	5.57	5.65	5.79	5.94	6.07	6.01	6.47
150.0	6.01	6.16	6.32	6.39	6.47	6.54	6.68	6.83	6.97	6.90	7.38
160.0	6.96	7.12	7.27	7.34	7.42	7.49	7.64	7.78	7.92	7.86	8.34
170.0	7.98	8.14	8.29	8.36	8.43	8.51	8.65	8.80	8.94	8.87	9.37
180.0	9.06	9.21	9.36	9.44	9.51	9.59	9.73	9.87	10.01	9.95	10.46
190.0	10.20	10.36	10.51	10.58	10.65	10.73	10.87	11.01	11.16	11.09	11.61
200.0	11.41	11.56	11.71	11.78	11.86	11.93	12.07	12.22	12.36	12.30	12.82
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	70.00	56.24	42.53	35.71	28.95	22.32	10.70	5.35	3.71	45.84	51.30
20.0	70.00	56.35	42.85	36.24	29.81	23.75	14.13	9.18	6.93	52.72	64.70
30.0	70.00	56.52	43.36	37.04	31.04	25.57	17.17	12.40	9.82	60.13	77.37
40.0	70.00	56.75	44.02	38.03	32.46	27.49	19.90	15.25	12.47	67.34	89.10
50.0	62.31	49.70	38.17	33.10	28.65	24.92	19.45	15.97	13.68	70.13	96.44
60.0	48.69	38.02	29.51	26.20	23.47	21.23	17.91	15.61	13.94	70.19	100.68
70.0	36.33	29.15	24.06	22.13	20.52	19.16	17.01	15.39	14.13	70.26	104.26
80.0	28.10	24.00	21.04	19.86	18.84	17.94	16.44	15.25	14.27	70.34	107.28
90.0	23.58	21.17	19.30	18.52	17.81	17.18	16.08	15.16	14.37	70.42	109.86
100.0	21.07	19.51	18.22	17.66	17.15	16.68	15.83	15.10	14.46	70.52	112.06
110.0	19.55	18.45	17.51	17.09	16.70	16.33	15.66	15.06	14.53	70.64	113.96
120.0	18.56	17.74	17.02	16.69	16.38	16.08	15.54	15.04	14.59	70.76	115.63
130.0	17.87	17.24	16.67	16.40	16.15	15.91	15.45	15.04	14.65	70.89	117.09
140.0	17.39	16.88	16.41	16.19	15.98	15.78	15.39	15.04	14.71	71.03	118.40
150.0	17.03	16.61	16.22	16.03	15.86	15.68	15.35	15.05	14.76	71.18	119.57
160.0	16.76	16.40	16.07	15.92	15.76	15.62	15.33	15.06	14.81	71.35	120.65
170.0	16.55	16.25	15.97	15.83	15.70	15.57	15.32	15.08	14.86	71.52	121.64
180.0	16.39	16.13	15.89	15.77	15.65	15.54	15.32	15.11	14.91	71.70	122.56
190.0	16.27	16.05	15.83	15.72	15.62	15.52	15.33	15.14	14.96	71.90	123.43
200.0	16.18	15.98	15.79	15.70	15.61	15.52	15.34	15.17	15.01	72.11	124.26

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia						Napężenie podstawowe			Strona	
	SII SIIa						75.0 [MPa]			31	
WIKROL	Typ przewodu						Naciąg podstawowy				
	SAX-W 70mm ² 20kV						5.54 [kN]				
q= 73.9 [mm ²]		d= 14.3 [mm]		ap= 47.0 [m]		α=0.0000230 1/°K			β=0.0000167 1/MPa		
Rozp.	Temperatura [°C]									sn	sk
a [m]	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.07	0.11	0.04	0.07
20.0	0.02	0.03	0.04	0.04	0.05	0.06	0.10	0.17	0.24	0.15	0.23
30.0	0.05	0.07	0.08	0.10	0.11	0.14	0.20	0.29	0.38	0.30	0.43
40.0	0.10	0.12	0.15	0.17	0.20	0.23	0.32	0.43	0.54	0.49	0.67
50.0	0.16	0.19	0.24	0.28	0.32	0.37	0.49	0.61	0.74	0.71	0.95
60.0	0.27	0.34	0.44	0.50	0.57	0.64	0.78	0.92	1.05	1.03	1.32
70.0	0.48	0.60	0.75	0.83	0.91	0.99	1.14	1.29	1.43	1.40	1.73
80.0	0.81	0.98	1.15	1.24	1.32	1.41	1.56	1.71	1.85	1.83	2.20
90.0	1.26	1.45	1.63	1.72	1.81	1.89	2.05	2.20	2.34	2.31	2.72
100.0	1.81	2.00	2.18	2.26	2.35	2.43	2.59	2.74	2.88	2.86	3.29
110.0	2.42	2.60	2.78	2.87	2.95	3.03	3.19	3.34	3.49	3.46	3.91
120.0	3.09	3.27	3.44	3.52	3.61	3.69	3.84	4.00	4.14	4.12	4.59
130.0	3.81	3.99	4.16	4.24	4.32	4.40	4.56	4.71	4.86	4.83	5.33
140.0	4.59	4.77	4.93	5.02	5.10	5.18	5.33	5.49	5.63	5.61	6.12
150.0	5.43	5.60	5.77	5.85	5.93	6.01	6.16	6.32	6.47	6.44	6.97
160.0	6.32	6.49	6.66	6.74	6.82	6.90	7.05	7.20	7.35	7.33	7.87
170.0	7.27	7.44	7.60	7.68	7.76	7.84	8.00	8.15	8.30	8.28	8.83
180.0	8.28	8.45	8.61	8.69	8.77	8.85	9.00	9.16	9.31	9.28	9.85
190.0	9.35	9.51	9.67	9.75	9.83	9.91	10.07	10.22	10.37	10.35	10.92
200.0	10.47	10.63	10.80	10.87	10.95	11.03	11.19	11.34	11.49	11.47	12.05
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	75.00	61.23	47.50	40.66	33.85	27.12	14.44	6.57	4.14	50.26	55.11
20.0	75.00	61.32	47.75	41.05	34.48	28.13	17.11	10.53	7.58	56.42	67.75
30.0	75.00	61.46	48.15	41.67	35.42	29.53	19.81	13.81	10.61	63.38	80.08
40.0	75.00	61.64	48.67	42.46	36.56	31.13	22.34	16.70	13.35	70.32	91.63
50.0	71.63	58.60	46.23	40.48	35.17	30.45	23.09	18.28	15.22	75.12	100.82
60.0	59.06	47.15	36.73	32.33	28.56	25.41	20.71	17.55	15.36	75.18	105.31
70.0	46.21	36.72	29.44	26.61	24.26	22.30	19.28	17.09	15.46	75.24	109.17
80.0	35.58	29.38	24.92	23.19	21.71	20.44	18.39	16.80	15.53	75.31	112.49
90.0	28.76	25.04	22.28	21.15	20.16	19.29	17.80	16.60	15.59	75.40	115.34
100.0	24.83	22.50	20.66	19.88	19.17	18.53	17.41	16.46	15.65	75.49	117.81
110.0	22.50	20.92	19.61	19.03	18.50	18.01	17.13	16.37	15.69	75.59	119.96
120.0	21.02	19.87	18.89	18.45	18.03	17.64	16.93	16.30	15.74	75.71	121.85
130.0	20.01	19.14	18.38	18.02	17.69	17.37	16.79	16.26	15.78	75.83	123.52
140.0	19.31	18.62	18.00	17.71	17.44	17.17	16.68	16.23	15.82	75.96	125.01
150.0	18.79	18.23	17.72	17.48	17.25	17.03	16.61	16.22	15.86	76.10	126.35
160.0	18.40	17.93	17.50	17.30	17.10	16.91	16.55	16.21	15.90	76.26	127.57
170.0	18.10	17.71	17.34	17.17	17.00	16.83	16.52	16.22	15.94	76.42	128.68
180.0	17.87	17.53	17.21	17.06	16.91	16.77	16.49	16.23	15.98	76.59	129.72
190.0	17.69	17.40	17.12	16.98	16.85	16.73	16.48	16.25	16.02	76.77	130.68
200.0	17.55	17.29	17.05	16.93	16.81	16.70	16.48	16.27	16.07	76.96	131.59

ENERGOLINIA w Poznaniu	Strefa obciążenia szdria		Napreżenie podstawowe		Strona						
	SII SIIa		80.0 [MPa]		32						
	Typ przewodu		Naciąg podstawowy								
WIKROL	SAX-W 70mm ² 20kV		5.91 [kN]								
q= 73.9 [mm ²]	d= 14.3 [mm]	ap= 50.2 [m]	α=0.0000230 1/°K	β=0.0000167 1/MPa							
Rozp. a [m]	Temperatura [°C]								sn	sk	
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.05	0.09	0.04	0.06
20.0	0.02	0.03	0.03	0.04	0.05	0.05	0.09	0.14	0.21	0.14	0.22
30.0	0.05	0.06	0.08	0.09	0.10	0.12	0.18	0.26	0.35	0.29	0.42
40.0	0.09	0.11	0.13	0.15	0.18	0.20	0.28	0.39	0.50	0.47	0.65
50.0	0.14	0.17	0.21	0.23	0.27	0.31	0.41	0.53	0.66	0.67	0.92
60.0	0.23	0.29	0.36	0.41	0.47	0.53	0.67	0.81	0.95	0.96	1.26
70.0	0.39	0.48	0.61	0.68	0.76	0.84	1.00	1.15	1.30	1.31	1.66
80.0	0.64	0.79	0.96	1.05	1.14	1.22	1.39	1.55	1.70	1.71	2.10
90.0	1.02	1.21	1.40	1.49	1.58	1.67	1.84	2.00	2.16	2.17	2.60
100.0	1.51	1.71	1.90	2.00	2.09	2.18	2.35	2.51	2.66	2.68	3.14
110.0	2.08	2.28	2.47	2.56	2.65	2.74	2.91	3.07	3.23	3.24	3.73
120.0	2.70	2.90	3.09	3.18	3.27	3.35	3.52	3.69	3.84	3.86	4.37
130.0	3.38	3.57	3.76	3.85	3.94	4.02	4.19	4.36	4.51	4.53	5.07
140.0	4.12	4.30	4.49	4.58	4.66	4.75	4.92	5.08	5.24	5.26	5.81
150.0	4.90	5.09	5.27	5.36	5.44	5.53	5.69	5.86	6.02	6.04	6.61
160.0	5.74	5.92	6.10	6.19	6.27	6.36	6.53	6.69	6.85	6.87	7.46
170.0	6.63	6.81	6.99	7.08	7.16	7.25	7.41	7.58	7.74	7.76	8.36
180.0	7.58	7.76	7.93	8.02	8.10	8.19	8.36	8.52	8.68	8.70	9.32
190.0	8.58	8.75	8.93	9.01	9.10	9.18	9.35	9.51	9.68	9.70	10.33
200.0	9.63	9.81	9.98	10.07	10.15	10.23	10.40	10.57	10.73	10.75	11.39
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	80.00	66.22	52.48	45.62	38.79	32.00	18.81	8.54	4.73	54.80	59.10
20.0	80.00	66.29	52.67	45.92	39.26	32.73	20.74	12.37	8.40	60.29	70.96
30.0	80.00	66.41	52.99	46.41	39.98	33.81	22.98	15.60	11.57	66.80	82.91
40.0	80.00	66.56	53.41	47.04	40.89	35.10	25.23	18.46	14.40	73.45	94.26
50.0	80.01	66.75	53.92	47.78	41.94	36.50	27.40	21.05	16.99	79.97	104.97
60.0	68.86	56.28	44.64	39.39	34.67	30.55	24.18	19.89	16.99	80.17	109.79
70.0	56.49	45.40	36.07	32.24	28.97	26.22	22.03	19.08	16.95	80.22	113.89
80.0	44.71	36.26	29.88	27.39	25.28	23.49	20.67	18.56	16.93	80.29	117.47
90.0	35.57	30.05	26.00	24.39	23.00	21.78	19.78	18.20	16.92	80.37	120.58
100.0	29.72	26.25	23.60	22.51	21.54	20.67	19.18	17.95	16.92	80.46	123.31
110.0	26.19	23.90	22.06	21.28	20.56	19.91	18.76	17.78	16.93	80.56	125.70
120.0	23.98	22.37	21.02	20.43	19.88	19.37	18.45	17.65	16.94	80.66	127.81
130.0	22.52	21.32	20.29	19.82	19.39	18.98	18.23	17.56	16.96	80.78	129.69
140.0	21.50	20.57	19.75	19.38	19.02	18.68	18.06	17.49	16.97	80.90	131.36
150.0	20.76	20.02	19.35	19.04	18.75	18.46	17.93	17.45	17.00	81.03	132.88
160.0	20.21	19.60	19.05	18.78	18.53	18.29	17.84	17.42	17.02	81.18	134.25
170.0	19.79	19.28	18.81	18.59	18.37	18.16	17.77	17.40	17.05	81.33	135.50
180.0	19.46	19.03	18.62	18.43	18.24	18.06	17.72	17.39	17.08	81.49	136.66
190.0	19.21	18.83	18.48	18.31	18.15	17.99	17.68	17.39	17.11	81.66	137.73
200.0	19.00	18.68	18.37	18.22	18.07	17.93	17.66	17.40	17.15	81.84	138.74

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia								Napreżenie podstawowe		Strona	
	SII SIIa								60.0 [MPa]		33	
	Typ przewodu								Naciąg podstawowy			
WIKROL	SAX-W 120mm ² 20kV								7.72 [kN]			
q=128.7 [mm ²]		d= 17.6 [mm]		ap= 54.2 [m]		α=0.0000230 1/°K		β=0.0000167 1/MPa				
Rozp.	Temperatura [°C]										sn	sk
a [m]	-25	-15	-5	0	5	10	20	30	40	-5	-5	
T A B L I C A Z W I S O W [m]												
10.0	0.01	0.01	0.01	0.02	0.02	0.03	0.07	0.11	0.14	0.04	0.07	
20.0	0.03	0.03	0.05	0.06	0.08	0.10	0.17	0.24	0.30	0.15	0.21	
30.0	0.06	0.08	0.11	0.13	0.16	0.20	0.29	0.38	0.46	0.29	0.40	
40.0	0.11	0.14	0.19	0.22	0.26	0.32	0.43	0.54	0.64	0.46	0.61	
50.0	0.17	0.21	0.28	0.33	0.39	0.45	0.58	0.71	0.83	0.65	0.85	
60.0	0.27	0.34	0.45	0.51	0.58	0.66	0.81	0.95	1.08	0.91	1.15	
70.0	0.45	0.57	0.72	0.80	0.89	0.97	1.13	1.28	1.42	1.23	1.51	
80.0	0.72	0.89	1.07	1.16	1.25	1.34	1.50	1.66	1.80	1.61	1.92	
90.0	1.10	1.30	1.49	1.58	1.67	1.76	1.93	2.09	2.24	2.04	2.38	
100.0	1.57	1.77	1.96	2.06	2.15	2.24	2.41	2.57	2.72	2.52	2.88	
110.0	2.10	2.30	2.49	2.58	2.67	2.76	2.93	3.10	3.25	3.05	3.43	
120.0	2.68	2.88	3.07	3.16	3.25	3.34	3.51	3.68	3.83	3.63	4.03	
130.0	3.32	3.51	3.70	3.79	3.88	3.97	4.14	4.31	4.47	4.26	4.67	
140.0	4.00	4.19	4.38	4.47	4.56	4.65	4.82	4.99	5.15	4.94	5.37	
150.0	4.74	4.93	5.11	5.20	5.29	5.38	5.55	5.72	5.88	5.67	6.11	
160.0	5.52	5.71	5.90	5.99	6.07	6.16	6.34	6.50	6.67	6.45	6.91	
170.0	6.36	6.55	6.73	6.82	6.91	7.00	7.17	7.34	7.50	7.29	7.75	
180.0	7.24	7.43	7.61	7.70	7.79	7.88	8.05	8.22	8.39	8.17	8.64	
190.0	8.18	8.37	8.55	8.64	8.73	8.81	8.99	9.16	9.33	9.11	9.59	
200.0	9.17	9.35	9.54	9.62	9.71	9.80	9.97	10.15	10.31	10.10	10.58	
T A B L I C A N A P R E Ż E N przy słupie [MPa]												
10.0	60.00	46.26	32.59	25.85	19.27	13.18	5.77	3.66	2.84	35.27	39.39	
20.0	60.00	46.40	33.09	26.71	20.77	15.71	9.44	6.78	5.45	40.86	49.80	
30.0	60.00	46.64	33.83	27.90	22.60	18.21	12.48	9.53	7.88	46.78	59.58	
40.0	60.00	46.95	34.73	29.26	24.48	20.53	15.13	12.04	10.14	52.48	68.60	
50.0	60.01	47.32	35.74	30.68	26.30	22.68	17.52	14.34	12.27	57.88	76.98	
60.0	54.41	42.63	32.55	28.43	24.99	22.18	18.09	15.39	13.52	60.11	82.24	
70.0	44.57	34.88	27.51	24.71	22.40	20.50	17.61	15.56	14.04	60.15	85.11	
80.0	35.95	29.06	24.17	22.30	20.74	19.41	17.29	15.69	14.44	60.19	87.57	
90.0	29.78	25.29	22.05	20.77	19.66	18.68	17.07	15.79	14.74	60.25	89.68	
100.0	25.88	22.92	20.68	19.75	18.93	18.19	16.92	15.87	14.99	60.30	91.50	
110.0	23.44	21.39	19.75	19.05	18.41	17.83	16.81	15.94	15.18	60.37	93.08	
120.0	21.85	20.35	19.10	18.55	18.04	17.57	16.73	16.00	15.35	60.44	94.46	
130.0	20.76	19.61	18.63	18.18	17.77	17.38	16.68	16.05	15.48	60.51	95.67	
140.0	19.98	19.07	18.27	17.91	17.56	17.24	16.64	16.09	15.60	60.60	96.74	
150.0	19.41	18.67	18.01	17.70	17.41	17.13	16.61	16.14	15.70	60.68	97.70	
160.0	18.97	18.36	17.80	17.54	17.29	17.05	16.60	16.18	15.79	60.78	98.57	
170.0	18.64	18.12	17.64	17.41	17.20	16.99	16.59	16.22	15.88	60.88	99.36	
180.0	18.38	17.93	17.51	17.32	17.13	16.94	16.59	16.26	15.95	60.99	100.08	
190.0	18.17	17.78	17.42	17.24	17.07	16.91	16.60	16.30	16.02	61.10	100.75	
200.0	18.00	17.66	17.34	17.19	17.04	16.89	16.61	16.34	16.09	61.22	101.38	

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia						Napreżenie podstawowe			Strona	
	SII SIIa						70.0 [MPa]			34	
WIKROL	Typ przewodu						Naciąg podstawowy				
	SAX-W 120mm ² 20kV						9.01 [kN]				
q=128.7 [mm ²]		d= 17.6 [mm]		ap= 63.2 [m]		α=0.0000230 1/°K			β=0.0000167 1/MPa		
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.01	0.02	0.04	0.08	0.12	0.03	0.06
20.0	0.02	0.03	0.04	0.04	0.05	0.07	0.12	0.19	0.26	0.12	0.19
30.0	0.05	0.06	0.08	0.10	0.12	0.15	0.22	0.32	0.40	0.25	0.36
40.0	0.09	0.11	0.15	0.17	0.20	0.24	0.34	0.46	0.57	0.41	0.57
50.0	0.14	0.18	0.23	0.26	0.30	0.36	0.48	0.61	0.74	0.59	0.80
60.0	0.21	0.25	0.32	0.37	0.42	0.48	0.62	0.77	0.92	0.79	1.05
70.0	0.31	0.38	0.48	0.54	0.62	0.69	0.86	1.02	1.18	1.06	1.36
80.0	0.47	0.58	0.73	0.81	0.90	0.99	1.17	1.34	1.51	1.38	1.73
90.0	0.70	0.86	1.04	1.14	1.24	1.34	1.53	1.71	1.88	1.75	2.13
100.0	1.02	1.22	1.43	1.53	1.64	1.74	1.93	2.12	2.29	2.16	2.58
110.0	1.42	1.65	1.87	1.98	2.08	2.18	2.38	2.57	2.75	2.61	3.06
120.0	1.90	2.13	2.36	2.47	2.57	2.68	2.88	3.07	3.25	3.11	3.58
130.0	2.43	2.67	2.89	3.00	3.11	3.21	3.41	3.61	3.79	3.65	4.15
140.0	3.02	3.25	3.47	3.58	3.69	3.79	3.99	4.19	4.38	4.23	4.75
150.0	3.65	3.88	4.10	4.21	4.31	4.42	4.62	4.81	5.00	4.86	5.40
160.0	4.32	4.55	4.77	4.88	4.98	5.09	5.29	5.48	5.67	5.53	6.09
170.0	5.04	5.26	5.48	5.59	5.69	5.80	6.00	6.20	6.39	6.24	6.82
180.0	5.80	6.02	6.24	6.35	6.45	6.55	6.76	6.95	7.15	7.00	7.59
190.0	6.60	6.82	7.04	7.15	7.25	7.35	7.56	7.76	7.95	7.80	8.40
200.0	7.45	7.67	7.88	7.99	8.09	8.20	8.40	8.60	8.79	8.65	9.26
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	70.00	56.23	42.51	35.67	28.89	22.22	10.35	4.93	3.38	44.22	47.26
20.0	70.00	56.32	42.77	36.11	29.61	23.43	13.50	8.50	6.34	48.42	56.11
30.0	70.00	56.46	43.20	36.78	30.66	25.03	16.33	11.52	9.02	53.44	65.17
40.0	70.00	56.66	43.75	37.63	31.90	26.75	18.88	14.19	11.48	58.59	73.81
50.0	70.00	56.90	44.40	38.59	33.23	28.49	21.21	16.62	13.76	63.64	81.97
60.0	70.01	57.17	45.13	39.62	34.60	30.18	23.36	18.86	15.91	68.53	89.71
70.0	64.33	52.16	41.21	36.44	32.23	28.64	23.17	19.45	16.88	70.13	94.33
80.0	55.54	44.71	35.70	32.02	28.88	26.25	22.20	19.34	17.24	70.17	97.22
90.0	47.08	38.24	31.44	28.76	26.48	24.56	21.51	19.25	17.52	70.21	99.79
100.0	39.90	33.30	28.41	26.47	24.80	23.37	21.02	19.19	17.74	70.26	102.07
110.0	34.52	29.82	26.30	24.87	23.62	22.51	20.65	19.15	17.92	70.32	104.08
120.0	30.78	27.42	24.82	23.73	22.76	21.89	20.38	19.13	18.07	70.38	105.88
130.0	28.21	25.74	23.75	22.90	22.13	21.42	20.17	19.11	18.19	70.44	107.48
140.0	26.41	24.53	22.96	22.28	21.65	21.06	20.01	19.10	18.30	70.51	108.92
150.0	25.11	23.63	22.37	21.80	21.28	20.78	19.89	19.10	18.39	70.59	110.21
160.0	24.14	22.95	21.91	21.43	20.99	20.57	19.80	19.10	18.48	70.67	111.38
170.0	23.41	22.42	21.54	21.14	20.76	20.39	19.72	19.11	18.55	70.75	112.45
180.0	22.83	22.00	21.25	20.91	20.57	20.26	19.67	19.12	18.62	70.85	113.42
190.0	22.38	21.67	21.02	20.72	20.43	20.15	19.62	19.14	18.68	70.94	114.32
200.0	22.02	21.40	20.83	20.57	20.31	20.06	19.59	19.15	18.74	71.04	115.15

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia								Naprezenie podstawowe		Strona	
	SII SIIa								75.0 [MPa]		35	
	Typ przewodu								Naciąg podstawowy			
WIKROL	SAX-W 120mm ² 20kV								9.65 [kN]			
q=128.7 [mm ²]		d= 17.6 [mm]		ap= 67.8 [m]		α=0.0000230 1/°K		β=0.0000167 1/MPa				
Rozp.	Temperatura [°C]										sn	sk
a [m]	-25	-15	-5	0	5	10	20	30	40	-5	-5	
T A B L I C A Z W I S O W [m]												
10.0	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.07	0.11	0.03	0.05	
20.0	0.02	0.03	0.03	0.04	0.05	0.06	0.10	0.16	0.23	0.11	0.18	
30.0	0.05	0.06	0.08	0.09	0.10	0.13	0.19	0.28	0.37	0.24	0.35	
40.0	0.09	0.11	0.13	0.15	0.18	0.21	0.30	0.41	0.53	0.39	0.55	
50.0	0.13	0.16	0.21	0.24	0.27	0.32	0.43	0.56	0.69	0.57	0.77	
60.0	0.19	0.24	0.29	0.33	0.38	0.44	0.57	0.72	0.86	0.76	1.02	
70.0	0.27	0.33	0.41	0.46	0.52	0.59	0.74	0.91	1.07	0.99	1.30	
80.0	0.40	0.49	0.61	0.68	0.76	0.84	1.02	1.20	1.38	1.29	1.65	
90.0	0.58	0.71	0.87	0.96	1.06	1.16	1.35	1.54	1.72	1.63	2.03	
100.0	0.83	1.00	1.21	1.31	1.42	1.52	1.73	1.92	2.11	2.01	2.46	
110.0	1.16	1.38	1.60	1.71	1.82	1.93	2.14	2.34	2.53	2.44	2.91	
120.0	1.57	1.81	2.05	2.16	2.28	2.39	2.60	2.80	3.00	2.90	3.41	
130.0	2.06	2.30	2.54	2.66	2.77	2.89	3.10	3.31	3.50	3.40	3.94	
140.0	2.59	2.84	3.08	3.20	3.31	3.43	3.64	3.85	4.05	3.95	4.51	
150.0	3.18	3.43	3.67	3.78	3.90	4.01	4.22	4.43	4.63	4.53	5.12	
160.0	3.80	4.05	4.29	4.41	4.52	4.63	4.85	5.06	5.26	5.16	5.77	
170.0	4.47	4.72	4.95	5.07	5.18	5.29	5.51	5.72	5.93	5.82	6.45	
180.0	5.18	5.42	5.66	5.77	5.89	6.00	6.22	6.43	6.63	6.53	7.18	
190.0	5.93	6.17	6.41	6.52	6.63	6.74	6.96	7.17	7.38	7.28	7.94	
200.0	6.72	6.96	7.19	7.31	7.42	7.53	7.75	7.96	8.17	8.07	8.75	
T A B L I C A N A P R E Z E N przy słupie [MPa]												
10.0	75.00	61.23	47.48	40.63	33.81	27.05	14.21	6.13	3.78	48.89	51.49	
20.0	75.00	61.30	47.69	40.96	34.33	27.90	16.58	9.84	6.95	52.52	59.57	
30.0	75.00	61.41	48.02	41.47	35.12	29.10	19.04	12.92	9.77	57.08	68.21	
40.0	75.00	61.57	48.45	42.14	36.10	30.50	21.39	15.63	12.33	61.92	76.60	
50.0	75.00	61.76	48.98	42.92	37.20	31.98	23.58	18.08	14.69	66.76	84.62	
60.0	75.01	61.99	49.58	43.77	38.37	33.48	25.65	20.35	16.89	71.50	92.27	
70.0	73.31	60.62	48.74	43.29	38.31	33.86	26.79	21.91	18.59	75.12	98.72	
80.0	65.18	53.33	42.80	38.23	34.21	30.74	25.35	21.57	18.88	75.16	101.78	
90.0	56.82	46.34	37.65	34.08	31.00	28.39	24.29	21.32	19.11	75.20	104.53	
100.0	48.93	40.32	33.62	30.94	28.64	26.67	23.52	21.14	19.29	75.24	107.00	
110.0	42.22	35.64	30.66	28.66	26.93	25.43	22.94	21.00	19.43	75.29	109.21	
120.0	37.08	32.23	28.53	27.02	25.69	24.51	22.51	20.89	19.56	75.35	111.19	
130.0	33.36	29.78	26.99	25.81	24.76	23.82	22.18	20.81	19.66	75.41	112.98	
140.0	30.71	28.02	25.85	24.91	24.06	23.29	21.92	20.76	19.75	75.48	114.60	
150.0	28.80	26.72	24.99	24.23	23.52	22.88	21.72	20.71	19.83	75.55	116.06	
160.0	27.40	25.74	24.32	23.69	23.10	22.55	21.56	20.68	19.90	75.62	117.38	
170.0	26.33	24.98	23.80	23.27	22.77	22.30	21.43	20.66	19.96	75.70	118.60	
180.0	25.51	24.38	23.39	22.93	22.50	22.09	21.33	20.65	20.02	75.79	119.71	
190.0	24.86	23.91	23.05	22.66	22.28	21.92	21.25	20.64	20.08	75.88	120.73	
200.0	24.34	23.52	22.78	22.43	22.10	21.78	21.19	20.64	20.13	75.97	121.67	

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia						Napreżenie podstawowe			Strona	
	SII SIIa						80.0 [MPa]			36	
	Typ przewodu						Naciąg podstawowy				
	SAX-W 120mm ² 20kV						10.30 [kN]				
WIKROL	q=128.7 [mm ²]		d= 17.6 [mm]		ap= 72.3 [m]		α=0.0000230 1/°K		β=0.0000167 1/MPa		
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.05	0.09	0.03	0.05
20.0	0.02	0.02	0.03	0.04	0.04	0.05	0.08	0.14	0.21	0.11	0.17
30.0	0.05	0.05	0.07	0.08	0.09	0.11	0.16	0.25	0.34	0.22	0.33
40.0	0.08	0.10	0.12	0.14	0.16	0.19	0.27	0.37	0.49	0.37	0.53
50.0	0.13	0.15	0.19	0.21	0.24	0.28	0.38	0.51	0.64	0.54	0.75
60.0	0.18	0.22	0.27	0.30	0.34	0.39	0.52	0.66	0.81	0.73	0.99
70.0	0.25	0.30	0.36	0.41	0.46	0.52	0.66	0.82	0.99	0.94	1.26
80.0	0.35	0.42	0.52	0.58	0.64	0.72	0.89	1.07	1.25	1.21	1.58
90.0	0.49	0.60	0.73	0.82	0.90	1.00	1.19	1.39	1.57	1.53	1.95
100.0	0.69	0.84	1.02	1.12	1.22	1.33	1.54	1.74	1.93	1.89	2.35
110.0	0.96	1.15	1.37	1.48	1.59	1.70	1.92	2.13	2.33	2.28	2.79
120.0	1.30	1.53	1.77	1.89	2.01	2.12	2.35	2.56	2.77	2.72	3.26
130.0	1.72	1.97	2.22	2.35	2.47	2.59	2.81	3.03	3.24	3.19	3.76
140.0	2.21	2.47	2.72	2.85	2.97	3.09	3.32	3.54	3.75	3.70	4.31
150.0	2.74	3.01	3.27	3.39	3.51	3.63	3.86	4.09	4.30	4.25	4.88
160.0	3.33	3.59	3.85	3.97	4.10	4.22	4.45	4.67	4.89	4.84	5.49
170.0	3.95	4.22	4.47	4.60	4.72	4.84	5.07	5.29	5.51	5.46	6.14
180.0	4.62	4.88	5.13	5.26	5.38	5.50	5.73	5.95	6.17	6.12	6.82
190.0	5.32	5.58	5.83	5.95	6.08	6.19	6.43	6.65	6.87	6.82	7.54
200.0	6.06	6.32	6.57	6.69	6.81	6.93	7.16	7.39	7.61	7.56	8.30
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	80.00	66.22	52.46	45.60	38.76	31.95	18.67	8.12	4.33	53.64	55.87
20.0	80.00	66.28	52.62	45.85	39.14	32.56	20.33	11.69	7.74	56.77	63.21
30.0	80.00	66.37	52.89	46.25	39.75	33.47	22.32	14.71	10.69	60.90	71.40
40.0	80.00	66.50	53.24	46.78	40.52	34.59	24.37	17.40	13.34	65.42	79.53
50.0	80.00	66.66	53.67	47.41	41.42	35.82	26.37	19.83	15.77	70.03	87.38
60.0	80.01	66.85	54.16	48.12	42.40	37.12	28.29	22.08	18.03	74.60	94.91
70.0	80.01	67.06	54.70	48.89	43.44	38.43	30.12	24.18	20.14	79.09	102.14
80.0	74.28	61.83	50.29	45.03	40.23	35.96	29.07	24.18	20.75	80.15	106.21
90.0	66.40	54.85	44.65	40.23	36.32	32.93	27.56	23.70	20.88	80.18	109.11
100.0	58.47	48.26	39.79	36.27	33.22	30.60	26.42	23.33	20.99	80.23	111.74
110.0	51.05	42.59	35.92	33.22	30.88	28.85	25.57	23.05	21.09	80.28	114.13
120.0	44.72	38.09	33.00	30.93	29.13	27.54	24.92	22.84	21.16	80.33	116.29
130.0	39.74	34.72	30.84	29.23	27.82	26.55	24.42	22.67	21.23	80.39	118.25
140.0	36.03	32.22	29.22	27.96	26.82	25.80	24.02	22.54	21.29	80.45	120.03
150.0	33.30	30.37	28.00	26.98	26.06	25.21	23.72	22.44	21.34	80.51	121.66
160.0	31.28	28.98	27.07	26.23	25.46	24.74	23.47	22.36	21.39	80.58	123.14
170.0	29.76	27.91	26.33	25.63	24.98	24.37	23.27	22.30	21.44	80.66	124.50
180.0	28.59	27.07	25.75	25.15	24.60	24.07	23.11	22.25	21.48	80.74	125.75
190.0	27.68	26.40	25.28	24.77	24.28	23.83	22.98	22.21	21.52	80.82	126.90
200.0	26.95	25.87	24.90	24.45	24.03	23.62	22.87	22.19	21.56	80.91	127.97

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia							Napreżenie podstawowe		Strona	
	SII SIIa							60.0 [MPa]		37	
WIKROL	Typ przewodu							Naciąg podstawowy			
	SAX-W 50mm2 30kV							3.02 [kN]			
q= 50.3 [mm ²]		d= 15.0 [mm]		ap= 25.3 [m]		$\alpha=0.0000230$ 1/°K		$\beta=0.0000160$ 1/MPa			
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.02	0.02	0.03	0.05	0.09	0.12	0.15	0.08	0.11
20.0	0.04	0.05	0.07	0.09	0.11	0.14	0.20	0.26	0.32	0.24	0.32
30.0	0.11	0.15	0.21	0.25	0.29	0.33	0.41	0.48	0.55	0.48	0.60
40.0	0.35	0.45	0.55	0.60	0.65	0.69	0.78	0.86	0.93	0.85	1.01
50.0	0.83	0.93	1.03	1.08	1.12	1.17	1.25	1.33	1.41	1.32	1.51
60.0	1.42	1.52	1.62	1.66	1.71	1.75	1.83	1.91	1.99	1.90	2.11
70.0	2.12	2.22	2.31	2.35	2.39	2.44	2.52	2.60	2.68	2.59	2.81
80.0	2.92	3.01	3.10	3.15	3.19	3.23	3.32	3.40	3.48	3.39	3.62
90.0	3.83	3.92	4.01	4.05	4.09	4.13	4.22	4.30	4.38	4.29	4.53
100.0	4.84	4.93	5.02	5.06	5.10	5.14	5.23	5.31	5.39	5.30	5.55
110.0	5.96	6.05	6.13	6.18	6.22	6.26	6.35	6.43	6.51	6.42	6.67
120.0	7.19	7.27	7.36	7.40	7.44	7.49	7.57	7.65	7.74	7.65	7.91
130.0	8.52	8.61	8.69	8.74	8.78	8.82	8.91	8.99	9.07	8.98	9.25
140.0	9.97	10.05	10.14	10.18	10.22	10.27	10.35	10.43	10.52	10.43	10.70
150.0	11.52	11.61	11.69	11.74	11.78	11.82	11.91	11.99	12.07	11.98	12.26
160.0	13.18	13.27	13.36	13.40	13.44	13.49	13.57	13.66	13.74	13.65	13.93
170.0	14.96	15.05	15.13	15.18	15.22	15.26	15.35	15.43	15.52	15.43	15.71
180.0	16.85	16.94	17.02	17.07	17.11	17.15	17.24	17.32	17.41	17.32	17.60
190.0	18.85	18.94	19.03	19.07	19.11	19.16	19.24	19.33	19.41	19.32	19.61
200.0	20.97	21.05	21.14	21.18	21.23	21.27	21.36	21.44	21.53	21.44	21.73
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	60.00	45.73	31.66	24.85	18.47	13.08	7.16	5.05	4.06	41.02	51.64
20.0	60.00	46.08	32.83	26.79	21.50	17.27	11.95	9.25	7.70	53.78	72.47
30.0	49.26	36.71	26.27	22.25	19.10	16.68	13.39	11.34	9.96	60.12	85.76
40.0	27.53	21.51	17.63	16.23	15.07	14.11	12.59	11.45	10.56	60.21	91.53
50.0	18.43	16.37	14.82	14.18	13.62	13.11	12.24	11.52	10.91	60.34	95.73
60.0	15.48	14.49	13.66	13.29	12.95	12.64	12.07	11.57	11.13	60.48	98.87
70.0	14.19	13.59	13.07	12.83	12.60	12.39	11.99	11.62	11.29	60.66	101.28
80.0	13.50	13.11	12.74	12.57	12.40	12.25	11.95	11.67	11.41	60.86	103.22
90.0	13.10	12.82	12.55	12.42	12.29	12.17	11.94	11.72	11.52	61.09	104.82
100.0	12.86	12.64	12.43	12.33	12.23	12.14	11.95	11.78	11.61	61.34	106.20
110.0	12.71	12.53	12.37	12.29	12.21	12.13	11.98	11.83	11.70	61.63	107.43
120.0	12.62	12.47	12.34	12.27	12.21	12.14	12.02	11.90	11.78	61.94	108.57
130.0	12.57	12.45	12.34	12.28	12.23	12.17	12.07	11.96	11.87	62.28	109.64
140.0	12.55	12.45	12.35	12.31	12.26	12.21	12.12	12.04	11.95	62.64	110.69
150.0	12.55	12.47	12.39	12.35	12.31	12.27	12.19	12.11	12.04	63.04	111.71
160.0	12.58	12.51	12.43	12.40	12.36	12.33	12.26	12.20	12.13	63.46	112.74
170.0	12.62	12.55	12.49	12.46	12.43	12.40	12.34	12.28	12.23	63.91	113.77
180.0	12.67	12.62	12.56	12.53	12.51	12.48	12.43	12.38	12.33	64.39	114.83
190.0	12.74	12.69	12.64	12.62	12.59	12.57	12.52	12.48	12.43	64.90	115.91
200.0	12.81	12.77	12.73	12.70	12.68	12.66	12.62	12.58	12.54	65.44	117.02

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia							Napreżenie podstawowe		Strona	
	SII SIIa							70.0 [MPa]		38	
WIKROL	Typ przewodu							Naciąg podstawowy			
	SAX-W 50mm ² 30kV							3.52 [kN]			
q= 50.3 [mm ²]	d= 15.0 [mm]	ap= 29.6 [m]	α=0.0000230 1/°K				β=0.0000160 1/MPa				
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.02	0.02	0.03	0.06	0.10	0.13	0.07	0.10
20.0	0.03	0.04	0.06	0.07	0.08	0.10	0.16	0.22	0.28	0.21	0.30
30.0	0.08	0.10	0.13	0.15	0.18	0.21	0.29	0.37	0.45	0.41	0.55
40.0	0.20	0.26	0.35	0.40	0.45	0.50	0.60	0.69	0.77	0.72	0.91
50.0	0.50	0.62	0.74	0.79	0.85	0.90	1.00	1.09	1.18	1.13	1.35
60.0	1.00	1.12	1.24	1.29	1.34	1.40	1.50	1.59	1.68	1.63	1.88
70.0	1.60	1.72	1.83	1.88	1.93	1.99	2.08	2.18	2.27	2.22	2.49
80.0	2.29	2.40	2.51	2.56	2.62	2.67	2.77	2.86	2.95	2.90	3.19
90.0	3.07	3.18	3.29	3.34	3.39	3.44	3.54	3.63	3.73	3.68	3.98
100.0	3.94	4.05	4.15	4.20	4.25	4.30	4.40	4.50	4.59	4.54	4.85
110.0	4.90	5.01	5.11	5.16	5.21	5.26	5.36	5.45	5.55	5.50	5.82
120.0	5.95	6.05	6.16	6.21	6.26	6.31	6.40	6.50	6.60	6.54	6.88
130.0	7.09	7.20	7.30	7.35	7.40	7.45	7.54	7.64	7.74	7.69	8.03
140.0	8.33	8.43	8.53	8.58	8.63	8.68	8.78	8.87	8.97	8.92	9.27
150.0	9.65	9.76	9.86	9.91	9.96	10.01	10.10	10.20	10.30	10.25	10.60
160.0	11.08	11.18	11.28	11.33	11.38	11.43	11.53	11.62	11.72	11.67	12.03
170.0	12.59	12.69	12.79	12.84	12.89	12.94	13.04	13.14	13.24	13.19	13.55
180.0	14.20	14.30	14.40	14.45	14.50	14.55	14.65	14.75	14.85	14.80	15.17
190.0	15.90	16.00	16.11	16.16	16.21	16.26	16.36	16.45	16.55	16.50	16.88
200.0	17.70	17.80	17.91	17.96	18.01	18.06	18.16	18.26	18.35	18.31	18.68
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	70.00	55.67	41.44	34.41	27.51	20.92	10.62	6.31	4.68	48.28	57.62
20.0	70.00	55.89	42.10	35.48	29.22	23.58	15.32	10.97	8.71	59.62	77.44
30.0	69.23	55.48	42.38	36.31	30.77	25.97	18.92	14.72	12.19	70.10	94.68
40.0	48.40	37.01	28.02	24.60	21.83	19.62	16.40	14.23	12.68	70.18	101.45
50.0	30.32	24.64	20.75	19.28	18.05	16.99	15.30	13.99	12.96	70.29	106.69
60.0	22.04	19.64	17.82	17.07	16.39	15.79	14.74	13.88	13.14	70.41	110.77
70.0	18.74	17.48	16.43	15.97	15.54	15.15	14.44	13.82	13.27	70.56	114.00
80.0	17.14	16.35	15.66	15.35	15.06	14.78	14.26	13.79	13.37	70.74	116.61
90.0	16.24	15.70	15.20	14.98	14.76	14.55	14.15	13.79	13.46	70.93	118.77
100.0	15.68	15.28	14.91	14.74	14.57	14.41	14.10	13.81	13.53	71.15	120.60
110.0	15.32	15.01	14.72	14.59	14.45	14.32	14.07	13.83	13.61	71.39	122.19
120.0	15.08	14.84	14.60	14.49	14.38	14.27	14.06	13.87	13.68	71.66	123.60
130.0	14.92	14.72	14.53	14.43	14.34	14.25	14.08	13.91	13.75	71.95	124.89
140.0	14.81	14.65	14.48	14.40	14.33	14.25	14.10	13.96	13.82	72.26	126.09
150.0	14.75	14.60	14.47	14.40	14.33	14.27	14.14	14.02	13.90	72.60	127.23
160.0	14.71	14.59	14.47	14.41	14.36	14.30	14.19	14.08	13.97	72.96	128.33
170.0	14.70	14.59	14.49	14.44	14.39	14.34	14.24	14.15	14.05	73.34	129.40
180.0	14.71	14.62	14.52	14.48	14.44	14.39	14.31	14.22	14.14	73.75	130.47
190.0	14.73	14.65	14.57	14.53	14.49	14.45	14.38	14.30	14.23	74.18	131.53
200.0	14.77	14.70	14.63	14.59	14.56	14.52	14.45	14.39	14.32	74.64	132.60

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia						Naprezenie podstawowe			Strona	
	SII SIIa						75.0 [MPa]			39	
WIKROL	Typ przewodu						Naciąg podstawowy				
	SAX-W 50mm2 30kV						3.77 [kN]				
q= 50.3 [mm ²]		d= 15.0 [mm]		ap= 31.7 [m]		α=0.0000230 1/°K			β=0.0000160 1/MPa		
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.02	0.02	0.02	0.05	0.08	0.12	0.06	0.09
20.0	0.03	0.04	0.05	0.06	0.07	0.09	0.14	0.20	0.26	0.20	0.29
30.0	0.07	0.09	0.12	0.13	0.16	0.18	0.26	0.34	0.42	0.39	0.53
40.0	0.17	0.21	0.28	0.32	0.36	0.41	0.51	0.61	0.70	0.68	0.87
50.0	0.39	0.49	0.61	0.66	0.72	0.78	0.89	0.99	1.08	1.06	1.29
60.0	0.81	0.94	1.07	1.13	1.18	1.24	1.35	1.45	1.55	1.52	1.79
70.0	1.37	1.50	1.62	1.68	1.74	1.79	1.90	2.00	2.10	2.07	2.37
80.0	2.02	2.14	2.26	2.32	2.37	2.43	2.53	2.64	2.74	2.71	3.02
90.0	2.75	2.87	2.98	3.04	3.09	3.15	3.25	3.36	3.46	3.43	3.76
100.0	3.56	3.68	3.79	3.84	3.90	3.95	4.06	4.16	4.26	4.24	4.58
110.0	4.46	4.57	4.68	4.74	4.79	4.84	4.95	5.05	5.15	5.13	5.49
120.0	5.44	5.55	5.66	5.71	5.77	5.82	5.93	6.03	6.13	6.11	6.48
130.0	6.50	6.61	6.72	6.78	6.83	6.88	6.99	7.09	7.20	7.17	7.55
140.0	7.65	7.76	7.87	7.93	7.98	8.03	8.14	8.24	8.35	8.32	8.71
150.0	8.89	9.00	9.11	9.16	9.22	9.27	9.38	9.48	9.58	9.56	9.95
160.0	10.22	10.32	10.43	10.49	10.54	10.59	10.70	10.80	10.91	10.88	11.29
170.0	11.63	11.74	11.84	11.90	11.95	12.00	12.11	12.21	12.32	12.30	12.70
180.0	13.13	13.23	13.34	13.40	13.45	13.50	13.61	13.71	13.82	13.80	14.21
190.0	14.71	14.82	14.93	14.98	15.04	15.09	15.20	15.30	15.41	15.38	15.81
200.0	16.39	16.50	16.61	16.66	16.71	16.77	16.87	16.98	17.08	17.06	17.49
T A B L I C A N A P R E Z E N przy słupie [MPa]											
10.0	75.00	60.66	46.38	39.30	32.30	25.47	13.53	7.32	5.11	52.25	60.90
20.0	75.00	60.83	46.89	40.11	33.58	27.47	17.71	12.17	9.37	62.81	80.10
30.0	75.00	61.11	47.67	41.29	35.31	29.88	21.42	16.19	13.10	73.37	97.49
40.0	59.05	46.42	35.36	30.73	26.83	23.63	19.00	15.99	13.94	75.17	106.09
50.0	39.43	31.10	25.17	22.95	21.12	19.59	17.21	15.46	14.12	75.27	111.76
60.0	27.14	23.37	20.63	19.54	18.58	17.74	16.33	15.19	14.25	75.39	116.28
70.0	21.89	20.02	18.53	17.89	17.30	16.77	15.83	15.03	14.34	75.53	119.92
80.0	19.45	18.34	17.40	16.97	16.58	16.21	15.54	14.94	14.41	75.69	122.88
90.0	18.12	17.38	16.72	16.42	16.14	15.86	15.36	14.90	14.48	75.87	125.34
100.0	17.32	16.78	16.30	16.07	15.85	15.64	15.25	14.88	14.54	76.07	127.43
110.0	16.80	16.39	16.01	15.84	15.66	15.50	15.18	14.88	14.60	76.30	129.23
120.0	16.45	16.13	15.82	15.68	15.54	15.40	15.14	14.89	14.66	76.55	130.82
130.0	16.20	15.94	15.70	15.58	15.46	15.35	15.13	14.92	14.72	76.82	132.25
140.0	16.04	15.82	15.62	15.52	15.42	15.32	15.13	14.96	14.78	77.11	133.56
150.0	15.92	15.74	15.57	15.48	15.40	15.31	15.15	15.00	14.85	77.42	134.79
160.0	15.85	15.69	15.54	15.47	15.40	15.33	15.19	15.05	14.92	77.76	135.96
170.0	15.80	15.67	15.54	15.47	15.41	15.35	15.23	15.11	14.99	78.12	137.09
180.0	15.78	15.67	15.55	15.50	15.44	15.39	15.28	15.17	15.07	78.50	138.19
190.0	15.78	15.68	15.58	15.53	15.48	15.43	15.34	15.24	15.15	78.90	139.28
200.0	15.80	15.71	15.62	15.57	15.53	15.49	15.40	15.32	15.23	79.33	140.36

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia						Naprezenie podstawowe			Strona	
	SII SIIa						80.0 [MPa]			40	
WIKROL	Typ przewodu						Naciąg podstawowy				
	SAX-W 50mm2 30kV						4.02 [kN]				
q= 50.3 [mm ²]		d= 15.0 [mm]		ap= 33.8 [m]		α=0.0000230 1/°K			β=0.0000160 1/MPa		
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.02	0.02	0.04	0.07	0.11	0.06	0.09
20.0	0.03	0.04	0.05	0.05	0.06	0.08	0.12	0.18	0.24	0.19	0.28
30.0	0.07	0.08	0.10	0.12	0.14	0.16	0.23	0.31	0.39	0.37	0.52
40.0	0.14	0.17	0.22	0.26	0.30	0.34	0.44	0.54	0.63	0.63	0.83
50.0	0.31	0.39	0.49	0.55	0.61	0.67	0.78	0.89	0.99	0.99	1.23
60.0	0.65	0.78	0.91	0.97	1.04	1.10	1.21	1.32	1.43	1.43	1.71
70.0	1.15	1.29	1.42	1.49	1.55	1.61	1.73	1.84	1.94	1.94	2.26
80.0	1.76	1.90	2.02	2.09	2.15	2.21	2.32	2.43	2.54	2.54	2.88
90.0	2.45	2.58	2.70	2.76	2.82	2.88	3.00	3.11	3.21	3.21	3.58
100.0	3.21	3.34	3.46	3.52	3.58	3.64	3.75	3.86	3.97	3.97	4.35
110.0	4.05	4.18	4.30	4.36	4.41	4.47	4.58	4.70	4.80	4.81	5.20
120.0	4.97	5.09	5.21	5.27	5.33	5.39	5.50	5.61	5.72	5.72	6.13
130.0	5.97	6.09	6.21	6.27	6.33	6.38	6.50	6.61	6.72	6.72	7.14
140.0	7.05	7.17	7.29	7.34	7.40	7.46	7.57	7.68	7.79	7.80	8.23
150.0	8.21	8.33	8.45	8.50	8.56	8.62	8.73	8.84	8.95	8.95	9.40
160.0	9.45	9.57	9.68	9.74	9.80	9.86	9.97	10.08	10.19	10.19	10.64
170.0	10.77	10.89	11.01	11.06	11.12	11.18	11.29	11.40	11.51	11.52	11.97
180.0	12.18	12.29	12.41	12.47	12.52	12.58	12.69	12.80	12.92	12.92	13.38
190.0	13.66	13.78	13.89	13.95	14.01	14.06	14.18	14.29	14.40	14.41	14.88
200.0	15.23	15.35	15.46	15.52	15.57	15.63	15.75	15.86	15.97	15.98	16.45
T A B L I C A N A P R E Z E N przy słupie [MPa]											
10.0	80.00	65.65	51.34	44.23	37.17	30.21	17.23	8.79	5.67	56.39	64.36
20.0	80.00	65.79	51.74	44.85	38.13	31.70	20.66	13.70	10.16	66.17	82.88
30.0	80.00	66.01	52.37	45.80	39.52	33.67	24.03	17.74	14.03	76.34	100.00
40.0	69.05	55.76	43.44	37.89	32.94	28.67	22.26	18.12	15.40	80.16	110.57
50.0	49.72	39.17	30.91	27.70	25.04	22.85	19.52	17.16	15.43	80.25	116.63
60.0	34.02	28.28	24.19	22.60	21.23	20.06	18.14	16.65	15.45	80.36	121.55
70.0	25.97	23.18	21.03	20.14	19.34	18.62	17.39	16.35	15.48	80.49	125.56
80.0	22.26	20.68	19.38	18.81	18.29	17.80	16.93	16.17	15.51	80.64	128.88
90.0	20.31	19.30	18.42	18.02	17.65	17.29	16.65	16.07	15.54	80.81	131.65
100.0	19.16	18.45	17.81	17.51	17.23	16.96	16.46	16.00	15.58	81.01	134.00
110.0	18.42	17.89	17.40	17.17	16.95	16.74	16.34	15.97	15.62	81.22	136.03
120.0	17.92	17.51	17.13	16.94	16.77	16.59	16.27	15.96	15.67	81.45	137.82
130.0	17.58	17.25	16.93	16.78	16.64	16.50	16.22	15.96	15.71	81.70	139.42
140.0	17.33	17.06	16.80	16.68	16.55	16.43	16.20	15.98	15.77	81.98	140.87
150.0	17.16	16.93	16.71	16.61	16.50	16.40	16.20	16.01	15.82	82.27	142.21
160.0	17.04	16.84	16.66	16.56	16.47	16.39	16.21	16.05	15.88	82.58	143.47
170.0	16.96	16.79	16.62	16.54	16.47	16.39	16.24	16.09	15.95	82.92	144.67
180.0	16.90	16.76	16.61	16.54	16.47	16.41	16.27	16.14	16.02	83.28	145.82
190.0	16.88	16.75	16.62	16.56	16.50	16.44	16.32	16.20	16.09	83.65	146.95
200.0	16.87	16.75	16.64	16.59	16.53	16.48	16.37	16.27	16.17	84.05	148.05

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia						Napreżenie podstawowe			Strona	
	SII SIIa						60.0 [MPa]			41	
WIKROL	Typ przewodu						Naciąg podstawowy				
	SAX-W 70mm2 30kV						4.43 [kN]				
q= 73.9 [mm ²]		d= 16.6 [mm]		ap= 33.9 [m]		α=0.0000230 1/°K			β=0.0000160 1/MPa		
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.02	0.02	0.03	0.04	0.08	0.12	0.15	0.06	0.09
20.0	0.04	0.05	0.07	0.08	0.10	0.13	0.20	0.26	0.31	0.20	0.27
30.0	0.08	0.10	0.14	0.17	0.20	0.24	0.33	0.41	0.49	0.38	0.50
40.0	0.17	0.23	0.31	0.36	0.41	0.46	0.56	0.66	0.75	0.64	0.80
50.0	0.40	0.51	0.63	0.69	0.75	0.81	0.92	1.02	1.11	0.99	1.19
60.0	0.80	0.94	1.07	1.13	1.19	1.24	1.35	1.46	1.55	1.43	1.66
70.0	1.33	1.46	1.58	1.64	1.70	1.76	1.87	1.98	2.08	1.95	2.20
80.0	1.93	2.06	2.18	2.24	2.30	2.36	2.47	2.57	2.68	2.55	2.81
90.0	2.62	2.74	2.86	2.92	2.98	3.03	3.14	3.25	3.35	3.22	3.50
100.0	3.38	3.50	3.62	3.68	3.73	3.79	3.90	4.01	4.11	3.98	4.27
110.0	4.22	4.34	4.46	4.52	4.57	4.63	4.74	4.85	4.95	4.82	5.12
120.0	5.14	5.26	5.38	5.43	5.49	5.55	5.66	5.77	5.87	5.74	6.05
130.0	6.15	6.26	6.38	6.43	6.49	6.55	6.66	6.77	6.87	6.74	7.06
140.0	7.23	7.34	7.46	7.51	7.57	7.63	7.74	7.85	7.95	7.82	8.14
150.0	8.39	8.51	8.62	8.68	8.73	8.79	8.90	9.01	9.12	8.98	9.31
160.0	9.63	9.75	9.86	9.92	9.98	10.03	10.14	10.25	10.36	10.23	10.56
170.0	10.96	11.07	11.19	11.25	11.30	11.36	11.47	11.58	11.69	11.56	11.89
180.0	12.37	12.48	12.60	12.65	12.71	12.77	12.88	12.99	13.10	12.96	13.31
190.0	13.86	13.97	14.09	14.14	14.20	14.26	14.37	14.48	14.59	14.46	14.80
200.0	15.43	15.55	15.66	15.72	15.77	15.83	15.94	16.05	16.16	16.03	16.38
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	60.00	45.70	31.55	24.66	18.13	12.51	6.45	4.46	3.56	37.75	45.56
20.0	60.00	45.97	32.48	26.23	20.70	16.25	10.82	8.22	6.80	47.53	62.01
30.0	60.00	46.40	33.76	28.18	23.39	19.55	14.43	11.54	9.78	56.70	76.47
40.0	49.73	37.61	27.71	23.90	20.85	18.45	15.09	12.91	11.40	60.12	84.94
50.0	33.50	26.01	20.98	19.16	17.66	16.42	14.49	13.07	11.98	60.19	89.29
60.0	23.87	20.42	17.97	17.00	16.15	15.41	14.18	13.19	12.37	60.27	92.69
70.0	19.68	17.90	16.49	15.89	15.35	14.86	14.00	13.27	12.64	60.37	95.39
80.0	17.67	16.58	15.67	15.26	14.88	14.53	13.89	13.33	12.83	60.49	97.57
90.0	16.55	15.82	15.17	14.87	14.59	14.32	13.83	13.39	12.98	60.62	99.36
100.0	15.87	15.33	14.84	14.61	14.40	14.19	13.80	13.44	13.11	60.76	100.86
110.0	15.42	15.01	14.63	14.45	14.27	14.10	13.79	13.49	13.21	60.92	102.15
120.0	15.11	14.79	14.48	14.33	14.19	14.05	13.79	13.54	13.31	61.10	103.28
130.0	14.90	14.63	14.38	14.26	14.14	14.03	13.81	13.59	13.39	61.29	104.30
140.0	14.75	14.53	14.32	14.22	14.12	14.02	13.83	13.65	13.47	61.49	105.22
150.0	14.65	14.46	14.28	14.19	14.11	14.02	13.86	13.70	13.55	61.71	106.09
160.0	14.58	14.42	14.26	14.19	14.11	14.04	13.90	13.76	13.63	61.95	106.90
170.0	14.54	14.40	14.26	14.20	14.13	14.07	13.94	13.82	13.70	62.20	107.69
180.0	14.52	14.40	14.28	14.22	14.16	14.10	13.99	13.88	13.78	62.47	108.46
190.0	14.51	14.40	14.30	14.25	14.20	14.15	14.05	13.95	13.86	62.76	109.21
200.0	14.52	14.43	14.33	14.29	14.24	14.20	14.11	14.02	13.93	63.06	109.97

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia				Napreżenie podstawowe		Strona
	SII SIIa				70.0 [MPa]		42
WIKROL	Typ przewodu				Naciąg podstawowy		
	SAX-W 70mm ² 30kV				5.17 [kN]		
q= 73.9 [mm ²]	d= 16.6 [mm]	ap= 39.5 [m]	α=0.0000230 1/°K		β=0.0000160 1/MPa		

Rozp.	Temperatura [°C]									sn	sk
a [m]	-25	-15	-5	0	5	10	20	30	40	-5	-5

T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.02	0.02	0.03	0.05	0.09	0.13	0.05	0.08
20.0	0.03	0.04	0.05	0.06	0.07	0.09	0.15	0.22	0.28	0.18	0.25
30.0	0.07	0.09	0.11	0.13	0.16	0.19	0.27	0.36	0.44	0.34	0.47
40.0	0.12	0.15	0.20	0.23	0.27	0.31	0.41	0.52	0.62	0.55	0.72
50.0	0.24	0.31	0.41	0.46	0.52	0.58	0.70	0.82	0.93	0.85	1.08
60.0	0.48	0.60	0.74	0.81	0.88	0.95	1.07	1.19	1.31	1.23	1.49
70.0	0.87	1.02	1.17	1.25	1.32	1.38	1.51	1.64	1.75	1.67	1.96
80.0	1.38	1.54	1.68	1.76	1.83	1.89	2.02	2.15	2.27	2.18	2.50
90.0	1.97	2.12	2.27	2.34	2.41	2.47	2.60	2.73	2.85	2.76	3.10
100.0	2.63	2.77	2.92	2.99	3.05	3.12	3.25	3.38	3.50	3.41	3.77
110.0	3.35	3.49	3.63	3.70	3.77	3.84	3.97	4.09	4.22	4.13	4.51
120.0	4.14	4.28	4.42	4.49	4.56	4.62	4.75	4.88	5.00	4.92	5.31
130.0	5.00	5.14	5.28	5.35	5.41	5.48	5.61	5.73	5.86	5.77	6.17
140.0	5.93	6.07	6.20	6.27	6.34	6.40	6.53	6.66	6.78	6.70	7.11
150.0	6.92	7.06	7.20	7.26	7.33	7.40	7.52	7.65	7.78	7.69	8.11
160.0	7.99	8.13	8.26	8.33	8.39	8.46	8.59	8.72	8.84	8.76	9.18
170.0	9.12	9.26	9.39	9.46	9.52	9.59	9.72	9.85	9.98	9.89	10.32
180.0	10.33	10.46	10.60	10.66	10.73	10.79	10.92	11.05	11.18	11.09	11.53
190.0	11.60	11.73	11.87	11.93	12.00	12.07	12.20	12.32	12.45	12.37	12.81
200.0	12.94	13.08	13.21	13.28	13.34	13.41	13.54	13.67	13.80	13.71	14.16

T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	70.00	55.66	41.39	34.32	27.35	20.64	9.93	5.63	4.12	45.67	52.16
20.0	70.00	55.82	41.90	35.15	28.72	22.85	14.20	9.86	7.72	53.91	67.36
30.0	70.00	56.09	42.67	36.36	30.51	25.36	17.78	13.45	10.96	62.37	81.36
40.0	69.42	55.87	43.12	37.29	32.02	27.47	20.70	16.48	13.83	70.10	93.90
50.0	54.43	42.56	32.69	28.74	25.46	22.79	18.86	16.22	14.35	70.16	98.96
60.0	39.87	31.69	25.84	23.63	21.79	20.26	17.85	16.06	14.69	70.23	103.14
70.0	29.91	25.43	22.21	20.94	19.83	18.86	17.26	15.98	14.93	70.32	106.58
80.0	24.69	22.19	20.25	19.43	18.70	18.04	16.89	15.93	15.11	70.42	109.44
90.0	21.95	20.38	19.08	18.52	18.00	17.51	16.65	15.90	15.24	70.53	111.83
100.0	20.35	19.27	18.35	17.93	17.54	17.17	16.49	15.89	15.35	70.65	113.86
110.0	19.34	18.55	17.85	17.53	17.22	16.93	16.39	15.90	15.45	70.79	115.61
120.0	18.66	18.06	17.50	17.25	17.00	16.76	16.32	15.91	15.53	70.94	117.13
130.0	18.19	17.70	17.26	17.05	16.84	16.65	16.28	15.93	15.60	71.10	118.47
140.0	17.84	17.45	17.08	16.90	16.73	16.57	16.25	15.95	15.67	71.28	119.67
150.0	17.59	17.26	16.95	16.80	16.66	16.52	16.24	15.99	15.74	71.47	120.76
160.0	17.41	17.13	16.86	16.73	16.61	16.48	16.25	16.02	15.81	71.67	121.77
170.0	17.27	17.03	16.80	16.69	16.58	16.47	16.26	16.06	15.87	71.89	122.71
180.0	17.17	16.96	16.76	16.66	16.56	16.47	16.29	16.11	15.94	72.12	123.61
190.0	17.09	16.91	16.73	16.65	16.56	16.48	16.32	16.16	16.00	72.36	124.46
200.0	17.05	16.88	16.73	16.65	16.57	16.50	16.35	16.21	16.07	72.62	125.28

ENERGOLINIA w Poznaniu	Strefa obciążenia sędzia				Napężenie podstawowe		Strona
	SII SIIa				75.0 [MPa]		43
WIKROL	Typ przewodu				Naciąg podstawowy		
	SAX-W 70mm ² 30kV				5.54 [kN]		
q= 73.9 [mm ²]	d= 16.6 [mm]	ap= 42.4 [m]	$\alpha=0.0000230$ 1/°K		$\beta=0.0000160$ 1/MPa		

Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.02	0.02	0.04	0.08	0.12	0.05	0.08
20.0	0.03	0.03	0.05	0.05	0.06	0.08	0.13	0.19	0.26	0.17	0.24
30.0	0.06	0.08	0.10	0.12	0.14	0.17	0.24	0.33	0.41	0.33	0.46
40.0	0.11	0.14	0.18	0.20	0.23	0.27	0.37	0.47	0.58	0.52	0.70
50.0	0.21	0.26	0.33	0.38	0.43	0.49	0.61	0.73	0.84	0.80	1.03
60.0	0.38	0.48	0.61	0.68	0.74	0.81	0.95	1.08	1.20	1.15	1.42
70.0	0.69	0.84	0.99	1.07	1.15	1.22	1.36	1.49	1.61	1.56	1.87
80.0	1.14	1.31	1.47	1.54	1.62	1.69	1.83	1.96	2.09	2.04	2.38
90.0	1.68	1.85	2.01	2.08	2.16	2.23	2.37	2.51	2.63	2.58	2.95
100.0	2.29	2.46	2.61	2.69	2.76	2.83	2.97	3.11	3.24	3.18	3.58
110.0	2.97	3.13	3.28	3.36	3.43	3.50	3.64	3.78	3.91	3.85	4.27
120.0	3.71	3.87	4.02	4.09	4.16	4.24	4.38	4.51	4.64	4.59	5.02
130.0	4.52	4.67	4.82	4.89	4.96	5.03	5.17	5.31	5.44	5.39	5.83
140.0	5.38	5.53	5.68	5.75	5.82	5.90	6.03	6.17	6.30	6.25	6.70
150.0	6.31	6.46	6.61	6.68	6.75	6.82	6.96	7.10	7.23	7.18	7.64
160.0	7.31	7.45	7.60	7.67	7.74	7.81	7.95	8.09	8.22	8.17	8.64
170.0	8.36	8.51	8.66	8.73	8.80	8.87	9.01	9.14	9.28	9.22	9.71
180.0	9.49	9.63	9.78	9.85	9.92	9.99	10.13	10.27	10.40	10.35	10.84
190.0	10.67	10.82	10.96	11.03	11.10	11.18	11.31	11.45	11.59	11.53	12.04
200.0	11.93	12.07	12.21	12.29	12.36	12.43	12.57	12.70	12.84	12.79	13.30

	T A B L I C A N A P R E Ż E N przy słupie [MPa]										
10.0	75.00	60.64	46.34	39.23	32.19	25.28	12.96	6.60	4.52	49.93	55.78
20.0	75.00	60.78	46.73	39.86	33.19	26.89	16.68	11.03	8.33	57.41	70.26
30.0	75.00	60.99	47.34	40.80	34.60	28.93	20.04	14.71	11.71	65.46	83.96
40.0	75.00	61.27	48.12	41.95	36.22	31.08	23.07	17.94	14.77	73.28	96.63
50.0	64.52	51.70	40.19	35.20	30.87	27.22	21.78	18.19	15.75	75.15	103.52
60.0	49.96	39.59	31.49	28.33	25.70	23.51	20.17	17.79	16.02	75.22	108.00
70.0	37.61	30.97	26.20	24.34	22.77	21.41	19.23	17.54	16.21	75.30	111.77
80.0	29.88	26.08	23.25	22.09	21.07	20.17	18.64	17.39	16.35	75.39	114.95
90.0	25.65	23.35	21.52	20.74	20.03	19.39	18.25	17.29	16.46	75.49	117.64
100.0	23.24	21.72	20.44	19.88	19.35	18.87	17.99	17.22	16.54	75.61	119.94
110.0	21.75	20.67	19.72	19.29	18.89	18.51	17.81	17.19	16.62	75.74	121.93
120.0	20.77	19.95	19.22	18.88	18.56	18.25	17.69	17.17	16.69	75.88	123.66
130.0	20.09	19.44	18.86	18.59	18.32	18.07	17.60	17.16	16.75	76.03	125.19
140.0	19.60	19.08	18.60	18.37	18.15	17.94	17.54	17.17	16.81	76.19	126.56
150.0	19.23	18.80	18.40	18.21	18.03	17.85	17.50	17.18	16.87	76.37	127.79
160.0	18.96	18.60	18.26	18.09	17.94	17.78	17.48	17.20	16.93	76.56	128.92
170.0	18.76	18.45	18.15	18.01	17.87	17.74	17.48	17.23	16.99	76.76	129.97
180.0	18.60	18.33	18.08	17.95	17.83	17.71	17.48	17.26	17.05	76.97	130.95
190.0	18.48	18.25	18.02	17.91	17.81	17.70	17.50	17.30	17.11	77.20	131.88
200.0	18.39	18.19	17.99	17.89	17.80	17.70	17.52	17.34	17.17	77.44	132.76

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia						Napreżenie podstawowe			Strona	
	SII SIIa						80.0 [MPa]			44	
WIKROL	Typ przewodu						Naciąg podstawowy				
	SAX-W 70mm ² 30kV						5.91 [kN]				
q= 73.9 [mm ²]		d= 16.6 [mm]		ap= 45.2 [m]		α=0.0000230 1/°K			β=0.0000160 1/MPa		
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.07	0.11	0.04	0.07
20.0	0.03	0.03	0.04	0.05	0.06	0.07	0.11	0.17	0.23	0.16	0.23
30.0	0.06	0.07	0.09	0.11	0.12	0.15	0.21	0.29	0.38	0.31	0.44
40.0	0.11	0.13	0.16	0.18	0.21	0.24	0.33	0.44	0.54	0.50	0.69
50.0	0.18	0.22	0.28	0.31	0.36	0.41	0.52	0.65	0.77	0.75	0.99
60.0	0.32	0.40	0.50	0.56	0.63	0.69	0.83	0.97	1.09	1.07	1.36
70.0	0.56	0.69	0.83	0.91	0.99	1.06	1.21	1.35	1.48	1.46	1.79
80.0	0.93	1.10	1.26	1.35	1.43	1.50	1.65	1.80	1.93	1.91	2.27
90.0	1.42	1.60	1.77	1.85	1.93	2.01	2.16	2.30	2.44	2.42	2.81
100.0	1.99	2.17	2.33	2.42	2.50	2.57	2.72	2.87	3.01	2.98	3.41
110.0	2.62	2.80	2.96	3.04	3.12	3.20	3.35	3.49	3.63	3.61	4.06
120.0	3.32	3.49	3.65	3.73	3.81	3.89	4.04	4.18	4.32	4.30	4.77
130.0	4.07	4.24	4.40	4.48	4.56	4.63	4.78	4.93	5.07	5.05	5.53
140.0	4.89	5.05	5.21	5.29	5.36	5.44	5.59	5.74	5.88	5.86	6.36
150.0	5.76	5.92	6.08	6.16	6.23	6.31	6.46	6.60	6.75	6.72	7.24
160.0	6.69	6.85	7.01	7.08	7.16	7.24	7.38	7.53	7.68	7.65	8.18
170.0	7.68	7.84	8.00	8.07	8.15	8.22	8.37	8.52	8.66	8.64	9.18
180.0	8.73	8.89	9.05	9.12	9.20	9.27	9.42	9.57	9.72	9.69	10.24
190.0	9.85	10.00	10.16	10.23	10.31	10.39	10.53	10.68	10.83	10.81	11.36
200.0	11.02	11.18	11.33	11.41	11.48	11.56	11.71	11.85	12.00	11.98	12.54
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	80.00	65.63	51.31	44.18	37.08	30.07	16.83	8.05	5.03	54.35	59.59
20.0	80.00	65.74	51.62	44.66	37.84	31.26	19.77	12.54	9.08	61.10	73.31
30.0	80.00	65.91	52.10	45.40	38.95	32.88	22.76	16.25	12.59	68.70	86.67
40.0	80.00	66.15	52.74	46.34	40.28	34.70	25.58	19.50	15.74	76.26	99.17
50.0	73.95	60.60	48.09	42.36	37.14	32.54	25.36	20.55	17.37	80.14	107.93
60.0	60.19	48.36	38.29	34.11	30.53	27.53	22.96	19.79	17.51	80.20	112.68
70.0	46.81	37.93	31.21	28.58	26.36	24.49	21.52	19.31	17.61	80.28	116.74
80.0	36.61	31.04	26.94	25.31	23.89	22.66	20.62	19.00	17.68	80.36	120.21
90.0	30.38	27.02	24.42	23.34	22.38	21.51	20.03	18.79	17.75	80.46	123.19
100.0	26.79	24.62	22.86	22.09	21.40	20.76	19.62	18.65	17.80	80.57	125.75
110.0	24.61	23.10	21.83	21.26	20.73	20.23	19.34	18.55	17.85	80.69	127.98
120.0	23.19	22.08	21.11	20.67	20.26	19.86	19.14	18.49	17.90	80.82	129.94
130.0	22.23	21.37	20.60	20.25	19.91	19.59	19.00	18.45	17.95	80.96	131.67
140.0	21.53	20.85	20.23	19.94	19.66	19.39	18.89	18.42	17.99	81.12	133.21
150.0	21.02	20.47	19.95	19.71	19.47	19.25	18.82	18.41	18.04	81.28	134.60
160.0	20.64	20.17	19.74	19.53	19.33	19.14	18.77	18.42	18.08	81.46	135.87
170.0	20.35	19.95	19.58	19.40	19.23	19.06	18.73	18.43	18.13	81.65	137.04
180.0	20.12	19.78	19.46	19.30	19.15	19.00	18.72	18.44	18.18	81.85	138.12
190.0	19.95	19.65	19.37	19.23	19.10	18.97	18.71	18.47	18.24	82.06	139.14
200.0	19.81	19.55	19.30	19.18	19.06	18.94	18.72	18.50	18.29	82.29	140.10

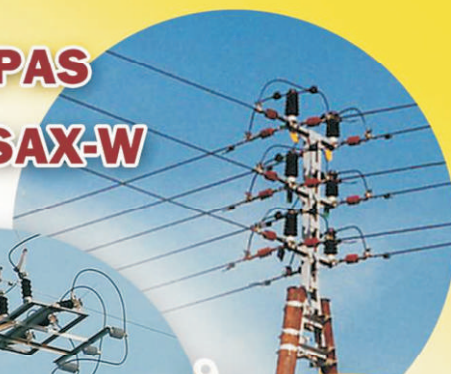
ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia						Napreżenie podstawowe			Strona	
	SII SIIa						60.0 [MPa]			45	
WIKROL	Typ przewodu						Naciąg podstawowy				
	SAX-W 120mm2 30kV						7.72 [kN]				
q=128.7 [mm ²]		d= 19.8 [mm]		ap= 49.5 [m]		α=0.0000230 1/°K			β=0.0000160 1/MPa		
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.02	0.03	0.04	0.08	0.12	0.15	0.05	0.07
20.0	0.03	0.04	0.06	0.07	0.09	0.12	0.19	0.25	0.31	0.16	0.22
30.0	0.07	0.09	0.13	0.15	0.19	0.23	0.32	0.41	0.48	0.31	0.41
40.0	0.12	0.16	0.22	0.26	0.30	0.35	0.46	0.57	0.67	0.49	0.64
50.0	0.20	0.25	0.33	0.38	0.44	0.50	0.63	0.75	0.87	0.69	0.89
60.0	0.35	0.45	0.57	0.64	0.72	0.79	0.93	1.06	1.18	1.00	1.23
70.0	0.60	0.74	0.90	0.98	1.06	1.14	1.29	1.42	1.55	1.36	1.62
80.0	0.96	1.13	1.31	1.39	1.47	1.55	1.70	1.84	1.97	1.77	2.06
90.0	1.41	1.60	1.77	1.86	1.94	2.02	2.17	2.31	2.45	2.24	2.55
100.0	1.94	2.12	2.30	2.38	2.46	2.54	2.69	2.84	2.98	2.77	3.10
110.0	2.52	2.70	2.88	2.96	3.04	3.12	3.27	3.42	3.57	3.35	3.70
120.0	3.17	3.34	3.51	3.60	3.68	3.76	3.91	4.06	4.21	3.99	4.35
130.0	3.86	4.04	4.21	4.29	4.37	4.45	4.60	4.76	4.90	4.68	5.06
140.0	4.62	4.79	4.95	5.04	5.12	5.20	5.35	5.50	5.65	5.43	5.82
150.0	5.42	5.59	5.76	5.84	5.92	6.00	6.16	6.31	6.46	6.24	6.63
160.0	6.29	6.46	6.62	6.70	6.78	6.86	7.02	7.17	7.32	7.10	7.50
170.0	7.20	7.37	7.54	7.62	7.70	7.78	7.94	8.09	8.24	8.02	8.43
180.0	8.18	8.35	8.51	8.59	8.67	8.75	8.91	9.06	9.22	8.99	9.41
190.0	9.21	9.38	9.54	9.62	9.70	9.78	9.94	10.09	10.25	10.02	10.44
200.0	10.30	10.46	10.63	10.71	10.79	10.87	11.02	11.18	11.33	11.11	11.54
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	60.00	45.68	31.48	24.52	17.87	12.04	5.84	3.96	3.15	34.89	39.72
20.0	60.00	45.89	32.21	25.80	20.04	15.38	9.85	7.36	6.04	41.50	51.41
30.0	60.00	46.23	33.26	27.45	22.43	18.40	13.19	10.38	8.73	48.17	62.11
40.0	60.00	46.66	34.49	29.22	24.73	21.10	16.11	13.12	11.23	54.46	71.87
50.0	59.51	46.71	35.41	30.64	26.61	23.32	18.58	15.54	13.50	60.09	80.66
60.0	48.50	37.73	29.35	26.14	23.50	21.35	18.13	15.89	14.25	60.13	83.99
70.0	38.44	30.79	25.36	23.30	21.58	20.13	17.84	16.13	14.80	60.18	86.79
80.0	31.21	26.39	22.93	21.56	20.38	19.36	17.66	16.31	15.21	60.24	89.15
90.0	26.79	23.74	21.42	20.46	19.60	18.84	17.53	16.45	15.53	60.30	91.14
100.0	24.15	22.09	20.43	19.72	19.08	18.49	17.45	16.56	15.79	60.37	92.84
110.0	22.48	21.00	19.76	19.21	18.71	18.24	17.39	16.65	15.99	60.44	94.29
120.0	21.36	20.25	19.28	18.85	18.44	18.06	17.35	16.73	16.16	60.53	95.56
130.0	20.58	19.71	18.94	18.58	18.24	17.92	17.33	16.79	16.30	60.62	96.66
140.0	20.02	19.31	18.68	18.38	18.10	17.83	17.32	16.86	16.43	60.72	97.65
150.0	19.60	19.02	18.48	18.23	17.99	17.76	17.32	16.92	16.54	60.83	98.52
160.0	19.28	18.79	18.33	18.12	17.91	17.71	17.33	16.97	16.64	60.94	99.32
170.0	19.03	18.62	18.22	18.04	17.85	17.68	17.34	17.03	16.73	61.06	100.05
180.0	18.84	18.48	18.14	17.97	17.81	17.66	17.36	17.08	16.81	61.19	100.72
190.0	18.69	18.38	18.08	17.93	17.79	17.65	17.39	17.13	16.89	61.33	101.35
200.0	18.58	18.30	18.03	17.90	17.78	17.65	17.41	17.18	16.96	61.47	101.95

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia						Napreżenie podstawowe			Strona	
	SII SIIa						70.0 [MPa]			46	
WIKROL	Typ przewodu						Naciąg podstawowy				
	SAX-W 120mm ² 30kV						9.01 [kN]				
q=128.7 [mm ²]		d= 19.8 [mm]		ap= 57.7 [m]		α=0.0000230 1/°K			β=0.0000160 1/MPa		
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.02	0.02	0.05	0.09	0.13	0.04	0.06
20.0	0.03	0.03	0.04	0.05	0.07	0.08	0.14	0.21	0.27	0.14	0.20
30.0	0.06	0.08	0.10	0.12	0.14	0.17	0.25	0.34	0.43	0.27	0.38
40.0	0.11	0.13	0.17	0.20	0.24	0.28	0.38	0.49	0.60	0.44	0.59
50.0	0.17	0.21	0.26	0.30	0.35	0.41	0.53	0.66	0.78	0.63	0.83
60.0	0.25	0.31	0.39	0.44	0.50	0.57	0.71	0.85	0.99	0.85	1.11
70.0	0.39	0.49	0.62	0.69	0.77	0.85	1.01	1.16	1.31	1.16	1.46
80.0	0.61	0.76	0.92	1.01	1.10	1.19	1.36	1.52	1.67	1.52	1.85
90.0	0.93	1.11	1.30	1.40	1.49	1.58	1.75	1.92	2.08	1.92	2.28
100.0	1.34	1.54	1.74	1.84	1.93	2.02	2.20	2.37	2.53	2.37	2.76
110.0	1.82	2.03	2.23	2.33	2.43	2.52	2.70	2.87	3.03	2.87	3.29
120.0	2.36	2.57	2.77	2.87	2.97	3.06	3.24	3.42	3.58	3.42	3.86
130.0	2.96	3.17	3.37	3.46	3.56	3.65	3.83	4.01	4.18	4.01	4.47
140.0	3.60	3.81	4.01	4.10	4.20	4.29	4.47	4.65	4.82	4.65	5.13
150.0	4.29	4.50	4.70	4.79	4.89	4.98	5.16	5.34	5.51	5.34	5.83
160.0	5.03	5.24	5.43	5.53	5.62	5.72	5.90	6.08	6.25	6.08	6.59
170.0	5.82	6.02	6.22	6.31	6.41	6.50	6.68	6.86	7.04	6.86	7.38
180.0	6.66	6.85	7.05	7.14	7.24	7.33	7.52	7.70	7.87	7.70	8.23
190.0	7.54	7.74	7.93	8.03	8.12	8.21	8.40	8.58	8.75	8.58	9.12
200.0	8.47	8.67	8.86	8.95	9.05	9.14	9.33	9.51	9.68	9.51	10.06
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	70.00	55.64	41.35	34.25	27.24	20.43	9.34	5.05	3.66	43.56	47.23
20.0	70.00	55.77	41.75	34.91	28.34	22.27	13.25	8.91	6.89	48.68	57.42
30.0	70.00	55.98	42.37	35.89	29.83	24.44	16.55	12.21	9.82	54.50	67.48
40.0	70.00	56.26	43.15	37.07	31.50	26.64	19.45	15.13	12.52	60.30	76.92
50.0	70.01	56.59	44.05	38.35	33.22	28.77	22.08	17.79	15.03	65.91	85.78
60.0	67.94	55.03	43.30	38.13	33.56	29.64	23.70	19.72	17.01	70.11	93.11
70.0	58.20	46.71	37.10	33.17	29.82	27.02	22.74	19.73	17.55	70.15	96.39
80.0	48.71	39.46	32.37	29.58	27.22	25.22	22.08	19.75	17.96	70.20	99.25
90.0	40.76	34.05	29.10	27.14	25.46	24.00	21.62	19.76	18.28	70.25	101.75
100.0	34.99	30.38	26.90	25.49	24.25	23.15	21.29	19.78	18.54	70.31	103.93
110.0	31.14	27.92	25.40	24.34	23.39	22.53	21.05	19.80	18.74	70.38	105.84
120.0	28.57	26.24	24.34	23.52	22.77	22.09	20.87	19.82	18.91	70.45	107.52
130.0	26.82	25.06	23.58	22.92	22.32	21.75	20.74	19.85	19.06	70.53	109.01
140.0	25.57	24.19	23.01	22.47	21.97	21.50	20.64	19.87	19.18	70.62	110.34
150.0	24.65	23.55	22.57	22.12	21.70	21.30	20.56	19.90	19.29	70.71	111.53
160.0	23.96	23.05	22.23	21.85	21.49	21.15	20.51	19.92	19.38	70.81	112.61
170.0	23.43	22.66	21.97	21.64	21.33	21.03	20.47	19.95	19.47	70.91	113.59
180.0	23.01	22.36	21.76	21.48	21.20	20.94	20.45	19.98	19.55	71.02	114.48
190.0	22.68	22.12	21.59	21.34	21.10	20.87	20.43	20.02	19.63	71.14	115.31
200.0	22.41	21.92	21.46	21.24	21.03	20.82	20.43	20.05	19.70	71.26	116.08

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia						Napreżenie podstawowe			Strona	
	SII SIIa						75.0 [MPa]			47	
WIKROL	Typ przewodu						Naciąg podstawowy				
	SAX-W 120mm ² 30kV						9.65 [kN]				
q=128.7 [mm ²]		d= 19.8 [mm]		ap= 61.9 [m]		α=0.0000230 1/°K			β=0.0000160 1/MPa		
Rozp.	Temperatura [°C]									sn	sk
a [m]	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.01	0.02	0.04	0.08	0.12	0.03	0.06
20.0	0.02	0.03	0.04	0.05	0.06	0.07	0.12	0.19	0.25	0.13	0.19
30.0	0.06	0.07	0.09	0.10	0.12	0.15	0.22	0.31	0.40	0.26	0.37
40.0	0.10	0.12	0.16	0.18	0.21	0.25	0.35	0.46	0.56	0.42	0.57
50.0	0.16	0.19	0.24	0.27	0.32	0.37	0.48	0.61	0.73	0.60	0.81
60.0	0.22	0.27	0.34	0.39	0.44	0.50	0.63	0.78	0.92	0.81	1.07
70.0	0.34	0.41	0.52	0.58	0.65	0.73	0.89	1.05	1.20	1.08	1.39
80.0	0.51	0.63	0.78	0.86	0.94	1.03	1.21	1.38	1.54	1.42	1.76
90.0	0.76	0.92	1.11	1.20	1.30	1.39	1.57	1.75	1.92	1.79	2.18
100.0	1.10	1.30	1.50	1.60	1.70	1.80	1.99	2.17	2.34	2.21	2.63
110.0	1.52	1.74	1.95	2.06	2.16	2.26	2.45	2.63	2.81	2.68	3.13
120.0	2.01	2.24	2.46	2.56	2.66	2.76	2.96	3.14	3.32	3.19	3.66
130.0	2.56	2.79	3.01	3.11	3.21	3.31	3.51	3.70	3.88	3.74	4.24
140.0	3.16	3.39	3.60	3.71	3.81	3.91	4.11	4.29	4.48	4.34	4.86
150.0	3.81	4.03	4.24	4.35	4.45	4.55	4.75	4.94	5.12	4.98	5.52
160.0	4.50	4.72	4.93	5.03	5.14	5.24	5.43	5.62	5.81	5.67	6.23
170.0	5.23	5.45	5.66	5.77	5.87	5.97	6.16	6.36	6.54	6.41	6.98
180.0	6.01	6.23	6.44	6.54	6.64	6.74	6.94	7.13	7.32	7.18	7.77
190.0	6.84	7.05	7.26	7.36	7.46	7.56	7.76	7.95	8.14	8.00	8.60
200.0	7.70	7.92	8.13	8.23	8.33	8.43	8.63	8.82	9.01	8.87	9.48
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	75.00	60.63	46.31	39.18	32.11	25.14	12.51	5.98	4.02	48.13	51.30
20.0	75.00	60.74	46.62	39.68	32.90	26.45	15.81	10.04	7.45	52.60	60.72
30.0	75.00	60.90	47.10	40.43	34.06	28.17	18.87	13.44	10.52	57.96	70.38
40.0	75.00	61.13	47.73	41.38	35.42	30.04	21.64	16.43	13.32	63.48	79.62
50.0	75.01	61.40	48.47	42.45	36.89	31.93	24.19	19.13	15.91	68.89	88.35
60.0	75.01	61.72	49.28	43.59	38.39	33.79	26.54	21.62	18.32	74.13	96.62
70.0	67.73	55.28	44.19	39.37	35.13	31.48	25.84	21.92	19.15	75.14	100.93
80.0	58.44	47.53	38.53	34.84	31.68	29.00	24.81	21.78	19.52	75.19	103.99
90.0	49.70	40.96	34.21	31.52	29.21	27.24	24.07	21.67	19.81	75.24	106.70
100.0	42.48	36.01	31.13	29.18	27.48	25.99	23.54	21.60	20.04	75.29	109.10
110.0	37.15	32.53	28.99	27.53	26.24	25.10	23.15	21.55	20.23	75.36	111.22
120.0	33.45	30.11	27.47	26.36	25.35	24.44	22.85	21.52	20.39	75.42	113.10
130.0	30.88	28.40	26.37	25.49	24.68	23.94	22.63	21.50	20.52	75.50	114.79
140.0	29.07	27.16	25.55	24.84	24.18	23.57	22.46	21.49	20.63	75.58	116.29
150.0	27.75	26.24	24.93	24.34	23.79	23.27	22.33	21.49	20.73	75.66	117.65
160.0	26.76	25.53	24.45	23.95	23.48	23.04	22.23	21.49	20.82	75.75	118.88
170.0	26.01	24.98	24.07	23.65	23.24	22.86	22.15	21.50	20.90	75.85	120.00
180.0	25.41	24.55	23.77	23.40	23.05	22.72	22.09	21.51	20.97	75.95	121.02
190.0	24.94	24.20	23.52	23.20	22.90	22.60	22.05	21.53	21.04	76.06	121.96
200.0	24.57	23.92	23.33	23.05	22.77	22.51	22.01	21.55	21.11	76.18	122.83

ENERGOLINIA w Poznaniu	Strefa obciążenia sadzia						Napreżenie podstawowe			Strona	
	SII SIIa						80.0 [MPa]			48	
	Typ przewodu						Naciąg podstawowy				
WIKROL	SAX-W 120mm ² 30kV						10.30 [kN]				
q=128.7 [mm ²]		d= 19.8 [mm]		ap= 66.0 [m]		α=0.0000230 1/°K			β=0.0000160 1/MPa		
Rozp. a [m]	Temperatura [°C]									sn	sk
	-25	-15	-5	0	5	10	20	30	40	-5	-5
T A B L I C A Z W I S O W [m]											
10.0	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.06	0.10	0.03	0.05
20.0	0.02	0.03	0.04	0.04	0.05	0.06	0.10	0.16	0.23	0.12	0.18
30.0	0.05	0.06	0.08	0.09	0.11	0.13	0.19	0.28	0.37	0.24	0.35
40.0	0.09	0.11	0.14	0.16	0.19	0.22	0.31	0.42	0.52	0.40	0.55
50.0	0.15	0.18	0.22	0.25	0.29	0.33	0.44	0.56	0.69	0.58	0.79
60.0	0.21	0.25	0.31	0.35	0.40	0.45	0.58	0.73	0.87	0.78	1.04
70.0	0.30	0.36	0.44	0.50	0.56	0.63	0.78	0.94	1.09	1.02	1.33
80.0	0.44	0.53	0.66	0.73	0.81	0.89	1.07	1.24	1.41	1.33	1.69
90.0	0.64	0.78	0.94	1.03	1.12	1.22	1.41	1.59	1.77	1.68	2.08
100.0	0.91	1.09	1.29	1.39	1.50	1.60	1.79	1.98	2.16	2.08	2.51
110.0	1.27	1.48	1.70	1.81	1.92	2.02	2.22	2.42	2.60	2.51	2.99
120.0	1.71	1.94	2.16	2.28	2.38	2.49	2.70	2.89	3.08	2.99	3.49
130.0	2.21	2.45	2.68	2.79	2.90	3.00	3.21	3.41	3.60	3.51	4.04
140.0	2.76	3.00	3.23	3.34	3.45	3.56	3.77	3.97	4.16	4.07	4.63
150.0	3.36	3.60	3.83	3.94	4.05	4.16	4.37	4.57	4.77	4.67	5.25
160.0	4.01	4.25	4.47	4.59	4.70	4.80	5.01	5.22	5.41	5.32	5.92
170.0	4.70	4.93	5.16	5.27	5.38	5.49	5.70	5.90	6.10	6.00	6.62
180.0	5.43	5.66	5.89	6.00	6.11	6.21	6.42	6.63	6.83	6.73	7.37
190.0	6.20	6.43	6.66	6.77	6.88	6.98	7.19	7.40	7.60	7.50	8.16
200.0	7.01	7.24	7.47	7.58	7.69	7.79	8.00	8.21	8.41	8.31	8.98
T A B L I C A N A P R E Ż E N przy słupie [MPa]											
10.0	80.00	65.63	51.28	44.14	37.02	29.97	16.52	7.42	4.49	52.80	55.55
20.0	80.00	65.71	51.52	44.52	37.62	30.92	19.03	11.55	8.16	56.70	64.19
30.0	80.00	65.84	51.91	45.11	38.51	32.26	21.69	14.97	11.36	61.61	73.44
40.0	80.00	66.03	52.42	45.87	39.62	33.81	24.24	17.98	14.26	66.82	82.43
50.0	80.01	66.26	53.02	46.75	40.85	35.45	26.64	20.70	16.92	72.02	91.01
60.0	80.01	66.52	53.71	47.72	42.15	37.10	28.90	23.20	19.38	77.11	99.19
70.0	76.71	63.68	51.59	46.09	41.07	36.62	29.47	24.44	20.94	80.13	105.34
80.0	67.98	55.97	45.43	40.89	36.89	33.43	27.98	24.08	21.24	80.18	108.57
90.0	59.18	48.77	40.22	36.70	33.65	31.04	26.89	23.81	21.48	80.22	111.47
100.0	51.10	42.72	36.19	33.56	31.28	29.30	26.09	23.61	21.66	80.28	114.06
110.0	44.44	38.11	33.26	31.28	29.55	28.03	25.49	23.47	21.82	80.33	116.37
120.0	39.43	34.76	31.14	29.63	28.29	27.09	25.04	23.35	21.95	80.40	118.45
130.0	35.83	32.36	29.59	28.41	27.35	26.38	24.70	23.27	22.05	80.47	120.32
140.0	33.25	30.61	28.44	27.50	26.64	25.84	24.43	23.21	22.15	80.54	122.00
150.0	31.38	29.31	27.57	26.80	26.08	25.42	24.22	23.16	22.23	80.62	123.52
160.0	29.99	28.33	26.90	26.25	25.65	25.08	24.05	23.13	22.31	80.71	124.90
170.0	28.93	27.56	26.37	25.82	25.31	24.82	23.92	23.11	22.38	80.80	126.17
180.0	28.10	26.96	25.94	25.47	25.03	24.61	23.82	23.10	22.44	80.89	127.32
190.0	27.45	26.48	25.60	25.20	24.81	24.43	23.74	23.09	22.50	81.00	128.39
200.0	26.92	26.09	25.33	24.97	24.62	24.29	23.67	23.10	22.56	81.10	129.37

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