1 METALNA FLEKSIBILNA CRIJEVA (METAL FLEXIBLE HOSES)

1.1 Valovita metalna fleksibilna crijeva (Corrugated hoses)

Zbog svoje valovite strukture, metalna crijeva su fleksibilna i otporna na tlak.
Crijeva su nepropusna, otporna na temperaturu i koroziju, kao i na uvijanje i koriste se u sljedećim primjenama:

- za prijenos tekućina i plinova pod tlakom,
- Kao vakuumska cijev i
- Kao ekonomična, fleksibilna veza za apsorpciju gibanja, širenja topline i vibracija.

Kada su ispravno konfigurirana, HYDRA metalna crijeva su robusne komponente koje gotovo ne zahtijevaju održavanje s visokim stupnjem sigurnosti u radu i dugim vijekom trajanja.

Through their corrugated structure, metal hoses are flexible and pressure resistant.
They are leakproof, temperature and corrosion resistant as well as torsionally rigid and are used in the following applications:

- For transport of liquids and gases under pressure,
- As vacuum pipe and
- As economic, flexible connection for absorbing movements, heat expansion and vibrations

When configured correctly, HYDRA metal hoses are robust and nearly maintenancefree components with a high degree of operational safety and a long service life.

Slika 1. *Valovita metalna fleksibilna crijeva*
Corrugated hoses

- Debljina stijenke: standard
- Valovitost: standard

Izvedbe:

- RS 330 / RS 331 S00 bez opleta
- RS 330 / RS 331 S12 sa jednim opletom

Standardna vrsta materijala:

- Valovite cijevi 1.4404 ili 1.4541
- Oplet 1.4301
- Ostale vrste materijala dostupne su na upit.

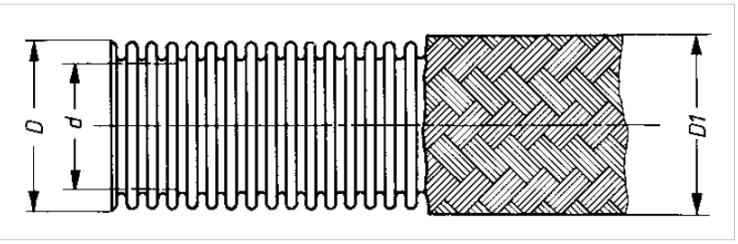
- Wall thickness: standard
- Corrugation: standard

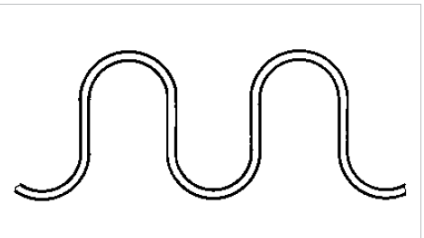
Versions:

- RS 330 / RS 331 S00 without braid
- RS 330 / RS 331 S12 with single braid

Standard materials:

- Annularly corrugated hose 1.4404 or 1.4541, braid 1.4301
- Other materials are available on request





DN	Type	Inside diameter	Outside diameter	Permissible deviation	Minimum bending radius Single bend	Nominal bending radius Frequent movements	Permissible static operating pressure at 20 °C SF4	Nominal pressure ISO 10380 SF4	Weight approx.
-	-	d	D,D1	d,D,D1	r_{min}	r_n	p_{perm}	PN	-
-	-	mm	mm	mm	mm	mm	bar	-	kg/m
4	RS331S00	4,3	7,1	±0,1	15	80	40		0,06
	RS331S12		8,2		25		100		0,11
6	RS331S00	6,2	9,7	±0,2	15	80	28		0,08
	RS331S12		10,8		25		150		0,14
8	RS331S00	8,3	12,3		16	120	20		0,1
	RS331S12		13,7		32		125		0,21
10	RS331S00	10,2	14,3		18	130	16		0,11
	RS331S12		15,7		38		100		0,23
12	RS331S00	12,2	16,8		20	140	10		0,12
	RS331S12		18,2		45		75		0,25
16	RS331S00	16,2	21,7		28	160	8		0,19
	RS331S12		23,3		58		65		0,4
20	RS331S00	20,2	26,7	±0,3	32	170	5		0,27
	RS331S12		28,3		70		40		0,49
25	RS331S00	25,5	32,2		40	190	4		0,38
	RS331S12		34,2		85		65		0,79
32	RS331S00	34,2	41		50	260	2,5		0,49
	RS331S12		43		105		25		0,96
40	RS331S00	40,1	49,7		60	300	2,5		0,77
	RS331S12		52		130		40		1,46
50	RS331S00	50,4	60,3	±0,4	70	320	1		0,91
	RS331S12		62,3		160		30		1,67
65	RS331S00	65,3	78		115	460	1	1	1,51
	RS331S12		81,2		200		35	25	2,88
80	RS331S00	80,2	94,8	±0,5	130	660	2	2	2,28
	RS331S12		98		240		32	16	4,08
100	RS331S00	100	116,2		160	750	1	1	2,53
	RS331S12		119,4		290		16	10	4,54
125	RS330S00	126,2	145	±0,6	350	1000	0,5	0,5	2,68
	RS330S12		148,2				10	6	5,25
150	RS330S00	151,6	171	±1,4	400	1250	0,5	0,5	3,41
	RS330S12		174,2				10	6	6,48

- Debljina stijenke: standard
- Valovitost: usko

Izvedbe:

- RS 321 S00 bez opleta
- RS 321 S12 sa jednim opletom

Standardna vrsta materijala:

- Valovite cijevi 1.4404 ili 1.4541
- Oplet 1.4301
- Ostale vrste materijala dostupne su na upit.

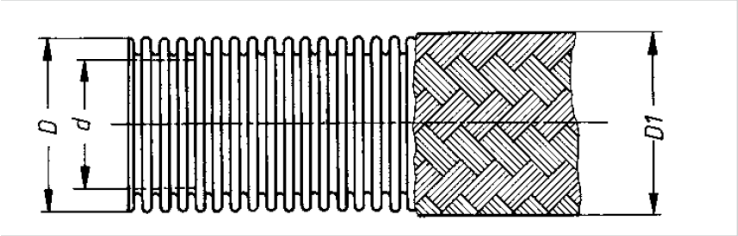
- Wall thickness: standard
- Corrugation: narrow

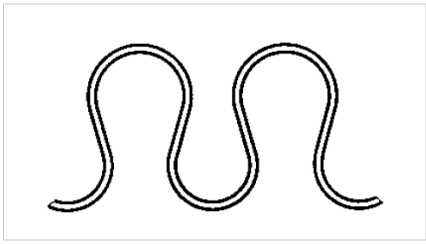
Versions:

- RS 321 S00 without braid
- RS 321 S12 with single braid

Standard materials:

- Annularly corrugated hose 1.4404 or 1.4541
- braid 1.4301
- Other materials are available on request.





DN	Type	Inside diameter	Outside diameter	Permissible deviation	Minimum bending radius Single bend	Nominal bending radius Frequent movements	Permissible static operating pressure at 20 °C SF4	Nominal pressure ISO 10380 SF4	Weight approx.
-	-	**d**	**D,D1**	**d,D,D1**	**r_{min}**	**r_n**	**p_{perm}**	**PN**	-
-	-	*mm*	*mm*	*mm*	*mm*	*mm*	*bar*	-	*kg/m*
6	RS321S00	6,1	9,9	± 0,2	20	70	25		0,1
	RS321S12		11		25		100		0,17
8	RS321S00	8,2	12,5		25	80	16		0,14
	RS321S12		13,9		30		100		0,25
10	RS321S00	10,1	14,4		30	90	10		0,14
	RS321S12		15,8		35		80		0,26
12	RS321S00	12,1	17		35	100	8		0,17
	RS321S12		18,4		40		50		0,3
16	RS321S00	16,2	22		40	110	6		0,26
	RS321S12		23,6		50		50		0,46
20	RS321S00	20,2	26,8	± 0,3	50	130	4		0,31
	RS321S12		28,4		55		40		0,53
25	RS321S00	25,5	32,2		60	150	4		0,49
	RS321S12		34,2		65		40		0,9
32	RS321S00	34,2	41		70	200	2,5		0,5
	RS321S12		43		75		20		0,97
40	RS321S00	40	49,8	± 0,4	80	210	1	1	1,13
	RS321S12		52,1		90		30	20	1,81
50	RS321S00	50,1	60,5	± 0,5	100	240	1	1	1,34
	RS321S12		62,8		110		25	16	2,1
65	RS321S00	65	78,2		145	280	1	1	1,96
	RS321S12		81,4		200		20	16	3,33
80	RS321S00	80	95		200	400	1	1	3,12
	RS321S12		98,2		240		16	10	4,92
100	RS321S00	99,4	116,8	± 0,6	240	500	1	1	3,7
	RS321S12		120		290		16	4	5,71

- Debljina stijenke: standard
- Valovitost: široka

Izvedbe:

- RS 341 S00 bez opleta
- RS 341 S12 sa jednim opletom

Standardna vrsta materijala:

- Valovite cijevi 1.4404 ili 1.4541
- Oplet 1.4301
- Ostale vrste materijala dostupne su na upit.

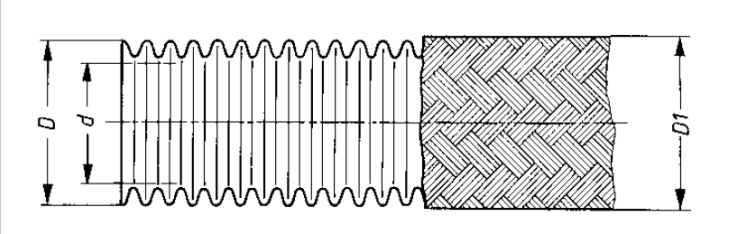
- Wall thickness: standard
- Corrugation: wide

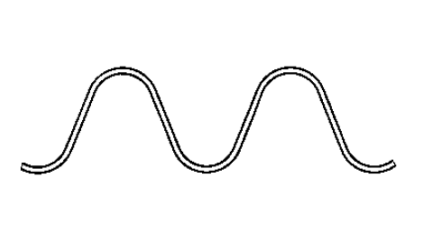
Versions:

- RS 341 S00 without braid
- RS 341 S12 with single braid

Standard materials:

- Annularly corrugated hose 1.4404 or 1.4541
- braid 1.4301
- Other materials are available on request





DN	Type	Inside diameter	Outside diameter	Permissible deviation	Minimum bending radius Single bend	Nominal bending radius Frequent movements	Permissible static operating pressure at 20 °C SF4	Nominal pressure ISO 10380 SF4	Weight approx.
-	-	**d**	**D,D1**	**d,D,D1**	**r_{min}**	**r_n**	**p_{perm}**	**PN**	-
-	-	*mm*	*mm*	*mm*	*mm*	*mm*	*bar*	-	*kg/m*
6	RS341S00	6,3	9,5	± 0,3	11	110	65	65	0,05
	RS341S12		10,6		25		135	100	0,12
8	RS341S00	8,5	12		15	130	25	25	0,07
	RS341S12		13,4		32		150	100	0,18
10	RS341S00	10,3	14,1		18	150	16	16	0,09
	RS341S12		15,5		38		90	65	0,2
12	RS341S00	12,5	16,4	± 0,2	20	165	18	18	0,1
	RS341S12		18		45		80	65	23
16	RS341S00	16,3	21,4	± 0,3	25	195	13	13	0,15
	RS341S12		23		58		65	65	0,36
20	RS341S00	20,7	26,5		30	225	20	20	0,31
	RS341S12		28,1		70		40	40	0,54
25	RS341S00	25,8	31,7	± 0,4	35	260	16	16	0,39
	RS341S12		33,7		85		60	50	0,8
32	RS341S00	34,6	41	± 0,5	40	300	2,5	2,5	0,36
	RS341S12		43		105		35	25	0,82
40	RS341S00	40,5	49,5		50	340	3	3	0,57
	RS341S12		51,5		130		40	40	1,26
50	RS341S00	50,8	60,2		60	390	2,5	2,5	0,71
	RS341S12		62,5		160		30	25	1,47
65	RS341S00	65,7	77,7	± 0,4	75	460	4	4	1,07
	RS341S12		80,9		200		32	25	2,44
80	RS341S00	80,6	94,2	± 0,5	90	660	4	4	1,72
	RS341S12		97,4		240		30	25	3,52
100	RS341S00	100,4	115	± 0,6	110	750	3	3	1,95
	RS341S12		118,2		290		16	16	3,94

- Debljina stijenke: veća
- Valovitost: standard

Izvedbe:

- RS 531 S00 bez opleta
- RS 531 S12 sa jednim opletom
- RS 531 S22 sa dva opleta

Standardna vrsta materijala:

- Valovite cijevi 1.4404 ili 1.4541
- Oplet 1.4301
- Ostale vrste materijala dostupne su na upit.

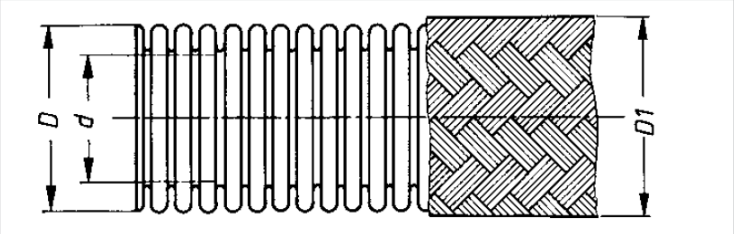
- Wall thickness: increased
- Corrugation: standard

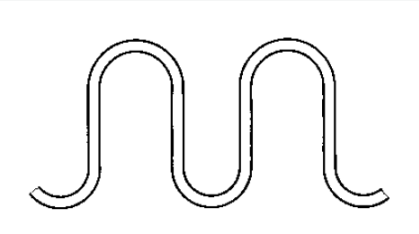
Versions:

- RS 341 S00 without braid
- RS 341 S12 with single braid
- RS 341 S22 with double braid

Standard materials:

- Annularly corrugated hose 1.4404 or 1.4541
- braid 1.4301
- Other materials are available on request





DN	Type	Inside diameter	Outside diameter	Permissible deviation	Minimum bending radius Single bend	Nominal bending radius Frequent movements	Permissible static operating pressure at 20 °C SF4	Nominal pressure ISO 10380 SF4	Weight approx.
-	-	**d**	**D,D1**	**d,D,D1**	**r_{min}**	**r_n**	**p_{perm}**	**PN**	-
-	-	*mm*	*mm*	*mm*	*mm*	*mm*	*bar*	-	*kg/m*
5	RS531S00	5,3	9,1	± 0,2	15	100	25	25	0,1
	RS531S12		10,2		25		150	150	0,14
	RS531S22		11,3		35		200	200	0,2
6	RS531S00	6,2	10,2		15	110	50	50	0,12
	RS531S12		11,6		25		200	200	0,23
	RS531S22		13		40		250	250	0,33
8	RS531S00	8	12,9		20	130	50	50	0,2
	RS531S12		14,5		32		200	200	0,35
	RS531S22		16,1		50		250	250	0,49
10	RS531S00	10	15,9	± 0,3	25	150	25	25	0,29
	RS531S12		17,5		38		150	150	0,48
	RS531S22		19,1		60		225	225	0,66
12	RS531S00	12,1	18,7		30	165	25	25	0,41
	RS531S12		20,3		45		100	100	0,62
	RS531S22		21,9		70		200	200	0,82
16	RS531S00	16,1	23,8		40	195	20	20	0,55
	RS531S12		25,8		58		150	150	0,92
	RS531S22		27,8		90		200	200	1,29

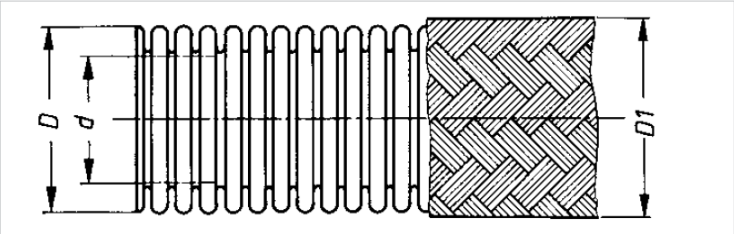
- Debljina stijenke: veća
- Valovitost: standard

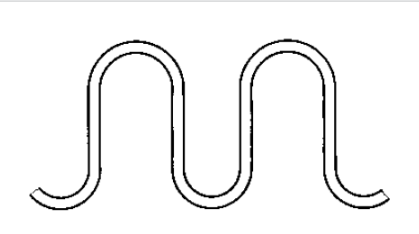
Izvedbe:

- RS 430 S00 bez opleta
- RS 430 S12 sa jednim opletom
- RS 430 S22 sa dva opleta
- RS 430 S42 sa jednim opletom, dodatno upleten
- RS 430 S52 sa dva opleta, dodatno upleten
- RS 430 S92 sa dva opleta, oplet specijalne izvedbe

Standardna vrsta materijala:

- Valovite cijevi 1.4404 ili 1.4541
- Oplet 1.4301 standard, dodatno upleteni 1.4306
- Ostale vrste materijala dostupne su na upit.





- Wall thickness: increased
- Corrugation: standard

Versions:

- RS 430 S00 without braid
- RS 430 S12 with single braid
- RS 430 S22 with double braid
- RS 430 S42 with single braid, knurled
- RS 430 S52 with double braid, knurled
- RS 430 S92 with double special braid

Standard materials:

- Annularly corrugated hose 1.4404 or 1.4541
- standard braid 1.4301, knurled 1.4306
- Other materials are available on request

DN	Type	Inside diameter	Outside diameter	Permissible deviation	Minimum bending radius Single bend	Nominal bending radius Frequent movements	Permissible static operating pressure at 20 °C SF4	Nominal pressure ISO 10380 SF4	Weight approx.
-	-	d	D,D1	d,D,D1	r_{min}	r_n	p_{perm}	PN	-
-	-	mm	mm	mm	mm	mm	bar	-	kg/m
20	RS430S00	20,2	29,2	± 0,3	45	285	6	6	0,54
	RS430S12		31,2		70		90	65	0,93
	RS430S22		33,2		70		125	100	1,31
25	RS430S00	25,2	34,2		50	325	6	6	0,65
	RS430S12		36,2		85		65	50	1,07
	RS430S22		38,2		85		100	100	1,49
32	RS430S00	33,7	42,7		60	380	4	4	0,77
	RS430S12		45		105		65	65	1,41
	RS430S22		47,2		105		80	80	2,05
40	RS430S00	40	55	± 0,4	75	130	2,5	2,5	1,37
	RS430S12		57,3		130		40	40	2,09
	RS430S22		59,5		130		65	65	2,81
50	RS430S00	50	65		90	190	2,5	2,5	1,616
	RS430S12		68,2		160		50	50	2,91
	RS430S22		71,3		160		80	65	4,15
65	RS430S00	65	81		110	580	0,5	0,5	2,06
	RS430S12		84,2		200		35	25	3,46
	RS430S22		87,3		200		50	50	4,89
80	RS430S00	79,8	98,3	± 0,5	135	800	0,5	0,5	2,82
	RS430S12		101,5		240		25	16	4,64
	RS430S22		104,6		240		50	25	6,46
100	RS430S00	99,8	117,8		160	1000	0,5	0,5	3,59
	RS430S12		121		290		30	10	5,97
	RS430S22		124,1		290		40	16	8,25
125	RS430S00	125,6	146	± 0,6	350	1250	1	0,5	5,23
	RS430S12		149,2				25	10	7,8
	RS430S22		152,4				45	16	10,4
150	RS430S00	151,9	177,4	± 1,4	400	800	0,2	-	4,97
	RS430S12		180,6				6	6	8,1
	RS430S42		181,4				10	10	8,27
	RS430S22		183,7				12	10	11,2
	RS430S92		184,6				16	16	11,37
200	RS430S00	202,2	231,4	± 1,6	520	1100	0,2	-	7,92
	RS430S12		235				6	6	12,32
	RS430S42		236,9				10	10	12,42
	RS430S22		238,5				12	10	16,72
	RS430S92		239,7				16	16	16,82
	RS430S52		242,4				16	16	16,92
250	RS430S00	248,4	284,2		620	1350	102	-	13
	RS430S42		289,7				8	6	17,96
	RS430S52		295,2				12	10	22,96
300	RS430S00	298,6	335,8		1000	1600	0,1	-	17,2
	RS430S42		341,3				4	4	23,03
	RS430S52		346,8				6	6	28,83

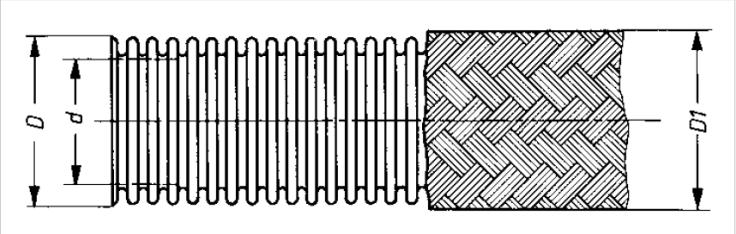
- Debljina stijenke: standard
- Valovitost: standard

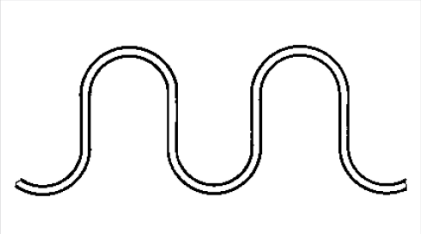
Izvedbe:

- RZ 331 S00 bez opleta
- RZ 331 S13 sa jednim opletom

Standardna vrsta materijala:

- Valovite cijevi 2.1010 (CuSn2)
- Oplet 2.1016 (CuSn4)





- Wall thickness: standard
- Corrugation: standard

Versions:

- RZ 331 S00 without braid
- RZ 331 S13 with single braid

Standard materials:

- Annularly corrugated hose 2.1010 (CuSn2)
- standard braid 2.1016 (CuSn4)

DN	Type	Inside diameter	Outside diameter	Permissible deviation	Minimum bending radius Single bend	Nominal bending radius Frequent movements	Nominal pressure ISO 10380 SF4	Weight approx.
-	-	**d**	**D,D1**	**d,D,D1**	**r_{min}**	**r_n**	**PN**	-
-	-	*mm*	*mm*	*mm*	*mm*	*mm*	-	*kg/m*
8	RZ331S00	8,6	12,6	± 0,2	16	90	6	0,11
	RZ331S13		14		32		60	0,23
10	RZ331S00	10,7	15,1		18	130	6	0,13
	RZ331S13		16,5		38		45	0,27
12	RZ331S00	12,7	17,7		20	150	4	0,14
	RZ331S13		19,1		45		35	0,31
16	RZ331S00	16,7	22,2		28	170	4	0,24
	RZ331S13		23,6		58		32	0,47
20	RZ331S00	20,6	27,1		32	200	4	0,44
	RZ331S13		28,5		70		30	0,71
25	RZ331S00	25,6	33,2	± 0,3	40	230	2,5	0,46
	RZ331S13		35,5		85		30	0,97
32	RZ331S00	32,6	42		50	260	2,5	0,72
	RZ331S13		44,3		105		30	1,43
40	RZ331S00	40,5	52		60	310	1,6	0,95
	RZ331S13		54		130		25	1,83
50	RZ331S00	50,5	63	± 0,4	70	360	1,6	1,35
	RZ331S13		66,2		160		28	2,77

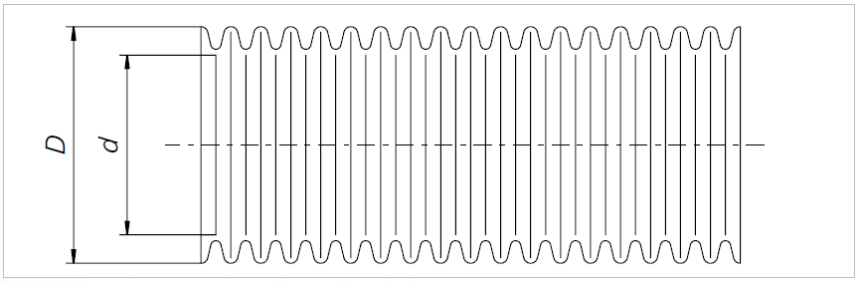
- Debljina stijenke: standard
- Valovitost: vrlo široka

Izvedbe:

- RS 351 S00 bez opleta

Standardna vrsta materijala:

- Valovite cijevi 1.4404



- Wall thickness: standard
- Corrugation: very wide

Versions:

- RS 351 S00 without braid

Standard materials:

- Annularly corrugated hose 1.4404

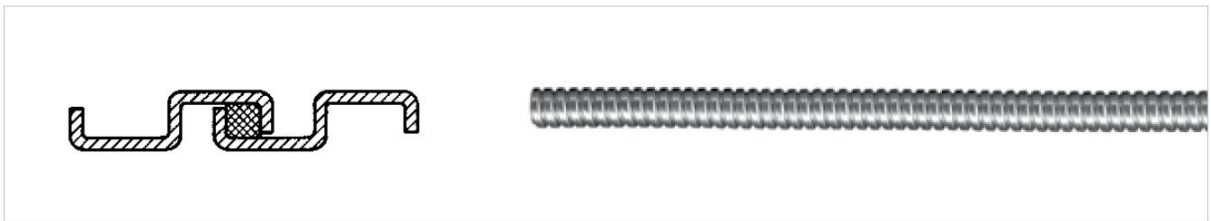
DN	*Type*	*Inside diameter*	*Outside diameter*	*Permissible deviation*	*Minimum bending radius Single bend*	*Permissible static operating*	*Weight approx.*
-	-	**d**	**D**	**d,D**	**r_{min}**	**p_{perm}**	-
-	-	*mm*	*mm*	*mm*	*mm*	*bar*	*kg/m*
20	RS351S00	12,5	16,6	± 0,3	20	18	0,095
25	RS351S00	16,7	21,3		16	17	0,125
32	RS351S00	20,5	26,4	± 0,4	20	9	0,165
40	RS351S00	25,8	31,7		35	10	0,36

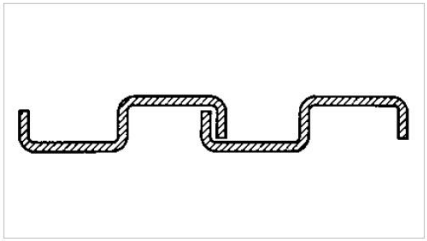
Prednosti spiralno pletenih crijeva su visoka otpornost na napetosti i transverzalni tlak te kemijska i toplinska stabilnost. Koriste se:

- Kao zaštitno crijevo za svjetlosne vodiče i električne instalacije,
- Kao zaštita od prekomjernog savijanja za sklopove valovitog crijeva,
- Kao usisno i transportno crijevo za dim, strugotine i granulate,
- Kao crijevo za ispušne plinove,
- Kao oplet za optimizaciju uvjeta protoka
- U strojarstvu, tehnologiji mjerenja i upravljanja i medicinskoj tehnologiji.
- Za razdvajanje ispušnih sustava automobila i teretnih vozila.

The advantages of stripwound hoses are a high resistance to tension and transversal pressure as well as chemical and thermal stability. They are, for example, used

- As protective hose for light conductors and electrical wiring,
- As over-bending protection for corrugated hose assemblies,
- As suction and conveying hose for smoke, shavings and granulates,
- As exhaust gas hose or
- As liner to optimise flow conditions
- in mechanical engineering, measurement and control technology, communications technology and fibre optics as well as medical technology.
- as a liners in decoupling elements for car and HGV exhaust systems.





Primjena:

- Zaštitno crijevo prema normi DIN EN ISO 15465
- Standardno zaštitno crijevo za električne instalacije prema normi DIN EN 50086-2-3
- Zaštitno crijevo za gumena i plastična crijeva

Karakteristike:

- Vrlo fleksibilno
- Otporno na napetosti
- Visoka otpornost na drobljenje

Izvedbe:

- Zaštitno crijevo, pocinčani čelik, tip SG-S-O
- Zaštitno crijevo, mesing, tip SG-M-O
- Zaštitno crijevo, kromirani mesing, tip SG-M-C
- Zaštitno crijevo, poniklani mesing tip SG-M-N
- Zaštitno crijevo, nehrđajući čelik, tip SG-E-O

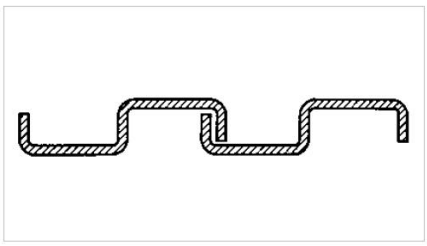
Standardna vrsta materijala:

- Pocinčani čelik (1.0330) do DN 18
- Vruće pocinčani čelik (1.0226) od DN 20
- Mesing (2.0321)
- Nehrđajući čelik (1.4301)

Radna temperatura:

- Mesing: 250 °C
- Pocinčani čelik: 400 °C
- Nehrđajući čelik: 600 °C

1.2.1 SG TIP BEZ PREVLAKA (SG TYPE WITHOUT COATING)



Applications:

- Protective hose according to DIN EN ISO 15465 (type SOU)
- Standard protective hose for electrical installations according to DIN EN 50086-2-3
- Protective hose for rubber and plastic hoses

Characteristics:

- Very flexible
- Tension-proof
- With high crushing strength

Types:

- Protective hose, galvanised steel, type SG-S-O
- Protective hose, bright brass, type SG-M-O
- Protective hose, chromium-plated brass, type SG-M-C
- Protective hose, nickel-plated brass, type SG-M-N
- Protective hose, stainless steel, type SG-E-O

Materials:

- Galvanised steel (1.0330) to DN 18
- Hot-dip galvanised steel (1.0226) from DN 20
- Brass (2.0321)
- Stainless steel (1.4301)

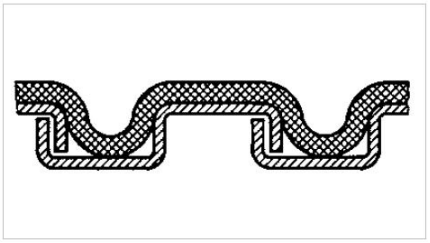
Operating temperature:

- Brass: 250 °C
- Zinc-plated steel: 400 °C
- Stainless steel: 600 °C

DN	Nominal size	Inside diameter	Outside diameter	Permissible deviation	Minimum bending radius	Weight approx.
-	PG	**d**	**D**	**d,D**	**r_{min}**	-
-	DIN 40430	*mm*	*mm*	*mm*	*mm*	*kg/m*
3	-	3	4,6	± 0,2	18	0,028
4	-	4	5,8	± 0,3	19	0,035
5	-	5	6,8	± 0,4	20	0,045
6	-	6	8	± 0,3	21	0,05
7	-	7,1	9,1	± 0,3	23	0,06
8	7	8	10	± 0,3	25	0,065
9	-	9	11	± 0,3	30	0,075
10	-	10	13	± 0,3	32	0,11
11	9	11	14	± 0,3	34	0,12
12	-	12	15	± 0,3	36	0,13
13	-	13	16	± 0,3	40	0,14
14	11	13,5	16,5	± 0,3	40	0,135
15	-	14	17	± 0,3	40	0,145
16	13,5	15	18	± 0,3	45	0,155
17	-	16	19	± 0,3	45	0,165
18	16	17	20	± 0,3	50	0,175
19	-	18	21	± 0,3	50	0,185
20	-	20	24	± 0,3	60	0,28
21	-	21	25	± 0,3	62	0,295
22	-	21,8	25,8	± 0,3	65	0,305
23	21	23	27	± 0,3	67	0,32
25	-	25	29	± 0,3	75	0,345
28	-	28	32	± 0,3	80	0,385
29	-	29,2	34,2	± 0,4	85	0,415
30	-	30	35	± 0,4	85	0,43
31	29	31	36	± 0,4	90	0,445
32	-	32	37	± 0,4	90	0,455
35	-	35	40	± 0,4	95	0,495
36	-	36	41	± 0,4	100	0,51
37	-	37	42	± 0,4	105	0,53
38	-	38,2	43,2	± 0,4	105	0,54
40	36	40	45	± 0,4	110	0,56
45	-	45,2	50,2	± 0,4	120	0,63
47	42	47	52	± 0,4	125	0,66
48	-	48	53	± 0,5	125	0,67
49	-	49,2	54,2	± 0,5	125	0,68
50	-	50	55	± 0,5	125	0,7
51	48	51	56	± 0,5	130	0,71

DN	Inside diameter	Outside diameter	Permissible deviation	Minimum bending radius	Weight approx.
-	**d**	**D**	**d,D**	**r_{min}**	-
-	*mm*	*mm*	*mm*	*mm*	*kg/m*
3	2,4	3,8	± 0,2	15	0,03
3	2,6	3	± 0,2	15	0,03
3	3	4,5	± 0,2	15	0,031
3	3,2	4,7	± 0,2	15	0,032
4	3,5	5	± 0,2	15	0,033
4	4	6	± 0,2	20	0,044
5	5	7	± 0,2	20	0,05
6	6	8	± 0,2	20	0,056
7	7	9	± 0,2	20	0,074
8	8	9	± 0,2	25	0,084
9	9	11	± 0,2	25	0,105
10	10	13	± 0,3	25	0,104
12	11,5	14	± 0,3	30	0,103
12	12	15	± 0,3	30	0,115
13	13	16	± 0,3	35	0,119
14	14	17,4	± 0,3	35	0,148
15	15	18	± 0,3	40	0,157
16	16	19,2	± 0,3	40	0,205
17	17	20	± 0,3	45	0,218
18	18	21,3	± 0,3	45	0,238
19	19	22	± 0,3	45	0,268
20	20	23	± 0,3	50	0,282

DN	Inside diameter	Outside diameter	Permissible deviation	Minimum bending radius	Weight approx.
-	**d**	**D**	**d,D**	**r_{min}**	-
-	*mm*	*mm*	*mm*	*mm*	*kg/m*
2	1,4	3	± 0,1	16	0,02
3	3	4,6	± 0,2	18	0,03
4	4	5,8	± 0,2	19	0,035
5	5	6,8	± 0,2	20	0,04
6	6	8	± 0,3	25	0,05
7	7	9	± 0,3	27	0,06
8	8	10	± 0,3	29	0,065
9	9	11	± 0,3	30	0,075
10	10	13	± 0,3	25	0,105
11	11	14	± 0,3	30	0,115
12	12	15	± 0,3	30	0,125
13	13	16	± 0,3	35	0,135
14	14	17,4	± 0,3	35	0,14
15	15	18	± 0,3	40	0,16
16	16	19,2	± 0,3	40	0,17
17	17	20	± 0,3	45	0,175
18	18	21,3	± 0,3	45	0,185
19	19	23	± 0,3	45	0,235
20	20	24	± 0,3	50	0,25
20	21,5	25,5	± 0,3	50	0,265
22	22	26	± 0,3	50	0,27
23	23	27	± 0,3	55	0,285
25	24,5	28,5	± 0,3	55	0,305
25	25	29	± 0,3	60	0,315
26	26	30	± 0,3	60	0,325
27	27	31	± 0,3	60	0,335
28	28	32	± 0,3	60	0,35



Primjena:

- Standardno zaštitno crijevo za električne instalacije prema normi DIN EN 61386-2-3
- Zaštitno crijevo za gumena i plastična crijeva

Karakteristike:

- Vrlo fleksibilno
- Otporno na napetosti
- Visoka otpornost na drobljenje
- PVC prevlaka

Izvedbe:

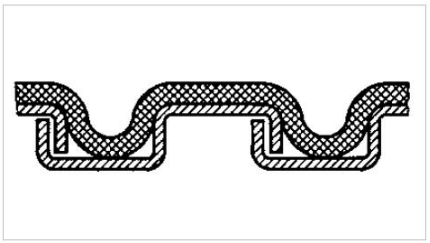
- Zaštitno crijevo, pocinčani čelik sa crnom PVC prevlakom, tip SG-S-P

Standardna vrsta materijala:

- Pocinčani čelik (1.0330) do DN 18
- Vruće pocinčani čelik (1.0226) od DN 20

Radna temperatura:

- Pocinčani čelik sa PVC prevlakom: -20 do 80 °C



Applications:

- Standard protective hose for electrical installations according to DIN EN 61386-2-3
- Protective hose for rubber and plastic hoses

Characteristics:

- Very flexible
- Tension-proof
- With high crushing strength
- Liquid-tight
- With PVC coating

Types:

- Protective hose, zinc-plated steel with black PVC coating, type SG-S-P

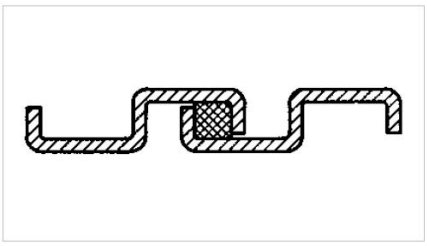
Materials:

- Galvanised steel (1.0330) to DN 18
- Hot-dip galvanised steel (1.0226) from DN 20

Operating temperature:

- Galvanised steel with PVC coating: -20 to 80 °C

DN	Nominal size	Inside diameter	Outside diameter	Permissible deviation	Minimum bending radius	Weight approx.
-	PG	**d**	**D**	**d,D**	**r_{min}**	-
-	DIN 40430	*mm*	*mm*	*mm*	*mm*	*kg/m*
4	-	4	6,6	± 0,2	23	0,05
5	-	5	7,6	± 0,3	25	0,055
6	-	6	8,8	± 0,3	28	0,7
7	7	7,1	9,9	± 0,3	30	0,75
8	-	8	10,8	± 0,3	34	0,85
9	-	9	11,8	± 0,3	38	0,95
10	9	10	14	± 0,3	42	0,14
11	-	11	15	± 0,3	46	0,155
12	-	12	16	± 0,3	48	0,165
13	11	13	17	± 0,3	51	0,175
14	-	13,5	17,5	± 0,3	51	0,185
14	-	14	18,2	± 0,3	53	0,195
15	13,5	15	19,2	± 0,3	56	0,21
16	-	16	20,2	± 0,3	58	0,22
17	16	17	21,2	± 0,3	60	0,235
18		18	22,2	± 0,3	64	0,245
20	-	20	25,4	± 0,3	69	0,37
21	-	21	26,4	± 0,3	74	0,385
22	21	21,8	27,2	± 0,3	75	0,4
23	-	23	28,4	± 0,3	77	0,42
25	-	25	30,4	± 0,3	82	0,45
28	-	28	33,4	± 0,3	90	0,5
29	29	29,2	35,8	± 0,4	93	0,56
30	-	30	36,6	± 0,4	96	0,58
31	-	31	37,6	± 0,4	98	0,6
32	-	32	38,6	± 0,4	101	0,615
35	-	35	41,6	± 0,4	109	0,665
36	-	36	42,6	± 0,4	112	0,685
38	36	38,2	44,8	± 0,4	117	0,73
40	-	40	46,6	± 0,4	122	0,765
45	42	45,2	51,8	± 0,4	136	0,85
47	-	47	53,8	± 0,4	138	0,905
48	-	48	54,8	± 0,5	142	0,92
49	48	49,2	56	± 0,5	145	0,95
50	-	50	56,8	± 0,5	148	0,955
51	-	51	57,8	± 0,5	151	0,975



Primjena:

- Univerzalno zaštitno crijevo s brtvom, također se može koristiti kao crijevo za odvod i ispušne plinove

Karakteristike:

- Vrlo fleksibilno
- Otporno na napetosti
- Visoka otpornost na drobljenje

Izvedbe:

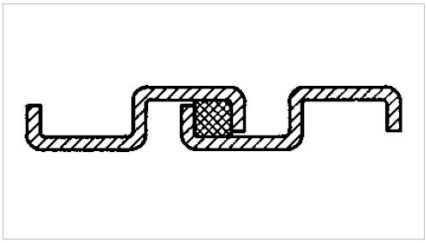
- Usisno crijevo, pocinčani čelik, tip SD-S-B
- Usisno crijevo, nehrđajući čelik, tip SD-E-K

Standardna vrsta materijala:

- Pocinčani čelik (1.0330) do DN 18
- Vruće pocinčani čelik (1.0226) od DN 20
- Nehrđajući čelik (1.4301)

Radna temperatura:

- Pocinčani čelik: 350 °C
- Nehrđajući čelik: 600 °C



Applications:

- Universal protective hose with gasket, also usable as extraction and exhaust gas hose

Characteristics:

- Very flexible
- Tension-proof
- With high crushing strength

Types:

- Extraction hose, zinc-plated steel, type SD-S-B
- Extraction hose, stainless steel, type SD-E-K

Materials:

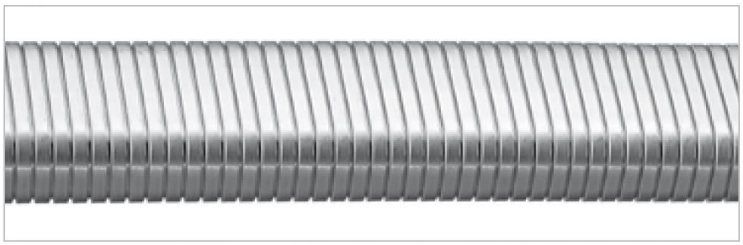
- Galvanised steel (1.0330) to DN 18
- Hot-dip galvanised steel (1.0226) from DN 20
- Stainless steel (1.4301)

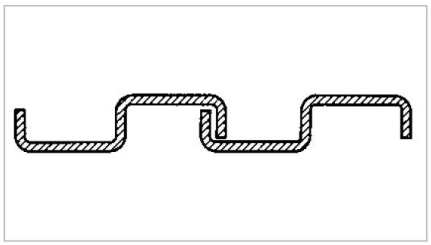
Operating temperature:

- Zinc-plated steel: 350°C
- Stainless steel: 600 °C

DN	Inside diameter	Outside diameter	Permissible deviation	Minimum bending radius	Weight approx.
-	d	D	d,D	r_{min}	-
-	mm	mm	mm	mm	kg/m
3	3	5	± 0,2	40	0,06
4	4	6	± 0,2	40	0,07
5	5	7	± 0,2	40	0,085
6	6	8	± 0,2	35	0,095
7	7	9	± 0,2	35	0,105
8	8	10	± 0,2	40	0,115
9	9	11	± 0,2	40	0,14
10	10	13	± 0,2	45	0,18
11	10,5	13	± 0,2	45	0,19
11	11	14	± 0,2	55	0,2
12	12	15	± 0,2	55	0,21
13	13	16	± 0,2	60	0,215
14	14	17,4	± 0,2	60	0,22
15	15	18	± 0,2	70	0,24
16	16	18,7	± 0,2	70	0,26
16	16	19,2	± 0,2	70	0,265
17	17	20	± 0,2	80	0,28
18	18	21,3	± 0,3	80	0,29
19	19	23	± 0,3	80	0,315
20	20	24	± 0,3	90	0,335
22	21,5	25,5	± 0,3	90	0,37
23	23	27	± 0,3	95	0,395
25	24,5	28,5	± 0,3	95	0,415
25	25	29	± 0,4	105	0,43
26	26	30	± 0,4	105	0,46
30	30	34	± 0,4	110	0,525
31	30,5	34,5	± 0,4	110	0,54
32	31,5	35,7	± 0,4	120	0,57
32	32	36	± 0,4	120	0,58
34	34	38,5	± 0,4	125	0,585
35	35	39,5	± 0,4	130	0,6
36	36	41,5	± 0,4	130	0,64
37	37	42,5	± 0,4	140	0,68
38	38	43,5	± 0,4	145	0,72
39	38,5	44	± 0,4	145	0,76
40	40	45	± 0,4	150	0,83
41	40,5	45,7	± 0,4	150	0,68
44	44	49,5	± 0,4	170	1,01
45	45	50,5	± 0,4	175	1,03
47	46,5	52,5	± 0,4	180	1,07
48	48	53,5	± 0,5	190	1,1

DN	Inside diameter	Outside diameter	Permissible deviation	Minimum bending radius	Weight approx.
-	**d**	**D**	**d,D**	**r_{min}**	-
-	*mm*	*mm*	*mm*	*mm*	*kg/m*
50	50	56	± 0,5	200	1,16
52	52	58	± 0,5	210	1,3
53	53	59	± 0,5	220	1,35
55	55	61	± 0,5	250	1,4
60	60	66	± 0,6	260	1,59
65	65	72	± 0,6	270	1,95
70	70	77	± 0,6	280	2,1
75	75	82	± 0,6	290	2,25
80	80	87	± 0,6	300	2,4
90	90	100	± 0,7	315	2,62
100	100	110,5	± 0,7	330	2,85
110	110	120,5	± 0,7	360	3,11
120	120	131,5	± 0,7	400	3,4
125	125	136,5	± 0,7	400	3,45





Primjena:

- Zaštitno crijevo za energetske vodiče, hidraulične vodove te kao transportno crijevo

Karakteristike:

- Vrlo fleksibilno
- Otporno na napetosti
- Visoka otpornost na poprečni tlak

Izvedbe:

- Pravokutno zaštitno crijevo, pocinčani čelik bez brtve, tip SV-S-O
- Pravokutno zaštitno crijevo, pocinčani čelik sa gumenom brtvom, tip SV-S-O
- Pravokutno zaštitno crijevo, pocinčani čelik sa pamučnom brtvom, tip SV-S-B

Standardna vrsta materijala:

- Pocinčani čelik (1.0333)

Applications:

- Protective hose for energy guide chains, hydraulic lines and as conveying hose

Characteristics:

- Very flexible
- Tension-proof
- Resistant to transversal pressure

Types:

- Rectangular protective hose, zinc-plated steel without seal, type SV-S-O
- Rectangular protective hose, zinc-plated steel with rubber joint, type SV-S-G
- Rectangular protective hose, zinc-plated steel with cotton packing, type SV-S-B

Materials:

- Galvanised steel (1.0333)

Nominal size	*Outside diameter*		*Inside diameter*		*Minimum bending radius*		*Weight approx.*
NS	**D_1, D_2**	**Permissible deviation**	**d_1, d_2**	**Permissible deviation**	**r_{min}**	**Permissible deviation**	**-**
mm	mm	*mm*	*mm*	*mm*	*mm*	*mm*	*kg/m*
15	30 x 50	± 1	27 x 47	± 1	70	-10	0,64
25	50 x 50	± 1	46,8 x 46,8	± 1	120	-10	0,82
38	45 x 85	± 1	40,8 x 81	± 1	100	-10	1,28
42	65 x 65	± 1	60,8 x 60,8	± 1	130	-10	1,26
51	60 x 85	± 1	55,8 x 81	± 1	130	-10	1,44
69	60 x 115	± 1	54,8 x 110,2	± 1	130	-20	2,37
92	80 x 115	± 1	74,6 x 110	± 1	170	-20	2,66
126	90 x 140	± 1	84,6 x 135	± 1	180	-20	3,15
140	80 x 175	± 1	74,4 x 169,8	± 1	170	-20	3,54
154	110 x 140	± 1	104,2 x 135,2	± 1	250	-20	3,6
193	110 x 175	± 1	104,2 x 169,6	± 1	250	-20	3,97
242	110 x 220	± 1,5	104,4 x 214,4	± 1,5	250	-20	4,6