

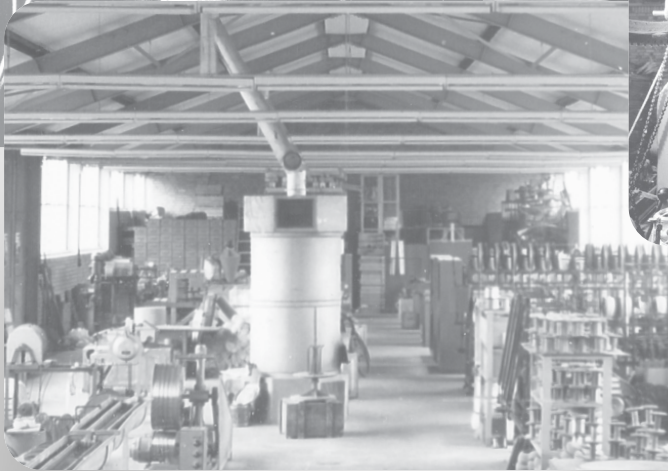
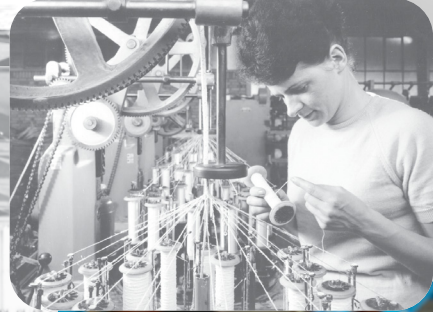
CABLES FOR CLEANROOM TECHNOLOGY



SAB Clean

www.sab-cable.com





TRADITIONAL
FAMILY BUSINESS
SINCE 1947

Family business in the third generation

75 years of experience in cable and wire manufacturing as well as in temperature measurement technology turned a one-man business into a company with more than 550 employees. We prove our strength every year with more than 1500 special products according to customers' requirements. Each product is a new challenge for our creative technical team. We at **SAB** see ourselves as a manufacturer and a service provider – in the sense of true partnership and the greatest possible customer orientation.

Today, the quality of our products is known and appreciated in more than 100 countries around the world. In all product ranges, we are certified according to DIN EN ISO 9001. Furthermore, we have implemented an environmental management system for our company according to DIN EN ISO 14001, an occupational health and safety management system according to NLF/ILO-OSH and DIN ISO 45001, and an energy management system according to DIN EN ISO 50001.

And also for the future, our slogan is: **"WE GO FORWARD!"**

FOUNDED:	1947 by Peter Bröckskes sen. an independent, medium-sized company.
CEO:	Peter Bröckskes and Sabine Bröckskes-Wetten
PLANT/LOCATION:	In Viersen (Lower Rhine) 110.000 m ² company site. Own manufacturing from copper conductor to outer sheath. VDE approved burnchamber and laboratory within the company.
EMPLOYEES/WORKERS:	approx. 430 at the plant in Viersen, 550 worldwide
YEARLY SALES:	over 134 Mio. € worldwide
PRODUCTS:	Special Cables Measurement Technology Cable Harnessing
CERTIFICATES AND APPROVALS:	Quality management system acc. to DIN EN ISO 9001 for every manufacturing field Environmental management system acc. to DIN EN ISO 14001 Occupational health and safety management acc. to NLF/ILO-OSH and DIN ISO 45001 Energy management system acc. to DIN EN ISO 50001





Content

SAB^{clean} Applications

5



SAB^{clean} Industrial Ethernet Cables

■ SAB ^{clean} CATLine CAT 5e S		CAT 5e Industrial Ethernet cable, suitable for cable tracks with UL recognition . . .	6
■ SAB ^{clean} CATLine CAT 6A S		CAT 6A Gigabit Ethernet cable, suitable for cable tracks with UL recognition . . .	6
■ SAB ^{clean} CATLine CAT 7A S		CAT 7A Gigabit Ethernet cable, suitable for cable tracks with UL recognition . . .	6



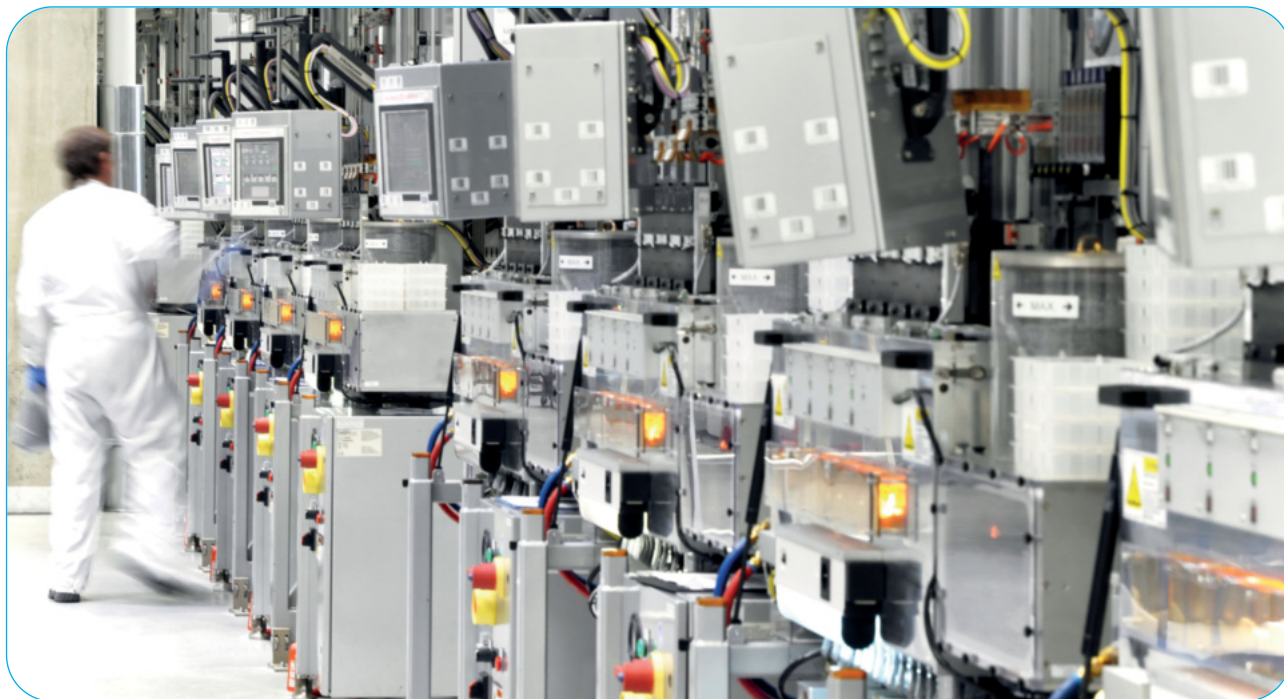
SAB^{clean} Cable Track Cables

■ SAB ^{clean} SD 776		continuously flexible data cable	7
■ SAB ^{clean} S 776		continuously flexible control cable	7
■ SAB ^{clean} SD 780 C		continuously flexible data cable with overall copper screen	8
■ SAB ^{clean} S 780 C		continuously flexible control cable with overall copper screen	8
■ SAB ^{clean} SD 787 C TP		continuously flexible data cable with twisted pairs and overall copper screen	9



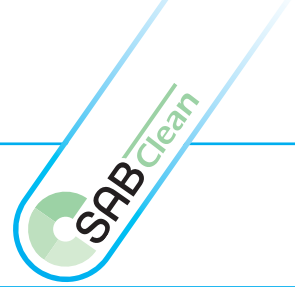
SAB^{clean} Torsion Cables

■ SAB ^{clean} RT 123 D TP (B)		torsional data cable with twisted pairs and overall copper screen, UL recognition, CSA approval	10
■ SAB ^{clean} RT 793 D		torsional control cable with overall copper screen, UL recognition, CSA approval	11



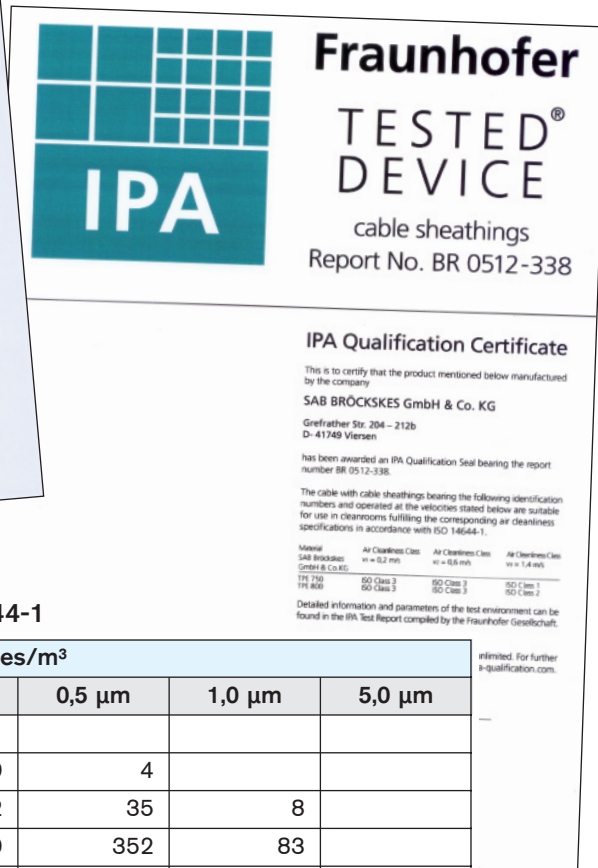
Cables for cleanroom technology

SAB_{clean} Applications



The guideline VDI 2083 sheet 8 treats the suitability of equipment for cleanrooms with respect to planning, production, maintenance, recovering and proof. The examination of our SAB_{clean} cables by the Fraunhofer Institut showed that our SAB_{clean} cables met all quality requirements.

Thus SAB Bröckskes is able to present its „Tested Device Certificate“ by the Fraunhofer Institute.



Classification of air cleanliness acc. to ISO 14644-1

class	maximum particles/m ³					
	0,1 µm	0,2 µm	0,3 µm	0,5 µm	1,0 µm	5,0 µm
ISO 1	10	2				
ISO 2	100	24	10	4		
ISO 3	1.000	237	102	35	8	
ISO 4	10.000	2.370	1.020	352	83	
ISO 5	100.000	23.700	10.200	3.520	832	29
ISO 6	1.000.000	237.000	102.000	35.200	8.320	293
ISO 7				352.000	83.200	2.930
ISO 8				3.520.000	832.000	29.300
ISO 9				35.200.000	8.320.000	293.000

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Application examples:

- SAB_{clean} cables are used in cleanrooms.
- Examples are the production of semiconductors, machines for display manufacturing, devices for biological or medical engineering, food and medical production.
- SAB_{clean} cables meet highest requirements acc. to DIN EN ISO 14644-1.

Industrial Ethernet Cables

SAB^{clean} CATLine CAT 5e S

SAB^{clean} CATLine CAT 6A S Industrial Ethernet Cable, suitable for cable tracks

SAB^{clean} CATLine CAT 7A S



Marking for SAB^{clean} CATLine CAT 7A S 17779003:

SAB BRÜCKSKES · D-VIERSEN · SAB Clean CATLine Cat. 7A S 4x2x26AWG 1777-9003 AWM Style 20549 80°C 300V CE RoHS and current meter marking

Construction:	SAB ^{clean} CATLine CAT 5e S	SAB ^{clean} CATLine CAT 6A S	SAB ^{clean} CATLine CAT 7A S
Dimension:	4 x 2 x 26 AWG		
Conductor:	bare copper strands, fine wires		
Insulation:	special polymer		
Colour code:	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown		
Stranding:	cores twisted to pairs, pairs together		cores twisted to pairs, pairs screened with foil, pairs together
Screen:	alu foil and tinned copper braiding		aluminized non-woven tape and tinned copper braiding
Wrapping:	non-woven tape		
Sheath material:	TPE		
Sheath colour:	black (RAL 9005)		

Technical data:	SAB ^{clean} CATLine CAT 5e S	SAB ^{clean} CATLine CAT 6A S	SAB ^{clean} CATLine CAT 7A S
Item number:	1577-9001	1677-9006	1777-9003
Peak operating voltage:	max. 90 V		
Voltage UL:	300 V		
Testing voltage core/core: core/screen:	2000 V 2000 V		
Min. bending radius fixed laying: flexible application: continuously flexible:	5 x d 10 x d 15 x d		
Temperature range fixed laying: flexible application:	UL: up to +80 °C -40/+70 °C -30/+70 °C		
Fire performance:	flame retardant and self-extinguishing acc. to IEC 60332-1-2 + VDE 0482-332-1-2 UL Horizontal Flame Test FT2		
Characteristic impedance:	100Ω ± 10Ω, fulfils the electrical and transmission requirements with high frequency with reference to EN 50288-2-2 / CAT 5	100Ω ± 10Ω, fulfils the electrical and transmission requirements with high frequency with reference to EN 50288-10-2 / CAT 6A	100Ω ± 10Ω, fulfils the electrical and transmission requirements with high frequency with reference to EN 50288-9-2 / CAT 7A
Oil resistance:	very good - Oil 60 °C acc. to UL 758		
Flexibility:	very good		
Air cleanliness class 1:	acc. to DIN EN ISO 14644-1		
UL Style:	20549		
Absence of harmful substances:	acc. to RoHS directive of the European Union		

item no.	type	dimension	outer-ø max. mm	copper figure kg/km	cable weight ≈kg/km
15779001	SAB Clean CATLine CAT 5e S	4 x 2 x 26 AWG	6,4	31,8	48
16779006	SAB Clean CATLine CAT 6A S	4 x 2 x 26 AWG	6,9	31,8	56
17779003	SAB Clean CATLine CAT 7A S	4 x 2 x 26 AWG	8,9	38,5	85

Other dimensions and colours are possible on request.



**Cleanroom
classification
DIN EN ISO 14644-1
air cleanliness class 1**

Also possible
as harnessed cable
with M12 or RJ 45 plug!



Cable Track Cables

SAB^{clean} SD 776 continuously flexible data cable

SAB^{clean} S 776 continuously flexible control cable



Marking for **SAB^{clean} SD 776** 37761402:
 SAB BRÖCKSKES · D-VIERSEN · SAB Clean SD 776 · 14 x 0,25 mm² CE RoHS and current meter marking



Marking for **SAB^{clean} S 776** 37760410:
 SAB BRÖCKSKES · D-VIERSEN · SAB Clean S 776 · 4 G 1,0 mm² CE RoHS and current meter marking

Construction:

Conductor:	SD 776: bare copper strands, extra fine wire S 776: bare copper strands acc. to IEC 60228, VDE 0295, class 6
Insulation:	TPE
Colour code:	SD 776: with reference to DIN 47100 S 776: black cores with consecutive numbers acc. to EN 50334 + VDE 0293-334, green-yellow earth wire from 3 cores
Stranding:	specialy adjusted layering
Wrapping:	non-woven tape
Sheath material:	TPE
Sheath colour:	black (RAL 9005)

Technical data:

Peak operating voltage:	SD 776: max. 350 V
Nominal voltage:	S 776: U ₀ /U 300/500 V
Testing voltage	SD 776: core/core 1500 V S 776: core/core 2000 V
Min. bending radius:	7,5 x d
Temperature range	<i>fixed laying:</i> -40/+80 °C <i>flexible application:</i> -30/+80 °C
Oil resistance:	very good - Oil 60 °C acc. to UL 758
Air cleanliness class 1:	acc. to DIN EN ISO 14644-1
Absence of harmful substances:	acc. to RoHS directive of the European Union

Outstanding features:

- flexible at low temperatures
- high abrasion resistance
- small outer diameter
- oil resistant

item no.	no. of cores x cross section n x mm ²	largest single wire ø mm	outer-ø ± 5% mm	copper figure kg/km	cable weight ≈ kg/km	ohmic resistance at 20 °C max. Ω/km
SD 776						
37760302	3 x 0,25	0,11	4,1	7,2	23	78,0
37760402	4 x 0,25	0,11	4,3	9,6	26	78,0
37760502	5 x 0,25	0,11	4,6	12,0	31	78,0
37760602	6 x 0,25	0,11	5,0	14,4	37	78,0
37760702	7 x 0,25	0,11	5,3	16,8	42	78,0
37761002	10 x 0,25	0,11	6,1	24,0	52	78,0
37761402	14 x 0,25	0,11	6,5	33,6	65	78,0
37760503	5 x 0,34	0,11	4,9	16,3	37	57,4
37763203	32 x 0,34	0,11	9,9	104,4	162	57,4
S 776						
37760205	2 x 0,50	0,16	5,3	9,6	35	39,0
37760305	3 x 0,50	0,16	5,5	14,4	41	39,0
37760405	4 x 0,50	0,16	5,9	19,2	49	39,0
37760505	5 x 0,50	0,16	6,4	24,0	60	39,0
37760705	7 x 0,50	0,16	7,3	33,6	79	39,0
37761205	12 x 0,50	0,16	8,7	57,6	111	39,0
37760407	4 x 0,75	0,16	6,5	28,8	63	26,0
37760507	5 x 0,75	0,16	7,1	36,0	77	26,0
37760707	7 x 0,75	0,16	8,1	50,4	104	26,0
37760410	4 x 1,00	0,16	7,0	38,4	77	19,5
37760415	4 x 1,50	0,16	7,7	57,6	100	13,3
37760515	5 x 1,50	0,16	8,4	72,0	123	13,3
37760425	4 x 2,50	0,16	9,6	96,0	157	7,98
37760440	4 x 4,00	0,16	12,1	153,6	252	4,95
37760460	4 x 6,00	0,21	13,2	230,4	335	3,30
37760461	4 x 10,0	0,21	15,8	384,0	514	1,91

Other dimensions and colours are possible on request.



Cleanroom classification
DIN EN ISO 14644-1
air cleanliness class 1

Cable Track Cables

SAB^{clean} SD 780 C continuously flexible data cable with overall copper screen

SAB^{clean} S 780 C continuously flexible control cable with overall copper screen



Marking for **SAB^{clean} SD 780 C** 37801803:

SAB BRÜCKSKES · D-VIERSEN · SAB Clean SD 780 · 18 x 0,34 mm² CE RoHS and current meter marking



Marking for **SAB^{clean} S 780 C** 37800410:

SAB BRÜCKSKES · D-VIERSEN · SAB Clean S 780 C · 4 G 1,0 mm² CE RoHS and current meter marking

Construction:

Conductor:	SD 780 C: bare copper strands, extra fine wire S 780 C: bare copper strands acc. to IEC 60228, VDE 0295, class 6
Insulation:	TPE
Colour code:	SD 780 C: with reference to DIN 47100 S 780 C: black cores with consecutive numbers acc. to EN 50334 + VDE 0293-334, green-yellow earth wire from 3 cores
Stranding:	specially adjusted layering
Wrapping:	non-woven tape
Inner sheath:	S 780 C: SABIX®
Wrapping:	S 780 C: non-woven tape
Screen:	tinned copper braiding
Wrapping:	non-woven tape
Sheath material:	TPE
Sheath colour:	black (RAL 9005)

Technical data:

Peak operating voltage:	SD 780 C: max. 350 V
Nominal voltage:	S 780 C: U _o /U 300/500 V
Testing voltage:	SD 780 C: core/core 1500 V core/screen 1200 V S 780 C: core/core 2000 V core/screen 2000 V
Min. bending radius:	7,5 x d
Temperature range	
<i>fixed laying:</i>	-40/+80 °C
<i>flexible application:</i>	-30/+80 °C
Oil resistance:	very good - Oil 60 °C acc. to UL 758
Air cleanliness class 1:	acc. to DIN EN ISO 14644-1
Absence of harmful substances:	acc. to RoHS directive of the European Union

Outstanding features:



- flexible at low temperatures
- high abrasion resistance
- small outer diameter
- oil resistant
- good EMC characteristics

item no.	no. of cores x cross section n x mm ²	largest single wire ø mm	outer-ø ± 5% mm	copper figure kg/km	cable weight ≈ kg/km	ohmic resistance at 20 °C max. Ω/km
SD 780 C						
37800201	2 x 0,14	0,11	4,3	13,4	25	139,3
37800301	3 x 0,14	0,11	4,4	14,8	27	139,3
37800302	3 x 0,25	0,11	4,8	18,3	32	78,0
37800402	4 x 0,25	0,11	5,0	20,8	36	78,0
37800303	3 x 0,34	0,11	5,0	21,0	35	57,4
37800503	5 x 0,34	0,11	5,6	31,8	51	57,4
37800703	7 x 0,34	0,11	6,3	39,2	62	57,4
37801003	10 x 0,34	0,11	7,2	52,8	77	57,4
37801803	18 x 0,34	0,11	8,4	84,6	117	57,4
S 780 C						
37800305	3 x 0,50	0,16	7,2	34,6	68	39,0
37800405	4 x 0,50	0,16	7,6	39,8	76	39,0
37800207	2 x 0,75	0,16	7,5	34,9	70	26,0
37800407	4 x 0,75	0,16	8,2	51,6	92	26,0
37800210	2 x 1,00	0,16	7,9	41,8	80	19,5
37800310	3 x 1,00	0,16	8,2	51,6	92	19,5
37800410	4 x 1,00	0,16	8,9	64,6	113	19,5
37800315	3 x 1,50	0,16	9,0	69,4	118	13,3
37800415	4 x 1,50	0,16	9,6	84,5	138	13,3
37800425	4 x 2,50	0,16	11,7	148,3	216	7,98
37800440	4 x 4,00	0,16	13,9	215,5	313	4,95

Other dimensions and colours are possible on request.



Cleanroom classification
DIN EN ISO 14644-1
air cleanliness class 1

Cable Track Cables

SAB^{clean} SD 787 C TP

continuously flexible paired data cable with overall copper screen



ERSEN · SAB Clean SD 787 C TP · 7 x 2 x 0,25 mm² CE



Marking for SAB^{clean} SD 787 C TP 37810725:

SAB BRÖCKSKES · D-VIERSEN · SAB Clean SD 787 C TP · 7 x 2 x 0,25 mm² CE RoHS and current meter marking

Construction:

Conductor:	tinned copper strands, extra fine wire with reference to VDE 0812
Insulation:	TPE
Colour code:	with reference to DIN 47100
Stranding:	cores twisted to pairs in specially adjusted layering
Wrapping:	non-woven tape
Screen:	tinned copper braiding
Wrapping:	non-woven tape
Sheath material:	TPE
Sheath colour:	black (RAL 9005)

Technical data:

Peak operating voltage:	max. 350 V
Testing voltage:	core/core 1500 V core/screen 1200 V
Min. bending radius:	7,5 x d
Temperature range	
fixed laying:	-40/+80 °C
flexible application:	-30/+80 °C
Oil resistance:	very good - Oil 60 °C acc. to UL 758
Air cleanliness class 1:	acc. to DIN EN ISO 14644-1
Absence of harmful substances:	acc. to RoHS directive of the European Union

Outstanding features:



- flexible at low temperatures
- high abrasion resistance
- small outer diameter
- oil resistant
- good EMC characteristics

item no.	no. of pairs x cross section n x 2 x mm ²	largest single wire ø mm	outer-ø ± 5% mm	copper figure kg/km	cable weight ≈ kg/km	ohmic resistance at 20 °C max. Ω/km
37810225	2 x 2 x 0,25	0,11	5,5	25,2	45	80,0
37810325	3 x 2 x 0,25	0,11	6,1	30,7	53	80,0
37810425	4 x 2 x 0,25	0,11	7,0	39,1	67	80,0
37810525	5 x 2 x 0,25	0,11	7,5	44,5	78	80,0
37810625	6 x 2 x 0,25	0,11	7,7	49,6	86	80,0
37810725	7 x 2 x 0,25	0,11	8,0	56,3	99	80,0
37810825	8 x 2 x 0,25	0,11	9,6	65,0	125	80,0
37811225	12 x 2 x 0,25	0,11	10,8	104,3	158	80,0
37810850	8 x 2 x 0,50	0,11	12,1	129,7	211	40,1

Other dimensions and colours are possible on request.

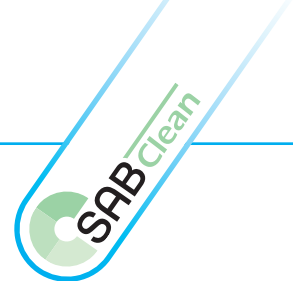


Cleanroom classification
DIN EN ISO 14644-1
air cleanliness class 1

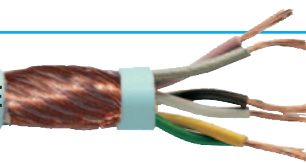
Torsion Cables

SAB^{clean} RT 123 D TP (B)

torsional data cable with twisted pairs and overall copper screen



80°C 300V CSA AWM I/II A/B 80°C 300V FT1 FT2 CE



Marking for SAB^{clean} RT 123 D TP (B):

SAB BRÖCKSKES · D-VIERSEN · SAB Clean RT 123 D TP (B) AWM Style 20233 80°C 300V CSA AWM I/II A/B 80°C 300V FT1 FT2 CE

Construction:

Conductor:	bare copper strands, extra fine wire, with reference to VDE 0812
Insulation:	TPE
Colour code:	colour code US 2
Stranding:	cores twisted to pairs in specially adjusted layering
Wrapping:	netting tape, non-woven tape
Screen:	wrapped with bare copper wires
Drain wire:	bare copper strands, extra fine wire 0,34 mm ²
Wrapping:	non-woven tape
Sheath material:	TPE
Sheath colour:	whitegreen (RAL 6019)

Technical data:

Peak operating voltage:	max. 350 V	
Voltage UL/CSA:	300 V	
Testing voltage:	core/core	2000 V
	core/screen	2000 V
Torsion angle:	up to ± 450°/1 m	
Min. bending radius <i>continuously flexible:</i>	7,5 x d	
Temperature range	DIN VDE	UL/CSA: up to +80 °C
<i>fixed laying:</i>	-50/+70 °C	
<i>flexible application:</i>	-40/+70 °C	
Air cleanliness class 1:	acc. to DIN EN ISO 14644-1	
Absence of harmful substances:	acc. to RoHS directive of the European Union	

Outstanding features:



- rugged and reliable
- torsion angle up to ± 450° over 1 m

item no.	no. of pairs x cross section n x 2 x mm ²	largest single wire ø mm	outer-ø ± 5% mm	copper figure kg/km	cable weight ≈ kg/km
on request	3 x 2 x 0,34	0,11	7,7	37,7	69
	4 x 2 x 0,34	0,11	8,6	44,5	82

Other dimensions and colours are possible on request.



Cleanroom classification
DIN EN ISO 14644-1
air cleanliness class 1

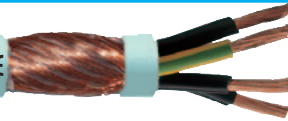
Torsion Cables

SAB^{clean} RT 793 D

torsional control cable with overall copper screen



60 80°C 600V CSA AWM I/II A/B 80°C 600V FT1 FT2 CE



Marking for SAB^{clean} SD 787 C TP 37930415:

SAB BRÖCKSKES · D-VIERSEN · 4 x 1,5 mm² SAB Clean RT 793 D 16 AWG/4c 37930415

AWM Style 21060 80°C 600V CSA AWM I/II A/B 80°C 600V FT1 FT2 CE

Construction:

Conductor:	bare copper strands acc. to IEC 60228, VDE 0295, class 6
Insulation:	TPE
Colour code:	black cores with consecutive numbers acc. to EN 50334 + VDE 0293-334, green-yellow earth wire from 3 cores
Stranding:	specially adjusted layering
Wrapping:	netting tape, non-woven tape
Screen:	wrapped with bare copper wires
Wrapping:	non-woven tape
Sheath material:	TPE
Sheath colour:	whitegreen (RAL 6019)

Technical data:

Nominal voltage:	U ₀ /U 300/500 V	
Voltage UL/CSA:	600 V	
Testing voltage:	core/core	3000 V
	core/screen	2000 V
Torsion angle:	up to ± 360°/1 m	
Min. bending radius <i>continuously flexible:</i>	7,5 x d	
Temperature range	DIN VDE	UL/CSA: up to +80 °C
<i>fixed laying:</i>	-50/+70 °C	
<i>flexible application:</i>	-40/+70 °C	
Air cleanliness class 1:	acc. to DIN EN ISO 14644-1	
Absence of harmful substances:	acc. to RoHS directive of the European Union	

Outstanding features:



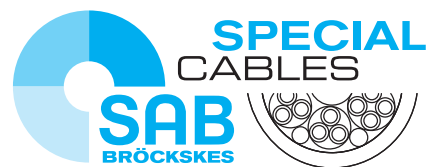
- rugged and reliable
- torsion angle up to ± 360° over 1 m

item no.	no. of cores x cross section n x mm ²	largest single wire ø mm	outer-ø ± 5% mm	copper figure kg/km	cable weight ≈ kg/km	ohmic resistance at 20 °C max. Ω/km
37930505	5 x 0,50	0,16	8,7	40,3	99	39,0
37930415	4 x 1,50	0,16	9,6	88,3	145	13,3
37931215	12 x 1,50	0,16	14,1	216,4	317	13,3
37930225	2 x 2,50	0,16	9,8	80,7	140	7,98
37930425	4 x 2,50	0,16	11,0	130,9	192	7,98

Other dimensions and colours are possible on request.



Cleanroom classification
DIN EN ISO 14644-1
air cleanliness class 1



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