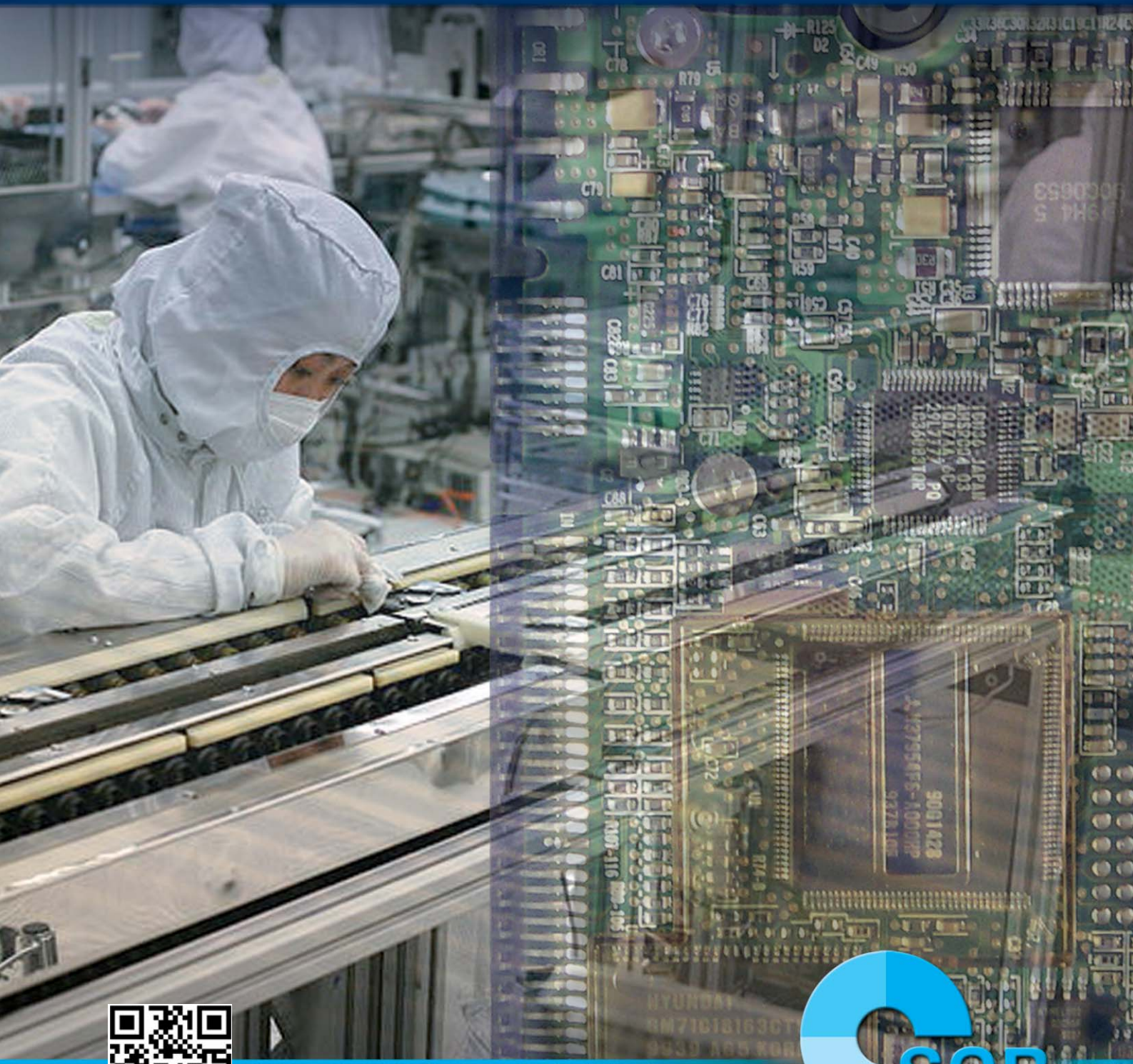


Cleanroom Cables



www.sab-worldwide.com



Content

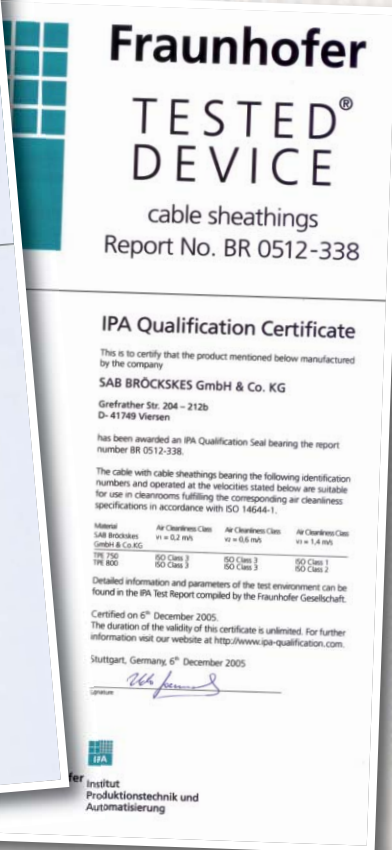
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THE COMPANY

More than 60 years of experience in temperature measurement and control technique as well as in cable production have made a one man business a company with nearly 500 staff members. Our strength is not only the production of standard products but also the development and manufacturing of special products acc. to customers' specifications. Every year we manufacture more than 1500 special products on our customer's request. Every single product is a challenge for our technical team.

We at SAB Bröckskes see ourselves as manufacturer and service provider - in the sense of real partnership and customer oriented work. The quality of our products is known in more than 40 countries of the world. Our customers have tested our products intensively and confirm that they have a longer service life than others. In all product ranges we are certified acc. to ISO 9001:2008. Besides we established an environmental management system for our company acc. to ISO 14001:2004, an occupational health and safety management acc. to NLF/ILO-OSH 2001 and OHSAS 18001:2007 as well as an energy management system acc. to DIN EN 16001:2009. And our future slogan is: **We go forward!**



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

Application examples:

SAB^{clean} cables are used in clean rooms.

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 ISO 14644-1 and US Federal Standard 209 E.

SAB_{clean} SD 776 continuously flexible data cable



· D-VIERSEN · SAB Clean SD 776 · 14 x 0,25 mm² CE RoHS



Marking for SAB_{clean} SD 776 37761402:

SAB BRÜCKSKES · D-VIERSEN · SAB Clean SD 776 · 14 x 0,25 mm² CE RoHS

Construction:

Conductor:	bare copper strands, extra fine wire
Insulation:	TPE
Colour code:	with reference to DIN 47100
Stranding:	specially adjusted layering
Wrapping:	non-woven tape
Sheath material:	TPE
Sheath colour:	black (RAL 9005)

Technical data:

Peak operating voltage:	max. 350 V
Testing voltage:	1500 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 14644-1 US Federal Standard 209 E
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
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
37760705	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

Other dimensions and colours are possible on request.



Cleanroom classification
DIN EN ISO 14644-1
air cleanliness class 1,
US Federal Standard 209 E
air cleanliness class 1.

SAB^{clean} S 776 continuously flexible control cable



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

Construction:

Conductor:	bare copper strands acc. to IEC 60228, EN 60228, VDE 0295, class 6
Insulation:	TPE
Colour code:	black cores with consecutive numbers acc. to EN 50334; green-yellow earth wire from 3 cores
Stranding:	specially adjusted layering
Wrapping:	non-woven tape
Sheath material:	TPE
Sheath colour:	black (RAL 9005)

Technical data:

Nominal voltage:	U ₀ /U 300/500 V
Testing voltage:	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 14644-1 US Federal Standard 209 E
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
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,
US Federal Standard 209 E
air cleanliness class 1.

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

D-VIERSEN · SAB Clean SD 780 · 18 x 0,34 mm² CE RoHS



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

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

Construction:

Conductor:	bare copper strands, extra fine wire
Insulation:	TPE
Colour code:	with reference to DIN 47100
Stranding:	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	
<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 14644-1 US Federal Standard 209 E
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*

* Copper braiding should be connected circularly to optimize the 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
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

Other dimensions and colours are possible on request.



Cleanroom classification
DIN EN ISO 14644-1
air cleanliness class 1,
US Federal Standard 209 E
air cleanliness class 1.

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



Marking for SAB^{clean} S 780 C 37800410:
SAB BRÖCKSKES · D-VIERSEN · SAB Clean S 780 C · 4 G 100 mm² CE RoHS

Construction:

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

Technical data:

Nominal voltage:	U ₀ /U 300/500 V
Testing voltage:	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 14644-1 US Federal Standard 209 E
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*

* Copper braiding should be connected circularly to optimize the 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
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,
US Federal Standard 209 E
air cleanliness class 1.

SAB_{clean} SD 787 C TP continuously flexible data cable with twisted pairs and overall copper screen

VIENNA · D · VIENNA · SAB Clean SD 787 C TP · 7 x 2 x 0,25mm² CE RoHS



Marking for SAB_{clean} SD 787 C TP 37810725:

SAB BRÜCKSKES · D-VIERSEN · SAB Clean SD 787 C TP · 7 x 2 x 0,25mm² CE RoHS

Construction:

Conductor:	tinned copper strands, extra fine wire with reference to DIN VDE 0812
Insulation:	TPE
Colour code:	with reference to DIN 47100
Stranding:	cores twisted to pairs, pairs twisted 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	
<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 14644-1 US Federal Standard 209 E
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*

* Copper braiding should be connected circularly to optimize the EMC characteristics

item no.	no. of cores 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

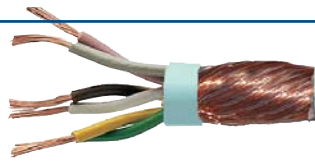
Other dimensions and colours are possible on request.



Cleanroom classification
DIN EN ISO 14644-1
air cleanliness class 1,
US Federal Standard 209 E
air cleanliness class 1.



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 3793900

Marking for SAB^{clean} RT 123 D TP (B) 37939001:

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 37939001

Construction:

Conductor:	bare copper strands, extra fine wire, with reference to DIN 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:	DIN VDE 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:	continuously flexible 7,5 x d	
Temperature range	DIN VDE	UL/CSA
<i>fixed laying:</i>	-50/+70 °C	up to +80 °C
<i>flexible application:</i>	-40/+70 °C	up to +80 °C
Air cleanliness class 1:	acc. to DIN EN 14644-1 US Federal Standard 209 E	
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 cores 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
37939001	3 x 2 x 0,34	0,11	7,7	37,7	69
37939002	4 x 2 x 0,34	0,11	8,6	44,5	82

Other dimensions and colours are possible on request.

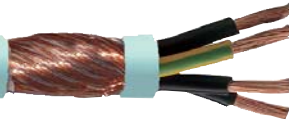


Cleanroom classification
DIN EN ISO 14644-1
air cleanliness class 1,
US Federal Standard 209 E
air cleanliness class 1.



SAB^{clean} RT 793 D torsional control cable with twisted pairs and overall copper screen

1060 80°C 600V CSA AWM I/II A/B 80°C 600V FT1 FT2 CE



Marking for SAB^{clean} RT 793 D 37930415:

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

UL 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, EN 60228, VDE 0295, class 6
Insulation:	TPE
Colour code:	black cores with consecutive numbers acc. to EN 50334; green-yellow earth wire from 3 cores
Stranding:	cores twisted to pairs in specially adjusted layering
Wrapping:	netting tape, non-woven tape
Screen:	wrapped with bare copper wires
Wrapping:	non-woven tape
Sheath material:	TPE
Sheath colour:	whitgreen (RAL 6019)

Technical data:

Nominal voltage U₀/U:	DIN VDE 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:	continuously flexible 7,5 x d	
Temperature range	DIN VDE	UL/CSA
<i>fixed laying:</i>	-50/+70 °C	up to +80 °C
<i>flexible application:</i>	-40/+70 °C	up to +80 °C
Air cleanliness class 1:	acc. to DIN EN 14644-1 US Federal Standard 209 E	
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,
US Federal Standard 209 E
air cleanliness class 1.



SAB_{clean} RT 795 D halogen-free torsional control cable with twisted pairs and overall copper screen



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

Marking for SAB_{clean} RT 795 D 37950425:

SAB BRÖCKSKES · D-VIERSEN · 37950425 4 x 2,5 mm² SAB Clean RT 795 D 14 AWG/4c 37951404

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

Construction:

Conductor:	bare copper strands, extra fine wire, with reference to DIN VDE 0812
Insulation:	TPE
Colour code to 0,34 mm²:	with reference to DIN 47100
Colour code from 0,50 mm²:	black cores with consecutive numbers acc. to EN 50334; green-yellow earth wire from 3 cores
Stranding:	specially adjusted layering
Wrapping:	netting tape
Wrapping:	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 U₀/U:	DIN VDE 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:	continuously flexible 7,5 x d	
Temperature range	DIN VDE	UL/CSA
<i>fixed laying:</i>	-50/+90 °C	up to +80 °C
<i>flexible application:</i>	-40/+90 °C	up to +80 °C
Halogen-free:	acc. to IEC 60754-1 and DIN VDE 0472 part 815	
Air cleanliness class 1:	acc. to US Federal Standard 209 E	
Air cleanliness class 2:	acc. to DIN EN 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
- halogen-free

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
37950303	3 x 0,34	0,11	4,1	18,4	27	57,4
37950403	4 x 0,34	0,11	4,4	21,7	32	57,4
37950505	5 x 0,50	0,11	6,1	34,6	58	39,0
37951005	10 x 0,50	0,11	8,1	64,2	98	39,0
37951505	15 x 0,50	0,11	9,3	88,5	138	39,0
37952505	25 x 0,50	0,11	11,6	162,6	219	39,0
37950225	2 x 2,50	0,16	9,8	77,3	126	7,98
37950425	4 x 2,50	0,16	11,0	128,6	188	7,98

Other dimensions and colours are possible on request.



Cleanroom classification
DIN EN ISO 14644-1
air cleanliness class 2,
US Federal Standard 209 E
air cleanliness class 1.



FLEXIBLE CABLES

- Halogen-free cables ■ Cable track cables
- Servo motor cables ■ ETFE, FEP, PFA cables
 - Bus cables ■ Torsion cables
- Hybrid and special cables ■ Control and connection cables
 - Data cables ■ Besilen® (Silicone) cables
- Compensating and extension cables ■ Tray cables

TEMPERATURE MEASUREMENT

- Protecting armatures and gauge slides
- Mineral insulated thermocouples and Mineral insulated resistance thermometers
- Temperature measurement in plastic processing industry/Hot runner technique
 - Diesel thermocouples ■ Probe with stainless steel sleeve
 - Temperature measurement in test vehicles
 - Measurement techniques

CABLE HARNESSING

- Harnessed cables acc. to customer's specification
 - Harnessed cable track cables
 - Helix cables ■ Cable harnesses
- Harnessed motor and transmission cables for Siemens and Indramat drives