

BlueLine Cables for Shipbuilding



www.sab-worldwide.com



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■ Applications

Our halogen-free SABIX® BlueLine cables are appropriate for flexible use below deck as well as on deck of ships with protected laying without being in permanent contact with oils and fuels. The flexible construction and small diameter enables a comfortable laying even in narrow spaces.

Our type BlueLine TA 180 C is appropriate for use under extreme ambient conditions. It is applied in machine rooms on ships for example as connection cable for the control of ships diesel engines. It shows a very good resistance against high temperatures as well as against oils and chemicals.

The Company



DIN EN ISO 9001

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 ISO 50001:2011. And our future slogan is: **We go forward!**

founded:

- 1947 by Peter Bröckskes sen.
- an independent, middle sized company

CEO:

- Peter Bröckskes

plant/location:

- in Viersen (lower Rhine) 110.000 m² company site
- manufacturing from copper conductor to outer sheath,
- own VDE proofed burnchamber and laboratory

employees/workers:

- approx. 420 at the plant in Viersen, 500 worldwide

yearly sales:

- approx. 95 Mio. € worldwide

products:

- Special Cables ■ Temperature Measurement ■ Cable Harnessing

certificates and approvals:

- quality management system acc. to ISO 9001:2008 for every manufacturing field
- environmental management system acc. to ISO 14001:2004
- occupational health and safety management acc. to NLF/ILO-OSH 2001 and OHSAS 18001:2007
- energy management system acc. to DIN EN ISO 50001:2011



**MIL, VDE, HAR, IEC, GL, DNV, BV, KR,
ABS, NK, RINA, LR, C€**

SAB - Worldwide



From our central stock in Viersen-Süchteln or our external stocks we supply standard lengths as well as special dimensions, often within 24 hours. It is our strength to be at different places at the same time. This shows also our wide product range. Being always ready to deliver our products of constant quality is one of the premises at SAB BRÖCKSKES. Challenge, obligation - but also guarantee at the same time. This is your advantage - we are present whenever you need our assistance.



Viersen - Germany
1947



Viersen - Germany
1995



Bergeijk - Netherlands
1995



Auxerre - France
1996



Nantes - France
1998



Fairfield - USA
2001



Shanghai - China
2004



Zapopan - Mexico
2004



Chung-Buk - Korea
2005



Faridabad - India
2006



Taipei County - Taiwan
2007



Yekaterinburg - Russia
2012

Our strengths



PROBLEM SOLUTIONS

- you need assistance - we act fast and competently
- our expertise - your solution

SERVICE AROUND THE CLOCK

- optimal support at any hour
- your direct wire to our service team
- for emergencies outside of our office hours
contact us under: 0173 / 28 68 408

FLEXIBILITY

- productions starting from a length of 100 m
- cable development customized to your request

SPEED

- from the development to the distribution
in maximum speed

HIGH QUALITY

- highest quality by
quality management system
acc. to ISO 9001:2008
- environmental management system
acc. to DIN EN ISO 14001:2004
- occupational health and safety management
acc. to NLF/ILO-OSH 2001 and OHSAS 18001:2007
- energy management system acc. to DIN EN 16001:2009

Selection table

► Germanischer Lloyd



SABIX® BlueLine Data	18745-11 HH
SABIX® BlueLine Control	18744-11 HH
SABIX® BlueLine Power	18743-11 HH
BlueLine TA 180 C	2498205 HH

► Lloyd's Register



SABIX® BlueLine Data	11/20026
SABIX® BlueLine Control	11/20024
SABIX® BlueLine Power	11/20027

► American Bureau of Shipping



SABIX® BlueLine Data	11-HG747543-PDA
SABIX® BlueLine Control	11-HG747543A-PDA
SABIX® BlueLine Power	11-HG747543B-PDA

Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested in accordance with the relevant requirements of the GL Type Approval System.

Certificate No. 18743 - 11 HH

Company SAB BROECKSKES GmbH & Co. KG
Grefrather Straße 204-212 b
41749 Viersen, GERMANY

Product Description Halogen free flame retardant energy cable with optional screen

Type SABIX BL 416 FRNC
SABIX BL 412 C FRNC

Environmental Category None

Technical Data / Range of Application Rated voltage: 0.6 / 1 kV
Maximum operating conductor temperature: 90° C
Conductor: Bare or tinned copper, fine stranded class 5 or class 6
Insulation: FRNC
Screen/Armor: Optional copper or steel wire braiding
Outer sheath: FRNC

Number of cores: 2 to 51
Cross-sectional area: 0.5 mm² to 50 mm²

Test Standard IEC 60952-310-1996, IEC 60332-1-2-2004, IEC 60332-3-22-2006, IEC 60332-3-25-2006
IEC 61034-2-2005, EN 50266-3-25-2006, EN 50267-2-102-1999

Documents Test reports: SAB 12/111 dated 15.03.2011, SAB 04/111 dated 25.01.2011,
YOE 493289-9021-0011/14041 dated 21.01.2011,
Currenta 081302, 091303, 091304, 09/1298, 09/1299,
09/1306, 09/1310, 09/1311, 09/1312

Remarks None

Valid until 2016-03-18

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File No. LN-01

Hamburg, 2011-06-20

Germanischer Lloyd

Christoph Kutzner
Carsten Hunsalz

Type Approval Symbol GL

This certificate is issued on the basis of "Guidelines for the Performance of Type Approvals Part 1: Procedure"

Lloyd's Register

Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the LR Type Approval System.

This certificate is issued to:

PRODUCER SAB BROECKSKES GmbH & Co. KG

PLACE OF PRODUCTION Grefrather Str. 204 - 212 b
41749 Viersen
Germany

DESCRIPTION Halogen free, flame retardant data cable with optional screen
U_i/U_m = 150/250V
U_m = 350V (maximum)

TYPE SABIX BL 405 FRNC (without screen)
SABIX BL 415 C FRNC (with screen)
SABIX BL 445 C FRNC TP (with screen and twisted pairs)

APPLICATION Flexible data cable for instrumentation circuits for fixed electrical installation in ships and on offshore platforms.

STANDARDS Product Specification SABIX BL 405, 415 and 445 - Version C (06.05.2011)
EN 50290-2-26 (VDE 0819-106): 2008
EN 50290-2-27 (VDE 0819-107): 2008
EN 50288-7 (VDE 0819-7): 2006

RATING Cross section: 0.14...2.5mm²

OTHER CONDITIONS An overall tinned copper braid is recommended whenever electrical interference distorts signal transmission or when EMI emissions need to be suppressed.

Certificate No. 11/20026

Issue Date 29 June 2011

Expiry Date 28 June 2016

Sheet 1 of 2

Martin Lange
Hamburg Design Support Centre
Lloyd's Register EMEA

Lloyd's Register EMEA
71 Fenchurch Street, London EC3M 4BS

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ABS

CERTIFICATE OF DESIGN ASSESSMENT

This is to Certify that a representative of this Bureau did, at the request of
SAB BROECKSKES GMBH - VIERSEN

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

PRODUCT Cable, Flame Retardant Halogen Free Electric Cables

MODEL SABIX BL 410 FRNC, SABIX BL 412 C FRNC screened

This Product Design Assessment (PDA) Certificate 11-HG747543B-PDA, dated 11 May 2011 remains valid until 13 May 2016 or until the Rules or specifications used in the assessment are revised (whichever occurs first).

This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction at the date of the ABS Rules or specifications used to evaluate the Product.

Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA.

Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

AMERICAN BUREAU OF SHIPPING

Michael R. V. Zach
Engineer

10011: This certificate complies with our Rules, Guidelines, standards or other criteria of ABS as a primary standard in manufacturing standards. In order to be used for other than the intended purpose, the user must obtain approval from ABS. This approval is not a guarantee of performance and will not be a warranty or endorsement of the product or service. ABS Rules, Guidelines, standards and other criteria are subject to change without notice and are subject to the terms and conditions of the Rules, Guidelines, standards and other criteria.

Selection table

		Cable type							
		SABIX® BL 405 FRNC	SABIX® BL 415 C FRNC	SABIX® BL 445 C FRNC TP	SABIX® BL 400 FRNC	SABIX® BL 438 C FRNC	SABIX® BL 410 FRNC	SABIX® BL 412 C FRNC	BlueLine TA 180 C
Construction	data cable	x	x	x					
	control cable				x	x			x
	power cable						x	x	
	screened		x	x		x		x	x
	twisted pairs			x					
Temperature range fixed laying*	+ 180 °C								
	+ 90 °C								
	- 40 °C								
	- 55 °C								
Voltage range	peak operating voltage max. 350 V	x	x	x					
	nominal voltage U ₀ /U 300/500 V				x	x			x
	nominal voltage U ₀ /U 600/1000 V						x	x	
Standards	halogen-free acc. to IEC 60754-1 + EN 60332-1-2	x	x	x	x	x	x	x	
	flame retardant and self-extinguishing acc. to IEC 60332-1-2 + EN 60332-1-2	x	x	x	x	x	x	x	x
	no flame propagation acc. to IEC 60332 -3-22 + DIN EN 60332-3-22	x	x	x	x	x	x	x	x
	smoke density acc. to IEC 61034 + EN 61034	x	x	x	x	x	x	x	
	corrosiveness of conflagration gases IEC 60754-2 + DIN EN 50267-2-2	x	x	x	x	x	x	x	
Type approvals	Germanischer Lloyd	x	x	x	x	x	x	x	x
	Lloyd's Register	x	x	x	x	x	x	x	
	American Bureau of Shipping	x	x	x	x	x	x	x	
Characteristics	flexible conductor stranding	x	x	x	x	x	x	x	x
	extended cross section range	x	x	x					
	oil resistance								x
	chemical resistance								x

from
to

*The temperature range for flexible application is mentioned on the corresponding catalogue page

SABIX® BL 405 FRNC halogen-free flexible data cable

BL = BlueLine

Data Cable 16 x 0,5 mm²  **ABS** Assessed · Lloyd's Register 

Marking for SABIX BL 405 FRNC 64051650:

SAB BRÖCKSKES · D-VIERSEN · SABIX BL 405 FRNC · Data Cable 16 x 0,5 mm²  **ABS** Assessed · Lloyd's Register **Construction:**

Conductor:	tinned copper strands acc. to DIN VDE 0812 resp. IEC 60228, EN 60228, VDE 0295, class 5
Insulation:	special SABIX®
Colour code:	with reference to DIN 47100
Stranding:	in layers
Sheath material:	special SABIX®
Sheath colour:	pigeon blue (RAL 5014)

Outstanding features:

- halogen-free
- asbestos-free
- no flame propagation
- flame retardant and self-extinguishing
- flexible
- approvals:
Germanischer Lloyds
Lloyd's Register
American Bureau of Shipping

Technical data:

Peak operating voltage:	max. 350 V
Testing voltage:	1500 V
Min. bending radius	
fixed laying:	5 x d
flexible application:	10 x d
Temperature range	
fixed laying:	-40/+90 °C
flexible application:	-30/+90 °C
Halogen-free:	acc. to EN 50267-2-1 + IEC 60754-1
Fire performance:	no flame propagation acc. to IEC 60332-3-22 + DIN EN 60332-3-22 cat. A. Flame retardant and self-extinguishing acc. to IEC 60332-1-2 + DIN EN 60332-1-2
Corrosiveness of conflagration gases:	in compliance with IEC 60754-2 + DIN EN 50267-2-2 - no development of corrosive conflagration gases
Smoke density:	acc. to IEC 61034 + EN 61034
Flexibility:	very good
Absence of harmful substances:	acc. to RoHS directive of the European Union

Possible on request:

- bare copper strands
- alternative colour code and sheath colour

for an improved uv resistance we recommend a black outer sheath

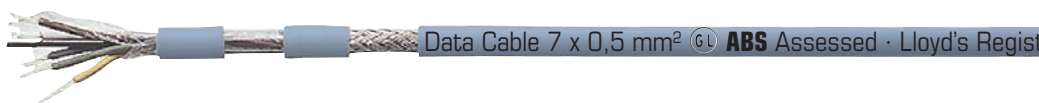
item no.	no. of cores x cross section n x mm ²	outer-ø ± 5% mm	copper figure kg/km	cable weight ≈ kg/km
64050214	2 x 0,14	3,6	2,7	18
64050314	3 x 0,14	3,8	4,0	21
64050414	4 x 0,14	4,1	5,4	24
64050514	5 x 0,14	4,5	6,7	29
64050614	6 x 0,14	4,8	8,1	33
64050714	7 x 0,14	4,8	9,4	35
64050814	8 x 0,14	5,5	10,8	42
64051214	12 x 0,14	6,3	16,1	56
64051614	16 x 0,14	7,0	21,5	70
64050225	2 x 0,25	3,9	4,8	22
64050325	3 x 0,25	4,1	7,2	26
64050425	4 x 0,25	4,5	9,6	31
64050525	5 x 0,25	4,9	12,0	37
64050625	6 x 0,25	5,3	14,4	43
64050725	7 x 0,25	5,3	16,8	46
64050825	8 x 0,25	6,2	19,2	57
64051225	12 x 0,25	7,0	28,8	74
64051625	16 x 0,25	7,7	38,4	93
64050234	2 x 0,34	4,3	6,5	28
64050334	3 x 0,34	4,6	9,8	33
64050434	4 x 0,34	5,0	13,1	39
64050534	5 x 0,34	5,4	16,3	47
64050634	6 x 0,34	6,1	19,6	58

item no.	no. of cores x cross section n x mm ²	outer-ø ± 5% mm	copper figure kg/km	cable weight ≈ kg/km
64050734	7 x 0,34	6,1	22,8	61
64050834	8 x 0,34	7,0	26,1	73
64051234	12 x 0,34	7,8	39,2	95
64051634	16 x 0,34	9,0	52,5	129
64050250	2 x 0,50	4,7	9,6	35
64050350	3 x 0,50	5,0	14,4	42
64050450	4 x 0,50	5,4	19,2	50
64050550	5 x 0,50	6,1	24,0	64
64050650	6 x 0,50	6,7	28,8	74
64050750	7 x 0,50	6,7	33,6	79
64050850	8 x 0,50	7,7	38,4	95
64051250	12 x 0,50	9,0	57,6	133
64051650	16 x 0,50	10,0	76,8	169
64050275	2 x 0,75	5,2	14,4	43
64050375	3 x 0,75	5,5	21,6	52
64050475	4 x 0,75	6,2	28,8	66
64050575	5 x 0,75	6,8	36,0	79
64050675	6 x 0,75	7,4	43,2	92
64050775	7 x 0,75	7,4	50,4	99
64050875	8 x 0,75	8,8	57,6	126
64051275	12 x 0,75	10,1	86,4	166
64051675	16 x 0,75	11,1	115,2	212

Other dimensions and colours are possible on request.

SABIX® BL 415 C FRNC halogen-free flexible data cable with overall copper screen

BL = BlueLine

Data Cable 7 x 0,5 mm² GL ABS Assessed · Lloyd's Register

Marking for SABIX BL 415 C FRNC 64150750:

SAB BRÖCKSKES · D-VIERSEN · SABIX BL 415 C FRNC · Data Cable 7 x 0,5 mm² GL ABS Assessed · Lloyd's Register CE**Construction:**

Conductor:	tinned copper strands acc. to DIN VDE 0812 resp. IEC 60228, EN 60228, VDE 0295, class 5
Insulation:	special SABIX®
Colour code:	with reference to DIN 47100
Stranding:	in layers
Wrapping:	PETP foil
Screen:	tinned copper braiding
Sheath material:	special SABIX®
Sheath colour:	pigeon blue (RAL 5014)

Outstanding features:

- halogen-free
- asbestos-free
- good EMC characteristics*
- no flame propagation
- flame retardant and self-extinguishing
- flexible
- approvals:
Germanischer Lloyds
Lloyd's Register
American Bureau of Shipping

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

Technical data:

Peak operating voltage:	max. 350 V
Testing voltage:	1500 V
Min. bending radius	
fixed laying:	5 x d
flexible application:	10 x d
Temperature range	
fixed laying:	-40/+90 °C
flexible application:	-30/+90 °C
Halogen-free:	acc. to EN 50267-2-1 + IEC 60754-1
Fire performance:	no flame propagation acc. to IEC 60332-3-22 + DIN EN 60332-3-22 cat. A. Flame retardant and self-extinguishing acc. to IEC 60332-1-2 + DIN EN 60332-1-2
Corrosiveness of conflagration gases:	in compliance with IEC 60754-2 + DIN EN 50267-2-2 - no development of corrosive conflagration gases
Smoke density:	acc. to IEC 61034 + EN 61034
Flexibility:	very good
Absence of harmful substances:	acc. to RoHS directive of the European Union

Possible on request:

- bare copper strands
- alternative colour code and sheath colour

for an improved uv resistance we recommend a black outer sheath

item no.	no. of cores x cross section n x mm ²	outer-ø ± 5% mm	copper figure kg/km	cable weight ≈ kg/km
64150214	2 x 0,14	4,1	13,0	25
64150314	3 x 0,14	4,3	14,4	29
64150414	4 x 0,14	4,6	19,3	35
64150514	5 x 0,14	5,0	20,7	40
64150614	6 x 0,14	5,3	22,2	43
64150714	7 x 0,14	5,3	23,5	45
64150814	8 x 0,14	6,2	28,4	57
64151214	12 x 0,14	6,8	35,8	70
64151614	16 x 0,14	7,5	43,0	85
64150225	2 x 0,25	4,4	18,6	32
64150325	3 x 0,25	4,6	21,1	36
64150425	4 x 0,25	5,0	23,6	41
64150525	5 x 0,25	5,4	27,9	49
64150625	6 x 0,25	5,8	30,5	54
64150725	7 x 0,25	5,8	32,9	57
64150825	8 x 0,25	6,7	38,8	71
64151225	12 x 0,25	7,5	50,3	89
64151625	16 x 0,25	8,6	62,2	118
64150234	2 x 0,34	4,8	20,5	37
64150334	3 x 0,34	5,1	23,8	42
64150434	4 x 0,34	5,5	29,0	50
64150534	5 x 0,34	6,1	32,4	61
64150634	6 x 0,34	6,6	39,1	71

item no.	no. of cores x cross section n x mm ²	outer-ø ± 5% mm	copper figure kg/km	cable weight ≈ kg/km
64150734	7 x 0,34	6,6	42,4	75
64150834	8 x 0,34	7,5	47,6	88
64151234	12 x 0,34	8,7	65,3	121
64151634	16 x 0,34	9,5	81,2	149
64150250	2 x 0,50	5,2	23,7	43
64150350	3 x 0,50	5,5	30,3	52
64150450	4 x 0,50	6,1	35,3	64
64150550	5 x 0,50	6,6	43,5	77
64150650	6 x 0,50	7,2	50,1	85
64150750	7 x 0,50	7,2	54,9	90
64150850	8 x 0,50	8,6	62,2	116
64151250	12 x 0,50	9,5	86,6	152
64151650	16 x 0,50	10,7	124,5	201
64150275	2 x 0,75	5,7	30,4	52
64150375	3 x 0,75	6,2	39,2	65
64150475	4 x 0,75	6,7	48,4	78
64150575	5 x 0,75	7,3	57,4	93
64150675	6 x 0,75	7,9	66,9	106
64150775	7 x 0,75	7,9	74,1	114
64150875	8 x 0,75	9,3	83,9	142
64151275	12 x 0,75	10,8	134,2	194
64151675	16 x 0,75	11,8	169,6	247

Other dimensions and colours are possible on request.

SABIX® BL 445 C FRNC TP halogen-free flexible paired data cable with overall copper screen

BL = BlueLine

3 x 2 x 0,25 mm² GL ABS Assessed · Lloyd's Register CE



Marking for SABIX BL 445 C FRNC TP 64450325:

SAB BRÖCKSKES · D-VIERSEN · SABIX BL 445 C FRNC TP · Data Cable 3 x 2 x 0,25 mm² GL ABS Assessed · Lloyd's Register CE



Construction:

Conductor:	tinned copper strands acc. to DIN VDE 0812 resp. IEC 60228, EN 60228, VDE 0295, class 5
Insulation:	special SABIX®
Colour code:	with reference to DIN 47100
Stranding:	pairwise, pairs in layers
Wrapping:	PETP foil
Screen:	tinned copper braiding
Sheath material:	special SABIX®
Sheath colour:	pigeon blue (RAL 5014)

Outstanding features:

- halogen-free
- asbestos-free
- good EMC characteristics*
- good transmission rates and crosstalk attenuation
- no flame propagation
- flame retardant and self-extinguishing
- flexible
- approvals:
Germanischer Lloyd's
Lloyd's Register
American Bureau of Shipping

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

Technical data:

Peak operating voltage:	max. 350 V
Testing voltage:	1500 V
Min. bending radius <i>fixed laying:</i> <i>flexible application:</i>	5 x d 10 x d
Temperature range <i>fixed laying:</i> <i>flexible application:</i>	-40/+90 °C -30/+90 °C
Halogen-free:	acc. to EN 50267-2-1 + IEC 60754-1
Fire performance:	no flame propagation acc. to IEC 60332-3-22 + DIN EN 60332-3-22 cat. A. Flame retardant and self-extinguishing acc. to IEC 60332-1-2 + DIN EN 60332-1-2
Corrosiveness of conflagration gases:	in compliance with IEC 60754-2 + DIN EN 50267-2-2 - no development of corrosive conflagration gases
Smoke density:	acc. to IEC 61034 + EN 61034
Flexibility:	very good
Absence of harmful substances:	acc. to RoHS directive of the European Union

Possible on request:

- bare copper strands
- alternative colour code and sheath colour

for an improved uv resistance we recommend a black outer sheath

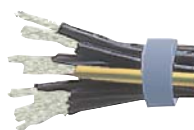
item no.	no. of pairs x cross section n x 2 x mm ²	outer-ø ± 10% mm	copper figure kg/km	cable weight ≈ kg/km
64450214	2 x 2 x 0,14	5,3	19,5	37
64450314	3 x 2 x 0,14	5,8	21,4	44
64450414	4 x 2 x 0,14	6,8	30,4	58
64450514	5 x 2 x 0,14	7,4	34,9	68
64450614	6 x 2 x 0,14	7,6	39,8	76
64450814	8 x 2 x 0,14	8,7	47,6	98
64451014	10 x 2 x 0,14	9,5	55,9	114
64451214	12 x 2 x 0,14	10,6	79,9	142
64451814	18 x 2 x 0,14	12,4	102,9	200
64450225	2 x 2 x 0,25	5,8	25,7	44
64450325	3 x 2 x 0,25	6,5	32,1	57
64450425	4 x 2 x 0,25	7,4	40,6	71
64450525	5 x 2 x 0,25	8,7	50,1	96
64450625	6 x 2 x 0,25	8,7	54,9	104
64450825	8 x 2 x 0,25	9,1	67,4	121
64451025	10 x 2 x 0,25	10,6	95,7	156
64451225	12 x 2 x 0,25	11,6	111,9	180
64451825	18 x 2 x 0,25	13,8	171,9	272
64452625	26 x 2 x 0,25	16,3	223,2	368
64450234	2 x 2 x 0,34	6,4	30,7	56
64450334	3 x 2 x 0,34	7,2	40,9	71
64450434	4 x 2 x 0,34	8,7	52,3	97
64450534	5 x 2 x 0,34	9,4	61,6	115

item no.	no. of pairs x cross section n x 2 x mm ²	outer-ø ± 10% mm	copper figure kg/km	cable weight ≈ kg/km
64450634	6 x 2 x 0,34	9,6	68,2	128
64450834	8 x 2 x 0,34	10,8	100,0	164
64451034	10 x 2 x 0,34	11,8	119,7	194
64451234	12 x 2 x 0,34	13,4	138,2	238
64451834	18 x 2 x 0,34	15,8	215,3	357
64450250	2 x 2 x 0,50	7,2	40,5	70
64450350	3 x 2 x 0,50	7,9	52,5	88
64450450	4 x 2 x 0,50	9,5	67,4	120
64450550	5 x 2 x 0,50	10,5	95,6	154
64450650	6 x 2 x 0,50	10,8	105,4	171
64450850	8 x 2 x 0,50	11,9	131,3	207
64451050	10 x 2 x 0,50	13,4	155,9	259
64451250	12 x 2 x 0,50	15,0	212,6	322
64451850	18 x 2 x 0,50	17,4	283,5	451
64450275	2 x 2 x 0,75	7,9	52,5	87
64450375	3 x 2 x 0,75	9,2	69,5	115
64450475	4 x 2 x 0,75	10,7	105,3	156
64450575	5 x 2 x 0,75	11,6	126,3	186
64450675	6 x 2 x 0,75	12,4	141,0	221
64450875	8 x 2 x 0,75	13,8	200,7	284
64451075	10 x 2 x 0,75	15,2	241,6	338
64451275	12 x 2 x 0,75	17,2	283,2	411
64451875	18 x 2 x 0,75	19,4	384,0	553

Other dimensions and colours are possible on request.

SABIX® BL 400 FRNC halogen-free flexible control cable 300/500 V

BL = BlueLine



FRNC · Control Cable 12 x 1,5 mm² GL ABS Assessed · Lloyd's Register



Marking for SABIX BL 400 FRNC 64001215:
SAB BRÖCKSKES · D-VIERSEN · SABIX BL 400 FRNC · Control Cable 12 x 1,5 mm² GL ABS Assessed · Lloyd's Register CE

Construction:

Conductor:	tinned copper strands acc. to IEC 60228, EN 60228, VDE 0295, class 5
Insulation:	special SABIX®
Colour code:	black conductors with consecutive numbers acc. to EN 50334 green-yellow earth wire from 3 conductors
Stranding:	in layers
Sheath material:	special SABIX®
Sheath colour:	pigeon blue (RAL 5014)

Outstanding features:

- halogen-free
- asbestos-free
- no flame propagation
- flame retardant and self-extinguishing
- flexible
- approvals:
Germanischer Lloyds
Lloyd's Register
American Bureau of Shipping

Technical data:

Nominal voltage:	U ₀ /U 300/500 V
Testing voltage U:	2000 V acc. to DIN VDE 0281 part 2 + HD 21.2
Min. bending radius	
fixed laying:	5 x d
flexible application:	10 x d
Temperature range	
fixed laying:	-40/+90°C
flexible application:	-30/+90°C
Halogen-free:	acc. to EN 50267-2-1 + IEC 60754-1
Fire performance:	no flame propagation acc. to IEC 60332-3-22 + DIN EN 60332-3-22 cat. A. Flame retardant and self-extinguishing acc. to IEC 60332-1-2 + DIN EN 60332-1-2
Corrosiveness of conflagration gases:	in compliance with IEC 60754-2 + DIN EN 50267-2-2 - no development of corrosive conflagration gases
Smoke density:	acc. to IEC 61034 + EN 61034
Flexibility:	very good
Absence of harmful substances:	acc. to RoHS directive of the European Union

Possible on request:



- bare copper strands
- alternative colour code and sheath colour

for an improved uv resistance we recommend a black outer sheath

item no.	no. of cores x cross section n x mm ²	outer-ø ± 5% mm	copper figure kg/km	cable weight ≈ kg/km
64000205	2 x 0,50	5,3	9,6	42
64000305	3 x 0,50	5,6	14,4	49
64000405	4 x 0,50	6,0	19,2	59
64000505	5 x 0,50	6,6	24,0	72
64000705	7 x 0,50	7,3	33,6	90
64001205	12 x 0,50	9,6	57,6	147
64001805	18 x 0,75	11,4	86,4	212
64000207	2 x 0,75	5,8	14,4	51
64000307	3 x 0,75	6,1	21,6	60
64000407	4 x 0,75	6,7	28,8	74
64000507	5 x 0,75	7,4	36,0	91
64000707	7 x 0,75	8,1	50,4	113
64001207	12 x 0,75	10,9	86,4	187
64001807	18 x 0,75	12,8	129,6	269
64000210	2 x 1,00	6,0	19,2	57
64000310	3 x 1,00	6,3	28,8	68
64000410	4 x 1,00	7,0	38,4	84
64000510	5 x 1,00	7,8	48,0	105

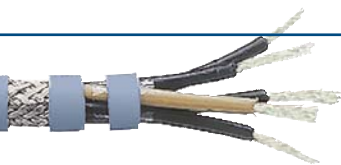
item no.	no. of cores x cross section n x mm ²	outer-ø ± 5% mm	copper figure kg/km	cable weight ≈ kg/km
64000710	7 x 1,00	8,4	67,2	131
64001210	12 x 1,00	11,3	115,2	216
64001810	18 x 1,00	13,5	172,8	318
64000215	2 x 1,50	6,7	28,8	73
64000315	3 x 1,50	7,0	43,2	89
64000415	4 x 1,50	7,9	57,6	112
64000515	5 x 1,50	8,6	72,0	136
64000715	7 x 1,50	9,5	100,8	174
64001215	12 x 1,50	12,7	172,8	287
64001815	18 x 1,50	15,3	259,2	426
64000225	2 x 2,50	8,1	48,0	111
64000325	3 x 2,50	8,6	72,0	137
64000425	4 x 2,50	9,5	96,0	171
64000525	5 x 2,50	10,6	120,0	212
64000725	7 x 2,50	11,7	168,0	272
64001225	12 x 2,50	15,7	288,0	452
64001825	18 x 2,50	18,9	432,0	670

Other dimensions and colours are possible on request.

SABIX® BL 438 C FRNC halogen-free flexible control cable with overall copper screen 300/500 V

BL = BlueLine

able 5 x 1,5 mm² GL ABS Assessed · Lloyd's Register CE



Marking for SABIX BL 438 C FRNC 64380515:

SAB BRÖCKSKES · D-VIERSEN · SABIX BL 438 C FRNC · Control Cable 5 x 1,5 mm² GL ABS Assessed · Lloyd's Register CE

Construction:

Conductor:	tinned copper strands acc. to IEC 60228, EN 60228, VDE 0295, class 5
Insulation:	special SABIX®
Colour code	black conductors with consecutive numbers acc. to EN 50334 green-yellow earth wire from 3 conductors
Stranding:	in layers
Wrapping:	PETP foil
Screen:	tinned copper braiding
Sheath:	special SABIX®
Sheath colour:	pigeon blue (RAL 5014)

Outstanding features:

- halogen-free
- asbestos-free
- good EMC characteristics*
- no flame propagation
- flame retardant and self-extinguishing
- flexible
- approvals:
Germanischer Lloyds
Lloyd's Register
American Bureau of Shipping

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

Technical data:

Nominal voltage:	U ₀ /U 300/500 V
Testing voltage U:	2000 V acc. to DIN VDE 0281 part 2 + HD 21.2, conductor/screen 2000 V
Min. bending radius	
fixed laying:	5 x d
flexible application:	10 x d
Temperature range	
fixed laying:	-40/+90 °C
flexible application:	-30/+90 °C
Halogen-free:	acc. to EN 50267-2-1 + IEC 60754-1
Fire performance:	no flame propagation acc. to IEC 60332-3-22 + DIN EN 60332-3-22 cat. A. Flame retardant and self-extinguishing acc. to IEC 60332-1-2 + DIN EN 60332-1-2
Corrosiveness of conflagration gases:	in compliance with IEC 60754-2 + DIN EN 50267-2-2 - no development of corrosive conflagration gases
Smoke density:	acc. to IEC 61034 + EN 61034
Flexibility:	very good
Absence of harmful substances:	acc. to RoHS directive of the European Union

Possible on request:

- bare copper strands
- alternative colour code and sheath colour

for an improved uv resistance we recommend a black outer sheath

item no.	no. of cores x cross section n x mm ²	outer-ø ± 5% mm	copper figure kg/km	cable weight ≈ kg/km
64380205	2 x 0,50	5,8	25,5	50
64380305	3 x 0,50	6,1	30,4	57
64380405	4 x 0,50	6,6	36,9	69
64380505	5 x 0,50	7,1	43,6	82
64380705	7 x 0,50	7,9	55,0	104
64381205	12 x 0,50	10,2	86,7	165
64381805	18 x 0,50	12,3	140,7	251
64380207	2 x 0,75	6,4	30,5	58
64380307	3 x 0,75	6,7	39,3	69
64380407	4 x 0,75	7,3	48,5	84
64380507	5 x 0,75	8,0	57,5	102
64380707	7 x 0,75	8,7	74,2	126
64381207	12 x 0,75	11,7	140,4	221
64381807	18 x 0,75	13,7	189,4	311
64380210	2 x 1,00	6,6	36,9	65
64380310	3 x 1,00	6,9	48,3	77
64380410	4 x 1,00	7,5	59,7	93
64380510	5 x 1,00	8,4	71,7	118

item no.	no. of cores x cross section n x mm ²	outer-ø ± 5% mm	copper figure kg/km	cable weight ≈ kg/km
64380710	7 x 1,00	9,0	93,4	145
64381210	12 x 1,00	12,1	169,4	250
64381810	18 x 1,00	14,6	258,5	378
64380215	2 x 1,50	7,3	48,5	80
64380315	3 x 1,50	7,6	64,5	97
64380415	4 x 1,50	8,4	81,3	120
64380515	5 x 1,50	9,3	98,2	150
64380715	7 x 1,50	10,1	129,9	188
64381215	12 x 1,50	13,5	232,5	323
64381815	18 x 1,50	16,3	357,1	488
64380225	2 x 2,50	8,7	71,8	115
64380325	3 x 2,50	9,3	98,2	145
64380425	4 x 2,50	10,1	125,1	180
64380525	5 x 2,50	11,5	167,9	237
64380725	7 x 2,50	12,5	222,4	299
64381225	12 x 2,50	16,8	386,4	513
64381825	18 x 2,50	20,1	556,3	753

Other dimensions and colours are possible on request.

SABIX® BL 410 FRNC halogen-free flexible power cable 0,6/1 kV

BL = BlueLine



Power Cable 0,6/1 kV 12 x 1,5 mm² GL ABS Assessed · Lloyd's Register

Marking for SABIX BL 410 FRNC 64101215:

SAB BRÖCKSKES · D-VIERSEN · SABIX BL 410 FRNC · Power Cable 0,6/1 kV 12 x 1,5 mm² GL ABS Assessed · Lloyd's Register CE



Construction:

Conductor:	tinned copper strands acc. to IEC 60228, EN 60228, VDE 0295, class 5
Insulation:	special SABIX®
Colour code	black conductors with consecutive numbers acc. to EN 50334 green-yellow earth wire from 3 conductors
Stranding:	in layers
Sheath:	special SABIX®
Sheath colour:	black (RAL 9005)

Outstanding features:

- halogen-free
- asbestos-free
- no flame propagation
- flame retardant and self-extinguishing
- flexible
- approvals:
Germanischer Lloyds
Lloyd's Register
American Bureau of Shipping

Technical data:

Nominal voltage:	U ₀ /U 0,6/1 kV
Testing voltage U:	4000 V acc. to DIN VDE 0281 part 2 + HD 21.2
Min. bending radius	
fixed laying:	5 x d
flexible application:	10 x d
Temperature range	
fixed laying:	-40/+90 °C
flexible application:	-30/+90 °C
Halogen-free:	acc. to EN 50267-2-1 + IEC 60754-1
Fire performance:	no flame propagation acc. to IEC 60332-3-22 + DIN EN 60332-3-22 cat. A. Flame retardant and self-extinguishing acc. to IEC 60332-1-2 + DIN EN 60332-1-2
Corrosiveness of conflagration gases:	in compliance with IEC 60754-2 + DIN EN 50267-2-2 - no development of corrosive conflagration gases
Smoke density:	acc. to IEC 61034 + EN 61034
Flexibility:	very good
Absence of harmful substances:	acc. to RoHS directive of the European Union

Possible on request:



- bare copper strands
- alternative colour code and sheath colour

for an improved uv resistance we recommend a black outer sheath

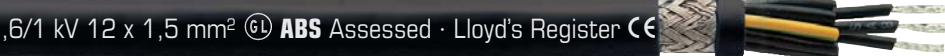
item no.	no. of cores x cross section n x mm ²	outer-ø ± 5% mm	copper figure kg/km	cable weight ≈ kg/km
64100215	2 x 1,50	8,9	28,8	120
64100315	3 x 1,50	9,4	43,2	137
64100415	4 x 1,50	10,6	57,6	174
64100515	5 x 1,50	11,6	72,0	210
64100715	7 x 1,50	12,6	100,8	257
64101015	10 x 1,50	16,3	144,0	366
64101215	12 x 1,50	16,8	172,8	415
64101415	14 x 1,50	17,6	201,3	468
64101815	18 x 1,50	19,9	259,2	609
64100225	2 x 2,50	9,7	48,0	151
64100325	3 x 2,50	10,7	72,0	187
64100425	4 x 2,50	11,6	96,0	224
64100525	5 x 2,50	12,7	120,0	272
64100725	7 x 2,50	13,8	168,0	337
64101025	10 x 2,50	17,9	240,0	480
64101225	12 x 2,50	18,4	288,0	549
64101425	14 x 2,50	19,3	336,0	622
64101825	18 x 2,50	21,9	432,0	808
64100240	2 x 4,00	12,1	76,8	236
64100340	3 x 4,00	12,8	115,2	276
64100440	4 x 4,00	14,0	153,6	334

item no.	no. of cores x cross section n x mm ²	outer-ø ± 5% mm	copper figure kg/km	cable weight ≈ kg/km
64100540	5 x 4,00	15,4	192,0	410
64100740	7 x 4,00	17,2	268,8	529
64100260	2 x 6,00	13,1	115,2	293
64100360	3 x 6,00	13,9	172,8	349
64100460	4 x 6,00	15,2	230,4	427
64100560	5 x 6,00	17,2	288,0	543
64100760	7 x 6,00	18,7	403,2	683
64100361	3 x 10,0	17,0	288,0	544
64100461	4 x 10,0	18,6	384,0	669
64100561	5 x 10,0	20,5	480,0	825
64100362	3 x 16,0	20,0	460,8	778
64100462	4 x 16,0	22,3	614,4	985
64100562	5 x 16,0	24,7	768,0	1218
64100363	3 x 25,0	24,3	720,0	1171
64100463	4 x 25,0	27,1	960,0	1480
64100563	5 x 25,0	29,9	1200,0	1828
64100364	3 x 35,0	27,7	1008,0	1581
64100464	4 x 35,0	30,4	1344,0	1967
64100365	3 x 50,0	31,5	1440,0	2207
64100465	4 x 50,0	34,5	1920,0	2760

Other dimensions and colours are possible on request.

SABIX® BL 412 C FRNC halogen-free flexible power cable with overall copper screen 0,6/1 kV

BL = BlueLine



Marking for SABIX BL 412 C FRNC 64121215:

SAB BRÖCKSKES · D-VIERSEN · SABIX BL 412 C FRNC · Power Cable 0,6/1 kV 12 x 1,5 mm² GL ABS Assessed · Lloyd's Register CE



Construction:

Conductor:	tinned copper strands acc. to IEC 60228, EN 60228, VDE 0295, class 5
Insulation:	special SABIX®
Colour code:	black conductors with consecutive numbers acc. to EN 50334 green-yellow earth wire from 3 conductors
Stranding:	in layers
Screen:	tinned copper braiding
Sheath:	special SABIX®
Sheath colour:	black (RAL 9005)

Outstanding features:

- halogen-free
- asbestos-free
- good EMC characteristics*
- no flame propagation
- flame retardant and self-extinguishing
- flexible
- approvals:
Germanischer Lloyds
Lloyd's Register
American Bureau of Shipping

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

Technical data:

Nominal voltage:	U ₀ /U 0,6/1 kV
Testing voltage U:	4000 V acc. to DIN VDE 0281 part 2 + HD 21.2 conductor/screen 2000 V
Min. bending radius <i>fixed laying</i> <i>flexible application:</i>	5 x d 10 x d
Temperature range <i>fixed laying</i> <i>flexible application:</i>	-40/+90 °C -30/+90 °C
Halogen-free:	acc. to EN 50267-2-1 + IEC 60754-1
Fire performance:	no flame propagation acc. to IEC 60332-3-22 + DIN EN 60332-3-22 cat. A. Flame retardant and self-extinguishing acc. to IEC 60332-1-2 + DIN EN 60332-1-2
Corrosiveness of conflagration gases:	in compliance with IEC 60754-2 + DIN EN 50267-2-2 - no development of corrosive conflagration gases
Smoke density:	acc. to IEC 61034 + EN 61034
Flexibility:	very good
Absence of harmful substances:	acc. to RoHS directive of the European Union

Possible on request:

- bare copper strands
- alternative colour code and sheath colour

for an improved uv resistance we recommend a black outer sheath

item no.	no. of cores x cross section n x mm²	outer-ø ± 5% mm	copper figure kg/km	cable weight ≈ kg/km
64120215	2 x 1,50	9,4	55,0	126
64120315	3 x 1,50	9,9	72,2	150
64120415	4 x 1,50	11,3	105,2	202
64120515	5 x 1,50	12,3	126,2	243
64120715	7 x 1,50	13,3	160,4	292
64121015	10 x 1,50	17,2	253,8	437
64121215	12 x 1,50	17,7	283,2	486
64121415	14 x 1,50	18,5	313,1	539
64121815	18 x 1,50	20,8	384,8	690
64120225	2 x 2,50	10,2	77,1	139
64120325	3 x 2,50	11,4	119,6	212
64120425	4 x 2,50	12,3	150,2	242
64120525	5 x 2,50	13,4	179,6	306
64120725	7 x 2,50	15,1	253,9	405
64121025	10 x 2,50	18,8	351,9	550
64121225	12 x 2,50	19,7	411,8	646
64121425	14 x 2,50	20,6	461,2	721
64121825	18 x 2,50	22,8	572,7	895
64120240	2 x 4,00	12,8	131,3	253
64120340	3 x 4,00	13,5	174,9	282
64120440	4 x 4,00	14,9	239,6	380

item no.	no. of cores x cross section n x mm²	outer-ø ± 5% mm	copper figure kg/km	cable weight ≈ kg/km
64120540	5 x 4,00	16,7	290,3	481
64120740	7 x 4,00	18,1	379,7	591
64120260	2 x 6,00	13,8	175,0	309
64120360	3 x 6,00	15,2	258,8	406
64120460	4 x 6,00	16,5	328,4	440
64120560	5 x 6,00	18,1	398,9	602
64120760	7 x 6,00	20,0	527,5	770
64120361	3 x 10,0	17,9	398,7	589
64120461	4 x 10,0	19,5	508,1	724
64120561	5 x 10,0	21,8	618,8	913
64120362	3 x 16,0	21,3	598,7	847
64120462	4 x 16,0	23,2	755,9	1037
64120562	5 x 16,0	26,0	938,8	1315
64120363	3 x 25,0	25,6	889,8	1238
64120463	4 x 25,0	28,0	1135,9	1528
64120563	5 x 25,0	31,2	1400,7	1923
64120364	3 x 35,0	28,6	1185,4	1602
64120464	4 x 35,0	31,7	1546,6	2041
64120365	3 x 50,0	32,4	1645,3	2213
64120465	4 x 50,0	35,4	2149,1	2786

Other dimensions and colours are possible on request.

BlueLine TA 180 C flexible FEP-Connection cables with overall copper screen



BRÖCKSKES · D-VIERSEN · BL TA 180 C 7 x 1,5 mm² C

Marking for BlueLine TA 180 C 37530715:
SAB BRÖCKSKES · D-VIERSEN · BL TA 180 C 7 x 1,5 mm² 37/11

Construction:

Conductor:	tinned copper strands acc. to IEC 60228, EN 60228, VDE 0295, class 5
Insulation:	FEP
Colour code:	black conductors with consecutive numbers acc. to EN 50334, without green-yellow earth wire
Stranding:	in layers
Inner sheath:	Besilen®
Screen:	tinned copper braiding
Sheath:	FEP
Sheath colour:	black (RAL 9005)

Outstanding features:

- no flame propagation
- flame retardant and self-extinguishing
- good EMC characteristics*
- oil and fuel resistant
- good chemical resistance
- high cold and heat resistance
- asbestos-free
- approval:
Germanischer Lloyd

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

Technical data:

Nominal voltage:	U ₀ /U 300/500 V
Testing voltage:	2000 V (AC)
Min. bending radius <i>fixed laying</i>	5 x d
<i>flexible application:</i>	10 x d
Radiation resistance:	1 x 10 ⁷ cJ/kg
Temperature range <i>fixed laying:</i>	-55/+180 °C
<i>flexible application:</i>	-55/+180 °C
Fire performance:	no flame propagation acc. to IEC 60332-3-22 + DIN EN 60332-3-22 cat. A. Flame retardant and self-extinguishing acc. to IEC 60332-1-2 + DIN EN 60332-1-2
Oil and fuel resistance:	very good
Flexibility:	good
Halogen-free:	not fulfilled
Absence of harmful substances:	acc. to RoHS directive of the European Union

item no.	no. of cores x cross section n x mm ²	outer-ø ± 0,3 mm mm	copper figure kg/km	cable weight ≈ kg/km
37530207	2 x 0,75	5,7	32,0	62
37530307	3 x 0,75	6,0	39,3	72
37530507	5 x 0,75	7,1	59,6	104
37530607	6 x 0,75	7,7	67,0	121
37530707	7 x 0,75	7,7	74,2	127
37530807	8 x 0,75	8,9	83,9	159
37531207	12 x 0,75	10,2	134,3	210
37531607	16 x 0,75	11,4	169,8	270
37532007	20 x 0,75	12,8	229,5	343
37530210	2 x 1,00	5,9	36,6	69
37530215	2 x 1,50	6,6	48,6	86
37530315	3 x 1,50	6,9	64,6	102
37530515	5 x 1,50	8,2	98,2	151
37530615	6 x 1,50	9,0	115,5	178
37530715	7 x 1,50	9,0	129,9	188
37531215	12 x 1,50	12,0	232,5	318

Other dimensions and colours are possible on request.

Possible on request:



- without overall copper screen
- alternative colour code and sheath colour

for an improved uv resistance we recommend a black outer sheath



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