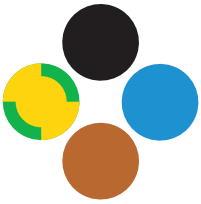
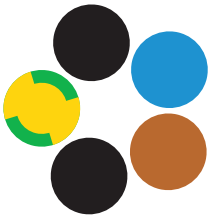
Nexans

RHEYHALON® Series 911
Special Navy Cables

In future will be changed the colour code for power cables type MGSGO and LMGSGO

Existing colour code			Futural colour code		
	with gn/ye	without gn/ye		with gn/ye	without gn/ye
2 cores			**2 cores**		
3 cores			**3 cores**		
4 cores			**4 cores**		
5 cores			**5 cores**		

Special Cables Marine

Defence- or war-ships are complex platforms with a number of inter-dependent systems and subsystems. As a consequence, the Navy, governmental agencies and system designers have to deal with a large range of variables and parameters; moreover, most of the different military specified variables also have a significant effect on how the system will perform or not.

New designed or midlife converted warships are made-to-order products. This forces the user, the project management and the team of designers to combine and harmonize a large amount of different partly controversial requirements, specified and progressively tightened by naval authorities.

In case of electric/electronic systems on board the overall objective of the work is to intervene the different modules in most cases by cables. All major NATO members independently have tithed rules on Navy cables with respect to toxic and hazardous by-products in case of fire, cross linking, shielding efficiency, cross talk, wire identification etc. Non of the military specifications are the same.

The size and weight optimised Rheyhalon Navy cables, in accordance with VG 95218 part 60 - 66, listed in this catalogue are free of halogens and correspond simultaneously with all requirements of naval ship design and construction rules of the German Navy (BV 3400). Rheyhalon Navy cables are matching and exceeding also international specification requirements of low fire hazard, limited fire hazard and low smoke Navy cables.

From the beginning of the demand for cross-linked, halogen free Navy cables Nexans Deutschland Industries GmbH & Co. KG as predecessor of Alcatel Kabel, Kabel Rheydt and AEG Kabel has been developing, manufacturing and supplying more than 13,000 km of cables according to VG 95218 part 60 (50) through 66 (56) for the German and other navies.

This catalogue seeks to address a solution in a context of concurrent engineering, with active linkage between international design variables and processing Cable parameters.

With this catalogue all other catalogue issues for Navy cables according to VG 95218 invalid.

List of Reference
RHEYHALON Navy Cables

Ship type	Quantity	Country
Frigate F122	8	Germany
Frigate MEKO 200 TN	4	Turkey
Frigate MEKO 200 PN	3	Portugal
Frigate MEKO 200 HN	3	Greece
Frigate F123	4	Germany
Frigate F124	3	Germany
Minesweeper SM 343	10	Germany
Minesweeper MJ 332	12	Germany
Serviceboats FD 423	3	Germany
Tender 404	6	Germany
P-Boats P200	4	Brasil
Frigate MEKO 200 TN	2	Turkey
Torpedo Boats	5	Turkey
Torpedo Boats	4	Indonesia
Submarines U 206 A	10	Germany
Submarines	2	Turkey
Submarines SK-Class	9	Korea
Submarines DOLPHIN	3	Israel
Diverse Projects e.g. maintenance		Germany Australia Singapore Thailand India Colombia Chile Greece RSA New Zealand Argentina Peru
Task Force Supply Vessel	2	Germany
Submarines U212	4	Germany
Current Projects		
Submarines U214	4	Greece
Modernisation U209	3	Greece
Submarines U209	3	RSA
Corvettes	4	RSA
Speedboats KILIC II	6	Turkey
Minesweeper MHV	6	Turkey
Submarines U 209	3	Turkey
Frigate F-310	5	Norway
OPV	6	Malaysia
OPV	3	Thailand

Comparation List
old and new discriptions acc. to VG 95218
Navy Cables

type	VG 95218	old discriptions	RHEYHALON-discription acc. to VG 95218
Power - Navy Cables with or without overall screen and defined transfer impedance	part 60	MGCG	MGSGO
Light Power - Navy Cables with overall and defined transfer impedance	part 61	LMKK	LMGSGO
Telecommunication - Navy cables with twisted pairs, overall screen and defined crosstalk attenuation	part 62	LFMKK	FMGSGO
Telecommunication - Navy cables with screened pairs, overall screen and high crosstalk attenuation	part 63	XLFMKK	FMSGSGO
Light Telecommunication - Navy cables with twisted pairs, double overall screen and defined crosstalk attenuation, low transfer impedance	part 64	LSK	LFMGSSGO
Light Telecommunication - Navy cables with screened pairs and overall screen, high crosstalk attenuation and defined transfer impedance	part 65	LSKC	LFMSGSGO
Light Telecommunication - Navy cables with screened triples and double overall screen, high crosstalk attenuation, low transfer impedance	part 66	LSKC	LFMSGSSGO

CERTIFICATE

DQS GmbH

Deutsche Gesellschaft zur Zertifizierung von Managementsystemen

hereby certifies that the company

Nexans Deutschland Industries GmbH & Co. KG
Business Group Industrial Applications

Bonnenbroicher Straße 2-14
41238 Mönchengladbach
Germany

for the scope

Design, development, production and sales of wires, strands, special cables for energy, control and signal transmission

has implemented and maintains a

Quality Management System.

An audit, documented in a report, has verified that this quality management system fulfills the requirements of the following standard:

DIN EN ISO 9001 : 2000
December 2000 edition

This certificate is valid until	2005-06-26
Certificate Registration No.:	067944 QM
Frankfurt am Main, Berlin	2003-03-13

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Deutscher Akkreditierungs Rat DAR TGA-ZM-02-90-00 TGA-ZM-02-90-01

FMSGSGO

acc. to VG 95218 part 63

With screened pairs, overall screen and high crosstalk attenuation , halogenfree, crosslinked

250 V

Max core temperature: 85°C

Approval/Certificates

For these RHEYHALON® Navy cables following certificates/ approvals are available:

- BWB Certificate of Approval according to VG 95211
- VDE Certificate of conformity with manufacturing surveillance
- Approval Certificate from „Germanischer Lloyd"
- Approved QPL manufacturer according to VG 95212-22
- Certified manufacturer according to ISO 9001

Applications

RHEYHALON® Navy cables are determined for fixed installation in electrial power- and control systems below and above deck, preferably on ships of the German Navy and/or German design of construction. These cables are not intended for permanent installation in or under water. RHEYHALON® Navy cables fulfill all requirements of BV3400 („Specification for Construction of German Navy vessels").

Standards

VG 95218 part 63

Design

1. Conductor
Bare copper conductor, stranded class 2

2. Insulation
Insulation of crosslinked HEPR

3. Pair Screen
Bare copper wire braided screen, separator tape (optional)

3. Overall Screen
Copper wire braided screen, bare, separator tape

4. Outer Sheath
Outer sheath of crosslinked elastomer compound, colour black

Core Identification

2-pair cable	1st pair black-blue	
	2nd pair black-brown	
4- to 24 pair cable	1st pair black-blue	
	2nd pair black-brown	(Pilot pair)
	3rd to 24th pair black-grey	(Direction pair)

Marking

Colour of outer sheath black, marked by printing in contrast-colour
Sample:
I NEXANS I D 0768 VDE-Reg.-Nr. 9257 RHEYHALON-Series 911 VG 95218 T063 A001 FMSGSGO 2x2x0.75 250 V

FMSGSGO 250 V acc. to VG 95218 part 63

Nomenclature acc. VG 95218 Part 63 Type/Part No.	Number of cores and nominal cross section mm^2	Diameter of conductor nominal mm	Wall thickness of insulation nominal mm	Wall thickness sheath nominal mm	Outer diameters min./max. mm		Cable-Weight max. kg/km	Current rating at ambient temperature of 45 °C A
A001	2x2x0.75	1.2	0.4	0.8	11.1	12.5	220	8
A002	4x2x0.75	1.2	0.4	1.0	12.9	14.5	330	6
A003	7x2x0.75	1.2	0.4	1.0	14.9	16.4	470	5
A004	11x2x0.75	1.2	0.4	1.2	19.6	21.4	700	4
A005	14x2x0.75	1.2	0.4	1.2	20.8	22.8	890	3
A006	19x2x0.75	1.2	0.4	1.4	23.4	25.4	1,120	3
A007	24x2x0.75	1.2	0.4	1.4	26.4	28.4	1,420	2

Electrical and mechanical characteristics

Nominal Voltage	250 V
Max. permissible operating voltage	AC 250 V DC 355 V
Operating temperature at conductor	+ 85 °C
Minimum bending radius during installation	5 x outer diameter
Lowest permissible temperature for installation	- 10 °C

Further electrical features

Operating capacity	max. 250 nF/km at 800 Hz
Transfer impedance Inner conductor - Pair Screen	max. 50 mΩ/m at 10 MHz
Transfer impedance Inner conductor - Overall Screen	max. 30 mΩ/m at 10 MHz
Characteristic impedance	100 Ω at 1 MHz (standard value)
Crosstalk attenuation	min. 90 dB referred to 50 m, at 10 kHz

Current rating

The values for current carrying capacity, listed in the tables, correspond to the values in BV 3400 ("Specification for Construction of German Navy vessels"). This values are given for continuous operating and single installation at ambient temperature of 45°C. For higher ambient temperatures, following factures have to be used for calculation:

Ambient temperature:	Derating factor:
45°C	1.0
50°C	0.93
55°C	0.86
60°C	0.79
65°C	0.70
70°C	0.61
75°C	0.50