

RTFRO
Wires and cables for marine diesel engines

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Introduction

Habia Cable is a leading international manufacturer of specialist wire and cable. Our diesel engine cables have been used for over 20 years by a number of leading diesel manufacturers.

Developed for demanding installations in tough areas such as engine rooms and control rooms, our cables are able to offer mechanical strength which enables installation without added protection along with a wide temperature range of -65°C to +95°C that can guarantee a long lifetime, even when placed close to the heat source. Habia's diesel engine cables are oil and chemical resistant and flame retardant to IEC 60332-3 adding major safety benefits. The small dimension, light-weight cables have been approved by a number of internationally recognised bodies including:

ABS

2010 Steel Vessel Rules 1-1-4/7.7, 1-1-A3 and 4-8-3/9.5
(referenced as 'A' in the following table data)

Det Norske Veritas

Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards
(referenced as 'D' in the following table data)

Germanischer Lloyd

GL Type Approval System
(referenced as 'G' in the following table data)

Nippon Kaiji Kyokai

Society's type test requirements for electrical equipment and cables.
(referenced as 'N' in the following table data)

In addition to the approved types detailed within this document, Habia Cable can also offer a wide range of variant designs the RTFRO concept as a basis. Number and size of cores, screening, dimensions and arrangements can all be tailored to the specific requirement from the customer, please contact your local sales office for more details.

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As well as the standard RTFRO types, RTFRO-TCK provides a range of cables suitable for any measuring system using thermocouple transducers. Commonly available as a KX type (Nickel/Chromel, Nickel/Alumel) extension cable, the RTFRO-TCK can also be used as the basis for any number of non-approved, customised variants with a wide range of extension and compensation metals available for use. Suitable connecting wires are available from Habia's RT range of power cores

ABS certificate



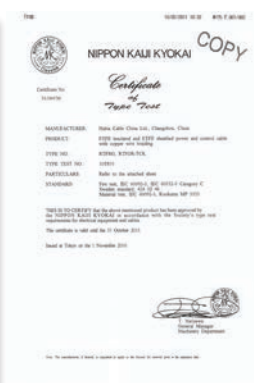
DNV certificate



GL certificate



NK certificate



RTFRO Multi-core cables

300V
-65°C/+95°C

Multi core cables, screened

Voltage	300/500V U ₀ /U
Test voltage	1 minute at 5kV DC
Flame retardant	
Low smoke generation	

Screen and sheath may appear un-round due to the drain wire on one side of the cable. Dimensions are stated as A,A x B,B. A,A is the diameter over the normal shape and B,B is the dimension over the drain.

Construction

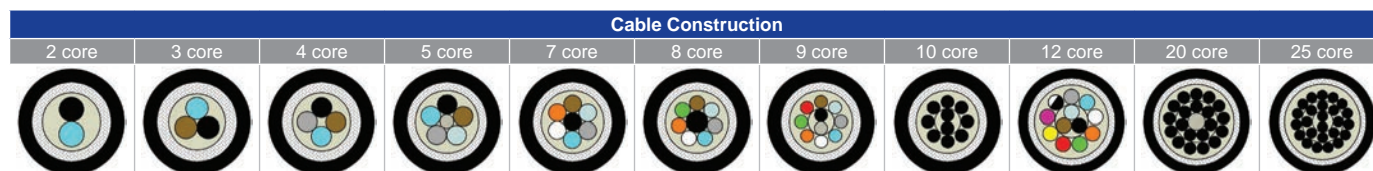
Conductor	Tin Plated Copper (TPC)	Insulation	ETFE with filling layer
Shield	Braid of Tin Plated Copper (T) with drain wire	Sheath	ETFE with ripcord

Identification

Cores	See individual drawing for details
Sheath	Black
Marking	HABIA CABLE ZZZZZ TYPE VOLTAGE XXXXX YYWW IEC 60332-1-2 IEC 60332-3-24 (e.g. Habia Cable AB RTFRO 2x0,75 300/500V 121026001 1239 IEC60332-1-2 IEC60332-3-24) ZZZZZ to be replaced with production code (e.g. Sweden = AB , China = Changzhou plant) TYPE to be replaced with Habia description (e.g. RTFRO 2 x 0,75) XXXXX to be replaced with unique batch number YYWW to be replaced with year and week of manufacture (e.g. 1114)

Description	Construction							Electrical amps at 40°C max	Approval	Order reference
	no. / size CSA	conductor Ø	insulation Ø	cabled Ø	shield (s) Ø	sheath (s) Ø	weight g/m			
RTFRO 2 x 0,75	2x 0,75	1,05	1,61	3,9	4,8 x 5,8	5,6 x 6,6	79	12,8	A, D, G, N	43171-001-07
RTFRO 2 x 1,5	2x 1,50	1,50	2,26	5,4	6,3 x 7,3	7,3 x 8,3	123	20,2	A, D, G, N	43171-006-01
RTFRO 3 x 0,5	3x 0,50	0,88	1,44	3,9	4,6 x 5,6	5,4 x 6,4	70	9,1	A, D, G, N	43171-008-03
RTFRO 3 x 0,75	3x 0,75	1,05	1,61	4,2	5,1 x 6,1	5,9 x 6,9	87	11,9	A, D, G, N	43171-001-08
RTFRO 3 x 1,5	3x 1,50	1,50	2,26	5,7	6,6 x 7,6	7,6 x 8,6	134	18,7	A, D, G, N	43171-006-02
RTFRO 4 x 0,5	4x 0,50	0,88	1,44	4,0	4,8 x 5,8	5,6 x 6,6	72	8,2	A, D, G, N	43171-008-04
RTFRO 4 x 0,75	4x 0,75	1,05	1,61	4,7	5,6 x 6,6	6,4 x 7,4	102	10,8	A, D, G, N	43171-001-09
RTFRO 4 x 1,5	4x 1,50	1,50	2,26	6,3	7,2 x 8,0	8,2 x 9,0	157	17,0	A, D, G, N	43171-006-03
RTFRO 5 x 0,75	5x 0,75	0,88	1,61	5,1	6,1 x 7,1	7,1 x 8,1	120	10,1	A, D, G, N	43171-001-10
RTFRO 5 x 1,5	5x 1,50	1,50	2,26	7,1	8,0 x 9,0	9,1 x 10,1	192	15,9	A, D, G, N	43171-006-04
RTFRO 7 x 0,75	7x 0,75	1,05	1,61	5,7	6,7 x 7,7	7,7 x 8,7	143	8,7	A, D, G, N	43171-001-11
RTFRO 7 x 1,5	7x 1,50	1,50	2,26	7,8	8,7 x 9,7	9,8 x 10,8	215	13,8	A, D, G, N	43171-006-05
RTFRO 8 x 0,75	8x 0,75	1,05	1,61	6,3	7,2 x 8,2	8,2 x 9,2	164	8,3	A, D, G, N	43171-001-12
RTFRO 9 x 0,5	9x 0,50	0,88	1,44	6,5	7,5 x 8,4	8,5 x 9,4	145	6,1	A, D, N	43171-008-12
RTFRO 10 x 1,5	10x 1,50	1,50	2,26	10,1	11,2 x 12,2	12,4 x 13,4	318	12,5	A, D, N	43171-006-06
RTFRO 12 x 0,75	12x 0,75	1,05	1,61	7,7	8,6 x 9,6	9,7 x 10,7	216	7,4	A, D, G, N	43171-001-13
RTFRO 20 x 0,75	20x 0,75	1,05	1,61	9,6	10,6 x 11,6	12,0 x 13,0	320	6,4	D, G	43171-010-05
RTFRO 25 x 0,75	25x 0,75	1,05	1,61	10,8	11,8 x 12,4	13,2 x 13,8	370	5,7	A, D, G, N	43171-010-04

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Ref: RT_MC1_03 Created: CJV Approved: AE Date: 2013-09-12

Data indicates nominal values unless stated otherwise, is only valid for reference purposes at the time of publication and is subject to change without prior notice.

Multi core cables, screened

Voltage	300/500V U ₀ /U
Test voltage	1 minute at 5kV DC
Flame retardant	
Low smoke generation	

Screen and sheath may appear un-round due to the drain wire on one side of the cable. Dimensions are stated as A,A x B,B. A,A is the diameter over the normal shape and B,B is the dimension over the drain.




Construction

Conductor	Tin Plated Copper (TPC)	Insulation	ETFE with filling layer
Shield	Braid of Tin Plated Copper (T) with drain wire	Sheath	ETFE with ripcord

Identification

Cores	See individual drawing for details
Sheath	Black
Marking	HABIA CABLE ZZZZZZ TYPE VOLTAGE XXXXX YYWW IEC 60332-1-2 IEC 60332-3-24 (e.g. Habia Cable AB RTFRO 15x2x0,75 300/500V 121026001 1239 IEC60332-1-2 IEC60332-3-24)
	ZZZZZ to be replaced with production code (e.g. Sweden = AB , China = Changzhou plant)
	TYPE to be replaced with Habia description (e.g. RTFRO 2 x 0,75)
	XXXXX to be replaced with unique batch number
	YYWW to be replaced with year and week of manufacture (e.g. 1114)

Description	Construction							Electrical amps at 40°C max	Approval	Order reference
	no. / size CSA	conductor Ø	insulation Ø	cabled Ø	shield (s) Ø	sheath (s) Ø	weight g/m			
RTFRO 15 x 2 x 0,75	15 pr 0,75	1,05	1,61	15,2	16,1	17,5	500	5,2	D	43171-001-14
RTFRO 15 x 3 x 0,75	15 tri 0,75	1,05	1,61	17,8	18,7	20,3	665	4,7	D	700022427
RTFRO 20 x 3 x 0,75	20 tri 0,75	1,05	1,61	18,8	19,9	21,5	890	4,5	D	43171-001-17

Cable Construction										
15 pair	15 triple	20 triple	-	-	-	-	-	-	-	-
										

RTFRO-TCK Multi-core thermocouple cables

300V
-65°C/+95°C

Multi core cables, screened

Voltage	300/500V U ₀ /U
Test voltage	1 minute at 5kV DC
Flame retardant	
Low smoke generation	

Screen and sheath may appear un-round due to the drain wire on one side of the cable. Dimensions are stated as A,A x B,B. A,A is the diameter over the normal shape and B,B is the dimension over the drain.




Construction

Conductor	Nickel Chromel Nickel Alumel	Positive leg Negative leg	Insulation	ETFE with filling layer
Shield	Braid of Tin Plated Copper (T) with drain wire		Sheath	ETFE with ripcord

Identification

Cores	See individual drawing for details
Sheath	Yellow
Marking	HABIA CABLE ZZZZZZ TYPE VOLTAGE XXXXX YYWW IEC60332-1-2 IEC60332-3-24 (e.g. Habia Cable AB RTFRO-TCK 2x0,5 300/500V 121026001 1239 IEC60332-1-2 IEC60332-3-24) ZZZZZ to be replaced with production code (e.g. Sweden = AB, China = Changzhou plant) TYPE to be replaced with Habia description (e.g. RTFRO 2 x 0,75) XXXXX to be replaced with unique batch number YYWW to be replaced with year and week of manufacture (e.g. 1114)

Description	Construction							Electrical amps at 40°C max	Approval	Order reference
	no. / size CSA	conductor Ø	insulation Ø	cabled Ø	shield (s) Ø	sheath (s) Ø	weight g/m			
RTFRO-TCK 2 x 0,5	2x 0,50	0,88	1,44	3,4	4,4	5,3 x 6,0	95	9,8	A, D	700024353
RTFRO-TCK 2 x 0,75	2x 0,75	1,05	1,61	3,9	4,8	5,6 x 6,6	65	12,8	A, D, N	29171-001-02
RTFRO-TCK 4 x 0,5	4x 0,50	0,88	1,44	4,3	5,2 x 5,8	6,0 x 6,6	84	8,2	A, D, N	29281-001-01
RTFRO-TCK 8 x 0,5	8x 0,50	0,88	1,44	5,4	7,1 x 8,1	8,2 x 9,2	165	6,4	A, D, N	29171-003-01

Cable Construction										
2 core	4 core	8 core	-	-	-	-	-	-	-	-
										

Ref: RT_TCK1_03 Created: CJV Approved: AE Date: 2013-09-12
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Multi core cables, screened

Voltage	300/500V U ₀ /U
Test voltage	1 minute at 5kV DC
Flame retardant	
Low smoke generation	

Screen and sheath may appear un-round due to the drain wire on one side of the cable. Dimensions are stated as A,A x B,B. A,A is the diameter over the normal shape and B,B is the dimension over the drain.

Construction

Conductor	KX: Nickel Chromel (+) and Nickel Alumel (-)	Insulation	ETFE with filling layer
Shield	Braid of Tin Plated Copper (T) with drain wire	Sheath	ETFE with ripcord

Identification

Cores	See individual drawing for details
Sheath	Yellow
Marking	HABIA CABLE ZZZZZZ TYPE VOLTAGE XXXXX YYWW IEC 60332-1-2 IEC 60332-3-24 (e.g. Habia Cable AB RTFRO-TCK 3x2x0,75 300/500V 121026001 1239 IEC60332-1-2 IEC60332-3-24) ZZZZZ to be replaced with production code (e.g. Sweden = AB , China = Changzhou plant) TYPE to be replaced with Habia description (e.g. RTFRO 2 x 0,75) XXXXX to be replaced with unique batch number YYWW to be replaced with year and week of manufacture (e.g. 1114)

Description	Construction							Electrical amps at 40°C max	Approval	Order reference
	no. / size CSA	conductor Ø	insulation Ø	cabled Ø	shield (s) Ø	sheath (s) Ø	weight g/m			
RTFRO-TCK 3x 2x 0,75	3 pr 0,75	1,05	1,61	7,2	8,0	9,1 x 10,1	170	9,3	A, D, N	29171-001-01
RTFRO-TCK 12x 2x 0,75	12 pr 0,75	1,05	1,61	13,3	14,3	15,8 x 16,8	400	5,8	A, D, N	29171-001-03

Cable Construction										
3 pair	12 pair	-	-	-	-	-	-	-	-	-