

RTFRO
Marine Diesel Engine Cables

Established in 1941, Habia Cable has developed a wealth of experience in the design and manufacture of high performance wires and cables to meet the requirements of international standards and exacting customer specifications.

RTFRO

RTFRO cables have a wide temperature range of -65°C to +150°C (depending on installation) with a standard operational range of -40°C to +90°C, ensuring a long life time, even when placed close to a heat source.

With excellent flame retardance to IEC 60332-3-24, and extremely good chemical and water resistance the RTFRO concept provides a complete solution for marine diesel engine installations.

These small and light-weight cables have been approved by a number of internationally recognised standards authorities including:

- ABS

2010 Steel Vessel Rules 1-1-4/7.7, 1-1-A3 and 4-8-3/9.5

- BV

Rules for the classification of steel ships

- DNV.GL

Rules for Classification of Ships, High Speed & Light Craft

The approved RTFRO and RTFRO-TCK designs are rigidly defined and are included within this document. Habia Cable is frequently requested to provide other sizes and constructions. Whilst the RTFRO concept can be adapted for cables with different numbers and sizes, colours etc... however these variants are not covered by the existing approval and reference to the name RTFRO cannot be made.

Should you require an RTFRO cable variant, please contact one of our sales offices for more details.



RTFRO

Multicore cables

300V

-40°C/+95°C

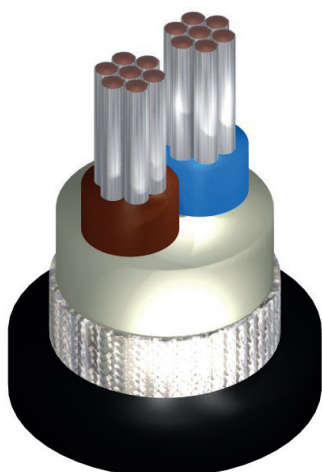
Construction

Conductor	Tin Plated Copper (TPC)	Insulation	ETFE filling layer	Voltage	300/500V AC U ₀ /U
Screen	Braid of Tin Plated Copper (T) with drain wire	Sheath	ETFE ripcord	Test voltage	5000V DC
Colour code	Varies with design - refer to drawing for details			Sheath	Black
Marking	Habia Cable ZZZZZZ Description Voltage XXXX YYWW IEC 60332-1-2 IEC 60332-3-24 ZZZZZ = production code (Sweden = AB, China = Changzhou plant) XXXX = Unique batch code YYWW = Year and week of manufacture e.g.: Habia Cable AB RTFRO 9 x 0.5 300/500V 121026001 1239 IEC 60332-1-2 IEC 60332-3-24				

Description	Arrangement	Construction							Electrical	Article Number
	no. cores	size CSA	conductor Ø	insulation Ø	cabled Ø	shield/s * Ø	sheath/s * Ø	weight g/m	amps at 40°C **	
RTFRO 2 x 0,75	2	0.75	1.05	1.61	3.9	4.8 x 5.8	5.6 x 6.6	79	12.8	43171-001-07
RTFRO 2 x 1,5	2	1.50	1.50	2.26	5.4	6.3 x 7.3	7.3 x 8.3	123	20.2	43171-006-01
RTFRO 3 x 0,5	3	0.50	0.88	1.44	3.9	4.6 x 5.6	5.4 x 6.4	70	9.1	43171-008-03
RTFRO 3 x 0,75	3	0.75	1.05	1.61	4.2	5.1 x 6.1	5.4 x 6.9	87	11.9	43171-001-08
RTFRO 3 x 1,5	3	1.50	1.50	2.26	5.7	6.6 x 7.6	7.6 x 8.6	134	18.7	43171-006-02
RTFRO 4 x 0,5	4	0.50	0.88	1.44	4.0	4.8 x 5.8	5.6 x 6.6	72	8.2	43171-008-04
RTFRO 4 x 0,75	4	0.75	1.05	1.61	4.7	5.6 x 6.6	6.4 x 7.4	102	10.8	43171-001-09
RTFRO 4 x 1,5	4	1.50	1.50	2.26	6.3	7.0 x 8.0	8.0 x 9.0	157	17.0	43171-006-03
RTFRO 5 x 0,75	5	0.75	1.05	1.61	5.1	6.1 x 7.1	7.1 x 8.1	120	10.1	43171-001-10
RTFRO 5 x 1,5	5	1.50	1.50	2.26	7.1	8.0 x 9.0	9.1 x 10.1	192	15.9	43171-006-04
RTFRO 7 x 0,75	7	0.75	1.05	1.61	5.7	6.7 x 7.7	7.7 x 8.7	143	8.7	43171-001-11
RTFRO 7 x 1,5	7	1.50	1.50	2.26	7.8	8.7 x 9.7	9.8 x 10.8	215	13.8	43171-006-05
RTFRO 8 x 0,75	8	0.75	1.05	1.61	6.3	7.2 x 8.2	8.2 x 9.2	164	8.3	43171-001-12
RTFRO 9 x 0,5	9	0.50	0.88	1.44	6.5	7.5 x 8.4	8.5 x 9.4	145	6.1	43171-008-12
RTFRO 10 x 1,5	10	1.50	1.50	2.26	10.1	11.2 x 12.2	12.4 x 13.4	318	12.5	43171-006-06
RTFRO 12 x 0,75	12	0.75	1.05	1.61	7.7	8.6 x 9.6	9.7 x 10.7	216	7.4	43171-001-13
RTFRO 20 x 0,75	20	0.75	1.05	1.61	9.6	10.6 x 11.6	12.0 x 13.0	320	6.4	43171-010-05
RTFRO 25 x 0,75	25	0.75	1.05	1.61	10.8	11.8 x 12.4	13.2 x 13.8	370	5.7	43171-010-04

* Cable is un-round due to drain wire: Dimensions stated as A x B where A is the diameter over the normal shape of the cable and B is the diameter over the drain wire.

** Core current rating applies to a single cable hanging in free air. Additional de-rating required for ambient temperature, multiple cables and/or method of installation.



Application

Designed for use in engine rooms and control rooms, RTFRO cables are able to offer mechanical strength along with a wide temperature range enabling them to provide a long lifetime, even when placed close to the heat-source.

- Flame retardant to IEC 60332-1-2
- Flame retardant to IEC 60332-3-24
- Low smoke generation
- RoHS compliant
- Approved by DNV.GL for use in ships

RTFRO-TCK

Multicore thermocouple cables

300V

-40°C/+95°C

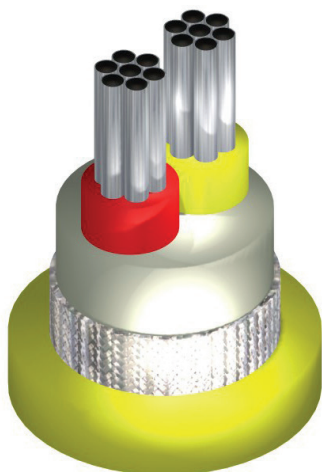
Construction

Conductor	Nickel Chromel (positive leg) Nickel Alumel (negative leg)	Insulation	ETFE filling layer	Voltage	300/500V AC U ₀ /U
Screen	Braid of Tin Plated Copper (T) with drain wire	Sheath	ETFE ripcord	Test voltage	5000V DC
Colour code	Varies with design - refer to drawing for details			Sheath	Black
Marking	Habia Cable ZZZZZZ Description Voltage XXXXX YYWW IEC 60332-1-2 IEC 60332-3-24 ZZZZZZ = production code (Sweden = AB, China = Changzhou plant) XXXXX = Unique batch code YYWW = Year and week of manufacture e.g.: Habia Cable AB RTFRO-TCK 2 x 0.5 300/500V 121026001 1239 IEC 60332-1-2 IEC 60332-3-24				

Description	Arrangement	Construction							Electrical	Article Number
	no. cores	size CSA	conductor Ø	insulation Ø	cabled Ø	shield/s * Ø	sheath/s * Ø	weight g/m	amps at 40°C **	
RTFRO-TCK 2 x 0,5	2	0.50	0.88	1.44	3.4	4.4	5.3 x 6.0	58	9.8	700024353
RTFRO-TCK 2 x 0.75	2	0.75	1.05	1.61	3.9	4.8	5.6 x 6.6	75	12.8	29171-001-02
RTFRO-TCK 4 x 0,5	4	0.50	0.88	1.44	4.3	5.2 x 5.8	6.0 x 6.6	87	8.2	29281-001-01
RTFRO-TCK 8 x 0,5	8	0.50	0.88	1.44	5.4	7.1 x 8.1	8.2 x 9.2	165	6.4	29171-003-01
RTFRO-TCK 3x 2 x 0,75	6	0.75	1.05	1.61	7.2	8.0	9.1 x 10.1	170	9.3	29171-001-01
RTFRO-TCK 12x 2 x 0,75	24	0.75	1.05	1.61	13.3	14.3	15.8 x 16.8	400	5.8	29171-001-03

* Cable is un-round due to drain wire: Dimensions stated as A x B where A is the diameter over the normal shape of the cable and B is the diameter over the drain wire.

** Core current rating applies to a single cable hanging in free air. Additional de-rating required for ambient temperature, multiple cables and/or method of installation.



Application

Designed for use in engine rooms and control rooms, RTFRO-TCK cables are able to offer mechanical strength along with a wide temperature range enabling them to provide a long lifetime, even when placed close to the heat-source.

- Flame retardant to IEC 60332-1-2
- Flame retardant to IEC 60332-3-24
- Colour coded according to ANSI MC96.1
- Low smoke generation
- RoHS compliant
- Approved by DNV.GL for use in ships

RTFRO_TCK_03 2016-02-08

T's & C's available on www.habia.com

Material comparison

RTFRO and RTFRO-TCK insulation and sheath materials

Both RTFRO and RTFRO-TCK use the same concept

of ETFE cores, a filling jacket to improve cable circularity and an ETFE jacket. Habia Cable offers a clear comparison of the key strengths and weaknesses of the materials that affect the performance of the products. Information is compiled from what are believed to be authoritative sources and/or independent testing of material samples and knowledge of the relevant compounds.

ETFE

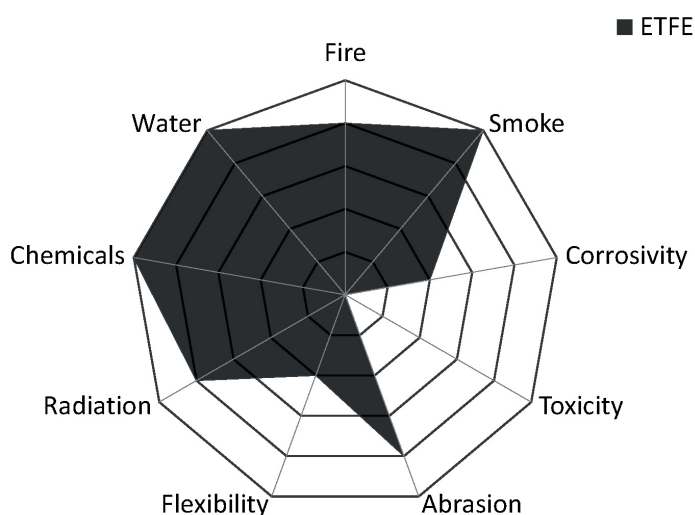
Habia Cable's ETFE insulation and sheath material is one of the best all-round materials offering extremely good mechanical, fire, temperature, chemical and water resistance properties.

There is a small limitation in the temperature rating of RTFRO and RTFRO-TCK cables compared to ETFE due to temperature range of the inner filling jacket - higher temperatures may be achieved but the filling jacket may soften, reducing the roundness of the cable. All other material properties are largely unaffected.

ETFE

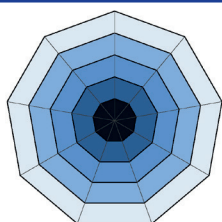
Insulation and sheath material used in:

- RTFRO
- RTFRO-TCK



Spider-graph key

- Excellent
- Good
- Average
- Below average
- Poor



Habia Cable develops, manufactures and markets standard and custom designed cables and cable assemblies and harness systems for demanding industry applications.

In its segment, Habia Cable is today one of Europe's leading wire and cable manufacturers.

The company has a global presence and sales in more than 50 countries worldwide.

Habia Cable's competitive advantages are a high level of service, high technical competence and a global organisation.

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