

(1) **EC-TYPE EXAMINATION CERTIFICATE**

(2) **Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 94/9/EC**

(3) EC-Type Examination Certificate Number: **KEMA 03ATEX2043 U** Issue Number: 2

(4) Component: **Self Limiting Heating Cable series MCA..-I-FF**

(5) Manufacturer: **RAYTECH S.r.l.**

(6) Address: **Via Enrico Fermi 11-13-17, 20019 Settimo Milanese (Milano), Italy**

(7) This component and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) KEMA Quality B.V., notified body number 0344 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this component has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the directive.

The examination and test results are recorded in confidential report no. 2111228-1.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0 : 2006
EN 61241-0 : 2006

EN 62086-1 : 2005
EN 61241-1 : 2004

IEC 60079-30-1 : 2007

(10) The sign "U" placed after the certificate number indicates that this certificate describes components and must not be mistaken for a certificate intended for an equipment or protective system. This EC-Type Examination Certificate may be used as a basis for certification of an equipment or protective system.

(11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified component according to the Directive 94/9/EC. Further requirements of the directive apply to the manufacturing process and supply of this component. These are not covered by this certificate.

(12) The marking of the component shall include the following:



II 2 G Ex e II 200 °C (T2), T3, T4
II 2 D Ex tD A21 T 200 °C, T 195 °C, T 130 °C

This certificate is issued on December 20, 2007 and, as far as applicable, shall be revised before the date of cessation of presumption of conformity of (one of) the standards mentioned above as communicated in the Official Journal of the European Union.

KEMA Quality B.V.



P.B.A. Jansen
Certification Manager





(13) **SCHEDULE**

(14) **to EC-Type Examination Certificate KEMA 03ATEX2043 U** Issue No. 2

(15) **Description**

The Self Limiting Heating Cable series MCA..-I-FF is a parallel trace heater, used to raise or maintain the temperature of a workpiece where they are externally applied to. The MCA..-I-FF cable series consists of an electrical resistance heater element with positive temperature coefficient. This means that the MCA..-I-FF heating cable series reduces its power output with increasing temperature.

Maximum operating temperature, power "on": +120 °C
 Maximum withstand temperature, power "off": +190 °C
 Minimum start-up temperature: -60 °C
 Minimum installation temperature: -60 °C
 Minimum bending radius: 25 mm

Electrical data

Rated Voltage: 254 Vac

MCA xx -I-FF
 I II III

Designation	Explanation	Value	Explanation
I	Cable Series Designation	MCA	
III	Power output rating at 230 Vac and 10 °C	3	10 W/m
		5	15 W/m
		8	25 W/m
		10	30 W/m
		20	60 W/m
III	Overjacket option	-I-FF	Fluoropolymer overjacket

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Temperature class and maximum surface temperature “T”

The maximum surface temperature “T” is based upon an exposure to a workpiece having the same temperature as the maximum surface temperature.

Rated voltage	Power output rating	T-class determined by Product classification approach	Maximum surface temperature “T”
254 Vac	10, 15, 20, 25, 30, 45 W/m	T3	+195 °C
	60 W/m	T2	+200 °C

Systems approach, design verification method

Rated voltage	Power output rating	Maximum exposure temperature	T-class	Maximum surface temperature “T”
254 Vac	10 W/m	105 °C	T4	130 °C
	15 W/m	70 °C	T4	130 °C
	20 W/m	60 °C	T4	130 °C
	25 W/m	55 °C	T4	130 °C
	30 W/m	25 °C	T4	130 °C
	60 W/m	120 °C	T3	195 °C

Conditions for systems approach, design verification method

For insulated externally heated surfaces lower T-class systems may be obtained by ensuring that the heating cable shall not be exposed to temperatures exceeding those listed under maximum exposure temperature.

The T-class obtained through systems approach is based on the energy balance of heat loss and heat production of the system at a certain temperature. The maximum exposure temperature of the system including the resulting T-class and heating cable type shall be provided as a record of system documentation for each stabilized designed system. The parameters in the system documentation shall be checked during commissioning of the system.

The system documentation shall be kept by the owner of the system and be available at all times for as long as the system is in use.

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Installation instructions

Connections and terminations for installation with the MCA...I-FF heating cable series shall be certified according to the requirements of the applicable standards for their types of protection for potentially explosive gas and/or combustible dust atmospheres, as well as the requirements of EN 62086-1 and IEC 60079-30-1 as integral parts of this trace heating system.

For the connection of the heating cable to power certified glands, enclosures and terminals shall be used that are suitable for the application and are correctly installed. The cable glands shall be mounted in an enclosure in such a way that the ingress protection rating IP64 according to EN-IEC 60529 is ensured.

When used in TT and TN systems a residual current device according to EN 62086-1, clause 4.4 point d) shall be installed. When used in IT systems an insulation monitoring device according to EN 62086-1, clause 4.4 point e) shall be used.

Routine tests

For each supplied length of the MCA...I-FF heating cable series, an electric strength test according to EN 62086-1 clause 5.1.2 shall be carried out.

The overjacket over the metallic braiding shall be subjected to a dry spark test according to EN 62086-1 clause 5.2.1.

The rated power output shall be verified using a test procedure with measurement criteria correlated to the output verification test, as specified in EN 62086-1 clause 5.1.9. If statistical methods are used, the results shall represent a total product reliability of 95 % or greater. The test records shall show that the power output is measured and is within the manufacturer's declared tolerances with a 95 % confidence level.

(16) **Report**

KEMA No. 2111228-1.

(17) **Special conditions for safe use**

None.

(18) **Essential Health and Safety Requirements**

Covered by the standards listed at (9).

(19) **Test documentation**

As listed in Test Report No. 2111228-1.