



**Novec**™

Brand

# Advanced fire protection on-board Costa Crociere



**Costa neoRiviera is a cruise ship built in 1999 at St. Nazaire, France and owned by the navigation company Costa Crociere since 2013.**

Costa Crociere boasts the biggest fleet of the European operators with a total of 25 ships in operation and two new ships launched in 2016. Costa Crociere is part of the Carnival Corporation & plc group, the world's largest leisure travel company.

Costa Crociere's commitment to sustainability goes beyond responsible management of resources, to making a tangible contribution to the conservation of resources for future generation. Their pursuit of innovative solutions and services is linked to mitigating environmental impact in both local communities at their destinations and in the sea. The conservation of the marine environment is the top priority for Costa Crociere.

In line with this sustainable approach Costa Crociere turned to Johnson Controls to modernise the fire prevention system aboard the neoRiviera.

Costa Crociere needed to implement this system quickly and efficiently with the

lowest impact on their cruise activities, and with full compliance to the shipbuilder's specifications and regulatory requirements.

Costa neoRiviera represents a new concept of cruise ships where quality and excellence are top priority.

This ship has a total of 624 cabins: 94 suites, 4 scenic cabins with private deck and 6 grand-suites with private deck. Aboard the ship are 3 restaurants and 6 coffee bars, a wide range of leisure facilities and fitness centres, swimming pool, sporting field, a two floors theatre, casino, disco, library and more. The ship's measurements are impressive: tonnage (t): 48200, length: 216m, width: 29m, max number of guests: 1700, staff: 600.

The installation of the SAPPHIRE® fire suppression system from Johnson Controls represents a new technological standard in the cruise ships industry, compared to the traditionally used CO<sub>2</sub> system.

Typically, the fire systems on board cruise ships are centralised systems, located in the biggest room to be protected. The disadvantage of such systems is that

once activated in one of the locations, the system is then out of service and unable to protect the ship against subsequent outbreaks of fire.

The solution designed by Johnson Controls uses instead a specific architecture system which includes 100% room protection, 24/7, regardless of any individual gas discharges. The system is a bespoke, modular, lightweight design solution which takes up less space than other systems due to its lower pipe length and smaller pipe diameter. The result is the full elimination of the discharge collectors and welding parts: the modular system being cheaper and easier to install.

The modular system, using 3M™ Novec™ 1230 Fire Protection Fluid was able to be installed while the ship was sailing. This meant no disruption for passengers or obstacles for the staff, no compromise of security during sailing and installation in a total timeframe of just 2 months. The installation time was reduced by 80% compared to a traditional system, which would have also required the ship to remain static in a shipyard.

Johnson Controls project managed the entire life cycle of the project: risk analysis, design, detailed engineering, tests with RINA certification authority which guarantee the system's requirements, installation, trial, training and commissioning into service. Johnson Controls fire suppression systems are certified according to all registers operating in the shipbuilders' industry, such as US Coast Guard, Lloyd's Register, ABS, DNV, MED Marine, Bureau Veritas, GL and obviously RINA.

The SAPPHIRE® System comprises 65 containers, sizes from 147 to 180 lts @42 bar, and 7.500 Kgs of 3M™ Novec™ 1230 Fire Protection Fluid.

Johnson Controls designed the single components in their factories, assembling the plant's parts in their labs and charging the tanks with the fire-extinguishing agent. They used their own certified personnel with strict compliance to the directions of the certification authority who validated all development steps prior to installation.

SAPPHIRE® fire-protection system uses Novec 1230 fire protection fluid, a clean agent which is stored as a liquid but dispersed as a gas, requiring only low cylinder pressure for storage. It has an excellent environmental profile, with zero Ozone Depletion Potential, and a Global Warming Potential of 1 due to a 5 day atmospheric lifetime.

Since the fluid disperses as a gas, it leaves no moisture or residue. It is neither corrosive nor conductive, and extinguishes fires within seconds, minimising disruption to electronics or other sensitive equipment. Unlike CO<sub>2</sub>, Novec 1230 fluid is safe for people and provides the widest margin of safety relative to other clean agents such as HFCs and inert gas systems. This makes it an ideal solution for boats and ships where exiting from a protected space may be challenging.

3M™ Novec™ 1230 Fire Protection Fluid is an advanced clean agent fire suppression material, based on a proprietary chemistry from 3M. It was designed to address industry needs for clean agent fire protection that is safe and effective, while offering a sustainable environmental profile that no other halocarbon agent can match. This includes: Zero Ozone Depletion Potential; a 5-day atmospheric lifetime, and a Global Warming Potential of 1. Because of these properties, Novec 1230 fluid is not targeted for phase-down or regulatory restrictions anywhere in the world. It is approved for use in total flooding fire suppression systems by the U.S. EPA and most major regulatory bodies. All of this makes Novec 1230 fluid today's sustainable choice for clean agent fire protection.

## The 3M™ Novec™ Brand Family

The Novec brand is the hallmark for a variety of proprietary 3M products. Although each has its own unique formula and performance properties, all 3M™ Novec™ products are designed in common to address the need for safe, effective, sustainable solutions in industry-specific applications. These include precision and electronics cleaning, heat transfer, fire protection, protective coatings, immersion cooling, advanced insulation media replacement solutions and several specialty chemical applications.

3M™ Novec™ Engineered Fluids ■ 3M™ Novec™ Aerosol Cleaners ■ 3M™ Novec™ 1230 Fire Protection Fluid ■ 3M™ Novec™ Electronic Grade Coatings ■ 3M™ Novec™ Electronic Surfactants ■ 3M™ Novec™ Insulating Gases

<b>UK</b> 3M Electronics Materials Solutions Division 0800 032 0841	<b>Germany</b> 3M Germany 49 2131 140	<b>Belgium</b> 3M Belgium 32 3 250 7521	<b>Czech Republic</b> 3M Czech Republic 420 2 61380111	<b>3M East</b> 41 4179 94040	<b>France</b> 3M France 33 1303 16161	<b>Israel</b> 3M Israel 972 9 9561490	<b>Spain</b> 3M Spain 34 91 3216000
<b>Russia</b> 3M Russia 7 495 7847474	<b>Hungary</b> 3M Hungary 36 1 270 7777	<b>Romania</b> 3M Romania 40 21 202 800	<b>Italy</b> 3M Italy 39 2 70351	<b>Poland</b> 3M Poland 48 22 739 6000	<b>Switzerland</b> 3M Switzerland 41 17249090	<b>Lithuania</b> 3M Baltics 370 5216 0780	<b>Middle East</b> 3M Gulf 9714 367 0777

Regulatory: For regulatory information about this product, contact your 3M representative.

Important Notice: All statements, technical information, and recommendations related to 3M's products are based on information believed to be reliable, but the accuracy or completeness is not guaranteed. Before using this product, you must evaluate it and determine if it is suitable for your intended application. You assume all risks and liability associated with such use. Any statements related to the product which are not contained in 3M's current publications, or any contrary statements contained on your purchase order shall have no force or effect unless expressly agreed upon, in writing, by an authorised officer of 3M.

Warranty; Limited Remedy; Limited Liability. This product will be free from defects in material and manufacture for a period of one (1) year from the time of purchase. 3M MAKES NO OTHER WARRANTIES INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. If this product is defective within the warranty period stated above, your exclusive remedy shall be, at 3M's option, to replace or repair the 3M product or refund the purchase price of the 3M product. Except where prohibited by law, 3M will not be liable for any indirect, special, incidental or consequential loss or damage arising from this 3M product, regardless of the legal theory asserted.

### Electronics Materials Solutions Division

3M United Kingdom PLC  
3M Centre, Cain Rd  
Bracknell RG12 8HT  
United Kingdom  
0800 0320841  
[www.3M.co.uk/novec1230](http://www.3M.co.uk/novec1230)

J389334.

3M and Novec are trademarks of the 3M Company. Blue Sky is a Service Mark of the 3M Company. SAPPHIRE is a registered trademark of Johnson Controls.

Used under license by 3M subsidiaries and affiliates. Please recycle. Printed in the UK.  
© 3M 2018. All rights reserved.

Johnson Controls,  
3 Viale dell' Innovazione,  
Milano, MI 20126, Italy

