



FINAL INSPECTION REPORT

Certification of recreational craft to annex 1-a of the European Recreational Craft Directive 94/25/EC as amended by Directive 2003/44/EC

ECB reference	: FIU-1561 to FIU-1568	Date of report:	08-10-2007
Inspection dates	: 18-09-2007	01-09-2007	02-09-2007
Customer	: Fireaway LLC		
Contact	: Mr. M. Gross		
Address, city, country	: 11503 K-Tel Drive, MN 55343 Minnetonka, United States of America		
Type designation of products	: Stat-X (30, 60, 100, 250, 500, 1000, 1500 and 2500)		
Description of product	: Condensed aerosol fire extinguishing system (type A and B fires)		
Certification module	: ECB type approval		
Surveyor	: A. Boonstra		
Lead surveyor	: A. Halma, B.Eng		
This report is written by	: A. Boonstra		
Number of reports	: 1		

This report is based on inspection of:

- Stat-X (30, 60, 100, 250, 500, 1000, 1500 and 2500)
- Operation and Maintenance Manual
- Technical file
- Test report – MCA fire test for condensed aerosol fire extinguishing systems (test date: 12-06-2006)
- MCA certificate of inspection and tests (issued 20-11-2006)
- Stat-X – Certified test data
- Norway Sjøfartsinspektionen acceptance letter (dated 01-12-2006)

General

- This report is subdivided into sections corresponding with the essential requirements of the European Recreational Craft Directive 94/25/EC as amended by 2003/44/EC. The relevant (ISO) standards are listed with each part.
- At the beginning of each part the literal text of the RCD is included. The assessment is according to the standards listed. If text is taken from a standard, the relevant paragraph is mentioned in parenthesis at the beginning of the paragraph.
- Possible reparations should be executed by applicant within 3 months after the date of the inspection report. The manufacturer is expected to propose a solution to the surveyor.
- Reproduction of this report, in full or in part, is prohibited without express written permission by ECB.
- This report is only applicable to the inspected object(s) at the moment of inspection.
- ECB-inspections, calculations and assessments of the product and relevant documentation are based on random checks determined by ECB Nederland BV.



Introduction

This report deals with the assessment of the **Stat-X** 30, 60, 100, 250, 500, 1000, 1500 and 2500 gram aerosol units on the basis of the following requirements.

- Annex 1-a of the European Recreational Craft Directive 94/25/EC as amended by Directive 2003/44/EC.
- EN ISO 9094 part 1/2.
- ECB test protocol (on-site practical tests): covered by the MCA fire test for condensed aerosol fire extinguishing systems (test date: 12-06-2006).

Stat-X units can be activated by using the following methods.

- Electrical automatic operation.
- Electrical manual operation by means of a manual release device.

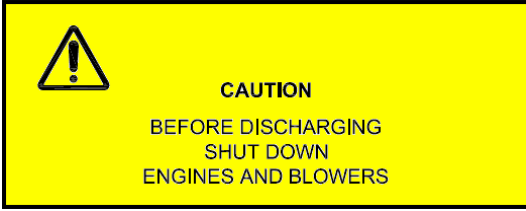

Document	Inspection report	Authorisation	Lead surveyor,	Page	1 of 6
File	report.1.final.071008.doc	Signature		Version	2.8

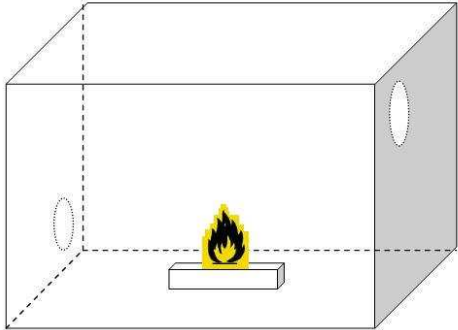
----- INSPECTED ITEMS -----		§ / ✓ / ✗
Annex XIII	Technical Construction File	✓
XIII.1	<p>Text of Directive: <i>The technical documentation [...] must comprise all relevant data or means used by the manufacturer to ensure that components or craft comply with the essential requirements relating to them.</i></p> <p><i>The technical documentation shall enable understanding of the design, manufacture and operation of the product, and shall enable assessment of conformity with the requirements of this Directive.</i></p> <p><i>The documentation shall contain so far as relevant for assessment:</i></p> <ul style="list-style-type: none"> • a general description of the type • conceptual design and manufacturing drawings and schemes of components, sub-assemblies, circuits, etc., • descriptions and explanations necessary for the understanding of said drawings and schemes and the operation of the product, • a list of the standards referred to in Article 5, applies in full or in part, and descriptions of the solutions adopted to fulfill the essential requirements when the standards referred to in Article 5 have not been applied, • results of design calculations made, examinations carried out, etc., • test reports, or calculations namely on stability according to point 3.2 of the Essential Requirements and on buoyancy according to point 3.3 of the Essential Requirements. 	---
ANNEX XIII	Technical Documentation supplied by the manufacturer	---
---	Remark: no non conformities found.	✓
---	Operation and Maintenance Manual	---
---	Remark: no non conformities found.	✓
5.6	Installation requirements > Fire protection	✓
5.6.1	<p>Text of Annex I of the Directive:</p> <p><i>The type of equipment installed and the layout of the craft shall take account of the risk and spread of fire. Special attention shall be paid to the surroundings of open flame devices, hot areas or engines and auxiliary machines, oil and fuel overflows, uncovered oil and fuel pipes and avoiding electrical wiring above hot areas of machines.</i></p>	---
5.6.2	<p>Text of Annex I of the Directive:</p> <p><i>Craft shall be supplied with fire-fighting equipment appropriate to the fire hazard, or the position and capacity of fire-fighting equipment appropriate to the fire hazard shall be indicated. The craft shall not be put into service until the appropriate fire-fighting equipment is in place. Petrol engine enclosures shall be protected by a fire extinguishing system that avoids the need to open the enclosure in the event of fire. Where fitted, portable fire extinguishers shall be readily accessible and one shall be so positioned that it can easily be reached from the main steering position of the craft.</i></p>	---
5.6.3	<p><i>Relevant parts of standard</i> <i>ISO 9094 - Small Craft - Fire Protection –</i> <i>Part 1: Craft with a hull length of up to and including 15 metres</i> <i>Part 2: Craft with a hull length of over 15 metres</i></p>	---
§	ISO 9094-1: 2003 Fire protection - Part 1: Craft with a hull length of up to and including 15 m	---
5.1	<p>Fire-extinguishing equipment > ISO classification of fires ISO 3941 defines classes of fires according to the nature of the material undergoing combustion. In consequence, it does not define a particular class of fire involving an electrical risk.</p> <p>The following designations are used to identify and classify fires according to their type and the effectiveness of various extinguishers and extinguishants,</p> <ul style="list-style-type: none"> - ISO Class A: fires involving solid materials, usually of organic nature, in which combustion normally takes place with the formation of glowing embers. - ISO Class B: fires involving liquids or liquefiable solids. - ISO Class C: fires involving gases. - ISO Class D: fires involving metals. 	---

5.3.2	Fire-extinguishing equipment > Requirements > Accommodation The accommodation area shall be equipped with either <ul style="list-style-type: none"> - portable fire extinguishers according to clause 6, or - fixed fire-extinguishing systems according to clause 7, plus one or more portable fire extinguishers according to clause 6. 	---																			
5.3.4.1	Fire-extinguishing equipment > Requirements > Engine and/or fuel spaces > Protection of engine and/or fuel spaces The protection of engine and/or fuel spaces shall be achieved according to the requirements given in Table 1. <table border="1" data-bbox="280 344 1414 1003"> <thead> <tr> <th>Engine position</th> <th>Type and rating of engine</th> <th>Protection achieved by</th> </tr> </thead> <tbody> <tr> <td>Open boat with engine(s) or part of engines above cockpit sole, nearly vertical casing</td> <td>Petrol inboard engine of less than 120 kW Diesel engine</td> <td>— fixed fire-fighting system (clause 7), or — portable fire extinguisher sized and suited to flood the engine space through a fire port in the engine casing</td> </tr> <tr> <td>Open boat with transom-mounted outboard motor, and portable fuel tank stowage in the open atmosphere</td> <td>Petrol outboard engine</td> <td>No requirement for single outboard engine < 25 kW (clause 6.4 applies)</td> </tr> <tr> <td>Open boat with transom-mounted outboard motor(s), and more than one portable fuel tank per engine or tank(s) installed in an enclosed space</td> <td>Petrol outboard engine</td> <td>— fixed fire-fighting system to protect the fuel space (clause 7), or — portable fire extinguisher sized and suited to flood the fuel space through a fire port in the fuel-space boundary</td> </tr> <tr> <td rowspan="3">Engine below cockpit level or inside boat</td> <td>Petrol inboard engine</td> <td>— fixed fire-fighting system (clause 7)</td> </tr> <tr> <td>Diesel inboard engine(s) of less than or equal to 120 kW combined rating (main and auxiliaries)</td> <td>— fixed fire-fighting system (clause 7), or — portable fire extinguisher of a type and size suitable to flood the engine space through a fire port in the engine casing</td> </tr> <tr> <td>Diesel inboard engine(s) of more than 120 kW combined rating (main and auxiliaries)</td> <td>— fixed fire-fighting system (clause 7)</td> </tr> </tbody> </table>	Engine position	Type and rating of engine	Protection achieved by	Open boat with engine(s) or part of engines above cockpit sole, nearly vertical casing	Petrol inboard engine of less than 120 kW Diesel engine	— fixed fire-fighting system (clause 7), or — portable fire extinguisher sized and suited to flood the engine space through a fire port in the engine casing	Open boat with transom-mounted outboard motor, and portable fuel tank stowage in the open atmosphere	Petrol outboard engine	No requirement for single outboard engine < 25 kW (clause 6.4 applies)	Open boat with transom-mounted outboard motor(s), and more than one portable fuel tank per engine or tank(s) installed in an enclosed space	Petrol outboard engine	— fixed fire-fighting system to protect the fuel space (clause 7), or — portable fire extinguisher sized and suited to flood the fuel space through a fire port in the fuel-space boundary	Engine below cockpit level or inside boat	Petrol inboard engine	— fixed fire-fighting system (clause 7)	Diesel inboard engine(s) of less than or equal to 120 kW combined rating (main and auxiliaries)	— fixed fire-fighting system (clause 7), or — portable fire extinguisher of a type and size suitable to flood the engine space through a fire port in the engine casing	Diesel inboard engine(s) of more than 120 kW combined rating (main and auxiliaries)	— fixed fire-fighting system (clause 7)	---
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5.3.4.2	Fire-extinguishing equipment > Requirements > Engine and/or fuel spaces > Extinguishing medium and capacity The extinguishing medium shall be suitable for extinguishing an engine room fire, and flooding the entire space. The extinguishing capacity of the portable extinguisher shall be sufficient for the volume of the engine space. A discharge opening shall be provided so that the extinguishing medium can be discharged into the engine space without opening the primary access. NOTE For engine spaces with a gross volume $\leq 1 \text{ m}^3$, any extinguishing medium suitable for extinguishing Class B fires is considered to fulfill this requirement. Remark: the maximum coverage for class B fires is as listed below. <table border="1" data-bbox="280 1391 1414 1664"> <thead> <tr> <th>Model</th> <th>Coverage (m³)</th> </tr> </thead> <tbody> <tr><td>Stat-X 30</td><td>0.50</td></tr> <tr><td>Stat-X 60</td><td>1.00</td></tr> <tr><td>Stat-X 100</td><td>1.62</td></tr> <tr><td>Stat-X 250</td><td>4.04</td></tr> <tr><td>Stat-X 500</td><td>8.08</td></tr> <tr><td>Stat-X 1000</td><td>16.20</td></tr> <tr><td>Stat-X 1500</td><td>24.20</td></tr> <tr><td>Stat-X 2500</td><td>40.40</td></tr> </tbody> </table>	Model	Coverage (m ³)	Stat-X 30	0.50	Stat-X 60	1.00	Stat-X 100	1.62	Stat-X 250	4.04	Stat-X 500	8.08	Stat-X 1000	16.20	Stat-X 1500	24.20	Stat-X 2500	40.40	✓	
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7.1	Fixed fire-extinguishing systems > Requirements > Purpose This clause specifies requirements for fixed fire-fighting systems, manually or automatically put into operation, if fitted, using extinguishing media suitable for total coverage or flooding of an enclosed space and capable of extinguishing fires of Class A and B. Remark: no nonconformities found.	✓																			
7.2.1	Fixed fire-extinguishing systems > Requirements > Manual system A fixed system put into operation manually shall be activated from the main steering position. If that position is more than 5 m away from the section or space to be protected, a means of local activation shall be provided near that space. Remark: all relevant data to fulfill this requirement is present in the provided Operation and Maintenance Manual.	✓																			

7.2.3	<p>Fixed fire-extinguishing systems > Requirements > Manual/automatic combined system The arrangement of a combined manual/automatic system shall be such that the operator can manually override the automatic mode. The system shall comply with the requirements of 7.4.</p> <p>Remark: no nonconformities found.</p>	✓
7.3	<p>Fixed fire-extinguishing systems > Application The installation of a fixed system using an asphyxiant as the extinguishing medium is limited to spaces in a boat that are not intended for accommodation purposes and are separated from the accommodation area. This requirement is fulfilled if the spaces have no permanent openings other than for the following purposes:</p> <ul style="list-style-type: none"> - connection to the surrounding bilges; - ventilation of engine space and supply of combustion air; - openings for piping and cables; - openings for access to equipment. <p>If the extinguishing medium is an asphyxiant, the separating structure shall be constructed to minimize the flow of the medium into the accommodation area.</p> <p>Remark: under the condition that it is applied in normal (design) concentrations the used aerosol is regarded as being a non asphyxiant.</p>	✓
7.4.1	<p>Fixed fire-extinguishing systems > Installation > General The components of a fixed system shall be securely fastened to the boat's structure to withstand motions, shock and vibrations during normal running conditions. Cylinders, distribution lines and controls shall be located so that they will not be subject to temperatures outside the system's designed operating range, while the boat is in service.</p> <p>Remark: all relevant data to fulfill this requirement is present in the provided Operation and Maintenance Manual.</p>	✓
7.4.2	<p>Fixed fire-extinguishing systems > Installation > Cylinders/containers Cylinders/containers may be installed either inside or outside the space to be protected. To minimize corrosion, cylinders shall be mounted clear of the anticipated bilge-water level. They shall be accessible for removal, and the controls and dials shall be readily accessible and visible. Cylinders shall be mounted to provide clearance above surfaces on which water may accumulate.</p> <p>Remark: all relevant data to fulfill this requirement is present in the provided Operation and Maintenance Manual.</p>	✓
7.4.3	<p>Fixed fire-extinguishing systems > Installation > Manual system, release device The release device shall be visible or its location visibly labeled and the protected space identified. The release device shall be readily accessible and operable.</p> <p>Remark: no nonconformities found.</p>	✓
7.4.4	<p>Fixed fire-extinguishing systems > Installation > Distribution line Non-metallic components of the distribution line(s), including fixtures that are not intended to melt as part of the fire-fighting system as installed, shall be fire resistant in accordance with ISO 7840. Solder or brazing material used for metallic lines or fittings shall have a melting temperature of not less than 600 °C. The number and location of discharge nozzle(s) shall ensure effective extinguishing of fires within the space.</p> <p>Remark: all relevant data to fulfill this requirement is present in the provided Operation and Maintenance Manual.</p>	✓
7.5.1	<p>Fixed fire-extinguishing systems > Discharge and control A visual indication of discharge shall be provided.</p> <p>Remark: no nonconformities found. Visual indication provided by means of a manual switch or by LED indication on a control panel.</p>	✓
7.5.2	<p>Fixed fire-extinguishing systems > Discharge and control The system shall be installed such that the discharge shall be completed according to the extinguisher manufacturer's specification.</p> <p>Remark: all relevant data to fulfill this requirement is present in the provided Operation and Maintenance Manual.</p>	✓
7.6.1	<p>Fixed fire-extinguishing systems > Operation > Range of operation The fixed system shall be capable of operating above an ambient temperature of 0°C.</p> <p>Remark: Stat-X is capable to be operated at ambient temperatures between -54°C and +54°C.</p>	✓

Document	Inspection report	Authorisation	Lead surveyor,	Page	4 of 6
File	report.1.final.071008.doc	Signature		Version	2.8

7.6.2	Fixed fire-extinguishing systems > Operation > Discharge instructions A label showing how to discharge the system shall be provided immediately adjacent to the release device. Remark: no nonconformities found.	✓								
7.6.3	Fixed fire-extinguishing systems > Operation > Operating instructions Operating instructions shall be provided for each system. If the extinguishing medium is an asphyxiant, these shall include directions on how to ventilate the space prior to entering for damage assessment and subsequent restarting of the engine. Remark: no nonconformities found.	✓								
7.7	Fixed fire-extinguishing systems > Design concentration The extinguishing capacity of the system shall be based on the net volume of the compartment (volume of air plus 20 %). Remark: no nonconformities found. In clause 4.2.1. of the 'Design, Installation, Operation, and Maintenance Manual' a comprehensive method for the calculation of the total mass of aerosol needed for protection is provided.	✓								
8.1	Displayed information Where a space, which is regarded as being separated from adjacent accommodation, is protected by a fixed system the following information shall be displayed near the release device. <div style="text-align: center;">  </div> Remark: no nonconformities found. Labels will be provided with each system.	✓								
8.2	Displayed information Where a space which cannot be regarded as being separated from adjacent accommodation is protected by a fixed system, the following information shall be displayed near the release device. <div style="text-align: center;">  </div> Remark: no nonconformities found. Labels will be provided with each system.	✓								
§	ISO 9094-2: 2003 Fire protection - Part 2: Craft with a hull length of over 15 m	---								
---	Remark: only additional requirements are reported below. All other requirements are covered by ISO 9094 part one.	---								
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§ ECB Test Protocol (on-site practical tests)		---	
1.1	<p>Extinguishing system to be installed in compliance with the manufacturers instructions.</p> <p>Additional requirements as stated in ISO 9094-1 and ISO 9094-2.</p> <p>Fire source: a trough with a horizontal projection of 160000 mm² (400 mm x 400 mm), approximately 10 cm in height, half-filled with water. Before each test 0.5 liter Heptane is added.</p> <p>Test: ignite the water/heptane mixture. The system passes when the fire is extinguished.</p> <p>Re-ignition verification.</p>		---
1.2	<p>Remark: approved based upon the tests as carried out and certified (MS 47 / 11 / 1042) by the Maritime and Coastguard Agency (MCA). The ECB on-site practical tests have been cancelled.</p>	✓	

Conclusion

The **Stat-X** A50/A200/A500/A1000/A5000 aerosol units fulfill the requirements for fire protection as stated in the recreational craft directive 94/58/EC as amended by 2003/44/EC and ISO 9094 part 1 and 2.

Signature		Signature	
Name	A. Boonstra	Name	A. Halma, B.Eng
Function	Surveyor	Function	Lead surveyor
Date	08-10-2007	Date	08-10-2007

END OF REPORT

Document	Inspection report	Authorisation	Lead surveyor,	Page	6 of 6
File	report.1.final.071008.doc	Signature		Version	2.8