Verband für Schiffbau und Meerestechnik e. V.

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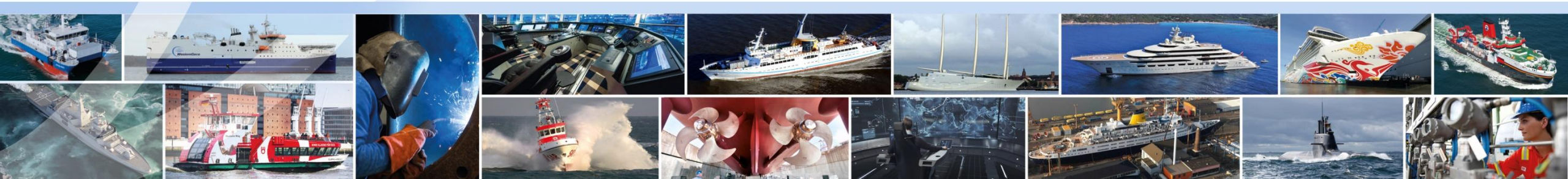
Fire safety and regulations – news from IMO SDC 12

MariLight Network Meeting Kiel - 28.01.2026



Introduction

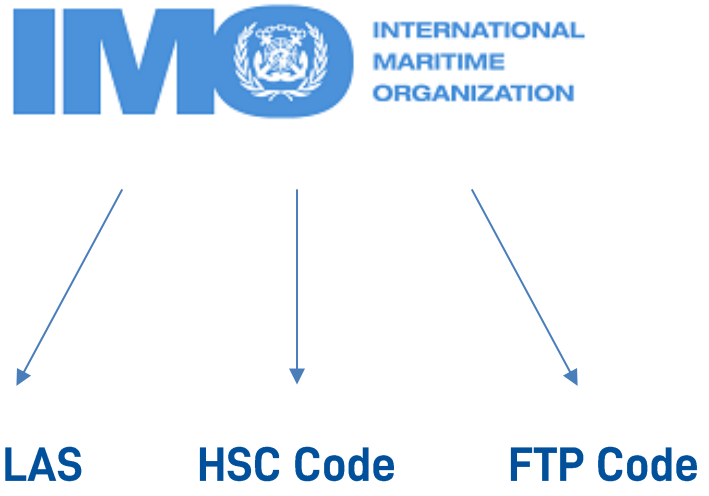
The German Shipbuilding and Ocean Industries Association (VSM)

- Founded in 1884 as a pure shipyard association, today **covering the entire shipbuilding and marine technology value chain**
- Headquarters in **Hamburg**
- Representational offices in **Berlin and Brussels**
- Umbrella organization for VMWD, MAZA, DSMA, VMPS, FSM
- Over **260 direct members**
- Over **850 maritime member companies** as an umbrella organization
- Active member of the European association **SEA Europe**
- **Accredited to IMO** via CESA

→ The voice of the entire industrial maritime value chain in Germany!

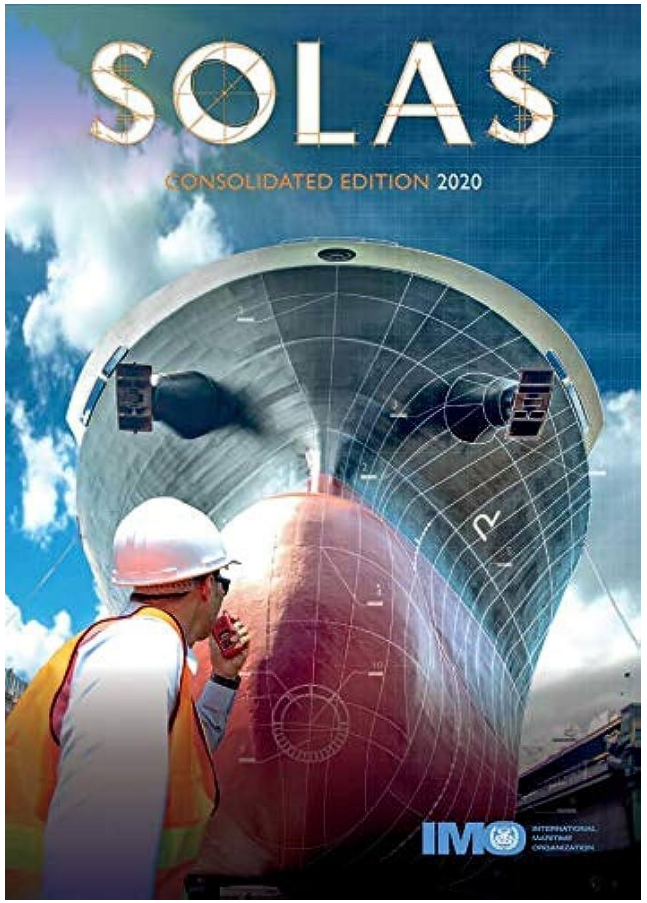
The International Maritime Organization

- Special agency of the United Nations (UN)
- Responsible for measures to improve the **safety of international shipping** and **prevent pollution of the environment** by ships
- IMO develops **rules, regulations and conventions** which are then ratified by the member states. Example: SOLAS
- Other instruments are Codes, Manuals etc. Examples:
  - High Speed Craft (HSC) Code
  - Fire Test Procedures (FTP) Code
- One of the 5 main committees of the IMO is the **'Maritime Safety Committee (MSC)'**



SOLAS

- International Convention for the Safety of Life at Sea
- Scope of application:
  - Applicable to ships engaged on international voyages
  - Not applicable to:
    - Ships of war and troopships
    - Cargo ships of less than 500 gross tonnage
    - Ships not propelled by mechanical means
    - Wooden ships of primitive build
    - Pleasure yachts not engaged in trade
    - Fishing vessels
- Most important set of rules for all seagoing vessels



Quelle: IMO

SOLAS

- SOLAS generally requires:
  - „ships shall be designed, constructed and maintained in compliance with the structural, mechanical and electrical requirements of a classification society which is recognized by the Administration" (SOLAS Ch. II-1/3-1)

  → Class Societies, recognized by the respective flag state

  - And further: "The hull, superstructures, structural bulkheads, decks and deckhouses **shall be constructed of steel or other equivalent material**" (SOALS Ch. II-2 Reg. 11/2)

Definition in Ch. II-2 Reg.3.43

- Steel or other equivalent material means **any non-combustible material which, by itself or due to insulation provided, has structural and integrity properties equivalent to steel at the end of the applicable exposure to the standard fire test** (e.g. aluminium alloy with appropriate insulation).

SOLAS

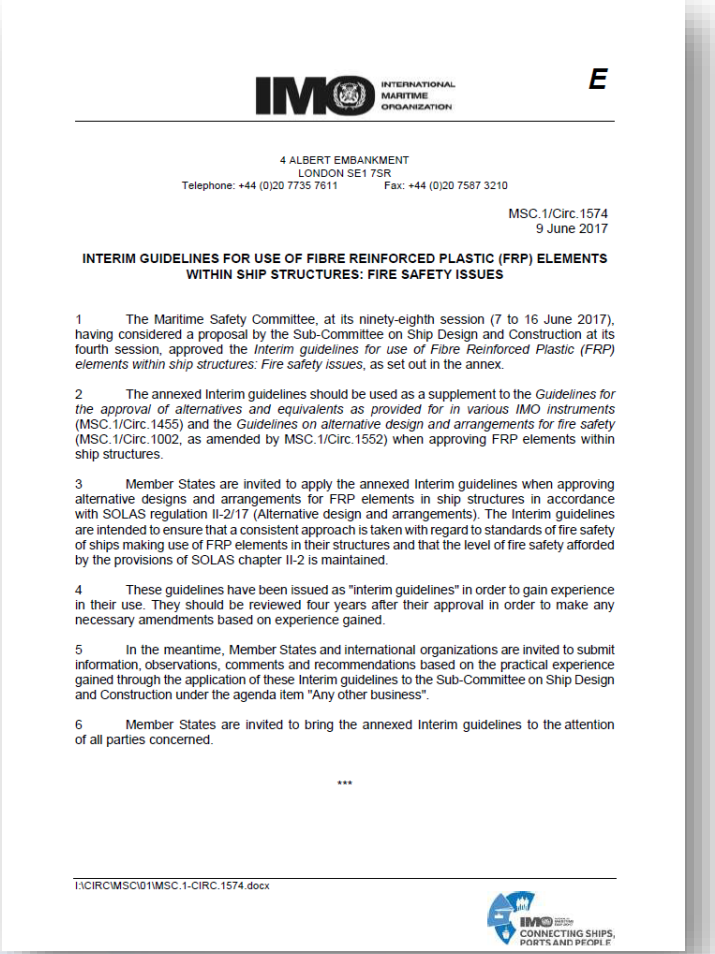
- To deviate from the SOLAS requirements, **SOLAS II-2 Reg. 17 'Alternative design and arrangements'** applies
  - Engineering Analysis (Reg. 17.3)

- To give **guidance** for the alternative design process, several guidelines exist:
  - Guidelines for the **approval of alternatives and equivalents** as provided for in various IMO instruments (MSC.1/Circ. 1455)
  - Guidelines on **alternative design and arrangements for fire safety** (MSC.1/Circ. 1002, as amended by MSC.1/Circ. 1552)

- Special guidance for the **alternative design process of FRP elements**:
  - Interim Guidelines for use of fibre reinforced plastic (FRP) elements within ship structures: Fire safety issues (MSC.1/Circ. 1574)
  - Issued in 2017

Interim Guidelines for use of fibre reinforced plastic (FRP) elements within ship structures: Fire safety issues (MSC.1/Circ. 1574)

- Focus on fire safety
- It is assumed that the materials under consideration are **combustible**
- FRP elements must fulfil the fire safety specifications and functional requirements of SOLAS Ch. II-2 → **equivalent safety level must be achieved!**
- The guideline only covered **elements that can be removed without compromising the safety of the ship**
    - This excluded elements contributing to global strength and load-bearing elements
- Research projects such as RAMSSES highlighted the need for a **revision of the interim guidelines to promote the wider application of FRP elements in the maritime industry**



IMO INTERNATIONAL MARITIME ORGANIZATION

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MSC.1/Circ.1574
9 June 2017

INTERIM GUIDELINES FOR USE OF FIBRE REINFORCED PLASTIC (FRP) ELEMENTS WITHIN SHIP STRUCTURES: FIRE SAFETY ISSUES

1 The Maritime Safety Committee, at its ninety-eighth session (7 to 16 June 2017), having considered a proposal by the Sub-Committee on Ship Design and Construction at its fourth session, approved the *Interim guidelines for use of Fibre Reinforced Plastic (FRP) elements within ship structures: Fire safety issues*, as set out in the annex.

2 The annexed Interim guidelines should be used as a supplement to the *Guidelines for the approval of alternatives and equivalents as provided for in various IMO instruments* (MSC.1/Circ.1455) and the *Guidelines on alternative design and arrangements for fire safety* (MSC.1/Circ.1002, as amended by MSC.1/Circ.1552) when approving FRP elements within ship structures.

3 Member States are invited to apply the annexed Interim guidelines when approving alternative designs and arrangements for FRP elements in ship structures in accordance with SOLAS regulation II-2/17 (Alternative design and arrangements). The Interim guidelines are intended to ensure that a consistent approach is taken with regard to standards of fire safety of ships making use of FRP elements in their structures and that the level of fire safety afforded by the provisions of SOLAS chapter II-2 is maintained.

4 These guidelines have been issued as "interim guidelines" in order to gain experience in their use. They should be reviewed four years after their approval in order to make any necessary amendments based on experience gained.

5 In the meantime, Member States and international organizations are invited to submit information, observations, comments and recommendations based on the practical experience gained through the application of these Interim guidelines to the Sub-Committee on Ship Design and Construction under the agenda item "Any other business".

6 Member States are invited to bring the annexed Interim guidelines to the attention of all parties concerned.

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IMO CONNECTING SHIPS, PORTS AND PEOPLE

Timeline of the Revision

2017:
Interim Guidelines (IG) for use of FRP Elements within Ship Structures are adopted

January 2023:
Following a submission from CESA (SDC 9/15/2), **SDC 9 decides to put a revision of the IG on the agenda of SDC 10.**

January 2024:
SDC 10:
- Discussions on the "Scope of the output" in the plenary session
- Establishment of a CG coordinated by SWE

2024:
Correspondence Group on FRP:
- CESA/LR proposal on fire testing
- There are still unresolved issues regarding fire safety of FRP

January 2025:
SDC 11:
- No working group
- Discussions on the "Scope of the output" in plenary
- Clarification of scope by MSC 110 (Jun 25) requested
- New CG established

2025:
Correspondence Group on FRP (2):
- Consideration of load-bearing divisions
- Editorial changes
- New definitions for elements

June 2025:
MSC 110:
- "Elements contributing to global strength" not part of scope
- Scope limited to fire safety aspects

January 2026:
SDC 12:
- Working Group
- Comprehensive review of the IG successful

The „new“ Guidelines:

- Comprehensive review of the IG was conducted by way of two Correspondence Groups and one Working Group at SDC 12
- Member States/NGOs actively engaged in the discussions:
  - FRA, UK, DEN, NOR, US, GER, SWE, CAN
  - IACS, CESA, ICS, SYBASS
- The revised Guidelines now need to be approved by Mother Comittee MSC in June
- The new guidelines will supersede the old Interim Guidelines

Changes to the Interim Guidelines

- New definitions have been created to help distinguish between the different types of elements:
  - Non load-bearing elements
  - Load bearing elements, that are not contributing to global strength
  - Load-bearing elements, that are contributing to global strength

- Elements contributing to global strength continue to be outside the scope of the IG but other **load bearing elements are inside the scope**!
- **Thermoplastic matrix systems** have been incorporated into the IG.
- Short passage on **life cycle considerations** has been taken onboard
- Editorial changes and alignments throughout the text

Most important changes to Appendix D: „Fire testing of FRP Composites“

- **New test methods** have been introduced to test the **structural (and thermal) integrity** of FRP elements.

	Option 1: Testing based on temperature		Option 2: Testing based on deflection	
	Test method	**Failure criterion**	**Test method**	**Failure criterion**
Non loadbearing elements	Based on FTP Code Annex I, Part 3	• Gap gauges • HDT between skin and insulation on the fire exposed side	FTP Code Annex I, Part 11, with the following loads: .1 bulkheads: 1.5 kN/m* .2 decks: 3.5 kN/m²**	• Gap gauges • Rate & amount of deflection acc. to FTP Code annex 1 Part 11 Appendix Reg. 4.7
Loadbearing elements			FTP Code Annex I, Part 11, with design load	

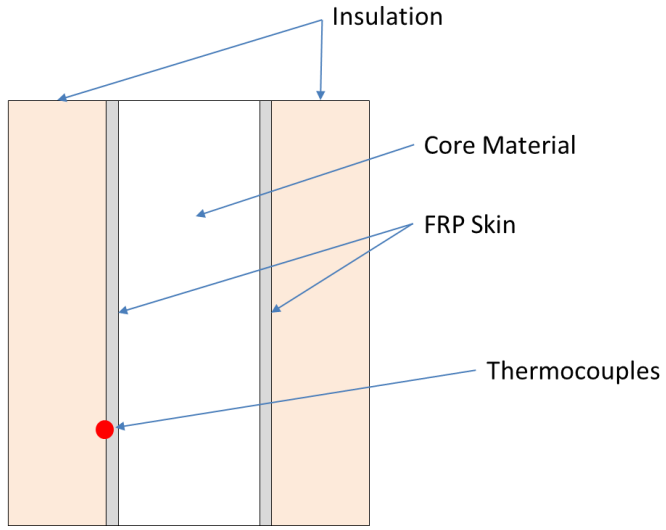
*The value for testing unloaded bulkheads was determined based on the value for corridors on ro-ro ships in accordance with SOLAS regulation II-2/13.7.3 (0.75 kN/m) with a load factor of 2, as this is a new type of material.
**Non-load-bearing horizontal elements may be tested with an appropriate alternative load subject to agreement with the Administration.

Option 1: Testing based on temperature

- Test method based FTP Code Annex I, Part 3 „Standard fire test“
  - Measure temperature rise on the fire-exposed side, between insulation and skin laminate
  - Same test for loaded and unloaded elements
- Failure criterion:
  - During the duration of the test, the temperature measured at the FRP skin (below insulation) does not exceed the Heat Deflection Temperature (HDT) of the laminate
  - Gap gauges acc. to FTP Code Annex 1, Part 3 Reg. 3.2.3

→ **Conservative approach**, could help to create acceptance

→ Relatively simple test procedure, no load application necessary



Option 2: Testing based on deflection

- Test method based on FTP Code Annex 1, Part 11 „Fire test procedures for fire-resisting divisions of high-speed craft“ with the following loads:
  - .1 bulkheads: 1.5 kN/m* (line load)
  - .2 decks: 3.5 kN/m²** (area load)

  } for unloaded parts

  or:
  - **Design load** for loaded parts
- Failure criterion:
  - Gap gauges
  - Rate & amount of deflection acc. to FTP Code annex 1 Part 11 Appendix Reg. 4.7

→ Presumably a **more accurate assessment of structural integrity**

→ More complex testing procedure, design loads can be very high

Picture source: RISE

Next steps

- The revised Guidelines now need to be **approved by Mother Committee MSC** in June

- Further **research and development** is necessary!
  - Expand the database on the fire behaviour of FRP
  - Further development of fire-retardant/non-combustible FRP
  - Consider the aspect of sustainability/recyclability

- **Demonstration of use cases for FRP on a full scale**
  - Dialogue with owners/shipowners → Create acceptanceto create confidence and gain experience
  - Exploit existing/new funding opportunities
  - Lobbying/marketing for maritime lightweight construction

Questions/Discussion