

USE AND MAINTENANCE MANUAL FOR M.E.RIN FLEXIBLE TANKS

INSTRUCTIONS FOR USE, MAINTENANCE CONTROLS, LIFESPAN AND PRECAUTIONS FOR USING M.E.RIN RACING EQUIPMENT; FUEL CELLS, VALVES, GASKETS, FOAM, SWIRL POTS, REFUELING RIGS, PUMPS, LEVELS, ETC.

USE: **COMPETITIONS VEICHLES**

PLEASE READ CAREFULLY

1. **TEMPERATURE** – Flexibility is the characteristic giving to safety fuel cells the resistance to impacts and punctures. A Decrease in temperature can impair fuel cell flexibility and effectiveness. M.E.RIN racing fuel cells are designed to adjust themselves to environments with temperatures between 0°C and 70°C. Temperatures below – 15°C can undermine fuel cell crash-resistance and reduce its performance. Temperatures above 100°C entail an early deterioration of the fuel cell; the longer the fuel cell remains exposed to high temperatures, the faster it deteriorates. Internal and external surfaces of the fuel cell should periodically be checked for chafing. In doubt, please contact us.
2. **LIFESPAN** – The main sanctioning organizations, such as the FIA, have recognized that over time, safety fuel cells and related equipment are affected by ozone, ultraviolet rays and weather action, as well as by the chemical action of gasoline and other racing fuels. Consequently, a five-year legal life span has been set for all safety fuel cell bladders. The rubber part of the fuel cell system can be certified within five years from the manufacture date and for a further two-year period. After this period of seven years, the fuel cell bladder can no longer be used.
3. **WATER & MOISTURE** – Water vapor and direct exposure to sunlight can damage fuel cell bladders and safety foam. It is recommended to always install the fuel cell bladder inside a metal and composite enclosure, checking that its inner and outer parts are kept free of water and water vapor. If some water should accidentally stagnate inside the fuel cell bladder, check the foam, and in the event of a clear deterioration (if the foam can easily be broken during its handling), replace it. A test carried out on a foam dipped in 70°C distilled water for the period of one month, showed a 35% reduction in its resilience.
4. **PERMEABILITY** – Due to the the polymeric nature of the safety fuel cell bladders, fuel permeation, or diffusion may occur. Always install an excellent ventilation system, which is able to prevent fuel vapors from accumulating around the fuel cell and the vehicle. Arrange dump cans in the lower part of the container.
5. **DEGRADATION DUE TO WEATHER CONDITIONS** – Most competition equipment is prone to degradation caused by sunlight, wind, freezing weather alternating with thawing, an increase and decrease in temperatures, airborne and rain-borne pollutants. Ozone, ultraviolet rays, water and acids are responsible for the deterioration of plastic and rubber parts. Therefore, if possible, protect the fuel cell and the refueling system from weathering exposure.
6. **ABRASION** – Most racing items, especially safety fuel cell bladders in rubberized material, are prone to chafing and abrasion. Therefore, handle these items with care and/or install them with caution, without applying force or pressure. Keep these items free of stones, sand or other corroding agents. Be sure that the safety tank container has a smooth and regular inner surface. Do not place sharp or uneven items loosely inside a safety fuel cell (i.e. fuel supply pumps, baffles, swirl pots, etc.), because they could chafe the rubber and, consequently, cause fuel leaks.
7. **FUEL COMPATIBILITY** – Almost any of the parts composing a fuel-feed system is resistant to fuel. Therefore, before buying the equipment and keeping it operational, it is necessary to consider the type of fuel that is intended to be

used (for example gasoline, diesel, methanol, etc.). Improper fuel will cause an early deterioration of the fuel cells. Also the material composing the safety foam of the fuel cells is susceptible to damages. Other chemical fuels, namely nitro-methane, nitro-propane, hydrazine and additives such as aniline, toluidine, benzene and aromatics can cause damage to hoses, gaskets, valves, fuel cell bladders and other fuel system parts. Fuel cell materials do tolerate additives at the usual rate (<2%), while for higher rates, some decays in the physical-chemical characteristics of inner layers are likely to occur. Check the compatibility and, in doubt, contact M.E.RIN. Do not take unnecessary risks.

8. **INSTALLATION** – During the phase of installation of fuel cells, dry-break valves, vent valves, fuel hoses or other components, always follow all the instructions, carefully. Be sure to perform cautiously all the operations of location, bracketing, venting, grounding and isolation of the driver's cab. Since there is a wide range of vehicles, it is impossible to give specific installation instructions for every single product. Anyway, during the installation, the formation of crease, fold or particular pressurized areas must to be avoid. In fact, if any crease or pressurized areas occurred during the installation, the bladder skin could collapse and cause, with the passing of time, leaking points. In case of doubt, please refer to professional chassis builder, a mechanical engineer or M.E.RIN for obtaining assistance and information during the installation.
9. **FOAM REMOVAL – CAUTION:** All the fuel cells and gasoline containers must be cleaned and out of use before any inspection, disassembly or storage. The internal safety foam baffling should be removed only when it is completely dry /after its complete drying. After the fuel cell is completely dried, the foam baffling can be cleaned and reinstalled, or replaced with a new one. NEVER REMOVE OR INSTALL A FOAM WET WITH FUEL, SINCE DROPLETS COULD BE SPRAYED AND IGNITED FROM ELECTROSTATIC CHARGES. WHEN WORKING ON FUEL CELLS, FUEL CONTAINERS OR OTHER ACCESSORIES, ALWAYS WEAR FULL PROTECTIVE CLOTHING.
10. **INFLATION TEST** – M.E.RIN fuel cells must not be inflated or pressurized. Nevertheless, a leak-control test can be carried out on these tanks at 0,12 bar (4.9 inches H₂O column) maximum pressure. A precision gauge and an additional pressure-regulating instrument are necessary accessories. Overpressure can cause the lengthening of the fuel tank and damages to the joints without showing any clear external signs. Anyway, a control should be performed in the event of other maintenance, ideally every 2 years if possible.
11. **CONTAINERS** – Safety fuel cells are to be installed inside a composite or aluminum enclosure. The enclosure acts as a support for the bladder, it deflects impacts and it serves as a fire protection.
12. **ELECTROSTATIC GROUNDING** – Electrostatic charges can be caused by the fuel agitation, the passing of large flows of fuel or by induction from other sources. In order to reduce the possibility of sparking and fuel ignition, always resort to electrostatic grounding for the equipment in contact with fuel. To prevent from electrical charge accumulation, fuel cells, filler pipes, and dry-break valves should always be installed with a bonding strap to the chassis. Overhead fuelling rigs, dump cans, hose connections, funnels, valves, gasoline cans, etc. must be connected to the ground through straps before the transfer of fuel or vapors. Always wear full protective clothing when working with flammable fuels. There must be a clean connection between the terminals in order to assure electrical conductivity.
13. **INSPECTION, MODIFICATIONS, OR REPAIRS** – Changes, modifications, and repairs on MERIN fuel cells and equipment may be performed exclusively by the manufacturer. Particularly, it is suggested that the disassembly required for periodical inspections and cleaning is carried out only by trained technicians. Reassembly is to be performed in compliance with the original design by MERIN; moreover, a low-pressure leak-control test (0,12 bar) must be implemented on all joints, gaskets and surfaces. The repair of a puncture guarantees not only the reseal of the fuel cell, but also the restoration of its original breaking load. Please do not perform inadequate repairs and do not use improper material. It is safest to send the fuel cell to MERIN for repair, or alternatively, replace it immediately with a new fuel cell.
14. **CLEANING AND LUBRICATION** – Most MERIN products do not need periodical lubrication. Nevertheless some products, such as dry-break valves, require frequent disassembly for cleaning and lubrication. Always keep

competition equipment free of dirt, sand or other pollutants. It is recommended to lubricate regularly the movable parts using fuel resistant grease in order to obtain a safe and effective use.

15. **VENTING SYSTEM** – An appropriate venting system of the fuel cell is paramount for the functioning of the fuel-feed system and guarantees fire safety. Make sure that the open vent pipe is tightly fastened to the fuel cell and oriented upwards and far from the cell, engine, exhaust pipe and driver's cab. Always use the highest quality fuel resistant hoses, make airtight joints and exit the vent on the bottom towards a catch tank or directly in the airflow, far from any potential source of ignition.
16. **SAFETY FOAM BAFFLING** – The fuel cell foam is made of an open cell reticulate material. If this kind of foam is used inside a safety fuel cell bladder, it serves to avoid explosions, control fuel slosh and absorb the energy given off from impacts. The foam should never be handled if wet with fuel. The surface could catch fire. Moreover, the foam should only be used with gasoline and not with additives, water, alcohol or aromatics in percentages above 50%. If additives have been used previously, the foam can still be used provided that it is cleaned and dried immediately after its use.
17. **DATA BLOCK** – All MERIN fuel cells are manufactured, inspected and serially numbered one by one. Information concerning MERIN fuel cells can be found on a data block located on the top of the fuel cell bladder. Information includes the manufacture date, model, production material, serial number and expiration date. This data block can be found on the top, side or bottom of the fuel cell, depending on the size and type. Before contacting MERIN, please make sure that you hold this information ready. This way we can assist you more efficiently.
18. **SPILLAGE** – Some accidents may take place during pits or even in the garage because of not accurate filling procedures, leading to fuel leaks. Please fill the fuel cell slowly, so that vapors have time to discharge and dripping is avoided. For quick-filling fuel cells, be sure that there is a proper valve, a roll over valve or a catch tank to collect liquid fuel coming from the vent line. Moreover, check assiduously whether all fuel circuits, pumps, level gauges, dipsticks and fuel return lines are airtight, sealed and free of leaks. Before the racing starts, be sure that the whole fuel-feed system, from dump can to ventilation manifold, is free from fuel spills and leaks.
19. **PERSONNEL PROTECTION** – Pit crews, mechanics and everybody else who is handling flammable substances must wear a full protective clothing, and fireproof, antistatic and waterproof equipment.
20. **STORAGE AND COLLECTING** – When fuel cells have been put in service, the fuel contained tends to dissolve the rubber plasticizing substance on the inner part of the fuel cell bladder. This loss of the plasticizing substance does not affect the functionality of the fuel cell bladder as long as there is fuel in the cell, which also acts as a plasticizer. However, if the fuel is consumed or extracted, the inner layer of the fuel cell is not protected any more and can become dry and less elastic. Therefore, if the vehicle is not going to be moved / used for a long time period, fill the bladder with gasoline for at least 2/3 of its overall capacity and, if possible, with a 2 % gasoline/ mineral oil mixture. In case of a dismantling of the fuel cell, is necessary to empty the bladder completely, let it dry both externally and internally, oil all the surfaces, close all the openings and keep it in a dry and dark place, with a temperature above 20°C. Please do not store fuel cells close to sources of heat and do not leave fuel inside fuel cell bladders if the vehicle is not being moved for a long time.
21. **CLOSURE PLATE ASSEMBLY** – If fuel cell closure plates are disassembled for inspection purposes, it is recommended to take the following precautions:
 - Closure plates are to be inspected before the connection, to prevent the presence of foreign materials, damages to screw-threads and other deficiencies. Verify the length of screws before installing screws that are too long and can damage screw-thread or connection flanges. .
 - The following instructions must be respected for the screw tightening:
M6 screws 6-8 Nm couple, M5 screws 2.5-3 Nm couple, for other kinds of screws look at the special chart. The tightening torque is reduced shortly after the screw tightening, due to the flow properties of the rubber material

that is used between the surfaces for the closure plates. Tighten again the screws to the fixed couple only once, and within 1 / 5 hours after their initial assembly. Please avoid tightening the screws above the set value or tightening the screws repeatedly, because it might damage the rubberized flange.

- The closure plates on which leaks have been found after the screws tightening must be disassembled to see possible imperfections or the presence of foreign material on the coupling surfaces, screws or holes. Furthermore, you should double-check that the screws are not too long (screw length is not exaggerated). If there are no imperfections, reassemble the closure plates and if necessary, use the special sealing paste (HYLOMAR GASKET COMPOUND type).

22. WARRANTY

M.E.RIN guarantees your new fuel tank from original defects. The warranty consists in the free replacing or repairing of the fuel cell whenever it should show defect in manufacture, according the following categories:

Group A Goods supplied to private consumers as identified in the code of commerce

Guarantee for 2 years from the date of sale shown on the transport document or the invoice (issued with sole reference to the Customer's tax code), or on the receipt not related to any VAT no.

Group B Goods supplied to professional consumers or companies, within the framework of their professional and/or business activities

Guarantee for one year from the date of sale shown on the transport document or the invoice, or the receipt issued with reference to the Customer's VAT no.

Group C Goods produced as an experimental prototype for the purposes of research and/or development, unique articles, or products manufactured according to the Customer's specifications and designs

There is no guarantee for these products because they are atypical and they are supplied solely without any insurance basis.

NB: a copy of full text is provided with Tank at the time of purchase, but it is also available on our website www.merin.it

23. **FACTORY SAFETY SUPPORT** – Gasoline and racing car fuels are highly flammable and susceptible to prompt ignition and/or explosion. Before any competition, be sure that all MERIN equipment has been carefully inspected to verify proper installation, functioning and absence of leaks. MERIN is at your disposal for any further information, technical advice, replacement of parts, and product services.

PLAY SAFE! DO NOT RUN ANY RISK WHEN HANDLING COMBUSTIBLE FUELS

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