

Twelve Months Material and Workmanship Warranty with Toray MBR Membrane Module

This Material and Workmanship Warranty (“Warranty”) sets forth the warranties with respect to Toray MBR Membrane Modules (“Module(s)”).

1. Definitions

- **BUYER**

“BUYER” - means the legal entity who purchases the Modules directly from TORAY, or through TORAY’s subsidiaries or the trading company which TORAY appoints.

- **Module Failure**

“Module Failure” means a situation where the Module does not meet the specifications in “INSPECTION STANDARD” described in Appendix A or fails to produce filtrate which meets the water quality requirements described in Appendix B as a result of failure to meet the specifications in “INSPECTION STANDARD”. This Warranty does not cover corrosion on module or module components and defects resulting from corrosion.

- **Module Failure Date**

“Module Failure Date” shall be the date that written notification of the alleged Module Failures is received by TORAY.

- **Term**

“Term” means Twelve (12) months following the Warranty Start Date, subject to certain expiry conditions for failure of the BUYER to comply with certain terms and conditions set out in Section 3.

- **TORAY**

“TORAY” means Toray Industries, Inc., a corporation duly organized and existing under the laws of Japan and having its principal place of business at 1-1, Nihonbashi-Muromachi 2-chome, Chuo-ku, Tokyo, 103-8666, Japan.

- **Warranty Start Date**

For purposes of the effective date for the commencement of the claims for the warranty, the “Warranty Start Date” means the date of risk transfer defined by the latest version of INCOTERMS in the relevant sales contract.

2. Warranties and Liabilities

2.1. Materials and Workmanship

TORAY warrants that its unused Module(s) meet the description in the “INSPECTION STANDARD” described in Appendix A, and its used Module(s) meet the description in “Appendix B: Guaranteed MBR Membrane Module Performance Criteria”. Subject to the applicable mandatory legal regulations, this Warranty is effective for Twelve (12) months from the Warranty Start Date, i.e. the Term.

2.2. TORAY Liability

In full satisfaction of any valid claim hereunder, TORAY, at its sole discretion, shall provide free of charge any replacement Modules or Module repair parts that are determined by TORAY to be a Module Failure, should Module Failure occur within the Term.

All replacement Modules shall be shipped from the FCA TORAY’s factory, factory of TORAY’s subsidiary, or the trading company designated by TORAY. All fees associated with freight, applicable taxes, import duties, brokerage, and other costs are the responsibility of the BUYER.

All repairs and installations of the Modules shall be made by the BUYER at its cost and expense.

2.3. Satisfaction of Claims

TORAY shall have the right to satisfy valid claims under this Warranty for the Module Failure in a flexible manner in order to restore performance to contractually specified levels of filtrate quality. Such flexibility may include repairing the originally shipped Modules, replacing only the components that make up the Module or the retrofit of newer Module components, or upgrading failed Modules with newer Modules that embody design and efficiency improvements. BUYER acknowledges that, by virtue of ongoing advances in TORAY’s technology and design, fewer compatible replacement Modules may, in the future, be required in a given installation.

2.4. Maximum Term of Warranty

The maximum term of warranty of Module or any replacement Module shall not exceed the Term of this Warranty.

2.5. Maximum Number of MBR Membrane Module(s)

TORAY's liability shall be limited to the extent that the total number of Module(s) or repair parts supplied for replacement will be less than or equal to the number of initial Module(s) purchased.

3. Conditions of Limited Warranty

3.1. Limitations of Warranty

Occurrence of any of the following as determined by TORAY shall void all warranties hereunder:

- 3.1.1.** Physical abuse and/or misuse of Modules.
- 3.1.2.** Failure to observe the precautions and instructions for receiving and storing Modules described in the TORAY MBR Instruction Manual when receiving and storing the Module.
- 3.1.3.** Faulty installation of Modules.
- 3.1.4.** Unauthorized alteration of any parts originally supplied by TORAY with Modules.
- 3.1.5.** Failure to provide TORAY with detailed design documents for the plant, and/or plans and procedures for installation, commissioning, and operational control method upon TORAY's request.
- 3.1.6.** Failure to comply with a request for an on-site inspection of the plant by TORAY and/or TORAY Group engineers, regardless of reasonable request.
- 3.1.7.** Failure to operate the Module complying with the specifications and operation and maintenance work described in the TORAY MBR Instruction Manual.
- 3.1.8.** Failure to strictly and exclusively adhere to TORAY specified MBR membrane module cleaning procedures, including the use of anything other than TORAY approved MBR membrane module cleaning agents.
- 3.1.9.** Failure by the BUYER to follow TORAY MBR Instruction Manual and other contractually specified maintenance procedures and schedule as updated by TORAY from time to time.
- 3.1.10.** Failure to prevent scale formation on the membrane surface that would affect membrane degradation.
- 3.1.11.** Failure to prevent inflow to MBR tank of mineral oil, organic solvents, strong alkalis, and substances that have a strong negative impact on biological treatment, and plastic materials such as membranes, membrane substrates, adhesives for membrane elements, permeate tubes, EPDM bushings, EPDM comb separator, permeate tubes, EPDM packings, and plastic nozzles are damaged.
- 3.1.12.** Failure to maintain complete and accurate operating and maintenance data at all times as described in TORAY MBR Instruction Manual and other technical documents that may be issued for the BUYER.
- 3.1.13.** Failure to record the quality of MBR feed water and, membrane tank sludge and the trend of trans membrane pressure data, plant operation data, and required record data according to the TORAY MBR Instruction Manual, and/or failure to transmit them to TORAY immediately upon TORAY's special request.
- 3.1.14.** Failure to follow the instructions advised by TORAY based on the data provided by BUYER.
- 3.1.15.** Failure to provide the end user with adequate manuals for system operation and maintenance, as well as training for the operators and supervisors. Or failure to let the end user perform cleaning and other performance restoration, diagnostic and troubleshooting procedures as per manuals and training.
- 3.1.16.** Failure to conduct chemical cleaning until TMP increases by 5 kPa (50 mbar) from the value for the system start-up or that for after the last chemical cleaning.
- 3.1.17.** In case of using coarse air diffuser, failure to clean the air diffuser at least once a day or at a shorter interval to prevent uneven air distribution, or failure to inspect sludge coming out of the drain port or in case of using fine air diffuser, failure to clean the air diffuser when the uneven air distribution occurs or failure to replace the fine air diffuser when it has deteriorated.
- 3.1.18.** Failure to maintain coarse/fine air diffuser cleaning and maintenance record at all times.
- 3.1.19.** Failure to install the membrane scouring air flow meter for Modules and/or to maintain the air flow rate record at all times.
- 3.1.20.** Failure to reject any foreign material from membrane tank, having a length or diameter of 3mm or larger which can damage Modules.
- 3.1.21.** Failure to install appropriate pretreatment equipment such as fine screen according to its specifications from TORAY and/or to maintain its operation record at all times including but not limited to the occurrence of feed water bypass; and
- 3.1.22.** Failure to prevent Module components from severe corrosion which deteriorates Module rigidity and makes Module unable to keep its operation.

3.2. Standard Guidelines

The design parameter plus instrumentation and other components of the system shall be consistent with sound engineering practice. TORAY reserves the right to review the system design. This Warranty is conditional upon

the shipping, storage, system design, installation, operation, and maintenance of the Modules in strict accordance with TORAY MBR Instruction Manual and other technical documents which may be issued for the BUYER as updated by TORAY from time to time. BUYER authorizes TORAY to conduct any reasonable review of the system design or to inspect facilities where Modules are installed upon reasonable notice to the BUYER. Such reviews and/or inspections are intended to assist TORAY and the BUYER in detection of system faults and to optimize the care and operation of the Modules.

3.3. Additional Equipment

TORAY assumes no liability for any additional equipment not authorized by TORAY that may be installed in or connected to the plant after operation has begun.

3.4. Warranty Maintenance

To maintain this Warranty described herein, plant operation and data record from initial start-up date until claim must be maintained and made available to TORAY upon request. Such documentation must be provided in detail as specified in section 3.5 below in order to: a) verify uninterrupted compliance with Section 4.2 hereof; and b) establish liability for Module(s) replaced or repaired under this Warranty. **IT IS AGREED AND UNDERSTOOD THAT THE BUYER SHALL NOT BE ENTITLED TO MAKE ANY CLAIMS UNDER THIS WARRANTY IF THE MODULES HAVE NOT BEEN OPERATED IN STRICT ACCORDANCE WITH THE TORAY MBR INSTRUCTION MANUALS AS UPDATED BY TORAY FROM TIME TO TIME.** BUYER must measure and maintain the data and items set forth in TORAY MBR Instruction Manual and other technical documents which may be issued for the BUYER to establish that the Module(s) have been operated in accordance with such instruction manuals, failing which all warranties and rights of the BUYER shall be null and void.

3.5. Notification of Performance Deficiency

All claims filed hereunder shall be made in writing within thirty (30) days of identifying a Module Failure and shall present a detailed analysis of the system and individual Module data showing the Module Failure, and must include: The serial number(s) of the Module(s) involved, and the individual Module(s) operating data, system operating data, or Module Failure upon which the claim is based. Operating data must include regular information on flow, trans-membrane pressure, contractually specified feed water quality parameters and temperature, and elapsed time since start-up (days).

TORAY reserves the right to require additional data as necessary to validate claims filed. The Module Failure Date shall be the date that written notification of the alleged Module Failure(s) is received by TORAY.

3.6. Verification of Performance Deficiency

After receipt of notice, TORAY will promptly undertake such investigations as, in TORAY's opinion are necessary to verify whether Module Failure exists and to establish liability for remedy of any Module Failure. BUYER may, in course of these investigations, be requested to return Module(s) to TORAY for examination. TORAY reserves the right to require the site visit to validate claims and TORAY may also conduct reasonable tests and inspections that are standard in the industry (hereinafter referred to as "Tests") at end-user's or at BUYER's premises. If, following the performance of such Tests, it is determined that the Modules do not have Module Failure and/or there is a problem or deficiency whose remedy is not the responsibility of TORAY, BUYER shall reimburse TORAY for all reasonable costs and expenses associated with said inspections and Tests, including applicable travel expenses.

3.7. Return Procedure

In the event that the return of a Module(s) is required pursuant to this Warranty, BUYER shall first obtain a Return Goods Authorization (hereinafter referred to as "RGA") number from TORAY. Module(s) shipped to TORAY for warranty examination must be shipped freight prepaid. If BUYER desires temporary replacement Module(s) to replace those alleged to have Module Failure and returned to TORAY for warranty examination, BUYER is responsible for the cost associated with any such replacements until examination of the returned Modules pursuant to this Warranty is complete. Module(s) examined as part of a warranty claim which are subsequently found by TORAY to be performing as warranted will be returned to BUYER, freight collect.

4. Disclaimer

NO WARRANTIES, EXPRESSED OR IMPLIED, ARE GIVEN EXCEPT AS EXPRESSLY PROVIDED ABOVE. THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE ARE NOT PROVIDED AND ARE EXPRESSLY DISCLAIMED AND EXCLUDED.

TORAY IS NOT LIABLE FOR CONSEQUENTIAL, INCIDENTAL, SPECIAL EXEMPLARY AND PUNITIVE DAMAGES, LOSS OF PROFITS, PLANT SHUT DOWN TIME OR SUITS BY THIRD PARTIES AGAINST BUYER, DUE TO A PERFORMANCE FAILURE OR DEFECT OF THE MODULE(S). ALL LIMITATIONS ON LIABILITY SHALL SURVIVE THE EXPIRATION, TERMINATION OR CANCELLATION OF THIS WARRANTY.

Appendix A: INSPECTION STANDARD

For Element Block, Element Deck

Inspection item and standard	
1.Appearance	Visual check for no large scars, spots and dents on the module.
2.Welding	Check for no crack on the important welding part by dye penetrant test.
3.Measurement	Check for the dimension of the important position to be within the tolerance by actual measurement.
4.Assembly	Check for the tube to fit up each nozzle tightly.
	Check for the bolts and nuts to be tightly.
	Check for the number of elements in the module.
5.Elements	Visual check for no large scars and dents and good adhesion in all elements.
	Visual check for burnt marks and hole openings and stains of spout in all elements.
	Sample check for the permeate water flow to be above the standard value. Applied pressure :-9807Pa Water : RO water Water temperature : Room temperature Standard Value : $\geq 3.00 \times 10^{-9} (\text{m}^3/\text{m}^2/\text{s}/\text{Pa at } 25^\circ\text{C})$ Viscosity equivalent
	Sample check for the holding pressure after 60 sec inside the element which are depressurized at-9807 Pa to be below the standard value. Membrane surface condition : Wet Standard value : $\leq -2452 (\text{Pa})$

For Aeration Block

Inspection item and standard	
1.Appearance	Visual check for no large scars, spots and dents on the module.
2.Welding	Check for no crack on the important welding part by dye penetrant test.
3.Measurement	Check for the dimension of the important position to be within the tolerance by actual measurement.
4.Assembly	Check for the bolts and nuts to be tightly.

Appendix B: Guaranteed MBR Membrane Module Performance Criteria

MBR filtered water quality

Criteria	Unit	Value
Turbidity	NTU	≤ 1.0
TSS	mg/L	≤ 3.0

Notes:

1. For the above turbidity warranty to be fulfilled it is mandatory on-line samples are collected every minute, using an Ultra-High Precision low range laser turbidimeter such as the HACH TU5400 model.
2. Turbidity meters should be calibrated correctly by the method specified by the manufacturer on a regular basis, preferably more than once a month.
3. If an abnormal turbidity or TSS value is found, the measurement should be repeated after checking for bubbles and cleaning the piping.
4. After chemical rinsing, there is a possibility that contaminants in the piping may exist, thus if an abnormal value is included, the value should be excluded, and the measurement should be repeated.
5. No guarantee is made for contamination of the inside of the membrane element and the piping from the outlet of the MBR filtrate water to the turbidimeter or TSS water sampling point.
6. The daily average value shall be the representative value for that day, and if the weekly average value deviates from the guaranteed conditions, please contact Toray.