



## MEMBRANE DATA SHEET Toray Submerged Membrane

Parameter	Units	Value
Manufacturer		Toray Industries, Inc.
Membrane Model Number		HSU-1515
Membrane Element ID Number(s)		
Membrane Commercial Designation		TORAYFIL
Number of Elements Tested	#	1
Approximate Size of Element (l x w x h)	inch	52.4 x 6.9 x 6.9
Inside Diameter of Fiber	mm	0.9
Outside Diameter of Fiber	mm	1.4
Active Length of Fiber	inch	43
Active Membrane Area per Module	sq ft	215
Flow Direction	inside out / outside in	outside in
Number of Fibers per Element		about 6,500
Available Operating Modes	Direct, Crossflow	Both
Membrane Material		PVDF
Membrane Surface Characteristics	<slightly> hydrophobic.. hydrophilic	hydrophilic
Membrane Charge	<slightly> negative / positive	not measured
Nominal Molecular Weight Cutoff	Daltons	150,000
Nominal Membrane Pore Size	micron	0.01
Maximum Membrane Pore Size	micron	0.088
Design Operating TMP	psi	0 – 10
Design Flux (at 20°C)	gfd at 20°C	12 – 49
Maximum Operating TMP	psi	10
Acceptable Range of Operating pH		1 – 10
Acceptable Range of Operating Temperature	degC	0 – 40
Maximum Turbidity	NTU	500*
Chlorine / Oxidant Tolerance	ppm-hrs	1,000,000

\*Consult TMUS for feed water turbidity greater than 500 NTU

# Technical Data Sheet Toray

**U. Balachandran, Kathleen Amm, David  
Evans, Eric Gregory, Mike  
Osofsky, Sastry Pamidi, Chan Park, Judy  
Wu, Mike Sumption**

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the 6th International Conference on Maritime Technology and Engineering MARTECH 2022 that was held in Lisbon Portugal from 24-26 May 2022. The Conference has evolved from the series of biennial national conferences in Portugal which have become an international event and which reflect the internationalization of the maritime sector and its activities. MARTECH 2022 is the sixth of this new series of biennial conferences. The book covers all aspects of maritime activity including in Volume 1 Structures Hydrodynamics Machinery Control and Design In Volume 2 Maritime Transportation and Ports Maritime Traffic Safety Environmental Conditions Renewable Energy Oil Gas and Fisheries and Aquaculture Trends in Maritime Technology and Engineering aims at academics and professionals in the above mentioned fields.

*High Temperature Materials and Mechanisms* Yoseph Bar-Cohen, 2014-03-03. The use of high temperature materials in current and future applications including silicone materials for handling hot foods and metal alloys for developing high speed aircraft and spacecraft systems has generated a growing interest in high temperature technologies. *High Temperature Materials and Mechanisms* explores a broad range of issues related to **Materials Science and Information Technology**. Cai Suo Zhang, 2012-01-03. Selected peer reviewed papers from the 2011 International Conference on Material Science and Information Technology MSIT 2011 September 16-18 2011 Singapore. **Textile Technology Digest**, 1997. Ullmann's Encyclopedia of Industrial Chemistry, 2003. **Material Science and Engineering Technology V** Yunqiu He, Ramesh K. Agarwal, Jean-Jacques Delaunay, 2017-03-20. Selected peer reviewed papers from the 5th International Conference on Material Science and Engineering Technology 5th ICMSET October 29-31 2016 University of Tokyo Japan. *Proceedings*, 1995. **Direct Anodic Oxidation of Methanol on Supported Platinum/ruthenium Catalyst in Aqueous Cesium Carbamate** Bruce Robert Rauhe, 1992. *Advances in Cryogenic Engineering Materials* U. Balachandran, Kathleen Amm, David Evans, Eric Gregory, Mike Osofsky, Sastry Pamidi, Chan Park, Judy Wu, Mike Sumption, 2008-04-04. All papers have been peer reviewed. The 2007 joint Cryogenic Engineering Conference and International Cryogenic Materials Conference CEC/ICMC was held at the Chattanooga Convention Center in Chattanooga TN from July 16th through 20th. Nearly 700 attendees from 28 countries came together to enjoy the joint technical programs industrial exhibit and special events. There were 382 papers presented in plenary oral and poster sessions. Papers in the ICMC part of the conference covered the physical and mechanical properties of metals alloys at cryogenic temperatures insulation materials used in magnets for large scale applications recent developments in the conventional low temperature superconductors YBCO coated conductors Bi based superconductors and MgB<sub>2</sub> conductors. Conductor stability AC losses as well as superconductor applications were also covered at this conference. ICMC papers selected after peer review process are published by AIP as Conference Proceedings Volume 986. Readers will get the latest information on materials and their properties used in cryogenic temperatures in this volume. **Japanese Technical Abstracts**, 1988. **Japanese Technical Periodical Index**, 1987. **Encyclopedia of Chemical Technology: Paper to pigment dispersions** Raymond Eller Kirk, Donald Frederick Othmer, 1991. Contains a

library of information for the chemical industry The 4th edition has undergone a complete revision with the inclusion of many new subjects which reflect the growth in chemical technology through the 1990s The book includes expanded coverage of biotechnology and materials science

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