

Titripac®: The Clever Packaging Solution

Reducing Environmental Impact Through Sustainable Design

The Titripac® packaging reduces laboratory waste, saves storage space, and cuts emission from shipping and waste.



Commitment to Product Sustainability

The products we create help our customers improve people’s lives every day, but we recognize that every product we make also has an environmental impact, both during manufacturing and in its use. That’s why we are committed to continually improving the sustainability performance of our products.

Our products are designed to offer the highest in innovation, quality, safety, and effectiveness, while at the same time helping minimize environmental impacts associated with their use. We aim to develop future-forward products and solutions that meet performance needs, result in reduced life cycle impacts and help solve global sustainability challenges.

Titripac® Packaging Features and Advantages

- Reduces environmental impact of disposal — less package waste as outer cardboard box and inner bag can be disposed of separately
- Saves costs and time — no unnecessary re-testing of the solution
- Reliable to use to the last drop — hermetically sealed pack, no contaminated residual amounts and less chemical waste
- Easy to use — integrated withdrawal tap, direct connection to instruments



The life science business of Merck KGaA, Darmstadt, Germany operates as MilliporeSigma in the U.S. and Canada.

Product Improvement Highlights

Packaging & Distribution



Reduction in greenhouse gas emissions for distribution to US customer¹

35%

Materials



Reduction in packaging material mass¹

42%

Emissions and Energy



Reduction in life cycle greenhouse gas emissions¹

42%

Waste



Reduction in solid waste mass at user facility¹

73%

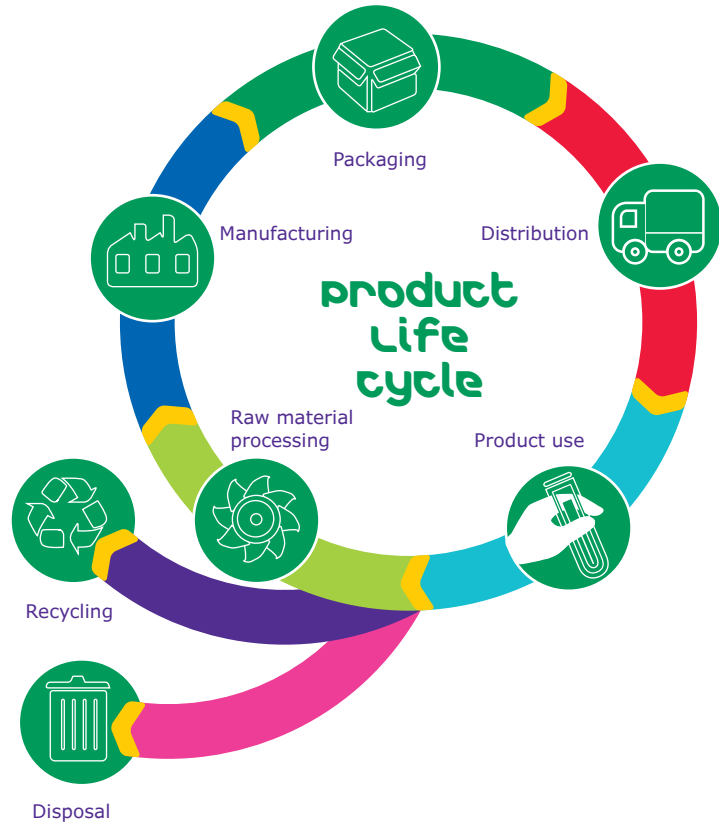
¹ Compared to MilliporeSigma’s product delivery system using 1 liter bottles.



Design for Sustainability

Design for Sustainability is an approach to product development we use that looks to minimize the environmental and health impacts at each stage of the product life cycle from manufacturing through use to disposal. At the same time, we look to maximize the product features that improve its performance and ease of use. We incorporate sustainability considerations early in the design process before impacts are locked in, and we use a set of criteria for major impact areas like energy and waste to measure improvements.

These approaches help reduce energy and water consumption, create more productive processes that minimize waste, streamline packaging, and reduce associated costs. The benefits come both during the manufacturing process as well as during product usage.



Titripac® Packaging: Reducing Environmental Impact Through Sustainable Design

Design Element	Benefits	Impacts	
42% reduction in mass of corrugated materials	<ul style="list-style-type: none"> • 61% reduction in product life cycle global warming potential (GWP) • 55% reduction in product life cycle energy demand • 35% reduction in global warming potential (GWP) of distribution to US customer • 73% reduction in solid waste at user facility 	Reduction of 9 kg CO ₂ for every 10 L package — equivalent to avoiding the combustion of 1 gallon of gasoline	= 1 gallon of gasoline
		Reduction of 45 kWh for every 10 L package — equivalent to the electricity usage of using a laptop computer for 1 hour	= 1 hour of computer use
		0.7 kg of use phase waste avoided for every 10 L package	= 1 hour of computer use
Increase the percent of corrugated materials from 45% to 86%	<ul style="list-style-type: none"> • 91% increase in the percent of bio-based materials 	Reduction of 1 kg of CO ₂ emissions during material production for every 10 L package — equivalent to 24 hours of light bulb use (75 watt incandescent)	= 24 hours of lightbulb use

Ordering Information for Products in Titripac® Packaging

Description	Concentration	Qty/Pk	VWR Cat. No.
Volumetric Solutions for titration			
Titripur® hydrochloric acid solution	0.1 mol/L (0.1 N)	4 L	EM1.09060.4000
Titripur® hydrochloric acid solution	0.1 mol/L (0.1 N)	10 L	EM1.09060.9010
Titripur® hydrochloric acid solution	0.357 mol/L (1/2.8 N)	10 L	EM1.13136.9010
Titripur® hydrochloric acid solution	0.5 mol/L (0.5 N)	4 L	EM1.09058.4000
Titripur® hydrochloric acid solution	1 mol/L (1 N)	4 L	EM1.09057.4000
Titripur® hydrochloric acid solution	1 mol/L (1 N)	10 L	EM1.09057.9010
Titripur® hydrochloric acid solution	3.571 mol/L (1/0.28 N)	10 L	EM1.13134.9010
Titripur® silver nitrate solution	0.1 mol/L (0.1 N)	4 L	EM1.09081.4000
Titripur® silver nitrate solution	0.1 mol/L (0.1 N)	10 L	EM1.09081.9010
Titripur® sodium hydroxide solution	0.25 mol/L (0.25 N)	10 L	EM1.09139.9010
Titripur® sodium hydroxide solution	0.33 mol/L (0.33 N)	10 L	EM1.05595.9010
Titripur® sodium hydroxide solution	0.5 mol/L (0.5 N)	4 L	EM1.09138.4000
Titripur® sodium hydroxide solution	0.5 mol/L (0.5 N)	10 L	EM1.09138.9010
Titripur® sodium hydroxide solution	1 mol/L (1 N)	4 L	EM1.09137.4000
Titripur® sodium hydroxide solution	1 mol/L (1 N)	10 L	EM1.09137.9010
Titripur® sodium thiosulfate solution	0.1 mol/L (0.1 N)	4 L	EM1.09147.4000
Titripur® sodium thiosulfate solution	0.1 mol/L (0.1 N)	10 L	EM1.09147.9010
Titripur® sulfuric acid solution	0.05 mol/L (0.1 N)	4 L	EM1.09074.4000
Titripur® sulfuric acid solution	0.05 mol/L (0.1 N)	10 L	EM1.09074.9010
Titripur® sulfuric acid solution	0.25 mol/L (0.5 N)	4 L	EM1.09073.4000
Titripur® sulfuric acid solution	0.25 mol/L (0.5 N)	10 L	EM1.09073.9010
Titripur® sulfuric acid solution	0.5 mol/L (1 N)	4 L	EM1.09072.4000
Titripur® sulfuric acid solution	0.5 mol/L (1 N)	10 L	EM1.09072.9010
Triplex® solution B for the determination of water hardness	10 mg CaO/L = 1 mL	10 L	EM1.08420.9010
Buffer solutions for pH measurement			
Certipur® buffer solution	pH 2.00 (20 °C)	4 L	EM1.09433.4000
Certipur® buffer solution	pH 2.00 (20 °C)	10 L	EM1.09433.9010
Certipur® buffer solution	pH 4.00 (20 °C)	4 L	EM1.09435.4000
Certipur® buffer solution	pH 4.00 (20 °C)	10 L	EM1.09435.9010
Certipur® buffer solution	pH 6.00 (20 °C)	4 L	EM1.09437.4000
Certipur® buffer solution	pH 7.00 (20 °C)	4 L	EM1.09439.4000
Certipur® buffer solution	pH 7.00 (20 °C)	10 L	EM1.09439.9010
Certipur® buffer solution	pH 8.00 (20 °C)	4 L	EM1.09460.4000
Certipur® buffer solution	pH 9.00 (20 °C)	4 L	EM1.09461.4000
Certipur® buffer solution	pH 9.00 (20 °C)	10 L	EM1.09461.9010
Certipur® buffer solution	pH 10.00 (20 °C)	4 L	EM1.09438.4000
Certipur® buffer solution	pH 10.00 (20 °C)	10 L	EM1.09438.9010



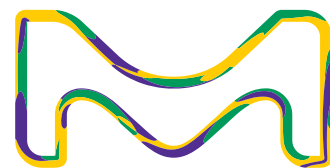
Description	Concentration	Qty/Pk	VWR Cat. No.
Certipur® buffer solution colored red	pH 4.00 (20 °C)	4 L	EM1.09475.4000
Certipur® buffer solution colored red	pH 4.00 (20 °C)	10 L	EM1.09475.9010
Certipur® buffer solution colored green	pH 7.00 (20 °C)	4 L	EM1.09477.4000
Certipur® buffer solution colored green	pH 7.00 (20 °C)	10 L	EM1.09477.9010
Certipur® buffer solution colored blue	pH 9.00 (20 °C)	4 L	EM1.09476.4000
Certipur® buffer solution colored blue	pH 9.00 (20 °C)	10 L	EM1.09476.9010
Buffer solutions for pH measurement			
Certipur® buffer solution colored yellow	pH 10.00 (20 °C)	4 L	EM1.09400.4000
Certipur® buffer solution colored yellow	pH 10.00 (20 °C)	10 L	EM1.09400.9010
Certipur® buffer solution	pH 1.00 (25 °C)	4 L	EM1.09441.4000
Certipur® buffer solution	pH 2.00 (25 °C)	4 L	EM1.09442.4000
Certipur® buffer solution	pH 3.00 (25 °C)	4 L	EM1.09444.4000
Certipur® buffer solution	pH 4.00 (25 °C)	4 L	EM1.09445.4000
Certipur® buffer solution	pH 4.01 (25 °C)	4 L	EM1.09406.0001
Certipur® buffer solution	pH 5.00 (25 °C)	4 L	EM1.09446.4000
Certipur® buffer solution	pH 6.00 (25 °C)	4 L	EM1.99036.4000
Certipur® buffer solution	pH 7.00 (25 °C)	4 L	EM1.09407.4000
Certipur® buffer solution	pH 8.00 (25 °C)	4 L	EM1.99038.4000
Certipur® buffer solution	pH 9.00 (25 °C)	4 L	EM1.09408.4000
Certipur® buffer solution	pH 10.00 (25 °C)	4 L	EM1.09409.4000
Certipur® buffer solution	pH 11.00 (25 °C)	4 L	EM1.99041.4000
Certipur® buffer solution colored red	pH 4.00 (25 °C)	4 L	EM1.99054.4000
Certipur® buffer solution colored yellow	pH 7.00 (25 °C)	4 L	EM1.99057.4000
Certipur® buffer solution colored blue	pH 10.00 (25 °C)	4 L	EM1.99050.4000
Other products			
EMSURE® water for analysis	—	4 L	EM1.16754.4000
EMSURE® water for analysis	—	10 L	EM1.16754.9010
Osteosoft® mild decalcifier-solution for histology	—	10 L	EM1.01728.9010



Future Improvements and Opportunities

Our commitment to produce sustainability is a never-ending journey. We are just beginning to identify the possibilities and potential within all industrial areas. We welcome your partnership and feedback as we continue to further improve packaging concepts and products.

The information and statements in this document should not be used for comparison with other bulk chemical packaging concepts' environmental and health impacts or improvements.



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