

WORLEY INSIGHTS StratLIBRARY

Battery Separator

Market Analysis Study

Report ID: WI-WSL-10042026-R00



© Copyright 2026 Worley ACN 096 090 158. No part of this document or the information it contains may be reproduced or transmitted in any form or by any means electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without permission in writing from Worley.



Notice

Contents of this study are only for use by the purchaser of Worley Group Inc.'s Global Battery Separator Study and is confidential. Only said purchaser's employees, and employees of companies 51% or more owned by the purchaser may use this study. It is not to be otherwise published or distributed. For inquiries, or tailored insights please contact insights@worley.com.

Disclaimer

The forecasts, estimates, opinions, analysis, evaluations, or recommendations contained herein are the sole property of Worley Group Inc.

Worley Group Inc., and its affiliates shall have no liability whatsoever to third parties for any defect, deficiency, error, or omission in any statement contained in or in any way related to the presentation. Neither Worley Group Inc. nor any person acting on Worley Group Inc.'s behalf makes any warranty, express or implied, or assumes any liability with respect to use of or reliance on any information, technology, engineering, or methods disclosed or discussed in the report. Any forecasts, estimates, projections, opinions, or conclusions reached in the presentation are dependent upon numerous technical and economic conditions over which Worley Group Inc. has no control, and which may or may not occur. Reliance upon such opinions or conclusions by any person or entity is at the sole risk of the person relying thereon. The data, information and assumptions used to develop the report were obtained or derived from documents or information furnished by others. Worley Group Inc. did not independently verify or confirm such information and does not assume responsibility for its accuracy or completeness. Any forecasts, or cost or pricing estimates in the presentation are considered forward looking statements and represent Worley Group Inc.'s current opinion and expectations of a likely outcome. They do not anticipate possible changes in governmental policies, governmental regulations, military action, embargoes or production cutbacks, regional conflicts or other events or factors that could cause forecasts or estimates to differ materially from what is contained in Worley Group Inc.'s forward-looking statements. The report is dated as of the date Worley Group Inc. completed its work. Worley Group Inc. has no obligation to update or revise the report or to revise any opinions, forecasts or assumptions because of events, circumstances or transactions occurring after the date of the report.

Table of contents

1. Executive summary	1
1.1 Study Objectives	1
1.2 Methodology Overview	1
1.3 Market Overview	1
1.3.1 Key Drivers and Restraints.....	2
1.3.2 Global Economic Snapshot	3
1.3.3 Major Trends and Technological Shifts.....	3
1.3.4 Market Size and Forecast Highlights	4
1.4 Competitive Landscape	5
1.5 Key Findings and Strategic Implications	5
2. Introduction	6
2.1 Report Scope and Definitions	6
2.2 Industry Context	7
2.2.1 Industry Scope.....	7
2.2.2 Maturity	7
2.2.3 Ecosystem Dynamics	8
2.2.4 Strategic Relevance	8
2.3 Research Methodology	9
2.4 Assumptions and Limitations	9
3. Market Dynamics	11
3.1 Growth Drivers	11
3.2 Market Restraints	12
3.2.1 Material Costs and Price Volatility	12
3.2.2 Technical Hurdles and Competition	12
3.2.3 Supply Chain Volatility	13
3.2.4 Geopolitical Tensions and Tariffs.....	14
3.2.5 Environmental and Sustainability Concerns	14
3.3 Opportunities and Emerging Use Cases	15
3.4 Challenges and Supply Constraints	15
3.5 Regulatory and Policy Environment.....	17
3.5.1 EU Batteries Regulation Requirements.....	17
3.5.2 US Inflation Reduction Act Incentives.....	17
3.5.3 China Battery Safety Regulations (GB 38031-2025)	17
3.5.4 Cross-Regional Policy Effects.....	18
3.5.5 Harmonized Safety and Performance Standards	18
3.5.6 Chemical-Content Restrictions under REACH and RoHS	18
3.5.7 Extended Producer Responsibility and End-of-Life Regulations.....	18
3.5.8 ESG Reporting and Corporate Sustainability Mandates.....	19
3.5.9 Intellectual Property and Trade-Remedy Investigations	19
4. Market Segmentation	20
4.1 Material Type.....	20
4.1.1 Polyethylene	20
4.1.2 Polypropylene	21

4.1.3	Ceramic-Coated Separators	22
4.1.4	Others.....	23
4.2	Battery Chemistry	24
4.2.1	Lithium-Ion Batteries	24
4.2.2	Sodium-Ion Batteries	25
4.2.3	New and Emerging Chemistries	26
4.3	Technology.....	27
4.3.1	Wet Process	27
4.3.2	Dry Process	29
4.3.3	Current Trends and Innovations	31
4.4	End Use industry	32
4.4.1	Transportation	32
4.4.2	Energy Storage Systems	33
4.4.3	Consumer Electronics.....	34
4.4.4	Others.....	34
5.	Global Capacity	36
5.1	Capacity by Region.....	37
5.1.1	China	37
5.1.2	North America.....	37
5.1.3	Europe	38
5.1.4	Other Asia	38
5.1.5	Rest of the World.....	38
6.	Demand	40
6.1	Demand by Region	40
6.1.1	North America: Accelerating Battery Manufacturing	40
6.1.1	Europe: Policy Push Amid Industrial Challenges.....	41
6.1.2	Asia-Pacific: Global Battery Production Hub.....	42
6.1.3	Latin America: Emerging Market with Resource Hub.....	43
6.1.4	Middle East: Early-Stage Growth Potential	44
6.1.5	Africa: Resource Driven Future Opportunities	45
6.1.6	Oceania: Upstream Strength, Limited Demand	46
6.2	Demand by End Use	47
6.2.1	Electric Vehicles: Largest and Fastest-Evolving Source of Demand	48
6.2.2	Stationary Storage: Massive Area, Evolving Chemistry Mix	49
6.2.3	Consumer Electronics: The Long-Standing Baseline Market	50
6.2.4	Other Applications: Industrial, Aerospace, Medical, and Specialty Uses.....	52
7.	Supply Demand Balance	53
7.1	Global Market Balance	53
7.2	Regional Market Balances.....	55
7.2.1	Asia-Pacific	55
7.2.2	North America.....	56
7.2.3	Europe	57
7.2.4	Rest of World	58
8.	Trade Analysis	60
8.1	Global Import-Export Patterns	60

8.2	Regional Trade Dependencies	62
8.2.1	China: Largely Self-Sufficient, Emerging as Exporter.....	62
8.2.2	Japan and South Korea: Technology Leaders but Import Dependent on Polymers ..	63
8.2.3	Europe: High Dependency, Building Local Supply.....	64
8.2.4	North America: Import Reliance but Active Localization	64
8.2.5	Rest of World: Dependency Without Scale	65
8.3	Impact of Tariffs and Trade Agreements.....	67
8.3.1	Tariffs on Separator Imports	67
8.3.2	Trade Agreements and Preferential Tariffs	67
8.4	Logistics, Customers, and Port Constraints	68
8.4.1	Global Shipping and Transportation.....	68
8.4.2	Customer Requirements	68
8.4.3	Logistics Constraints	69
9.	Price and Margin Outlook.....	70
9.1	Price-Margin Strategy analysis for Companies.....	71
9.1.1	Implications & Observations.....	73
9.1.2	Key Drivers of Cost Differences:	73
10.	Cost of Production	74
10.1	Raw material	75
10.2	Capex	75
10.3	Other Cost.....	75
11.	Competitive Landscape	78
11.1	Key Players and Market Shares	78
11.2	Company Profiles	80
11.2.1	Semcorp Advanced Materials Group	80
11.2.2	Asahi Kasei Corporation (including Celgard)	81
11.2.3	SKIET	82
11.2.4	Freudenberg SE.....	83
11.2.5	Toray Industries	84
11.3	Strategic Initiatives	85
11.4	Portfolio and Differentiation Strategies.....	85
12.	Market Trends and Developments.....	87
12.1	Technology Evolution and Manufacturing Efficiency.....	87
12.2	Innovations in Separator Materials	87
12.3	Sustainability and Eco-friendly Trends.....	88
12.4	IP Landscape and Patent Activity.....	88
13.	Market Outlook	89
13.1	Demand Outlook	89
13.2	Technology Outlook.....	89
13.3	Price and Margin Outlook	90
13.4	Strategic Implications	90
14.	SWOT Analysis.....	91
14.1	Strengths.....	91
14.2	Weaknesses	91
14.3	Opportunities.....	92

14.4	Threats	92
14.5	Strategic Summary	92
15.	Conclusion	93
15.1	Summary of Key Insights	93
15.2	Tactical and Long-Term Strategies	93
15.3	Risk Mitigation and Resilience Planning	94

Appendices

Appendix A. Abbreviations

List of tables

Table 1: Capacity by Key Players	36
Table 2: Company Margin Metrics	73
Table 3: Key Companies	79
Table 4: List of Abbreviations	96

List of figures

Figure 1: Function of the Separator in Lithium-Ion Battery Operation	2
Figure 2: Global Demand for PE Separators.....	21
Figure 3: Global Demand for PP Separators.....	22
Figure 4: Global Demand for Ceramic-coated Separators	23
Figure 5: Demand from Emerging Separator Technologies	24
Figure 6: Demand for Separators from LIB.....	25
Figure 7: Demand for Separators from SIB	26
Figure 8: Wet Process Manufacturing Steps.....	28
Figure 9: Global Demand for Wet-Process Separators.....	29
Figure 10: Dry Process Manufacturing Steps	30
Figure 11: Global Demand for Wet-Process Separators	31
Figure 12: Key Drivers of Separator Demand in LIBs	32
Figure 13: Global Separator Capacity by Region	39
Figure 14: North America Separator Demand	41
Figure 15: Europe Separator Demand	42
Figure 16: Asia-Pacific Separator Demand	43
Figure 17: Latin America Separator Demand	44
Figure 18: Middle East Separator Demand	45
Figure 19: Africa Separator Demand	46

Figure 20: Oceania Separator Demand	47
Figure 21: EV Demand for Separators	49
Figure 22: Stationary Storage Demand for Separators.....	50
Figure 23: Consumer Electronics Demand for Separators.....	51
Figure 24: Other Applications Demand for Separators	52
Figure 25: Global Supply Demand Balance.....	54
Figure 26: Asia-Pacific Supply Demand Balance.....	55
Figure 27: Other Asia Supply Demand Balance	56
Figure 28: North America Supply Demand Balance.....	57
Figure 29: Europe Supply Demand Balance	58
Figure 30: Rest of the World Supply Demand Balance	59
Figure 31: Global Net Trade Flows	61
Figure 32: China Net Exports	62
Figure 33: Other Asia Net-Exports	63
Figure 34: Europe Net Exports.....	64
Figure 35: North America Net-Exports.....	65
Figure 36: Rest of World Net-Exports	66
Figure 37: Separator Price Outlook (2020 to 2040)	71
Figure 38: Cost of Production Drivers	74
Figure 39: Cost of Manufacturing Factors.....	77
Figure 40: SWOT Snapshot	91