STRUCTURAL PARTS INDUSTRY

Market Research Report



GOLDEN DRAGON CAPITAL

Table of Contents

Execu	itive Summary	2
1.0	Introduction	11
1.1	Precision Structural Parts Characteristics	13
2.0	Principal Production Method	18
3.0	Commercialisation	20
3.1	Cylindrical, Prismatic and Pouch Structural Parts	20
3.2	New 4680-Type Large Cylindrical Battery	21
3.1	Competitive Landscape	24
3.2	Market Size Potential	31
Apper	ndix: Case Study — Shenzhen Kedali Industry Co., LtdLtd	34
1.0	Introduction	35
2.0	Lithium-ion Battery Structural Parts Business	36
2.1	Main Products	36
2.2	Production Bases	37
2.3	Customer Relationships	42
2.3	Research and Development	48
2.4	Technology Advantages	53
2.5	Imported Equipment	58
3.0	Financial Situation	63
References		69
Disclaimer		70

Figures

Figure 1: Lucid Air electric vehicles use high-performance lithium-ion batteriesbatteries	11
Figure 2: Lithium-ion battery component materials (cathode, anode, separator, electrolyte, structural parts	
Figure 3: Lithium-ion battery packaged shapes — (a) cylindrical, (b) prismatic, and (c) pouch	-
Figure 4: Lithium-ion battery outer shell casing types and component materialsmaterials	
Figure 5: Cash cost distribution of lithium-ion battery component materialsmaterials	
Figure 6: Lithium-ion battery structural parts (prismatic aluminium shell, round cover, soft link)	
Figure 7: Lithium-ion battery shell casings are classified by material	
Figure 8: Consumer cylindrical lithium-ion battery structural parts (illustrative)	
Figure 9: EV-Type lithium-ion battery structural parts (illustrative)	
Figure 10: Prismatic shaped lithium-ion battery structural parts (illustrative)	
Figure 11: Schematic diagram and physical picture of the safety valve of a lithium-ion battery case (illustra	ative)
Figure 12: Principal production process flowsheet of EV-Type lithium-ion battery top cover and casing	18
Figure 13: Principal production process flowsheet and mode of EV-Type lithium-ion battery case	
Figure 14: Casing, cover plate, and soft connection process flowsheet used by Shenzhen Kedali	
Figure 15: Mold development processing flowsheet used by Shenzhen Kedali	
Figure 16: Example of a large cylindrical battery	
Figure 17: All tab structure vs traditional cylindrical battery current collector	
Figure 18: Tesla 4680 battery cell	
Figure 19: Tesla 4680 battery cell	
Figure 20: Lithium-ion battery structural parts company sales revenue (2021)	
Figure 21: Market concentration of lithium-ion battery structural parts industry (2021)	
Figure 22: Sales proportion to total annual sales of the top five customers of structural component compa	
Figure 23: EVE Energy audit and certification process flowsheet for its upstream supplierssuppliers	
Figure 24: Proportion of fixed assets in the lithium-ion battery industrial chain	
Figure 25: Comparison of investment intensity needed for lithium-ion battery component material project	
Figure 26: Lithium-ion battery structural parts market size forecast (2021 to 2026E)	
Figure 27: CATL outer casing / top cover procurement volume (2015 to 2021)	
Figure 28: CATL lithium-ion battery production and structural parts unit price value (2015 to 2021)	
Figure 29: Kedali — Capital structure	
Figure 30: Kedali — Share price history	
Figure 31: Kedali — Core technology moats	
Figure 32: Kedali — Lithium-ion battery structural parts product offerings	
Figure 33: Market concentration of lithium-ion battery structural parts industry (2022)	
Figure 34: Kedali — Huizhou Kedali Precision Industry Co., Ltd	
Figure 35: Kedali — Huizhou Kedali Precision Industry Co., Ltd	
Figure 36: Planned production capacity of Huizhou and Jiangsu production bases	
Figure 37: Kedali — Planned production capacity of overseas production bases	
Figure 38: Kedali — Cooperation sales model	
Figure 39: Kedali — Main customers	
Figure 40: Top ten global power battery installed capacity (2022)	
Figure 41: Estimate Revenue from the CATL contract (2023E to 2025E)	
Figure 42: Tesla 4680 battery CTC structure diagram	
Figure 43: Kedali — Interactive R&D process	
Figure 44: Kedali — R&D expenditure (unit: million CNY, %)	
Figure 45: Kedali — R&D personnel	
Figure 46: Pre-nickel-plated steel shell process flowsheet used by Kedali	
Figure 47: Schematic diagram of the structure of a nickel-plated steel case for lithium-ion batteries	53

GOLDEN DRAGON CAPITAL

Figure 48: Previous flip valve technology (21' is the flip piece, 31' is the pole cover, 2' is the flip valve)	54
Figure 49: Kedali flip valve technology (33 is thermal insulation material, 32 is the accommodation area,	
covering part of the pole, 21 is the turning piece, 2 is the turning valve)	54
Figure 50: Existing explosion-proof valve technology (13' is explosion-proof valve)	55
Figure 51: Kedali explosion-proof valve technology (13 is explosion-proof valve, 12 is hot-melt material)	
Figure 52: Kedali copper-aluminium composite pole welding technology (Note: 1 is copper plate, 2 is alu	
column)	
Figure 53: Kedali copper-aluminium composite connecting plate welding technology (Note: 1 is the cor	nnection
plate, 2 is the copper pole, 11 is the aluminium plate, 12 is the copper block)	
Figure 54: Schematic diagram of the soft connector structure for battery interconnection with bars (I	
the soft connection part)	57
Figure 55: Schematic diagram of the soft connector structure of battery interconnection with stoppers	
is the soft connection part)	57
Figure 56: Fully automatic aluminium casing production line imported from Japan	58
Figure 57: Precision high-speed stamping equipment imported from Japan	59
Figure 58: Aluminium shell stretching equipment imported from Japan	60
Figure 59: High precision friction welding equipment	
Figure 60: Automatic assembly machine	61
Figure 61: Self-developed SPC and TS systems	61
Figure 62: German IPG laser equipment	62
Figure 63: Kedali — Operating income	63
Figure 64: Kedali — Net profit attributable to the parent company	64
Figure 65: Kedali — Proportion of the company's business revenue (unit: %)	64
Figure 66: Kedali — Gross profit margin of various businesses of the company (unit: %)	65
Figure 67: Kedali — Changes in gross profit margin and net profit margin (unit: %)	
Figure 68: Kedali — Expense ratios (unit: %)	
Figure 69: Kedali — Operating cash cost (2019 to 2022)	66
Figure 70: Kedali — Raw material purchase price leading to changes in gross profit margin	67
Figure 71: Kedali — Proportion of manufacturing costs in each link of lithium-ion batteries to operati	
	67
Figure 72: Kedali — Gross profit margin of companies in the battery and structural parts industry	68

GOLDEN DRAGON CAPITAL

Tables

Table 1: Comparison of precision structural parts of a conventional lithium-ion batterybattery	13
Table 2: Conventional lithium-ion battery precision structural parts (shell top cover and shell bottom)	14
Table 3: Comparison of cylindrical, prismatic, and pouch batteries	20
Table 4: Planned layout of large cylindrical batteries by mainstream gigafactories	
Table 5: Comparison similar projects within the lithium-ion battery precision structural parts industry	28
Table 6: Investment amount and payback periods of comparable projects	28
Table 7: Calculation of investment intensity in lithium-ion battery component material projects	30
Table 8: Investment funds needed for lithium-ion battery structural parts projects	31
Table 9: Calculation of demand for global lithium-ion battery structural parts industry (2021 to 2026E)	31
Table 10: CATL procurement of lithium-ion battery structural parts and unit price value	32
Table 11: Kedali — 13 domestic and 3 overseas production bases	41
Table 12: Kedali — Planned production capacity (2021 to 2024E)	42
Table 13: Kedali — Customer planned production capacity expansions (unit: 100 million CNY, GWh)	44
Table 14: Kedali — Revenue calculation for signing a strategic cooperation agreement with CATL	47
Table 15: Kedali — Company structural parts R&D projects	50
Table 16: Kedali — Related patents	52
Table 17: Kedali — Purchases a variety of imported equipment	
Table 18: Kedali — Quality management system certifications of its products	62
Table 19: Kedali — Financials forecast (2019 to 2024E)	