◆ SAMSUNG SDI Job Description

Division	Job classification		Role
Small battery	Platform development	Development of cylindrical cell design platform	Design of high capacity, long life cylindrical cells for next generation EV Design of high capacity power tool for next generation cylindrical cells Analysis by evaluation of battery materials and electrical chemistry
		Development of pouch cell design platform	Verification on the 4 key materials of pouch cells and review on cell design optimization Analysis on electrochemistry and test development Process optimization of high capacity/input cells with fast charging Analysis on pouch cell test result(data processing & interpretation)
	Process development	Development and verification of cylindrical battery assembly	Assembly design of EV & P/T new structure Process optimization
		Development and verification of cylindrical battery assembly	Design of stack/high input assembly/welding/test Process optimization
		Development and verification of cylindrical battery assembly	Development of new process for High ED/ultra-thin film/dry battery plate Process optimization for Mixing/coating/press
	Product development	Development of cylindrical/pouch cell products	Development of prismatic/pouch cell new line-up & approval by customer Mass production of the initial capital & customer issue support Test analysis on lifetime/safety & customer service
	Product analysis	Cylindrical/pouch cell performance test	Review on properties of new cylindrical/pouch cell line-up
		Analysis on cylindrical/pouch cell chronic quality issue	Analysis on mechanism of prismatic/pouch cell chronic quality issue
		Analysis on cylindrical/ pouch cell plate	Engineering cylindrical/pouch cell plate, measuring plate equivalence & plate/slurry analysis
	Material/parts development	Development of cylindrical /pouch cell parts	Development of prismatic/pouch cell parts
	Simulation	Product Simulation	Analysis on EV driving pattern & battery lifetime prediction Battery output forecasting & customer guide Development of fast charging pattern Stress-distortion/fracture analysis
	Process technology	Technical development of battery plate production	Optimization of coating Slot Die & development of fast drying technology
		Development of assembly production technology	Assembly process requirement set-up & productivity innovation, technical development of Laser welding Process optimization/process data analysis/test machine condition check
		Development of test technology	Responding to new platform, Process development/build-up Measurement for new manufacturing methods/new technology and quality assurance, Research and development of vision inspection
Automotive & ESS battery	Platform development	Advanced development of cell(platform)	Engineering & development of high-performance/safety cell for next-generation models
		Advanced development of module/pack	Engineering and development of vibration/fatigue/shock-resistance module/pack Development of module/pack advanced core technology
	Process development	Development of plate engineering	Development of a mixing/coating/pressing technique for composite/high-film coating
		Development of prismatic cell assembly	Development of stack and welding technology for high efficiency/safety cell manufacturing
		Development and verification of prismatic cell formation process	Cell engineering of new prismatic cell models & optimization of formation process Development electrolyte fill/formation process
	Product development	Development of prismatic cell line-up	Engineering and development of prismatic cell line-up
		Development of module/pack line-up	Module/pack structure engineering & product development
	Product analysis	Prismatic cell performance test	Review & analysis on prismatic cell properties
		System verification	Battery system test & analysis
	SW development	BMS software engineering & algorithm development	BMS SW development for xEV/ESS Battery status forecasting & development of control algorithm
	HW development	BMS system & circuit engineering	BMS hardware development for xEV/ESS
	Simulation	Cell/module/pack simulation	Thermal/structural analysis/lifetime forecasting & evaluation
	Process technology	Technical development of battery plate production	Development of mass production for composite materials/high-pressure rolling coating/press/slitting equipment
		Technical development of assembly production	Advanced development of Notching/stacking & production technology Development of a new welding technique using cell laser/ultrasound technology
		Technical development of formation production	Development of new charging & discharging process technology and reduction technology for formation index
SDI R&D Center	Material/parts development	Development of cathode material	Development of High voltage/capacity cathode material
		Development of separator	Development of next gen. separator & coating technology
		Development of cathode material	Development of silicone/carbon-based, cathode material for all-solid-state battery
		Development of electrolyte	Development of liquid electrolyte, solid/composite electrolyte, electrolyte additives
		Binder/conductive agent/material development	Development of low-resistance/expansion battery binder, dispersion system of conductive material and new materials
		Development of safe material	Material/system development for better battery safety
		Development of all-solid-state battery parts	Parts development for stability of all-solid-state battery
		Research on recycle	Development of battery material separation & return sale technology
	Cell/process development	Structural development of new battery plates	Development of new battery plate including fast charging, multi-layered structure etc.
		Development of battery plate core technology	Development of core technology including NG cell analysis technology, electrochemical mechanism
		Development of all-solid-state battery core technology	Research on all-solid-state battery plate (low resistance cathode, long life cycle anode) & interfacial engineering
		Development of all-solid-state battery process	Engineering all-solid-state battery plates, assembly process & cell structure
		Development of new/next generation cell	Research on next generation cell technology & Feasibility
	Platform development	Development of battery plate platform	Engineering plate formation & performance optimization, equivalence check
	Simulation	Analysis on battery safety /reliability	Development of Battery internal short, expansion, propagation of thermal wave, thermal flow analysis model
		Analysis on battery electrochemical property	Development of Battery electrochemical modeling, performance forecasting technology
		Battery material analysis	Design of inorganic/organic/high molecule/composite materials and analysis on material reaction mechanism
		Process simulation	Optimization of battery manufacturing process and fluid/heat/stress simulation
	Data technology development	Data system development	Development of R&D machine learning/ AI modeling & ML Ops platform, Data infra architecture
		Data technology development	Development of field/test data-based performance/lifetime forecasting model
Global process /facility Development center	Process development	Technical development of new process	Development of thick cathode/anode film technology, evaluation on battery design and electrochemical analysis
		Technical development of next generation battery plate process	Development of dry battery plates, high-dispersion mixing, ultra-high-speed coating, and rolling process technology
		Technical development of next generation assembly process	Development of new cylindrical 46Ø structure/process technology, high-speed stacking process, process development of equivalent press
		Technical development of next generation formation process	Development of High capacity charging & discharging control formation process and technology for cell impregnation
	Facility development	Technical development of stacking facility	Development of new structure of stacking facility & control technology of high-speed system
		Technical development of cell plating facility	Engineering development for the structure of the coating/drying facility & high-efficiency drying system(heat source/structure) Tech-development of high-pressure/speed pressing and press facility of the material precision alignment
		Technical development of assembly facility	Engineering high-speed/precision automation facility & development of system control technology
		Technical development of formation facility	Development of high-efficiency, slim charging, and discharging facility (Engineering circuit and facility structure)
		Mold technology development	Development/design and analysis of Press notching mold technology, material, post-processing technology
		AI test technical development	Vision AI inspection algorithm, non-destructive inspection/monitoring technology, deep learning engine development
		Facility Digital Twin	Tech-development for facility intelligence (Data acquisition, analysis, control algorithm development) Development of battery analysis model (Multi-physics analysis of particles, heat, flow, structure, etc.)
Global Safety /technology center	SW development	MES system development	Development of battery production system S/W & management (Smart Factory, Full Automation)
	HW development	Logistic HW development	Concept design of logistic facility including AGV, Stocker, OHT etc., production management and set up
	Simulation	Logistic simulation	Design & development of logistic simulation in accordance of battery production process
Quality verification room	Quality management	Cell/pack quality management & control	Design of cell/module/pack quality management system Evaluation coverage development / test running & quality management & control
		Quality process improvement	Improvement of quality verification process based on quality system
	Product analysis	Lifetime forecasting & performance test analysis	Analysis of market safety issues and interpretation of their causes, and securing safety in the pre-implementation phase
Electronic Materials business	Material/parts development	Development of semi-conductor material	Development of semi-conductor process material such as Lithography, Etching, CMP etc. Synthesis of organic/inorganic structure design, molecules/polymers/nanoparticles, surface modification, scale-up
		Development Of display material	Development of display materials including polarizing film, adhesive materials, light emitting diode(OLED/QD) etc. Organic/inorganic structure design, Synthesis of molecules/polymers/nanoparticles, surface modification, Scale-up
		Development Of display material	Development of anode/cathode electrode material & production process Modification of nanoparticle surface, blending, impurity control and scale-up
	Product analysis	Semi-conductor/display material analysis	Analysis on organic/inorganic material chemical structure (NMR, MS) & surface/shape analysis(TOF-SIMS, XPS)
	Simulation	Product simulation	Forecasting/screening of semi-conductor/display materials & properties of components
		Process simulation	Optimization of semi-conductor/film production condition
		Data simulation	Efficiency improvement of work through database construction and data interpretation