

Solutions to (problems about electrode bonding process) for mass-production of Lithium-ion batteries



Solutions to <problems about electrode bonding > for mass-production of LIB is a permanent theme. Since mass-production of LIB has been started in 1990s, fire accident caused by LIB still occurs. Drastic solutions to this problem are required because EV and PHV which are equipped with high capacity LIB under development will be mainstream.

Since mass-production of LiB has started in 1992, every battery manufacture was faced with fierce price competition of products triggered by the entry of foreign firms. Of cause investment budget for production facilities was tight and performance degraded. As a result, these lowered the quality of products, massive recalls were generated and the effect still continues. In parallel development of large capacity LIB used in automobiles are progressing rapidly. [Safety design] is an urgent task and also [100% repeatability and yield rate] are required technologically. As shown in Ultex's performance, Ultex's (SPS) bonding theory which has completed over a period of 25 years improves perfection of energy application technology dramatically. And so we achieved <zero> for mass-production defect rate and reduce production cost as <zero> as possible.

[Basic problems of device]

- ★Adoption of pressure method by [single support system] . ➡ ★Whole system is not precise because [rigidity] can't be secured and this causes bending of whole system. (bending)
- ★Is vibration wave of transducer [beautiful] ? ➡ ★When wave is not beautiful, [metal powder /contamination] is generated during bonding. (destruction mode)
- ★Load is controlled by [servo] . ➡ ★[Response speed] can't follow a physical phenomenon during bonding process. (big bang in the space)

[Problems at a mass-production factory and solutions by Ultex]

- ★Bonding condition can't be set. ➡ ★It is easy to set the bonding condition because bonding condition and bonding result match.
- ★Stable bonding can't be obtained. ➡ ★Percent defective is 0% by high repeatability.
- ★Device are often broken. ➡ ★There is no device failure due to overload.
- ★Worn horns and tools ➡ ★Ultex can provide good tools which can be used more than 500,000~1,000,000 shots.
- ★Bonding data can't be kept. ➡ ★Machine is designed for [IoT] by digitalization of whole system.

Ultex has many results of mass-production, but there are no application troubles. Especially <100%> yield rate makes mass-production of automobiles perfect.

Failure in introduction of Ultrasonic Welding technology leads fatal problems and there are no solutions to these problems. To solve problems, we recommend introduction of Ultex's [SoundBonding] technology which is only one technology in the world.

Damages to the parts and generation of contamination (metal powder) are prevented by brand new [CIB/Clip Ingot Bonding] technology which is for production of large capacity LIB used in automobiles. Furthermore there is <no wear of tools> and <protect sheets> are not needed. Valuable technologies and systems have to be selected and used and this affects the business. <Patents pending>



Tip of a tool for CIB



Examples of CIB (Copper multi-foil)

