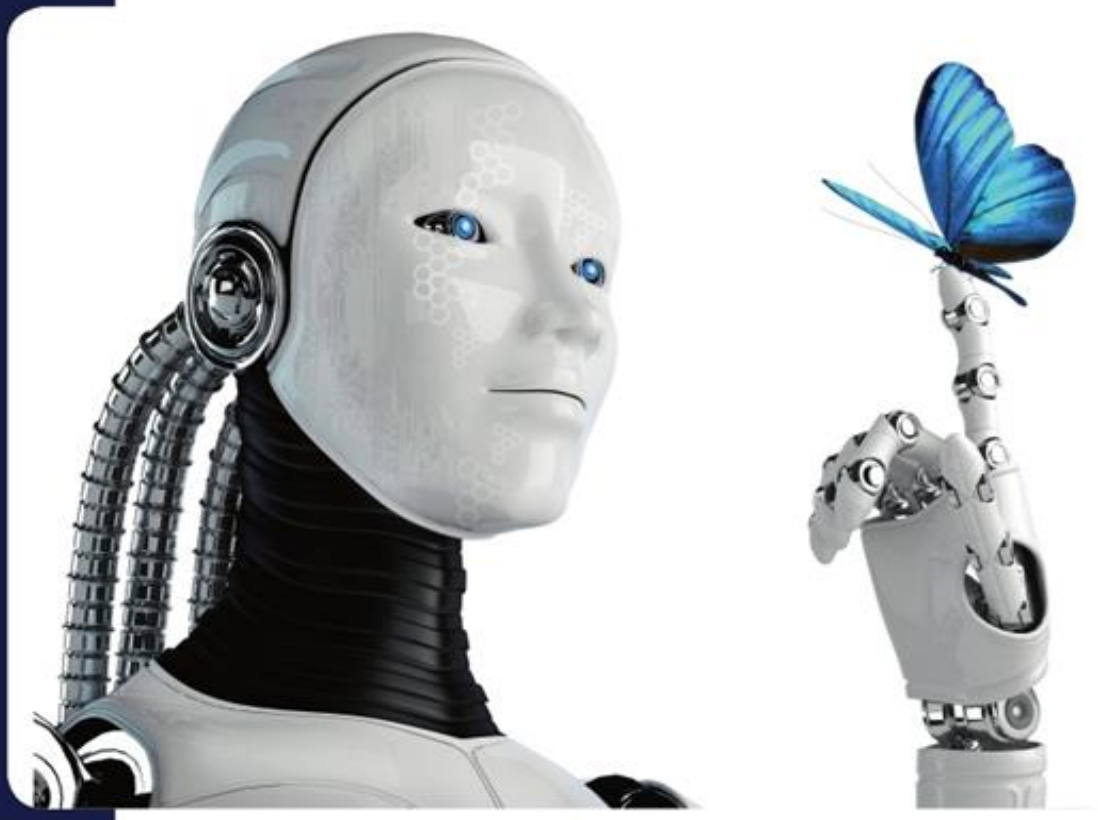
Newsletter
August, 2022

ICR



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Hot Issue

1. Completion of ICR Battery Testing Center
2. Change SEMI F47 Test conditions
3. Notification of review results of wireless field technology review (Technical Council)

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Completion of ICR Battery Testing Center

<View of ICR Pyeongtaek Battery Testing Center>

▣ ICR Ltd. is building a testing center specializing in mid- to large-sized **batteries (EV, ESS)** with a total floor area of 5,710m2 with 4 floors of performance test building and single floor of safety testing building in Pyeongtaek, Gyeonggi-do and it is scheduled to be completed by the end of July and start operation in September this year.

▣ In particular, **the safety test building consists of six medium/large explosion-proof rooms,** which allow abuse test to be carried out in a safe test environment, such as thermal runaway, propagation, external short circuit, crush, nail-penetration, and drop test and so on.

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Completion of ICR Battery Testing Center

<Testing Equipment>

Equipment / Facility	Setup & Operation	
	2022-09 ~ 2022-12	2022-11 ~ 2023-02
Pack Cycler (1500V, 1000V)	O	
Module Cycler (200V)	O	
Cell Cycler (6V)	O	
Walk-in Chamber	O	
Temp. & Humid. Chamber	O	
Large Thermal Shock Chamber	O	
Altitude Simulation		O
Salt Spray		O
IP Water(IPx1, 2, 3, 4, 4K, 5, 6, 6K, 9, 9K)		O
Pack/Module Crush/Nail Penetration	O	
Cell Crush/Nail Penetration		O
External Short-Circuit	O	
Immersion (IPx7, 8)	O	
Drop	O	
Impact		O
Large Shaker (30tf)	O	
Explosion-proof Room #1 (Drop, Impact)	O (Drop)	O (Impact)
Explosion-proof Room #2 (Immersion, Cell crush/nail, Heating, Propagation)	O (Immersion, Propagation)	O (Cell crush/nail, Heating)
Explosion-proof Room #3 (Pack crush/nail)	O	
Explosion-proof Room #4 (Propagation)	O	
Explosion-proof Room #5 (Overcharge, External short-circuit etc.)	O	
Explosion-proof Room #6 (Vibration)	O	

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Completion of ICR Battery Testing Center

<View of ICR Pyeongtaek Battery Testing Center>

▣ The below table shows **the list of equipment being set up**, and the operating time varies depending on the test equipment, **the 300kN(about 30tf) shaker and explosion-proof rooms can be used from September this year.**

▣ If you need any additional equipment other than the above equipment list, we can discuss and make additional investment, so please feel free to contact our Battery Testing Center.

☎ Inquiries
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Change SEMI F47 Test conditions

▣ As **SEMI F47 Test conditions have been changed** in detail, we would like to inform you of the changes.

▣ First, let's check **the purpose and requirements of SEMI F47**.

Purpose
❖ Semiconductor factories require high levels of power quality due to the sensitivity of equipment and process control. ❖ Semiconductor process equipment is particularly vulnerable to voltage drops. ❖ Defines the voltage drop tolerance required for semiconductor processing, instrumentation, and automation test equipment. ❖ Balance between voltage drop tolerance and increased equipment costs.

Requirements
❖ Semiconductor processing equipment, subsystems and components shall be resistant to the voltage sag levels and durations specified in Table 1 (Table 1). ❖ Voltage drop should be applied in individual Phase – Phase (Neutral) pairs. (Voltage drop of all Phase – Phase (Neutral) pairs at the same time is not required.)

Change SEMI F47 Test conditions

Table 1 Required Voltage Sag Immunity

Sag depth[#1]	*Duration at 50 Hz*	*Duration at 60 Hz*
50%	10 cycles	12 cycles
70%	25 cycles	30 cycles
80%	50 cycles	60 cycles

▣ Test conditions have been specifically changed to meet the above objectives and requirements. Let's take a look at that.

1. Maximum power processing

- ❖ The maximum power of each process shall be measured to satisfy the test condition and a voltage drop shall occur in the relevant section.
- ❖ Figure 1 of SEMIE6 (Figure 1) Use the Power Characterization Plot and Data Sheet 400 – Electrical Power to set the Sensitive process states section.
- ❖ Data Sheet 400 – Create an Electrical Power to understand the characteristics of the EUT and Components.
- ❖ Data Sheet 400 – The main components of the Electrical Power are set as monitoring points for the SEMIF47 test.

Change SEMI F47 Test conditions

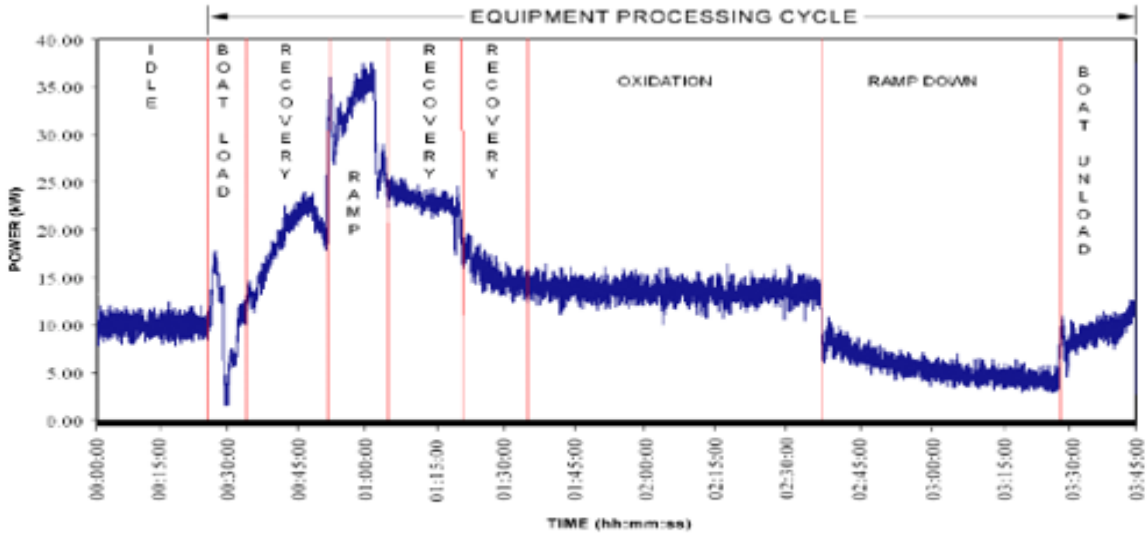

Figure 1
Equipment Power Characterization Plot

2. Number of test

❖ The voltage should be dropped in the maximum power section of each process through maximum power processing, and measurements should be made 3 times in Idle state and 3 times in Operating state.

☎ **Inquiries**
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Notification of review results of wireless field technology review (Technical Council)

▣ 1. Number

- Technical council -RF-22-04

▣ 2. Title

- Inquiry about rated voltage application range of simple radio station products using multiple batteries

▣ 3. Query content

- For products manufactured so that three types of batteries (7.2/7.4/7.7 V) can be attached or detached to the product, apply the specified voltage with an arbitrary range.
  Is it possible to test the lower limit voltage at 7.2V, the rated voltage test at 7.4V, and the upper limit voltage test at 7.7V?

▣ 4. Review the results

- A simple radio station product using multiple batteries can be interpreted as having an arbitrary range of rated voltage.
- The highest voltage at 7.7V, the lowest voltage at 7.2V

▣ 5. National Radio Research Institute's reply

- It is reasonable to test according to the results of the above review.

☎ Inquiries

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