Daramic Ek Rishta

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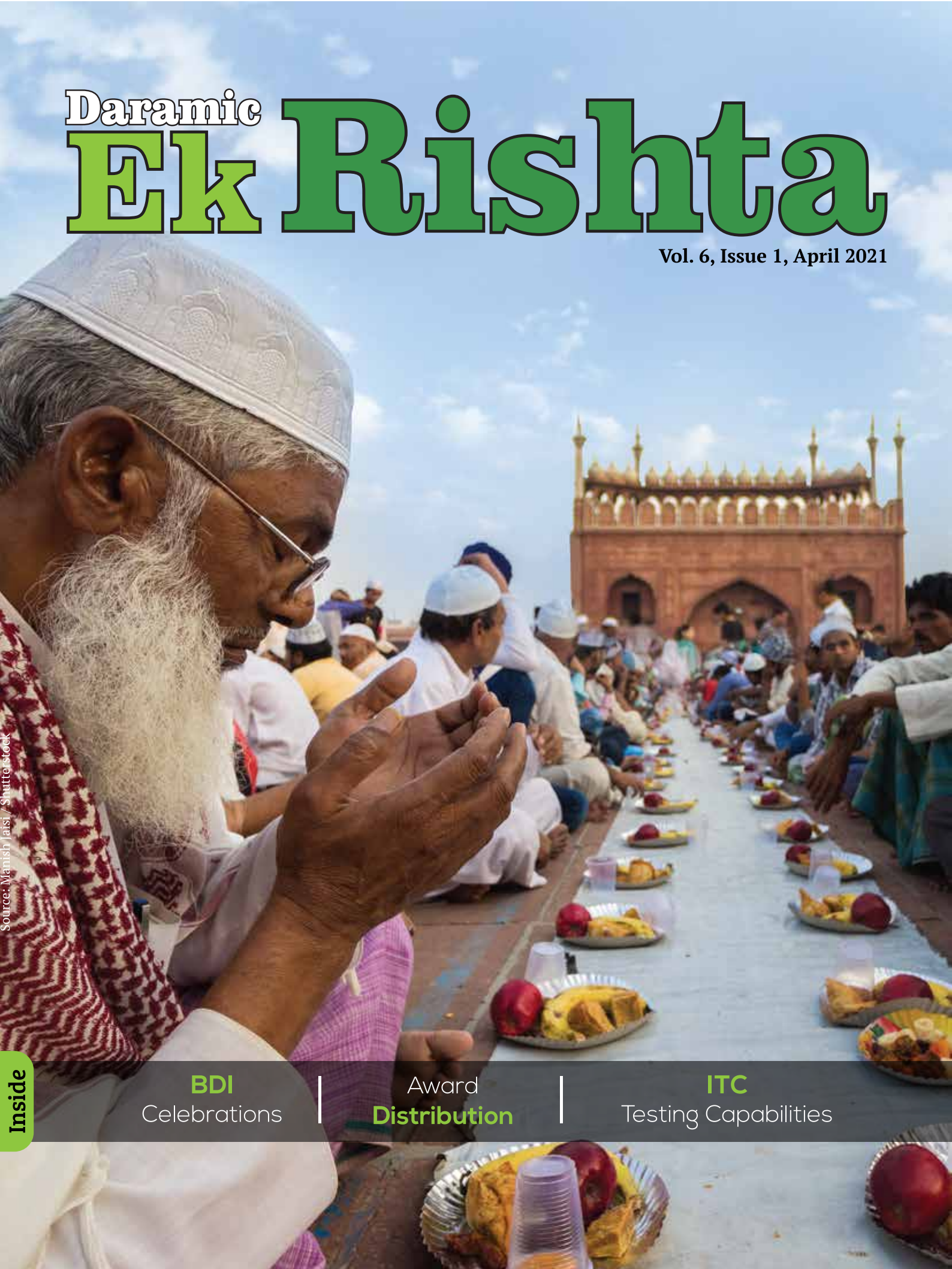

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Inside

From the **Editor's Desk**

Abhishek Agrawal
National Sales Manager

Wishing and praying for the well-being of all of you and your loved ones.

These are trying and tiring times. In the beginning of the year, when the vaccine was launched and there was a sharp decline in the number of COVID-19 cases, we all thought the pandemic was finally behind us and we could go about our lives normally.

In retrospect, maybe that comfort zone made the virus come back and with a vengeance, affecting so many of us. However, they always say that hindsight is 20/20, so for now, we just need to be safe and do our part in this fight.

The second half of fiscal year 2020, was a mixed bag. The demand was high, markets were picking up, economy was taking a V-shape recovery and going from one strength to another. This was evident from highest GST collections month-after-month and then came the international crisis of container availability.

A problem that looked small in the beginning and presumed to have a short life, stretched into months. Shipping freight, ideally the lowest for transportation, went through the roof. Sea freight was ten times the normal cost and still vessel space was not available.

It was a nightmare for any company having a global footprint and truly made us understand why it is said, "it's a small world." Fiscal year 2020 has taught and reiterated the fact very aggressively that the world is fully interconnected.

Gone are the days when one could exist in isolation and in their cocoon. What happens in one part of the world will influence not only that area but the whole world and quickly.

Learning is like any other advancement or development, "a connected world," although a boon can be a bane too. We are survivors and we will continue to learn and adapt.

To all of us: Be healthy, be cautious, be safe.

Business Director's Note

Dear All,

I hope all our business partners and their loved ones are safe and healthy during this pandemic.

In the last edition, I wrote about how the business will change but now I can see it actually happening and it is time to look at Business Process Re-engineering (BPR). According to experts, BPR is the "analysis and redesign of core business processes to achieve substantial improvements in performance, productivity and quality."

Earlier, we were running the business hands on. We were functioning on gathered wisdom, gained through experience and passed by generations. The pandemic shook the way we did business and the need to change our business process became very evident for us to survive. What previously got shrugged off as not feasible became the only option. We learned to do more with less.

An excellent experience for me was the virtual ELBC conference. Previously, we had to be physically present at the conference to attend the speeches. Now, technology has provided the experience of being in the hall and attending the sessions with our colleagues virtually.

The virtual sessions were more fruitful in my opinion because of the opportunity to review the slides in advance and have questions prepared when the speaker presented. The efficiency of the sessions, the togetherness–even when being far apart–and the virtual walk through the stalls made the conference as enjoyable as when attended physically.

Workplace restrictions for people in offices, social distancing, sanitizing, etc. will be the new norms and we will have to adapt ourselves and our business to the same.

This is the right time to reflect, rethink and redefine how we function with limited physical interactions, work virtually but still satisfy the customer with an awesome experience.

Baiju Parasuraman
Business Director

Quality Month and Road Safety Celebrations @ Baddi plant

Employees creating a "Q" showing their commitment towards quality

Defect identification training to employees

Classroom training and quiz for employees

Winners of Quality Month Poster Competition

Awards given to top entries received from kids of employees in poster competition for Road Safety month

Container Formation Process

Naveen Prabhu S
Technicial Service Manager, Daramic BIS

This article is in continuation to the 'Gyan Ganga' article published in the October 2020 edition of Ek Rishta.

In last article, we discussed the advantages of container formation over tank formation. In this article, we will cover the steps to be followed to achieve quality and performance along with increased battery production.

Acid Filling Gravity

The electrolyte density (gravity) is one of the key factors in container formation. Initial gravity of acid is selected on the basis of the targeted final gravity.

Final Acid Gravity	Initial Filling Gravity Used
~1.250	1.180 to 1.200
~1.280	1.210 to 1.230

Acid gravity needs periodic monitoring and once the targeted acid gravity is attained, it means that the formation is complete. Batteries with lower acid gravity should be recharged and batteries with higher gravity needs to be equalized by adding low gravity acid.

Acid Temperature During Filling

As the plates are assembled directly after curing, the rise in temperature will be much higher during acid filling. This needs to be controlled as rise in temperature will adversely impact the formation quality. Using acid chillers, the temperature of the electrolyte during filling should be maintained at 10° to 12°C so the battery temperature does not cross 50°C.

Sodium Sulphate Addition In Acid

This helps make available additional free sulphate ions in the electrolyte that facilitates conduction of electricity and improves the charging process. Adding 10 to 12gm of sodium sulphate per liter of electrolyte helps reduce battery failure due to sulphation of plates, mainly in deep cycle application. This is applicable for both container (green plate) formation as well as tank formation.

Acid Filling Quantity

This should be calculated per cell to get the right ratio between electrolyte and positive active material. The ratio will vary based on the application, process condition and basic electrode design. In container formation process, acid availability should be high and acid level should be maintained at 10 to 15mm above the separator. The final acid level can be adjusted after the formation step.

Soaking Time After Acid Filling

The battery requires some cooling/soaking time post-acid filling. The soaking time ensures that the battery reaches normal temperature, suitable for container formation. However, if the batteries are allowed to soak for too long, it will lead to formation of hard sulphates on the surface of the plates that will hinder proper charging. It is recommended that batteries should be allowed to soak for one to three hours after completion of acid "filling-in" and before starting the container formation step.

Water Bath For Temperature Control

One of the critical factors in proper container formation is the control of temperature at various steps of the process. This is mainly because in tank formation, the plates are in the pool of acid while in container (jar) formation and the plates are exposed only to a limited quantity of acid inside the container.

The ideal temperature range is 35-45°C. This should be restricted from rising beyond 55°C as it will negatively affect the battery plate quality and cause damage to the separators and the sealing of the cover. A water bath equipped with running water helps in maintaining the desired temperatures during the formation process.

The water level in the bath should be maintained so that the battery is submerged just below the top lid. The batteries should be placed apart and separated from the water bath bottom with the help of distance keepers. This allows waterflow between and under the batteries, allowing for better heat exchange.

Prevent Acid Spillage

In this process, a good amount of electrolyte (acid mist) is generated and tends to spill out from the vent holes in the battery cover. The electrolyte on top of battery cover can cause serious hazards such as:

- Short circuit between positive and negative terminal
- Can spillover and make connection with the cooling water causing cosmetic damage to the side walls of the battery
- In a poorly managed container formation setup, explosion may also occur due to spark generation in a gaseous ambience

  To address this hazard, acid condensers must be used to arrest and cool the acid fumes escaping from the vent holes. Also, a proper electrical earthing needs to be provided for the water bath

Quick Check Points

- Initial gravity of acid should be selected based on the targeted final gravity
- Acid temperature during filling should be between 10° to 12°C so the battery temperature does not cross 50°C
- Addition of 10 to 12gm of sodium sulphate per liter of acid reduces plate sulphation
- Acid level should be maintained at 10 to 15mm above the separator
- Batteries should be allowed to soak for one to three hours after completion of acid "filling-in"
- The ideal temperature range of acid during charging is 35-45°C and should be restricted from rising beyond 55°C
- Acid condensers must be used to arrest and cool the acid fumes escaping from the vent holes
- Charging should start with low current, increase in between and again at low at the end with some rest phases during the course

Adequate Ventilation

Adequate ventilation is a must for container formation as the process generates more gas and the batteries are surrounded with electrical connections. The suction system above the batteries should be installed and the area properly ventilated to avoid accumulation of gasses at any given point of time.

Charging Regime For Container Formation

The following regime will help in achieving the right capacity and performance of battery post formation:

• At start of formation, the charging should be with low current: As the binding between active material and grid (or spine) is low initially, slow charging will ensure that the current is rightly shared between grid and the active material, with majority of the charging current going to the active material and lesser to the grid

• Middle phase formation: After establishing a good adherence between grid (spine) and active material, the current can be increased to reduce the formation time. The increase in current should be such that it does not cause significant increase in heat and gassing

• Last phase of formation: Once the plates reach the gassing phase, the charging current should be reduced to control excessive gassing and heat. In case of tubular plate and heavy-duty batteries, incorporating a discharge cycle (3C) and recharging again will improve formation

• The entire charging schedule should have some rest phases (zero current) in order to control the exothermic electro-chemical process

Other suggestions: The diameter of the connection cables between the charger and batteries should be thick enough to withstand the electrical resistance (heating of cables). Loose connections or hanging electric cables should be avoided

Pre-Dispatch Inspection

Capacity testing can be done on sample batteries to confirm correct charging. If the batteries are kept in stock for more than three months, then a freshening charge is advisable before final dispatch.

Award Distribution for Daramic Jackpot *(Loyalty Program 2019-20)*

Overview

The highlight of Daramic Jackpot was supposed to be a fun-filled trip to Vietnam in February 2020. However, a worldwide surge in COVID-19 cases made us rethink our travel plans. It was a tough call to make as all the tickets were purchased and the itinerary was fixed but keeping in mind the safety of everyone, it was only prudent that we make the decision to cancel the trip, which we did with a heavy heart.

One of the main events during all our previous trips has been the award and achievement ceremony for our valued customers. We decided the least we could do was give our customers some flavor of Vietnam without actually going. We made t-shirts and trophies for all the qualifiers. Our sales team honored their customers and gave out the trophies and certificates during the course of the year. Here is a glimpse of the customers receiving their awards.

Source: Perfect Lazybones / Shutterstock










Ganpati


Mr. Mrityunjyay Singh
Taarmac International, Lucknow
Distributor for Eastern UP

I belong to a family where no one has worked in a business environment. My father and brother are in government jobs. I have worked in the private sector for ten years selling battery and battery components.

It was a very daunting decision for me to leave a nice job and jump into business. However, I was confident that whatever I had learned from my job would come in handy running the business.

I had learned two main things from the successful businessmen I had dealt with while on the job: One, we should honor what we say, as words are more important than written things in business, and two, have patience.

With the blessings of parents and support from my family I started Taarmac International in 2015. Initially, we started with the trading of batteries and Daramic PE separators in Eastern U.P. as a dealer.

In 2018, I got the chance to become a direct distributor of Daramic. This was a turning point for me because now I had the support of a big, brand name behind me. With every opportunity comes challenges but I am thankful for the extraordinary support I received from the local sales team as well as the guidance from senior members of the Daramic team.

Today, I am proud to say that in the last three years, with one year marred by the pandemic, I have been able to double my business. This is only because of the strong brand name, product quality and the family-like support from Daramic team.

I also want to thank all my customers who have shown faith in me and continued giving me business in tough times. There were people in the market who made all kind of negative remarks about how I may not be able to sustain even for a year. Only due to the faith that my customers showed in me, I am where I am today.

Finally, I want to thank my father, Shri Vasudev Singh. Without his strength behind me, I would never have taken this daring step. Also, thank you to the unconditional support of my wife and other family members in trusting me in making the right decisions.

ROAD TO SUCCESS IS BY
HAVING PATIENCE &
KEEPING YOUR WORDS

Source: luchunyu / Shutterstock

ITC - Now Open For Testing

Innovation & Technology are the core driving forces behind the Daramic leadership position since we invented the PE separators almost five decades ago.

India Technical Center (ITC) Dahej, Gujarat, is equipped with state of the art material and battery testing equipment in line with our commitment to research and development (R&D).

Our endeavor is to help battery manufacturers improve their batteries' quality and minimize warranty returns. Over the years, our technical and ITC teams have analyzed the field return in batteries/plates of customers to identify the root cause of the failure.

Customers have repeatedly sought out the testing facilities at ITC – available to them at a nominal charge – so that they have the best in technology available to them for testing without having to make their own investment.

We are happy to announce that ITC will conduct tests on batteries/materials for customers at nominal charges, making ITC the first lab to try this as a pilot project.

For testing requirements, see table below

Contact
Naveen Prabhu
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Test Element	Equipments	Tests
Alloy/Grid	SEM - EDX	Surface morphology and elemental analysis through EDX
	ICP	Identify impurity levels and trace elements
Oxide Powder	XRD	Composition analysis of lead and lead oxide
	ICP	Identify impurity levels and trace elements
Paste (before curing)	XRD	Compounds like lead sulphate, lead oxide, free-lead analysis
	ICP	Identify impurity levels and trace elements
Cured Plate	SEM	Lead sulphate crystal morphology (tri & tetra basic)
	SEM - EDX	Spot elemental identification in the plate
	Optical microscope	Corrosion layer study after plate curing
Formed Plate or Field-returned Battery Plates and Acid	XRD	Analysis of known (lead sulphate, lead dioxide, etc.) and unknown compounds
	SEM	Crystal morphology of lead dioxide, spongy lead and lead sulphate
	SEM - EDX	Spot elemental identification in the plate
	ICP	Identify impurity levels and trace elements
Plastic and Organic Materials	FTIR	Analysis of foreign materials, particulates, fibers, residues, bulk material compounds, constituents in multilayered materials

Ba□ery Tes□ng	Equipment	Tests	Remarks
Both tubular & flat plate 12V batteries - Automotive - Inverter - Solar - E-Rickshaw	1- Life cycle tester 2- HRD tester 3- Environment chamber 4- Charge acceptance tester 5- Water bath	Capacity test (C3 toC20 test, find actual battery capacity)	- Standard test regime (eg. JIS, Volkswagen, Toyota etc.) - Daramic test regimes (simulating field conditions and failure modes) - Customizable test regime as per customer requirement
		Cold cranking amperes (@ -18degC test in automotive)	
		High rate discharge (Cranking current up to 1000A)	
		Charge acceptance (@50% to 90% SOC @ room temperature)	
		Low load endurance test (LLE, small auto battery life-cycle)	
		Heavy load endurance test (HD auto battery life-cycle)	
		Comprehensive life test for 12V* (given below)	
		Water loss (@14.4V for 21 days, as per standard)	

Fourier Transform Infrared Spectroscopy (FTIR)

Fourier Transform Infrared Spectroscopy (FTIR) is used to identify organic (and in some cases inorganic) materials. This technique measures the absorption of infrared radiation by the sample material versus wavelength. The infrared absorption bands identify molecular components and structures.

It is used to:

- Identify the foreign materials (particulates, fibers, residues)
- Identify the bulk material compounds
- Identify the constituents in multilayered materials
- Quantify the unknown organics as contamination

Inductively Coupled Plasma Optical Emission Spectroscopy (ICP OES)

Inductively Coupled Plasma Optical Emission Spectroscopy is used for analyzing the concentration of metallic elements in solid and liquid samples. ICP OES uses the optical emission principles of exited atoms to determine the elemental concentration. Solid samples are dissolved (digested) in an appropriate solvent, (typically acid, and often further diluted in water to obtain a final specimen suitable for analysis.

It is used to:

- Measure trace elements present in the cured plates, formed plates, acid, separators and other battery components

Material Characterization Instruments

High Rate Discharge Tester

Charge Acceptance Tester

Life Cycle

s and Equipment

Scanning Electron Microscopy (SEM) and Energy Dispersive X-ray Spectroscopy

Scanning Electron Microscopy (SEM) scans a sample with an electron beam to produce a magnified image for analysis.

It is used to:

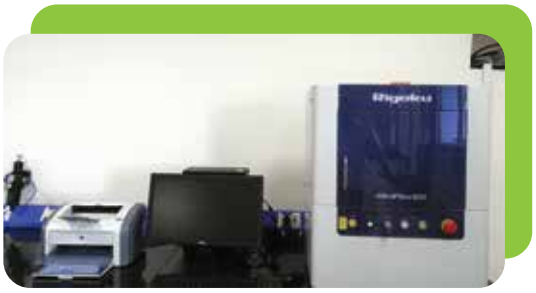
- Check the morphology and dimensions of the phases (lead alloys, lead powder, litharge, PbO_2, $PbSO_4$, dibasic, tribasic, tetra basic sulfates and other traces of impurities)

Energy Dispersive X-Ray Spectroscopy (EDS or EDX) is a chemical microanalysis technique used in conjunction with SEM. It provides qualitative, semi-quantitative, spot and line analysis and elemental mapping.

It is used to:

- Measure unknown traces/deposition on the cured/formed/failed battery plates
- Identify the deposits on the separator/alloys and other materials

X-Ray Diffraction Analysis (XRD)



X-Ray Diffraction (XRD) is a non-destructive test method used to analyze the structure and phases of materials.

It is used to:

- Measure the purity of lead alloy, litharge and other materials used in lead-acid batteries
- Measure the phases in the cured plates, formed plates and field battery plates

Battery Testing Equipment

Tester

Water Bath

Environment Chamber

DARAMIC
Battery Separators Reinvented

Daramic Footprint

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