Lithium Ion Batteries, Batteries, and Fuel Cells

Case Study:

Includes:
Opportunity Marketing Piece
Skills Survey
Candidate Scorecard

Contact:
Jeff Bennett
VP of Client Services
850.983.4871
bennett@ropella.com
COMPANY
DOW

POSITION
Director of Battery Application Development

LOCATIONS
- Midland, MI
- Shanghai, China

For more information contact:
Jeff Bennett
Vice President, Client Services
Ropella
850-983-4871
bennett@ropella.com
DOW Chemical

DOW is a diversified chemical company that combines the power of science and technology with the “Human Element” to constantly improve what is essential to human progress. The company delivers a broad range of products and services to customers in 160 countries, connecting chemistry and innovation with the principles of sustainability to help provide everything from fresh water, food and pharmaceuticals to paints, packaging and personal care products. In 2008, DOW had annual sales of $57.5 billion and employed 46,000 people worldwide. The Company has 150 manufacturing sites in 35 countries and produces over 3,000 products. On April 1, 2009, DOW acquired Rohm and Haas Company, a global specialty materials company with sales of $10 billion in 2008, 98 manufacturing sites in 30 countries and approximately 15,000 employees worldwide. This acquisition further solidifies its dominance in the chemical and materials market.

DOW’s Essential Elements

Taken together, DOW’s essential elements of mission, vision, values, and strategy describe why the company exists, who they are, what they intend to do, and how they intend to do it. These essential elements provide insight, offer motivation, and point the way forward as they seek to grow and achieve their goals.

Mission: To constantly improve what is essential to human progress by mastering science and technology.

Vision: To be the largest, most profitable, and most respected chemical company in the world.

Values: Integrity and Respect for People.

Corporate Strategy: Strengthen our franchise basics businesses and preferentially invest in our performance businesses.

DOW’s ability to innovate starts with high-caliber, high-performing people. Working on the right projects, and with the latest technology in their hands, DOW’s scientists pursue ideas from the definite to the improbable.

There is no substitute for a highly intelligent and naturally inquisitive person who has been properly educated. DOW looks for these attributes.
DOW Battery
Director of Battery Application Development

and a track record of success that would indicate a diligent work ethic and positive attitude. Once such a talent is found, DOW is committed to keeping them engaged – motivated by the nature of the work, and supported by technology and leadership that enables them to achieve.

An organization of such individuals with common goals simply cannot be denied success.

Unlike flashy startup companies DOW has the profit base and diversified portfolio to support aggressive research with room for trial and error. DOW Research & Development has the equivalent of 400 start-ups in its innovation project portfolio.

Careers in DOW R&D allow you to:
• Work in one of the world’s leading chemical and materials research organizations
• Create and discover new molecules
• Invent new products, processes and applications
• Work with customers to solve difficult problems
• Find practical uses for its products
• Innovate new solutions in growth markets
• Travel and interact with people around the globe

Dow Kokam LLC is a joint venture (JV) specializing in the manufacture and sale of lithium ion battery cells and packs. The JV is a separate legal entity in which The Dow Chemical Company has an equity stake. The JV is not the same as Dow, although certain facilities may be operated by Dow or with Dow employees. The Dow Chemical Company intends to be a supplier of lithium ion battery components to the Dow Kokam JV and potentially other battery manufacturers.

Press Release:

Dow Kokam LLC is a joint venture (JV) specializing in the manufacture and sale of lithium ion battery cells and packs. The JV is a separate legal entity in which The Dow Chemical Company has an equity stake. The JV is not the same as Dow, although certain facilities may be operated by Dow or with Dow employees. The Dow Chemical Company intends to be a supplier of lithium ion battery components to the Dow Kokam JV and potentially other battery manufacturers.

More Information:
www.dowkokam.com
Dr. Yao Weiguan, Chief Technology Officer, Asia Pacific
Global R&D Director, Energy Storage Devices Materials

Yao Weiguang is the Chief Technology Officer for Asia Pacific R&D; he is responsible for Asia-Pacific R&D Strategy to make sure Asia-Pacific Resources align with regional growth opportunities; he represents Dow R&D in Asia-Pacific region as the global R&D Director for Dow ESD materials. In this role he has overall responsibility for technology innovation, research, scale-up, development efforts, and technical resource management for new product development in battery applications for Dow. He also provides the vision and direction to deliver rapid development and scale-up of new proprietary energy storage products and processes. Yao is based in Shanghai.

Yao joined Dow in April, 2007 as Senior R&D Director for Dow Core R&D in Asia-Pacific. He was responsible for building AP core and business aligned research capability and strategy at Dow and driving AP core R&D innovation for regional growth.

Prior to joining the company, Yao was General Manager of Pacific Technology for Momentive Performance Material (formerly GE Silicone). Yao has held key technology positions within GE Plastics and Advanced Materials, including General Manager of Pacific Technology for GE-Toshiba Silicons; head of the Technology Center for GE Plastics, Japan; global manager for flexible Noryl technology in GE Plastics; and team leader and compounding specialist for Pacific Noryl technology, GE Plastics. In his roles, Yao was involved in new product and application development to grow markets in the Pacific and globally.

Yao is a graduate of Yamagata University in Japan with a doctorate in polymer science and engineering, a master degree in chemical engineering from East China University of Science and Technology, and a bachelor degree in physics from Yancheng Normal University in China. He holds 11 patents and is the author of numerous publications.
Dr. Deidre Strand,
Dow Fellow, Battery Materials R&D

Peer of Director of Battery Application Development.

Deidre (Dee) Strand is a Dow Fellow in the Battery Materials R&D Program. Dee is responsible for technical oversight of all new lithium ion battery (LIB) materials development, including cathodes, anodes, and electrolytes. This includes developing and implementing an intellectual property strategy to deliver a strong patent portfolio in LIB materials. Working closely with the LIB materials project leaders, Dee has responsibility for the Multiple Generation Platform Plan (MGPP) that guides the efforts of the R&D teams to deliver differentiating technology for Dow. Dee is also the front-end technology focal point to do external technology assessments and to guide early stage research in new materials.

Prior to joining the Dow Battery Materials Program, Dee had a very accomplished background in opportunity identification and project leadership, including key recent roles building the case for the battery materials program and a healthcare MFU as well as past project leadership roles in the advanced electronic materials area (recognized by the National Medal of Technology award). She was a key contributor to Dow’s successful Cyclotene, SiLK, Lumation product development efforts.

Dee is a graduate of University of Wisconsin – Madison with a Ph.D. in analytical chemistry. She also has an M.S. degree in electrochemistry from California Institute of Technology, and a B.S. degree in chemistry from North Dakota State University.
Mark E. Jones,
Research Fellow

Peer of Director of Battery Application Development.

Mark Jones currently is leading the Process Scale-up and Implementation Team within the Energy Storage Devices platform, part of Core R&D. This role builds on Mark’s previous experience in the processing of inorganic materials, fuel cell development for portable power applications, and technology exploration. Mark left Hydrocarbons and Energy, Basic Plastics and Chemicals, Licensing R&D to assume his current role. As Technology Strategy Development Scientist for Basic Plastics and Chemical / Hydrocarbons and Energy R&D, Mark was involved in a variety of alternative feedstock and sustainability issues.

Mark joined Dow in 1990 following a graduate career that had very little to do with his ultimate career path. After graduating with a BS in Chemistry from Randolph-Macon College, Mark received his Ph.D. with Barney Ellison at the University of Colorado-Boulder studying gas-phase ion molecule chemistry - not an area of great industrial interest.

Mark joined Dow in 1990 on the Research Assignments Program. In 1991, he moved into the Heterogeneous Catalysis group in what was then Central Research. That group became part of Core R&D – Chemical Sciences, which is where Mark spent much of his career. Mark moved to a role in Basic Plastics and Chemicals / Hydrocarbon and Energy / Licensing R&D in February 2006. Mark was promoted to Scientist, now renamed Research Fellow, in January 2007. Mark moved to Ventures and Business Development R&D in July 2009 and focused on battery materials. In May 2010, Mark moved to the Energy Storage Devices platform within Core R&D.

Mark is the author of over 16 issued patents and numerous publications.
Director of Battery Application Development

This position is responsible for overseeing the battery application development in various market segmentations such as EV, PHEV, power tools, and others.

Responsibilities:

- Apply fundamental science and engineering principles in battery application area and his/her profound experience to help to develop products that meet or exceed the customers’ technical requirements and differentiate Dow from the competition
- Work closely with Marketing functions to understand customer technical requirements and build multiple generation application plans for different applications
- Quickly screen technology alternatives, and choose the best cost/performance path to meet needs of our customers
- Assess competitive technologies
- Have an in-depth understanding of the patent and trade journal literature
- Support Process Research and Manufacturing functions to scale-up battery materials
- Work closely with marketing/commercial teams to qualify product for our customers
- Assist the Technical Service function in troubleshooting customer issues
- Assist Process Research and Manufacturing in troubleshooting product problems in the plants
- Interface with Supply Chain function on raw material selection and qualifications
- Identify and implement new technology for battery production and testing (partnership with Battery Lab Manager)
- Fully partner in trouble-shooting "unusual"results
- Develop and implement advanced testing protocols
- Interface externally for large scale battery production and testing
DOW Battery
Director of Battery Application Development

- Lead all aspects of specific technology assessments for new opportunities, including IP mapping (with ICMT), competitive assessment, and technical due diligence
- Lead proof of concept experiments and/or develop prototypes to rapidly validate viability of technology
- Assess external technology for licensing or acquisition
- Interface with specific product development teams to drive improvements
- Ensure rapid assessment of information obtained from development partners to drive Dow product improvement
- Publish externally to grow Dow credibility in the field

Requirements:
- The individual must have experience in and in-depth knowledge of lithium ion battery materials and have made contributions to cell/system performance in previous roles
- MS or PhD degree in Electrochemistry, Physical Chemistry, Materials Science, Chemistry, or Engineering and a minimum of 10 years of experience in an R&D and/or Application Development role within the battery industry
- A PhD and lithium ion battery materials commercialization experience is highly preferred
- Project leadership capabilities encompassing the entire product development cycle conceptualization through commercialization
- Proven technical expertise in the development of battery materials
- Strong background in battery fundamentals, including materials, components, and cells
- Sound technical judgment with a demonstrated track record of creating value through innovation
- Familiarity with the design and production of advanced lithium ion battery cells and packs

Locations for this opportunity include:
- Midland, MI
- Shanghai, China
Midland, MI

The DOW Chemical Company has resided in Midland, MI since 1897 when it was founded. Midland currently has a land area of 35.65 square miles, making it the 7th largest city in the state of Michigan. This community with a population of approximately 42,000 people, provides the amenities of big city life with all the charm and security of a mid-sized community. Light traffic, a healthy economy, moderate cost of living, impressive housing stocks, strong educational systems, and easy access to big-city attractions put Midland on Bizjournal’s 2008 list of the top “dream towns” in America.

Midland has many cultural opportunities ranging from music and theater to science and the arts. The Midland Center for the Arts delivers hands-on exhibits in science, art and technology. The Center provides two state-of-the-art auditoriums for audiences of 400 to 1500 to enjoy everything from the Midland Symphony and Theatre Guild to world-class orchestras and dance companies.

This community demonstrates its love of sports with world-class facilities. There are a wide range of athletic events at all levels, from large regional soccer tournaments to national competitions in speed skating. Midland has impressed many with its enthusiasm for sport as it was ranked the #1 tennis town in America, along with it being home to the only pro tennis tournament in Michigan.

There’s no better way to take in the great outdoors than in a city where three rivers converge and a county with miles and miles of hiking and biking trails. There are 80 Midland City parks totaling about 3,000 acres of...
park land. Two of Midland’s largest parks, Emerson and Plymouth, feature large sheltered picnic areas, playgrounds, a pool and a major softball complex. Walkers, joggers, bikers, and skaters can use the Pere Marquette Rail-Trail, a ribbon of asphalt stretching 30 miles to the neighboring city of Clare. A new BMX track is located in Midland’s growing Downtown area.

Midland offers two golf courses, The Midland community Center (with multiple swimming pools and exercise facilities), the West Midland Family Center, the North Midland Family Center, the Midland Gymnastics Center, the Midland Community Tennis Center and the Midland Curling Center. In addition, Midland is the home of Hangtime Sports, an 89,900-square-foot facility with eight indoor courts.

Nature is found in abundance at Midland’s Dow Gardens. The 100 acre garden and arboretum was the original gardens of the Herbert H. Dow homestead and is open for tours. In addition, the Alden B. Dow Home and Studio offers tours of this landmark American architect’s unique and influential style. Alden Dow designed the Grace A. Dow Memorial Library, Midland’s public library named in his mother’s honor.

The city’s major shopping district is located north of town, on Eastman Avenue near US-10. There are several Big-box stores located here, as well as the Midland Mall, which includes Barnes & Noble, JCPenney, Target, Elder-Beerman, and Sears.
Links

**Midland Area Links**
City of Midland  
www.midland-mi.org

Midland Tomorrow  
www.midlandtomorrow.org

Explore Midland  
www.midlandcvb.org

Midland Area Chamber of Commerce  
www.macc.org

Midland Historical Society  
www.macfta.org/A_historicalsociety

United Way of Midland  
www.unitedwaymidland.org

Midland Community Center  
www.midlandcommunitycenter.org

**Education**
Midland County Schools  
www.mcesa.k12.mi.us/aboutsch.htm

Northwood University  
www.northwood.edu

**Shopping**
Midland Mall  
www.shopmidlandmall.com/shop/midland.nsf/index

Midland Area Farmers’ Market  
www.michigan.org/Property/Detail.aspx?p=B14358

Downtown Midland  
downtownmidland.com

**Arts & Entertainment**
DOW Gardens  
www.dowgardens.com

Chippewa Nature Center  
www.chippewanaturecenter.org

Creative 360  
www.becreative360.org

Midland Center for the Arts  
www.mcfta.org

Midland County Fair  
www.midlandfair.com

**Professional Sports**
Great Lakes Loons  
www.loons.com

Detroit Lions  
www.detroitlions.com

Detroit Pistons  
www.nba.com/pistons/index_main.html

Detroit Shock  
www.wnba.com/shock

Detroit Redwings  
redwings.nhl.com

Detroit Tigers  
detroit.tigers.mlb.com/index.jsp?c_id=det
Local News Publications
Midland Daily News
www.ourmidland.com
Detroit News
detnews.com
Metro Times
www.metrotimes.com

Community Recreation
Midland Tennis
www.midlandtennis.com
Currie Municipal Golf Course
www.curriegolf.com
Midland Area Youth Football
mayfl.org
Midland BMX
www.midlandbmx.com
For more information contact:
Jeff Bennett
Vice President, Client Services
Ropella
850-983-4871
bennett@ropella.com

If you have open positions in your organization, give us a call and put our people and our process to work for you.
Skill Survey for: Director of Battery Application Development
Please type your answers in blue.

Name: Date:

1. Outline University Degree(s) with date(s):
   (Please provide the Name, the Location and the Phone # of each Institution & YOUR BIRTHDATE – so we can conduct degree confirmation check.) Note: This date is required in degree confirmation checks and will only be used for that purpose. Your birth date will not be supplied to the client.

2. Describe your experience in an R&D and/or Application Development role within the battery industry, specifically with battery fundamentals, such as materials, components and cells.

3. Tell us about your experience specifically working with cathode materials used in lithium ion batteries.

4. What is your familiarity with the design and production of advanced lithium ion battery cells and/or packs? Please describe specific contributions you have made to cell/system performance.

5. Describe your experience identifying and implementing new technology for battery testing.

6. Tell us about your experience leading proof of concepts experiments and/or developing prototypes to rapidly validate viability of technology.

7. What has been your experience leading all aspects of specific technology assessments for new opportunities, including IP mapping (with ICMT), competitive assessment, and technical due diligence.

8. Tell us about your experience assessing external technology for licensing and/or acquisition.

9. Describe your project leadership capabilities that encompass the entire product development cycle-conceptualization through commercialization.

10. Describe your experience working closely with marketing and/or commercial teams, to understand customer technical requirements to qualify product for customers, and/or help them build multiple generation application plans.
11. Describe your experience assisting and supporting Process Research & Manufacturing to scale-up battery materials and troubleshoot product problems at the plant.

12. Tell us about your experience interfacing with Supply Chain on raw material selection and qualifications?

13. Tell us about any entrepreneurial experience you may have and/or experience where you had to work as an independent contributor with little day to day direction.

14. Tell us about any non-compete, patent restrictions, and/or employer restrictions that you may have. Please provide these documents for our review.

15. What are your circumstances regarding relocation to either the Midland, MI or Shanghai, China area? Are there any special issues we should be aware of? (Such as selling your home? Spouse’s work? Ages/relocating children at home? Joint custody issues? Parental care?)

16. Are you a US Citizen? If no, what is your Visa status and provide the type of Visa that you are currently working under and any restrictions/issues our client will have to deal with.

17. If asked one of the following questions during an interview, how would you answer?
   Why are you considering this opportunity? (or)
   What’s motivated you to consider a job change at this time?

References
Please provide three to six references. The first priority is customers, past bosses, then employees, then peers.

Example: Bob Smith, currently – CTO at ABC Energy 412-123-4567, Email: bob.smith@abcenergy.com.
   Was VP of R&D, my direct boss, while I was Sr. R&D Leader at ABC Energy.

   We will NOT contact any references until after completing the interview process and not without notifying you first.

1)

2)

3)
Our scorecard is a form you complete on every candidate you have now screened as a potential fit. If you can tell that some of the candidates are probably C level in a superficial overview in comparison to others you set those aside now and grade the rest. The scorecard will help you objectively weigh all the Must Haves and even the preferences in such a way that at the end of using the scorecard process you can be pretty sure who the A plus candidates are, who the A candidates are, and who the B candidates are. Then we focus on scheduling for the A’s.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>A/B/C</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Education</td>
<td>A = PhD in Electrochemistry, Physical Chem, Materials Science, Chemistry or Engineering, B = MS in the above disciplines, C = BS in something other than above</td>
<td></td>
</tr>
<tr>
<td>2. Exp. in R&amp;D and/or application development within the battery industry. (Specifically with battery fundamentals like cathode materials, components and cells)</td>
<td>A = Yes, B = Somewhat, C = No</td>
<td></td>
</tr>
<tr>
<td>3. Exp. working with materials used specifically in lithium ion batteries.</td>
<td>A = Yes, B = Somewhat, C = No</td>
<td></td>
</tr>
<tr>
<td>4. Familiarity with the design and production of advanced lithium ion battery cells and/or packs. Did they provide examples of specific contribution that they made?</td>
<td>A = Yes and Yes, B = Somewhat and generic answer, C = No and No</td>
<td></td>
</tr>
<tr>
<td>5. Exp. identifying and implementing new technology for battery testing</td>
<td>A = Yes, B = Somewhat, C = No</td>
<td></td>
</tr>
</tbody>
</table>

Candidate Name: 
Client Name: Dow Battery
Position: Dir. of Battery Application Dev.
Our scorecard is a form you complete on every candidate you have now screened as a potential fit. If you can tell that some of the candidate’s are probably C level in a superficial overview in comparison to others you set those aside now and grade the rest. The scorecard will help you objectively weigh all the Must Haves and even the preferences in such a way that at the end of using the scorecard process you can be pretty sure who the A plus candidates are, who the A candidates are, and who the B candidates are. Then we focus on scheduling for the A’s.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 6. | Exp. leading proof of concepts experiments and/or developing prototypes to validate viability of technology | A = Yes  
B = Somewhat  
C = No |
| 7. | Exp. leading all aspects of specific technology assessments for new opportunities. (include IP Mapping with ICMT, competitive assessment and technical due diligence) | A = Yes  
B = Somewhat  
C = No |
| 8. | Exp. assessing external technology for licensing and/or acquisition. | A = Yes  
B = Somewhat  
C = No |
| 9. | Exp. with Project Leadership that encompasses the entire product development cycle: conceptualization through commercialization | A = Yes  
B = Somewhat  
C = No |
| 10. | Exp. working closely with marketing and/or commercial teams to deal with customer tech requirements, qualify product for customers, and help them build multiple gen app plans. | A = Yes  
B = Somewhat  
C = No |
| 11. | Exp. assisting & supporting Process Research & Manufacturing to scale up battery materials and troubleshoot product problems at the plant | A = Yes  
B = Somewhat  
C = No |
| 12. | Exp. interfacing with Supply chain on raw material selection and qualifications. | A = Yes  
B = Somewhat  
C = No |
Our scorecard is a form you complete on every candidate you have now screened as a potential fit. If you can tell that some of the candidate’s are probably C level in a superficial overview in comparison to others you set those aside now and grade the rest. The scorecard will help you objectively weigh all the Must Haves and even the preferences in such a way that at the end of using the scorecard process you can be pretty sure who the A plus candidates are, who the A candidates are, and who the B candidates are. Then we focus on scheduling for the A’s.

<table>
<thead>
<tr>
<th>13. Entrepreneurial exp.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A = Yes</td>
<td></td>
</tr>
<tr>
<td>B = Somewhat</td>
<td></td>
</tr>
<tr>
<td>C = No</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>14. Non-compete, patent restrictions, employer restrictions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A = No issues</td>
<td></td>
</tr>
<tr>
<td>B = Some issues but very minor</td>
<td></td>
</tr>
<tr>
<td>C = Yes, major red flags</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>15. Relocation to Midland, MI or Shanghai,</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A = Yes, no issues and/or lives in the area</td>
<td></td>
</tr>
<tr>
<td>B = Some issues but nothing major</td>
<td></td>
</tr>
<tr>
<td>C = Will have major issues relocating</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>16. Citizenship Status?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A = US Citizen or Greencard/Visa approved</td>
<td></td>
</tr>
<tr>
<td>B = VISA getting approved, won’t delay process</td>
<td></td>
</tr>
<tr>
<td>C = some significant visa issues, delays expected</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>17. Compensation: 140K to 160K with bonus 20%</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A = 130K to 150K</td>
<td></td>
</tr>
<tr>
<td>B = 100K to 120K or 165K to 175K</td>
<td></td>
</tr>
<tr>
<td>C = below 100K or over 180K</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>18. Job Changes/Stability</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Number of Job changes:</td>
<td></td>
</tr>
<tr>
<td>Total number of yrs working:</td>
<td></td>
</tr>
<tr>
<td>Average number of yrs at each job:</td>
<td></td>
</tr>
<tr>
<td>A = Avg. yrs = 5-10</td>
<td></td>
</tr>
<tr>
<td>B = Avg. yrs = 3-5</td>
<td></td>
</tr>
<tr>
<td>C = Avg. yrs &gt;3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grading Point System:</th>
<th>Total Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A’s = 4</td>
<td>Divided by ___ grades =</td>
</tr>
<tr>
<td>B’s = 3</td>
<td>Avg. Grade</td>
</tr>
<tr>
<td>C’s = 2</td>
<td></td>
</tr>
<tr>
<td>Bonus Points = 1</td>
<td></td>
</tr>
<tr>
<td>Now add up the numerical value of each grade and then divide by the total number of grades</td>
<td></td>
</tr>
</tbody>
</table>