Your Innovation. Our Ingenuity.
• To send up “smoke signals”, asking for your help/”partnership”

• Not to blow smoke elsewhere

• I want you to know what you need to know to be involved with us, our markets and our customers
Jabil Snapshot

- Founded in Michigan, 1966
- World’s Third Largest Electronic Manufacturing Services Provider
- 195 on Fortune 500
- $18.3 Billion in 2013
- Over 21 Million Square Feet Manufacturing
- Over 100 Sites on Four Continents
- Over 180,000 Dedicated Employees

Offering Global Electronics Solutions
Jabil Global Operations Enable Local Solutions

**ASIA** – 19 Million Square Feet

<table>
<thead>
<tr>
<th>China</th>
<th>India</th>
<th>Taiwan</th>
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</thead>
<tbody>
<tr>
<td>Beijing</td>
<td>Manesar</td>
<td>Changhua</td>
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<tr>
<td>Hong Kong</td>
<td>Pune</td>
<td>Hsinchu</td>
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<tr>
<td>Huangpu</td>
<td>Ranjangaon</td>
<td>Taichung*</td>
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<tr>
<td>Nanjing</td>
<td>Japan</td>
<td>Taipei</td>
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<tr>
<td>Shanghai*</td>
<td>Gotemba</td>
<td>United Arab Emirates</td>
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<tr>
<td>Shenzhen</td>
<td>Hachioji</td>
<td>Dubai</td>
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<tr>
<td>Suzhou*</td>
<td>Malaysia</td>
<td>Vietnam</td>
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<tr>
<td>Tianjin*</td>
<td>Penang*</td>
<td>Ho Chi Minh City</td>
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<tr>
<td>Wuxi*</td>
<td>Singapore</td>
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<tr>
<td>Yantai</td>
<td>Singapore City</td>
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</tbody>
</table>

**AMERICAS** – 8 Million Square Feet

<table>
<thead>
<tr>
<th>Argentina</th>
<th>United States</th>
<th>EUROPE – 4 Million Square Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buenos Aires</td>
<td>Auburn Hills</td>
<td>Austria</td>
</tr>
<tr>
<td>Brazil</td>
<td>Colorado Springs</td>
<td>Vienna*</td>
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<tr>
<td>Belo Horizonte</td>
<td>Council Bluffs</td>
<td>Belgium</td>
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<td>Manaus</td>
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<td>Hasselt</td>
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<td>Sorocaba</td>
<td>Louisville</td>
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<td>Valinhos</td>
<td>McAllen</td>
<td>Ostrava</td>
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<tr>
<td>Mexico</td>
<td>Memphis*</td>
<td>England</td>
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<tr>
<td>Chihuahua*</td>
<td>Poughkeepsie</td>
<td>St. Petersburg*</td>
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<tr>
<td>Guadalajara*</td>
<td>San Jose</td>
<td>Tempe</td>
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<tr>
<td>Reynosa*</td>
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<td>Tampa</td>
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</tbody>
</table>

**EUROPE** – 4 Million Square Feet

<table>
<thead>
<tr>
<th>Austria</th>
<th>France</th>
<th>Netherlands</th>
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<tbody>
<tr>
<td>Vienna*</td>
<td>Brest</td>
<td>Amsterdam</td>
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<tr>
<td>Belgium</td>
<td>Gallargues</td>
<td>Venray</td>
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<td>Hasselt</td>
<td>Germany</td>
<td>Poland</td>
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<td>Czech</td>
<td>Jena</td>
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<td>Ostrava</td>
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<td>Kwidzyn</td>
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<td>England</td>
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*There are 2 sites at this location. Support sites excluded.*
Robert Richardson

• 30+ years as a paint formulator/VP/GM/ Director Egyptian Coatings

• 3 years as Global Special Projects Manager Akzo Nobel Specialty Coatings

• 12+ Years Jabil Green Point as Chief Engineer
  – Training Employees
  – Searching for New Technology
  – Working with customers and suppliers to insure there are no problems on projects

Offering Global Electronics Solutions
Lee Zou Sun

- Wise Knowing Teacher
- Fat Horse Ass
Jabil Green Point

Jabil’s Green Point Team brings ingenious solutions to complex global supply chains for some of the world’s most well known and successful brands.

We provide innovative engineering solutions that leverage advanced design, mechanical excellence and breakthrough material technologies in plastics and metals—all delivered by the best engineering minds in the business.

Your Innovation. Our Ingenuity.
Green Point

- Part of Jabil since 2007
- Began as a premier custom molding company
- Still makes many of its own molds and specialized molding equipment
- Does what it needs to do to meet customer expectations
- Does not specify the most of the coatings used, but can help with qualifications at the OEMs
- Builds its plants to meet customer’s needs
- Recently purchased Nypro, which has added many locations (not listed or shown in presentation)
My ultimate goal here today is to give you the information needed to make you part of the team.

I will be telling you what our customer’s needs are, what is needed to qualify as a supplier, and then how Jabil’s Green Point Team can work with you and our customers. (and yes, other competitors)

The main thing to keep asking yourself: What do I add as value for the OEM?

Your Innovation. Our Ingenuity.
Green Point

- Recognized as a world leader in:
  - Innovative decorating technologies
  - Research, design and engineering of aesthetic, precise and structural mechanical plastic and metal components
  - Consumer Handheld Electronics Industry
  - Engineering and optimized mechanical solutions for mass production

- Business models serving a diversified base of industries, customers and service offerings

- Always looking for suppliers who can add value

Offering Global Materials Technology Solutions
Green Point lives it’s mission statement

Be the best. Improve daily for total customer satisfaction. Our focus is on 100% quality with a short time to market!
Green Point Footprint

Design Centers
- Taichung, Taiwan (R&D)
- Beijing, China
- Wuxi, China
- Singapore, Singapore
- San Jose (ESI)
- Jena, Germany (Optics)

Manufacturing Facilities
- North China
  - Tianjin
  - Yantai
- East China
  - Suzhou
  - Wuxi
  - Nanjing
- South China
  - Shenzhen
  - Huangpu
- West China
  - Chengdu
  - Taichung, Taiwan
  - Penang, Malaysia
  - San Jose, CA

Medical facilities are ISO 13485 certified with class 6, 7, & 8 clean rooms. All facilities meet a minimum of ISO 9001 & 14001.
We Understand Our Customer’s Unique Challenges

- Product differentiation in rapidly evolving markets
- Technical challenges and complexities
- Combining speed and quality
- Accelerating rate of change and increased risk
- Emerging challenges of complex market segments

Increasingly Complexity Brings Opportunity for Brand Differentiation
Your Innovation. Our Ingenuity.

- YOU must have a differentiated products
- YOU must have flexibility and reliability (and patience)
- YOU must be able to supply on an accelerated time-to-market basis
- YOU must have quality that builds brand equity
- YOU must add value

Building Stronger Brands Faster and More Efficiently with Quality Products
Customers demand quality

Almost all surfaces require a class A finish

You have a good part or you have trash

“Zero defects”
Speed is also a critical element

• Speed to market
• Speed to respond to needs
• Speed to support programs
A Typical Project

Projects go quickly. Usually lasting in less than a year in production.

It is a rare project that extends beyond three years.

- Our customer’s design team may take a month, or it may take years, to test and marry their product to your product
- Prototypes for marketing 1 month
- Evaluating sales for 2 months
- Scale up and production 3 months or cancelation of project
- Hopefully a reorder (or 2 or 10)
New projects depend on

- How much value is added
- How past projects went
- How well you convinced the OEM you are worthy to be a partner
A REPEAT: My goals

• Solve the OEM’s problems
• Get you involved, while understanding their needs
• Add value to our processes
• And to do that, you have to add value to the OEM’s products
Solutions that Drive Innovation

• Innovation and customized solutions
• Diverse know-how and capabilities, combining new and existing technologies
• Scale, speed and time-to-your-profitability
• Strategic partner for long-term success, with various working models to meet each customer’s unique needs
Green Point is there to help

Core Competencies
- New Product Introduction
- Design, Engineering and Development of Manufacturing Solutions for Optimum Performance
- Scaling to Mass Production

General Services
- Mechanical Design / ID Support
- Extensive R&D Engineering Services
- Tool / Fixture Design
- Plastic Injection Molding / Metal Casting
- Silicone Molding / LSR
- Metal Stamping
- Decorative Metals / Plastics
- Decorative Coating Technologies
- Precision Machining (CNC)
- Automation

Offering Global Electronics Solutions
Green Point Markets Served

- Healthcare & Life Sciences
- Consumer
- Industrial
- Automotive
- Mobility / Telecommunications
- Clean Energy
- Networking
- Computing & Storage
- Aerospace / Defense

Depth & Breadth of Expertise Adds Value to All Customers
Which of these is the largest market?

Consumer electronics and specifically:

Cell phones
Design Engineering Services

Joint Design Service
- Complete ME/HW design capabilities for mobile internet devices – ID, ME, CAE, Baseband, RF, antenna, ECAD, QA, PM, prototype validation and manufacturing test development
- 125+ engineering staffs, averaging 8 years of mobile design experience
- ISO 9001 compliant processes

Industrial Design
- Storyboard, hand sketch, rendering, surface modeling, mockup & CMF

Mechanical Design Service
- Joint Design Service
- Mechanical ESI/DfX Service
- Development Support Service
- FEA Service
Design Engineering Services

Electronics Design Services
• Hardware design for Mobile Internet Devices
• Antenna/RF/Baseband design and qualification
• Schematic design
• PCB/Flex layout design
• Proto-build support and NPI

Product Validation Laboratory
• Reliability, Environmental, Hardware and Failure Analysis lab focusing on mobile device test criteria

Manufacturing Test Development
• PCBA-level RF/non-RF testing, RF calibration/alignment
• Phone-level final RF/Non-RF testing, Product functional test
• Product firmware programming, PCBA and flash IC
• Customer specific programming and mass customisation/configuration (CFC)
• Customer test data archiving and product test traceability conformance
Design Tools Overviews

Mechanical Design
- Catia
- Pro/E Wildfire
- Windchill 10.0/PDM Link
- Unigraphics 8.0
- ZW-CAD/ AutoCad
- CorelDraw
- Cinema 4D
- Adobe Photoshop
- Adobe Illustrator

Software / Firmware Tools
- MS Visual Studio 2010 Pro

Collaboration Tools
- Windchill, Agile

Schematic Capture
- Cadence OrCad CIS

CAD Layout
- Cadence Allegro

Simulation / Reliability Tools
- Cadence SPECCTRAQuest
- Cadence PSpice
- Moldflow
- ANSYS (Static)
- LS-Dyna (Dynamic)
- SPEOS Light Simulation
- HyperWorks
- Lab View Developer Suite
## Mechanical Components

<table>
<thead>
<tr>
<th>Plastics</th>
<th>Metals</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-Shot Molding</td>
<td>AL/ZN Die Casting</td>
<td>Ceramic Injection Molding</td>
</tr>
<tr>
<td>Insert Molding</td>
<td>Mg Thixo-molding</td>
<td>Liquid Silicone Rubber</td>
</tr>
<tr>
<td>Nissha IMD</td>
<td>Metal Stamping</td>
<td>Single/Multi-Shot Molding</td>
</tr>
<tr>
<td>2D/3D IML/IMF</td>
<td>Physical Decoration</td>
<td>Insert Molding</td>
</tr>
<tr>
<td>Leather Over-molding</td>
<td>EP Polish</td>
<td>Micro Molding Technology (MMT)</td>
</tr>
<tr>
<td>Wood Over-molding</td>
<td>Mechanical Polish</td>
<td>Functional Coating (Anti Stain/Scratch)</td>
</tr>
<tr>
<td>Plastic Decoration</td>
<td>Laser</td>
<td>Composite (Glass/Carbon Fiber)</td>
</tr>
<tr>
<td>Painting</td>
<td>Surface Texturing</td>
<td>Digital Printing</td>
</tr>
<tr>
<td>PVD (NCVM for Plastic)</td>
<td>Chemical Decoration</td>
<td>Special Paint (Plastic and Metal)</td>
</tr>
<tr>
<td>2D/3D Laser Etching</td>
<td>Anodizing (Al)</td>
<td>Glass Insert Molding (Plastic)</td>
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<tr>
<td>Ink Filling</td>
<td>Electro-Deposition</td>
<td>Touch Sensor Laminations</td>
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<tr>
<td>Plating</td>
<td>Painting</td>
<td>Laser Selective Plating (LSP)</td>
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<tr>
<td>Optical Lenses</td>
<td>PVD (SS Metal)</td>
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<tr>
<td>Routine</td>
<td>Chemical Etching</td>
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<tr>
<td>Optical Coating</td>
<td>Precision Machining (CNC)</td>
<td></td>
</tr>
<tr>
<td>Glass Fiber Filled Plastic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Precision Machining (CNC)</td>
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</tr>
<tr>
<td></td>
<td>In Mold Assembly</td>
<td>Molded in Buttons and Seals</td>
</tr>
</tbody>
</table>
CNC Precision Machining

MTS Corporate CNC Competencies

- 3, 4 & 5 Axis Machining
- Cutting Tool Manufacture
- Vertical Milling/Drilling/Grinding
- Two Sided Grinding
- Laser Cutting
- Laser Welding / Etching
- Surface Finishing
- Sinker/Wire EDM*
- Horizontal Milling/Drilling
- Hole Grinding
- Turning (*Lathe*)
- Surface Finishing
- Automated CNC Machine Manufacturing Cells

Precision Machining Solutions
For Mass Production

- CNC precision machining experience 1981
- Tooling, automation and secondary operations
- Vertically integrates Jabil’s production
- Over 6,000 CNC machine tools and automation

* EDM = Electrical Discharge Machining
Tooling Capabilities

Plastic Injection Molding Tools
- Rapid Tools/Soft Prototype
- Production
- Single/Multi-Shot
- Insert Molding
- Over Molding (IMD/IML/IMF)
- Gas Assistance
- LSR Multi-Shot Molds
- Optical-Electronics
- Thin Wall Molding
- Hot Runner System/Valve Gate Application
- Frame of Back Light
- Stack / Rotary Stack
- End of Arm / Automation

Metal Stamping Tools
- Staged Stamping
- Progressive Stamping

Metal Molding / Casting Tools
- Thixo-Molding
- Zinc / Aluminum

CNC Precision Machining
- Cutting Tool Mfg.
- Aluminum
- Mag. Copper
- Tool Steels
- Stainless Types
- Plastic
- Ceramic
- Titanium
Green Point has manufactured much of its own injection molding machines and ancillary equipment. The result is a competitive advantage.

**Injection Molding Machines**
- Single Shot
- Multi-Shot
- LSR Single Shot
- LSR Double Shot
- Hydraulic and Electric, 50 to 300 ton

**Specialty Molding Equipment**
- Mini Injection Units
- Universal Injection Units
- Universal LSR Injection Units (Servo Driven)
- Multi-Shot Turntables

**Competitive Advantage**
- Lead Time
- Maintenance
- Flexibility / Custom Requirements
- Superior Performance
Mechanical Capacities

Tooling Departments
- 4,000+ Molds Per Year (Internal Manufacture)
- 300+ CNC Machine Tools
- 350+ CAD/CAM Stations
- 25,000m2+ Mold Making Space

Engineering
- 150+ Engineers on R&D
- 200+ Design Engineers
- 500+ Tooling Engineers
- 340+ Automation Engineers

Manufacturing Areas
- 1,000+ Injection Molding Machines
  - 50 to 800 ton
  - Single Shot and Multi-Shot
  - Electric and Hydraulic
  - LSR
- 200+ Stamping Presses
- 1,000+ CNC Machine Tools
  - 3,4 & 5 Axis Precision Machining
- Secondary equipment per requirements
- In excess of 1,000,000m2 mfg. space and growing.
JGP Manufacturing Services by Location

**Taichung, Taiwan**
- R&D
- Tooling
- Molding
- COM / IML / IMF
- LSP
- LSR
- CIM
- Metal stamping
- Anodize

**Tianjin/Yantai China**
- Tooling
- Molding
- IMD / IML
- Painting & NCVM
- Digital Printing
- Metal stamping

**Shenzhen, China**
- Tooling
- Molding
- IMD / IML
- Painting & NCVM
- Tactile Digital Printing

**Huangpu, China**
- SMT
- Box Builds
- Build to Order
- Configure to Order

**Suzhou/Wuxi/Nanjin, China**
- Tooling
- Molding
- IMD
- Painting & NCVM
- CNC Precision Production Machining
- Metal stamping
- Mg Thixomolding
- Anodize
- Backlight modules/light guides

**Tianjin/Yantai China**
- Tooling
- Molding
- IMD / IML
- Painting & NCVM
- Digital Printing
- Metal stamping

**Penang, Malaysia**
- Tooling
- Molding
- Painting

**Chengdu, China**
- Metal CNC
- Metal Decoration

**San Jose, CA. USA**
- FATP SERVICES

**JGP**
- Jabil Green Point
Every paint line is made up of multiple cells to give customers many options

- Parts are loaded on spindles
- Cleaning and destatic treatments
- Basecoat (s) with up to three booths
- VM or Non nonconductive VM
- Primer
- Laser etch
- Clear coat
- Hard coat
- Printing
- EMI/RFI Shielding
- Your process????
Primary substrates of interest

• Many Plastics
• Aluminum
• Magnesium
• Glass
• Also:
  – Fabric
  – Leather
Curing

- In line ovens (force drying)
- UV (all lines are now Hg vapor)
- Off line batch ovens where higher temperature is required
So what gets cured?

- 4 to 8 parts per spindle
- Spindles are 10 cm apart, so 400 to 800 parts per meter
- Lines move at 3 to 5 meters a minute, so 1200 to 4000 parts per minute or 72,000 to 240,000 an hour
- Most lines operate on two 10 hours shifts a day that average 85% full, so 1,224,000 to 4,080,000 parts per day 6 days a week, 50 weeks a year

Each line shuts 4 hours a day of operation for mandatory clean up
Each line is down Sunday (although about halve the weeks in a year there is overtime on part of the day)
All lines close two weeks a year for the Chinese New Year
What do you need to do to be a supplier?

Everyone’s goal is to add value.
That is what you need to do too.
Note: All products must meet automotive (or higher) specifications from a QS-9001 (or better) facility

Supply a product that is either superior to those now available unique or interesting enough to catch the interest of the buying public, which will translate to added market share

meets a design or function need of the customer or market
Product is not enough

You must also be able to provide:

Rapid global delivery
Global technical support on a local basis
A proven product (yes, this is the opposite of new and innovative, but these OEM companies are not big risk takers in spite of reputations for innovation)
Deep pockets
Specific Current Active Projects (Needs)

1. New Generation NCVM Coatings (Vacuum coating system for vacuum metalized parts)
2. HGUV Coatings (We are always looking for harder or unique high gloss UV coatings)
3. LGUV Coatings (Harder or more mar resistant low gloss UV coatings)
4. Sub-surface Laser Etching (coatings that allow us to do this)
5. New Generation Soft Touch Coatings (The current approved systems are PU, slow curing and do not level well. Customers want a more leather like feel and smoother surface)
6. “Silicone” Coatings (Coatings with slip, dirt collection, fingerprint and/or mar improvements)
7. Anodized Effect Coatings (Decorative finishes that look like anodizing.)
8. Texture finishes especially those that look like stone.
Value is always the “issue”
Supporting our OEM base is expensive and they know it.
Over time you may get pressure, but if they can differentiate based on your product, it allows for increased market share, you will get approvals
If we see value for you, us and the customer, we will help
Do you have something for us?

Need help qualifying product or process with an OEM?

If it adds value, we will help!

raregypt@msn.com
Jabil Green Point
Your Innovation. Our Ingenuity.
Thank you

Questions???