



# ADVANCING MANUFACTURING TECHNOLOGY

## Our Scope

iNEMI, an industry-led consortium, is advancing electronics manufacturing technology through identification of technology needs, development of industry infrastructure, accelerated deployment of new technologies, dissemination of efficient business practices and stimulation of standards. We are the only corporate membership organization focused exclusively on electronics manufacturing technology, from IC to system, and whose membership represents the full spectrum of the electronics assembly infrastructure. We provide industry-wide responses with a proven methodology that identifies and closes technology knowledge gaps.

## Why iNEMI

iNEMI offers the opportunity to collaborate across the entire supply infrastructure in an efficient manner. Our members include some of the world's leading electronics OEMs and EMS providers, component and board manufacturers, materials and equipment suppliers, and software providers. Working together, these companies have an impact, whether it is in creating consensus requirements to reduce risk for users and suppliers, evaluating alternative technologies, or influencing development of industry standards.

Today's electronics manufacturing companies must continually adjust their processes to a globally distributed environment and must be assured of strong development and manufacturing supply chains around the world. iNEMI is supporting this need with offices in North America, Asia and Europe. Our goal is to globalize our efforts, using these regional centers to attract leading electronics companies in these regions, and to conduct collaborative programs in the optimum location. We are also building formal alliances with regional organizations to further leverage our efforts.

## Strategy

iNEMI employs a well-proven strategy to ensure robust supply chain technology for high-volume electronics manufacturing. First, we roadmap global technology trends across numerous disciplines, drawing on the expertise of a broad cross-section of industry, academia and government. Next, gap analyses help determine where industry capabilities fall short of market and product requirements, and also identify meaningful opportunities. We then prioritize technology gaps to define R&D needs, and create a technical plan and research priorities that identify projects and activities to close identified gaps. The technical plan becomes the basis for iNEMI deployment projects, and we share research priorities with key funding agencies, universities and industry to facilitate focused R&D investments.

## OUR MISSION

**iNEMI's mission is to identify and close technology gaps, which includes the development and integration of the electronics industry supply infrastructure. The accelerated deployment of technology is shaped and led by our member firms, and provides benefits to the global electronics industry.**

## Initiatives

**Roadmapping.** The iNEMI roadmap charts future opportunities and challenges for the electronics manufacturing industry. Our widely utilized roadmaps influence R&D investments and technology deployment around the world. Updated every two years, the roadmap sets direction for technology development and deployment by predicting future packaging, component and infrastructure needs

and describing critical technical and business elements required to support industry growth. This information provides the basis for collaborative projects undertaken by our members.

**Influencing Industry R&D.** iNEMI members use our roadmaps to direct or validate internal technology and product development efforts. In addition, we stimulate R&D projects to fill anticipated technology and production gaps by advising government agencies and universities on areas of critical need. Several university research programs, government agencies and other consortia have aligned their R&D agendas with the iNEMI roadmap. iNEMI stimulates cooperation and coordination between industry and academia on high-priority research needs in order to proactively address innovation in both our roadmapping and development initiatives.

**Deploying Technology.** Our member companies invest their respective skills and resources in deployment projects that will improve the global industry supply infrastructure. Our current collaborative efforts emphasize three areas: (1) medical electronics, (2) miniaturization and (3) energy and the environment.

Members from all segments of the supply network participate in collaborative projects, ensuring that needs of users and suppliers are addressed. Cooperation among OEMs, EMS providers and suppliers at pre-competitive levels leads to common specifications, techniques and requirements, reducing new product development risks for suppliers and ensuring that OEMs and EMS providers receive the timely solutions they need.

**Stimulating Standards.** iNEMI regularly identifies areas where standards are needed and leverages the diversity of our members to develop consensus on solutions that address industry needs. iNEMI is not a standards-making body, but we work

| INDUSTRY NEED   | CHALLENGES/GAPS   | iNEMI ACTIONS  |
|---|---|--|
| Ensure reliability of medical electronics                                 | <ul style="list-style-type: none"> <li>No industry minimum guidelines or standards to ensure reliability.</li> <li>Component suppliers must satisfy many different customer requirements.</li> <li>Industry must prepare for future Pb-free requirements for the medical sector.</li> </ul>   | <ul style="list-style-type: none"> <li>Organized the Medical Components Reliability Specifications Project to develop testing and use conditions guidelines for electronic components used in life-critical devices: <ul style="list-style-type: none"> <li>Define when and how to test.</li> <li>Determine how to apply test results that are relevant to the use conditions.</li> </ul> </li> </ul>  |
| Ensure reliability for high-reliability / long-service-life products      | <ul style="list-style-type: none"> <li>Pb-free reliability cannot be predicted with the same certainty that SnPb can deliver.</li> <li>Manufacturers of high-reliability products are likely to stay with SnPb assembly processes until Pb-free knowledge gaps are closed.</li> <li>Conversion to Pb-free components is affecting availability of SnPb-compatible components, especially BGAs.</li> <li>Lack of industry-wide conversion date for high-reliability segments is causing confusion in the supply base.</li> </ul> | <ul style="list-style-type: none"> <li>High-Reliability RoHS Task Force organized to address reliability concerns with the components supply base.</li> <li>Published recommendations to communicate needs to the supply chain and standards groups.</li> <li>Identified and prioritized remaining “knowledge gaps” for Pb-free processing.</li> <li>Organized the Pb-Free Alloy Alternatives Project to help make Pb-free alloy proliferation easier to manage.</li> <li>Organized the Pb-Free Early Failure Project to investigate the causes of unexpected early failures found in some Pb-free reliability studies.</li> </ul> |
| Reduce processing temperatures required by Pb-free soldering              | <ul style="list-style-type: none"> <li>Higher reflow temperatures can: <ul style="list-style-type: none"> <li>Negatively affect product reliability.</li> <li>Require tougher qualification requirements for components.</li> <li>Significantly change manufacturing processes.</li> </ul> </li> </ul>  | <ul style="list-style-type: none"> <li>Pb-Free Nano-Solder Project is developing a nano-solder paste that can suppress the melting point of Pb-free solders.</li> <li>Demonstrated the ability to produce nano-particles of tin and confirmed a melting point depression.</li> </ul>   |
| Eliminate halogenated flame retardants (HFRs) from printed circuit boards | <ul style="list-style-type: none"> <li>Reliability of materials with alternative flame retardants has not been fully qualified.</li> <li>The properties of HFR-free materials are different from FR4 and may impact electrical and mechanical design parameters.</li> <li>Rapid conversion to HFR-free will have a major impact on the supply chain and needs to be coordinated.</li> </ul>   | <ul style="list-style-type: none"> <li>Evaluated commercially available halogen-free PWB laminate materials.</li> <li>Organized efforts to establish desirable “technology envelopes” to guide development and deployment of HFR-free solutions.</li> </ul>  |

Table 1. iNEMI’s methodology has successfully addressed several key issues affecting the electronics manufacturing industry.

closely with existing standards organizations, such as JEDEC, IPC, IEC, TIA and IEEE, to influence the development and release of required standards as identified by iNEMI initiatives.

## Member Benefits

iNEMI’s ultimate goal is to increase both market growth of the electronics industry and market share for our member companies. Critical information exchange, future technologies forecasting and networking with leading-edge companies are among the many opportunities available to our members. Active participation in iNEMI helps companies to:

- Understand and accelerate strategic changes.
- Define future needs and business opportunities.
- Validate company decisions based on experience of others.
- Leverage resources through collaborative efforts.
- Influence/accelerate industry standards.
- Reduce time to deployment and revenue for new technology and/or infrastructure.



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## Participation

Any organization committed to our mission is eligible to join and participate at all levels (from engineers contributing to and leading projects to senior executives driving strategy on the Board of Directors). All collaborative work is carried out at members’ facilities or other industry venues. iNEMI maintains a small central staff to provide a legal framework and facilitate the collaborative process. This allows us to minimize overhead costs and keep membership fees reasonable. Members pay an annual fee and, typically, there are no additional fees for participating in specific projects.

More than 65 companies, universities, associations and government agencies belong to iNEMI. Shouldn’t you be one of them? For information about how to join, call us at +1 703-834-0330 or visit [www.inemi.org](http://www.inemi.org).

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