



## **ISMI Guidelines for Supplier Requests for Participation in ISMI's 450 mm Program**

ISMI is accepting submissions from process and metrology equipment suppliers for 450mm tool transition projects to be considered for ISMI cost-sharing and other assistance. ISMI wants to understand the technical and commercial challenges your company faces in building tools to accommodate 450mm wafers. ISMI, which is composed of and represents potential customers, anticipates assisting tool suppliers with some of the costs involved in building a 450mm tool for use in ISMI's 450mm Program, to help the industry as a whole, and to accelerate the 450mm transition. If your company would like to be considered for cost-sharing or other assistance to support your 450mm program, please provide ISMI with the information requested in this packet.

This packet will be divided into 3 sections: 1) a brief description of ISMI's 450mm Test Wafer Generation Project; 2) what ISMI wants to know about your project; 3) specific questions for you to answer and topics for you to include in your submission.

*Please be aware that neither the issuance of this request for submissions nor the initiation of negotiations will obligate ISMI to enter into a contract. ISMI expects to base any future discussions or negotiations on the information you provide.*

***It is your responsibility to identify any confidential or proprietary information contained in your submission.*** ISMI will handle all confidential information according to the Confidential Information Agreement ("CIA") and any Addenda to CIA between your company and ISMI or SEMATECH. If your company does not have in place a current CIA with SEMATECH or ISMI, then please request that one be sent to you for your execution.

### **1 DESCRIPTION OF ISMI'S TEST WAFER GENERATION PROJECT**

As a consortium made up of IC manufacturers, ISMI wants to determine for its members and the industry as a whole (1) generally, what is the best and most efficient way for the industry to transition to 450mm, and (2) specifically, which tools can be built for 450mm manufacturing for a reasonable cost within a workable timeframe. ISMI understands that tool manufacturers must invest large sums of money to build 450mm tools.

The IC manufacturers understand that they may need to assist tool manufacturers in their efforts to transition to 450mm. To do this, ISMI has set up a test wafer generation project (“Project”). In this Project, ISMI will provide support – in the form of cost sharing assistance, test wafers, and measurement support- to help tool manufacturers scale up their existing tool platforms to accommodate 450mm wafers. Depending on the type(s) of tool(s) made by any individual supplier, ISMI’s assistance may vary. We do not envision joint development that results in shared IP. We envision support of your own 450mm transition activities.

In general, ISMI could foresee any individual tool project taking one of a number of possible forms. There may even be other situations which might be appropriate for your project that we have not thought of. We want to know what you think would be the best way to help you with your tool development. Here are our ideas:

Our goal is to end up with a state-of-the-art set of tools at ISMI’s facility. These final, demonstration-grade tools will perform various functions, will be made by different manufacturers, and will be used for demonstrations to validate equipment performance against defined expectations.

We know that it is almost never possible for a tool supplier to create a demonstration- level tool without building and testing at least one prototype, if not a prototype and an intermediate tool. As a result, we foresee a number of possible avenues to demonstration-grade tools. For a few tools, the 450mm transition might not present significant challenges. In those instances, an alpha tool might be mature enough to constitute a demonstration tool, after testing and tweaking based on the test results.

For some tools, it might be possible to create a Demonstration-grade tool after running and evaluating test wafers on the alpha tool, and incorporating the learnings into the second generation.

For still other tools, it might be necessary to build and test an alpha tool, and then to create an interim tool incorporating the learnings from the alpha tool, before having the background needed to produce a third, demonstration-grade tool.

ISMI anticipates that some early-generation tools will be most valuable at supplier sites, while others might be put to better use at ISMI’s site. In order to qualify for our program, ISMI will require that any tool, prototype or otherwise, be capable of generating test wafers.

## **1.1 Definitions for Reference**

“Alpha” or “prototype” tool – This would be the first hardware that would be developed in your laboratory for initial process or measurement capability. Depending on the specifics of the tool project, it might be shipped to ISMI or remain at your facility. It must be capable of early processing of test wafers.

“Beta” tool – the second tool in a 3-tool program. This Beta tool would incorporate the learnings from testing and evaluation of the Alpha/prototype tool, but may or may not be capable of a meaningful demonstration. Whether or not capable of a meaningful demonstration, however, this tool must be able to process test wafers in support of ISMI’s program. Depending on the specific circumstances, the Beta tool might be shipped to ISMI or it might remain at your facility.

Demonstration tool – The Demonstration tool will be a mature model, capable of demonstration against defined expectations, and it would process test wafers in support of ISMI’s program. If the Beta tool is capable of performing a meaningful demonstration, it would constitute the Demonstration tool. The Demonstration tool will incorporate learnings from testing and evaluation of the prior tool(s). While there may be a few instances in which it would be possible for the Demonstration tool to remain at your facility, it is most likely that the Demonstration tool would be shipped to ISMI for inclusion in our 450mm demonstration toolset.

## **2 YOUR 450MM PROJECT**

To help ISMI decide what type of assistance ISMI can provide to your company, ISMI needs to know some details about your transition plans toward a Demonstration tool.

Please answer the following questions and provide the following requested information.

***PLEASE MAKE SURE TO ANSWER FOR ONLY ONE TYPE OF TOOL. IF YOU HAVE MORE THAN ONE TYPE OF TOOL FOR WHICH YOU WANT TRANSITION ASSISTANCE, PLEASE COMPLETE A SEPARATE PACKET FOR EACH:***

## **3 QUESTIONS**

1. What type of existing tool do you want to transition to 450mm? If the tool has an existing model name or number, please provide it.
2. Have you started development work to scale up your existing tool to a 450mm platform?
3. Whether you have started scaling-up or not, what steps would you need to take to transition your existing tool to a 450mm platform? (eg – “one prototype generation, testing, and then demo”) Please provide an outline of a transition project for the tool.
4. How much money do you estimate it would cost to carry out the plan you outlined in question 3? Please give estimates for materials, and resources. If your project calls for more than one level of tool, please provide cost estimates for each level individually and for all levels together.
5. When would you expect to accomplish the various steps you outlined in #3, if you devoted the amount of money you have estimated in #4?

6. If you pursued the plan you outlined in #3, please explain the basic technical challenges you think you would encounter related to scaling your process or metrology tools to 450mm. Simple bullet format is encouraged for your response.
7. Please explain the commercial challenges you think you will encounter associated with initiating or continuing your 450mm tool development program (for the specific tool you are discussing). Simple bullet format is encouraged for your response.
8. For each level of tool (Alpha, Beta, Demonstration) you anticipate in your scale-up process, please tell us what process capabilities you would expect the tool to achieve.
9. For each level of tool you anticipate in your scale-up process,
  - a) What would be the best location for each tool to reside during its testing phase?
  - b) For each tool, why would the location you chose in 9a be the best location?
  - c) For each tool, how (if at all) would it affect your proposal if different locations were considered?
10. What type, quantity and timing of test wafers would be needed for development of each level of tool you propose?
  - a) For each level of tool in your project, please provide any details of films or structures required (dimensions, cross sections, etc.) and needed metrology to support your response in 10a.
  - b) Please estimate the number of wafers you think you will need for each level of tool in your project.
11. What type and quantity of test wafer processing or measurement could your Alpha tool provide ISMI?
12. What process capabilities would you expect your Beta tool (if applicable) and your Demonstration tool to achieve over time relative to your build schedule and the Equipment Performance Metrics?

If there are any details in your 450mm scale-up plan which you think are important, but which have not been stated in response to the questions in this packet, please provide those details. It is our intent to obtain all the information we need to evaluate the various 450mm tool transition projects.