Nano-Structure Silicon Mold Project Service Flow

Four service stages are introduced to any customer who are interested in the project based service provided by Datawise. During the development of the project, different type of purchase order is required per stage conditions. Please refer the following elucidation.

**Sample Evaluation**

Customer can purchase a few samples directly from the sample list for their own applications. The process parameters of these projects (Initiated by Datawise) are fixed and can be provided to any who orders them as SAMPLE ORDER. Such order benefit users of low price and short lead time in acquiring the nano-structured silicon mold. Orders of dimension modification or process fine-tuning on these samples require a creation of new project and customer should issue the orders as PILOT PROCESS ORDER. Please consider the following steps while sample verification is needed.

1. Glance all the SEM pictures of typical nano-structured profiles provided.
2. Purchase with a SAMPLE ORDER from the sample list for verification.
3. Use it to evaluate the feasibility for your technology development or process applications.
4. Enquire technical questions if any.
5. Consider to start a new project of your own.
6. Provide your schematic unit cell diagram for pattern review.
7. Discuss with us for process capability on your cell pitch (width/space) and the pattern type (convex or concave).

**Pilot Process (Project Start)**

A new project implies a new product code will be created with specifying process parameters to produce the silicon mold for only the customer who issue the PILOT PROCESS ORDER on it. The limitation of setting a new project is the technical specification of different process types that Datawise provided in the official website. Moreover, customer should also provide Datawise a schematic drawing of the required pattern for process review. Customer should also review the etch profile in advance through the provided SEM pictures of the same process type of other projects. In most cases, only etch depth can be altered. Changing the etch profiles is not acceptable in our production environment. Finalization of pattern array and target dimensions should be done before the project start.
1. Confirm the target dimensions (top width or top space) and required etch depth.
2. Kick off this project with purchasing item of PILOT PROCESS ORDER.
3. Receive the silicon mold from PILOT PROCESS and refer the associated SEM profile.
4. Examine carefully the expected results or performance in your applications.

**Pilot Order (Application Development)**

After the stage of PILOT PROCESS, Datawise provides the modification service on the same project for customers’ development on their applications. However, there are process limitations on such modification. Please check the following conditions:

1. Consider the PILOT ORDER on the same project(product code) if you have one of the following requirements:
   A. Just purchase more silicon molds with the same pilot process conditions and such conditions are not ready for PRODUCTION ORDER.
   B. Within a 10% change of previous target dimension for expected better results.
   C. Modification of etch depth within the etch range in the same process type.
   D. Experiment to split the target dimensions or etch depth with the same range mentioned above.

2. Consider to create a new project(PILOT PROCESS ORDER) from this present mother project if you have one of the following requirements:
   A. Two target dimensions or etch depths are needed and purchased in the future.
   B. Target dimensions or etch depths are changed that is out of the above range of PILOT ORDER limitation.

**Production Order (Process Maintenance)**

Fixing all process conditions is one of the requirements to enter this stage. In ULSI production environments, all process conditions are all set on production systems. Process variation is only maintained by the automatic system. Process cycling time will be much shorter than that in the PILOT ORDER stage, yet the process variation will be still controlled in the specification. Customer should make more consideration as mention below before entering this stage.

1. During the PILOT ORDER stage, check the process variation of all received silicon molds. Most of all, check the post process windows while using these molds.
2. There are a minimum number of molds, typically 100, from PILOT ORDER to entering this stage.
3. Any modification of process parameters need experimental results from additional PILOT ORDER on this project.
4. Any serious issues that the process cannot be fixed in a period of time in this PRODUCTION ORDER stage, PRODUCTION ORDER will not be acceptable.