



## WAFERS DESCRIPTION NOMENCLATURE

**ADVANCED TECHNOLOGY FOR  
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**KNOWLEDGE BASE FACT  
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- SCOPE: This article explains the nomenclature used to identify wafer types and specification, along with the key descriptive criteria to consider when choosing wafers.

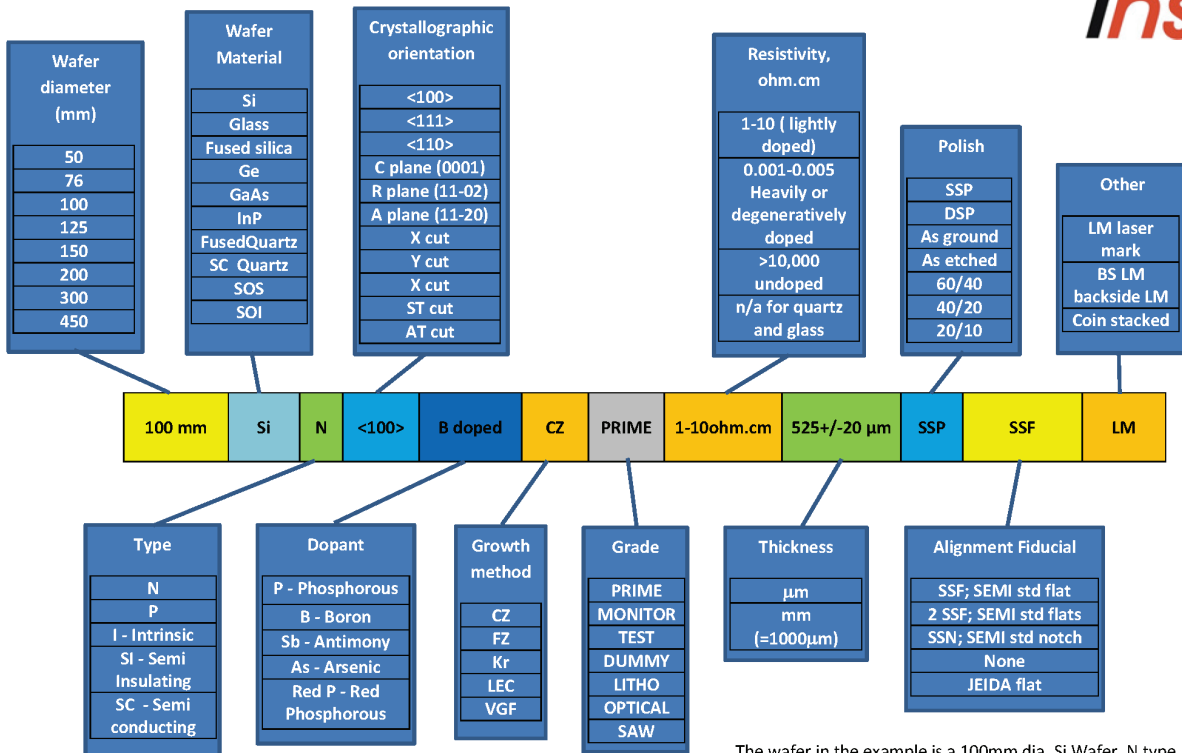
Semiconductor wafer selection is key to a successful use of wafers and substrates for your process. Wafers are manufactured with very high precision, with attributes specific to the electronic and mechanical properties and any coatings applied after manufacture.

Wafers are manufactured from four main materials:

- Silicon
- Glass and Fused Quartz
- 3-5 or 2-6 Compound Semiconductors
- Sapphire

The figure below describes Inseto's nomenclature chart for Silicon wafers:

**Inseto - Silicon Selection Nomenclatures Chart**



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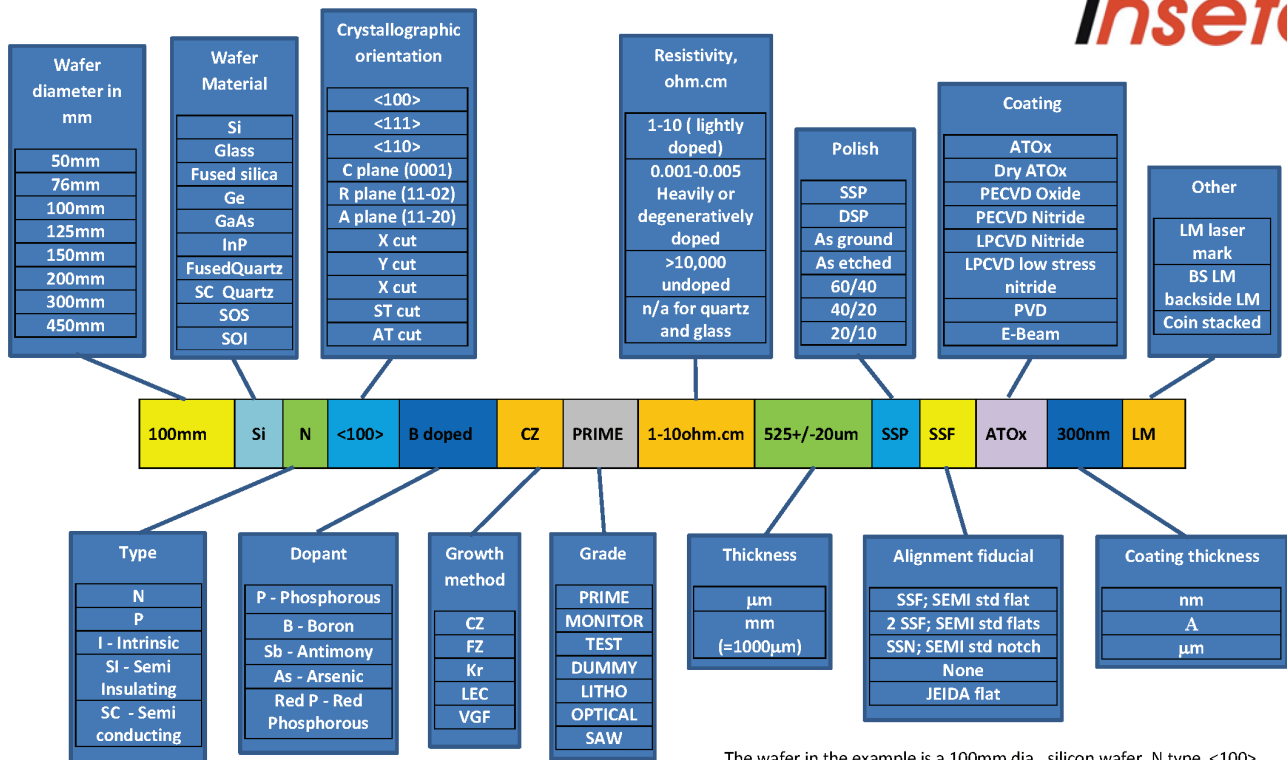
The wafer in the example is a 100mm dia, Si Wafer, N type, <100> orientation, B doped, CZ grown, PRIME grade with resistivity of 1-10ohm.cm, thickness is 525+/-20um and it is single side polished with SEMI std flat.

The wafer also has a Laser mark for identification.

The second category of wafers we classify is coated wafers. These are wafers with an added layer either on both the top and bottom surfaces of the silicon or just one of the surfaces – usually the top.

The figure below shows Inseto's nomenclature chart for Coated Wafers:

### Inseto – Coated Wafers Selection Nomenclatures Chart



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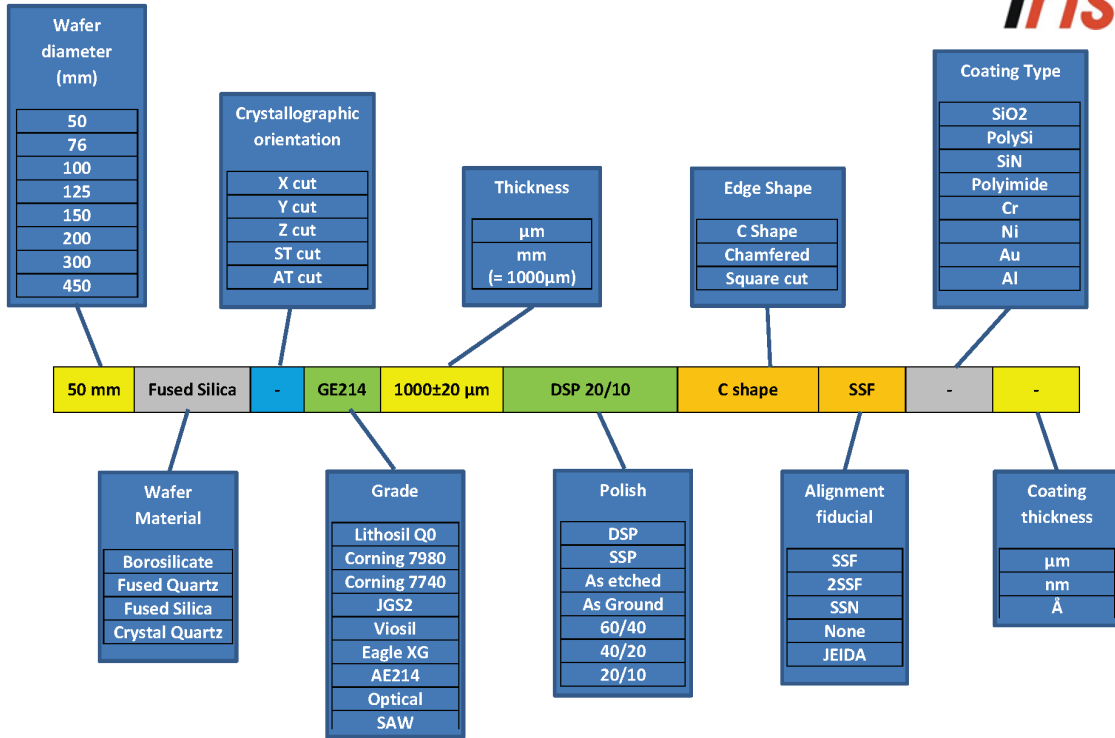
The wafer in the example is a 100mm dia, silicon wafer, N type, <100> orientation, B doped, CZ grown, PRIME grade with resistivity of 1-10ohm.cm, thickness is 525+/-20um and it is single side polished with SEMI std flat.

The wafer has Atmospheric thermal oxide of thickness 300nm on both sides and has a Laser mark

The third category of wafers we classify is glass wafers. These are used when a transparent substrate is required and are categorised by a different set of parameters.

The figure below shows Inseto's nomenclature chart for Glass Wafers:

### Inseto - Glass Selection Nomenclatures Chart



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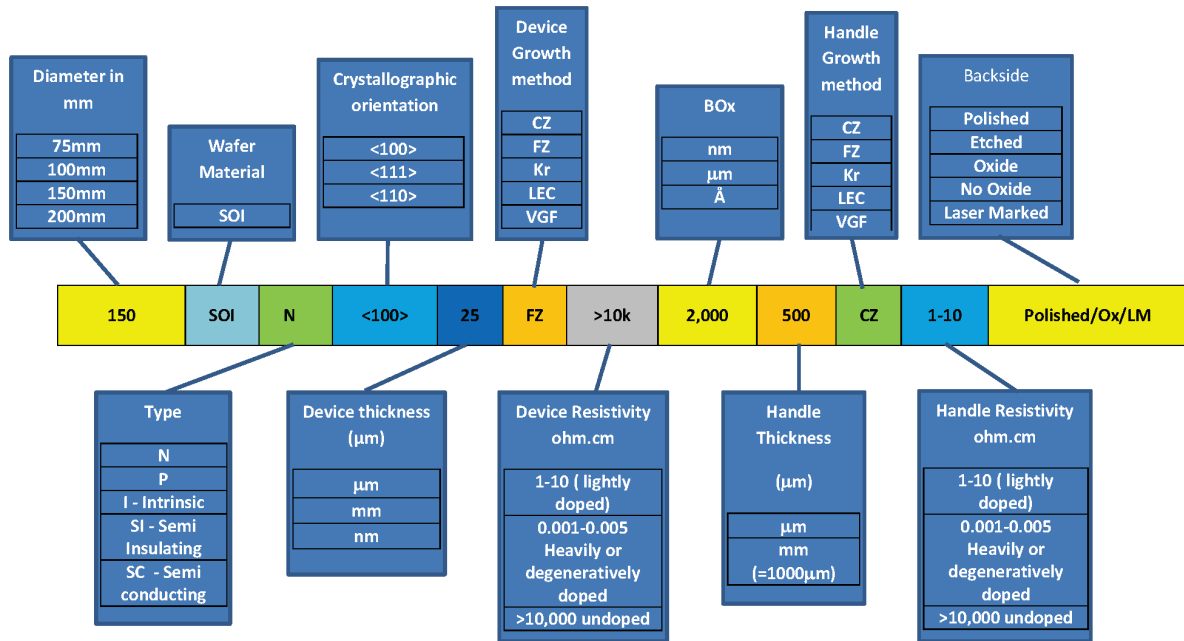
The wafer in the example is a 50 mm diameter, Fused Silica wafer, GE214 grade, 1000±20 µm, it is double side polished 20/10 with a C shape edge profile and a SEMI standard flat.

The fourth category we use to classify our wafers is SOI wafers or Silicon-on-Insulator.

These wafers are a sandwich of silicon-insulator-silicon. The insulator is typically silicon oxide or sapphire and the make-up of these is highly specific to the end application.

The figure below shows Inseto's nomenclature chart for SOI Wafers:

## Inseto - SOI Wafer Selection Nomenclatures Chart



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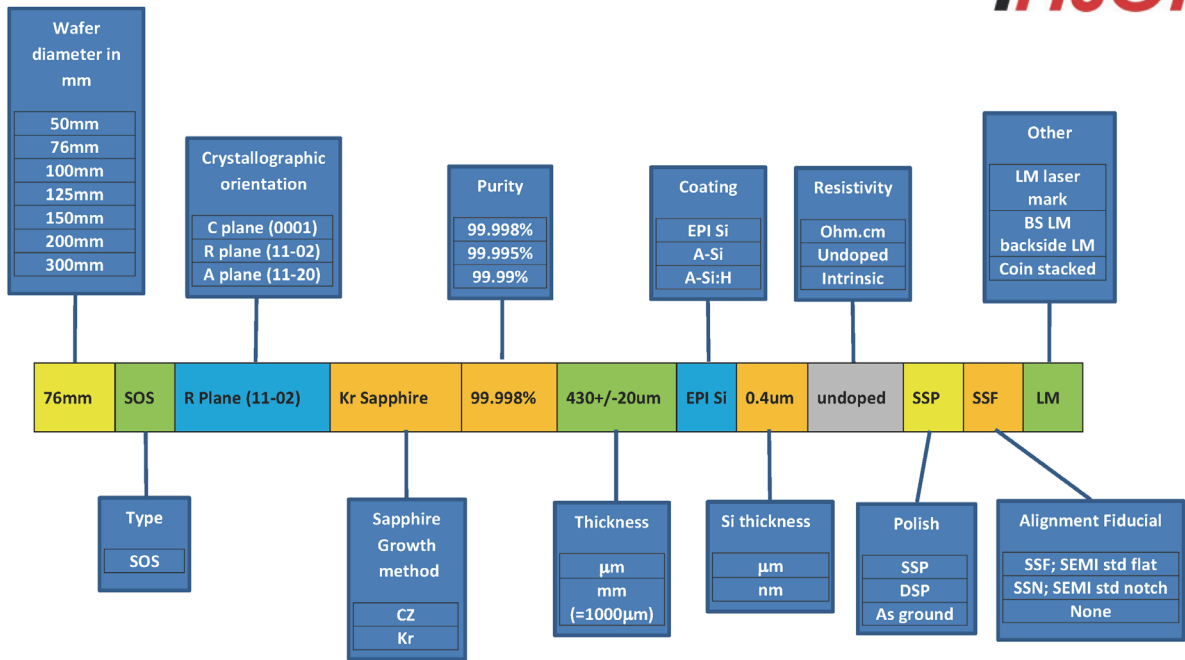
The wafer in the example is a 150mm, SOI, N type, <100> orientation, 25  $\mu$ m thick, FZ grown >10Kohm.cm device. With a 2000 nm buried oxide layer, handle thickness of 500  $\mu$ m, CZ grown 1-10ohm.cm.

The backside of the wafer is polished oxide that has been laser marked.

The fifth category we use to classify our wafers is SOS – Silicon-on-Sapphire.

These wafers have an EPI Silicon layer on Kr grown Sapphire Wafers. The figure below shows Inseto's nomenclature chart for SOS Wafers:

## Inseto – Silicon on Sapphire (SOS) Wafers Selection Nomenclatures Chart



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The wafer in the example is a 76mm dia SOS, R plane (11-02) Kr grown, PRIME grade Sapphire wafer, with Purity of 99.998%, thickness is 430+/-20um. It has an EPI Si layer of thickness 0.4um (400nm) which is undoped on the front and is single side polished with SEMI std flat.

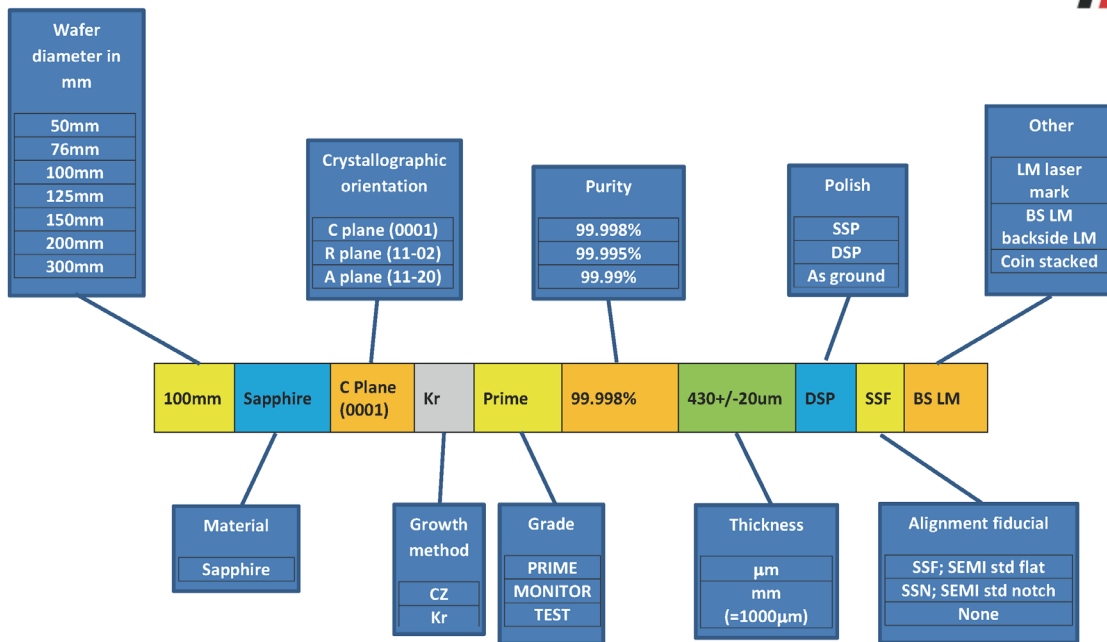
The wafer has a frontside laser mark.

The final category we use to classify our wafers is Sapphire.

These wafers are prime grade high quality with C, A and R plane crystal orientation from 2" to 150mm. They are single or double side polished, have low roughness and are defect free.

The figure below shows Inseto's nomenclature chart for Sapphire Wafers:

## Inseto – Sapphire Wafers Selection Nomenclatures Chart



The wafer in the example is a 100mm dia Sapphire Wafer, C plane (0001) Kr grown, PRIME grade, with Purity of 99.998%, thickness is 430+/-20um and it is Double side polished with SEMI std flat.

The wafer has a backside laser mark.

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For further information about Inseto's Wafers: <https://www.inseto.co.uk/consumables/semiconductor-wafers-and-substrates-by-inseto/>