Another known fact is that quartz crucibles made from synthetically obtained SiO_2 have different properties from quartz crucibles made from naturally obtained SiO_2.

The inventors surprisingly found that a fused silica crucible having an inside on which there is an inner layer of fused silica that forms a surface, where the inner layer is provided with a crystallization promoter, exhibits positive properties in terms of the multiple pulling of crystals from a crucible, specifically when the concentration C of synthetically obtained SiO_2 at one distance from the surface is greater than the concentration of synthetically obtained SiO_2 at a further distance from the surface.

Substances having a particularly preferred effect here as crystallization promoters include barium and strontium, with barium being especially preferred.

The inventors have also recognized that it is advantageous if the concentration C of synthetically obtained SiO_2 is greater than 90% when the distance from the surface is less than 0.4 mm.

Further experiments unexpectedly revealed that advantages arise in relation both to the quality (SPV) and to the fraction of dislocation-free length of the crystal if the relationships applying to the concentration of synthetically obtained SiO_2 as a function of the distance d are as follows:

C [%] <= 100 - (d [mm] – 0.25) x 30 and

C [%] >= 100 - (d [mm] + 0.25) x 80.

The inventors succeeded in narrowing down the range somewhat through further experiments, and found that advantages arise in relation both to the quality (SPV) and to the fraction of dislocation-free length of the crystal if the relationships applying to the concentration of synthetically obtained SiO_2 as a function of the distance d are as follows:

C [%] >= 100 - (d [mm] + 0.1) x 80

and C [%] <= 100 - (d [mm]- 0.05) x 36.

With particular preference here, the concentration of the crystal promoter is less than 1 ppba and greater than 0.05 ppba, based on silicon.

Single crystals produced using the crucible material just described were subsequently processed into semiconductor wafers.

The inventors here have found that the processing of the crystal pieces into semiconductor wafers must be modified in order to provide better detection of harmful pinholes and so to enable more effective and rapid optimization of the corresponding overarching measures.

After the corresponding manufacturing steps, measurements are typically conducted which result in the semiconductor wafer either being eliminated or being approved for the next processing step.

This approach was modified by carrying out measurements, after the individual manufacturing steps for the production of semiconductor wafers, and using the measurement methods apparently suitable for these measurements, and storing the results in a database. Here, independently of the measurement outcome, the individual semiconductor wafer is always approved for the next intended fabrication step. The measurement outcome in this context is regarded as the nature of the possible abnormality or defect, the local coordinates of this abnormality or defect, the measurement method used (including specifics), and the nature of the fabrication step.

The inventors have recognized that the entirety of the measurement outcomes after all of the manufacturing steps conducted and their associated measurements leads to substantially improved assessment of the material.

This technique proves to be very advantageous relative to the assessment of the data of individual measurement outcomes after each fabrication step. The combining of measurement data after different process steps makes it possible to specify with