Project Title:

SMART Reactors Project A04: Self-regulating enhanced surfaces for autonomously operated bioprocesses

Related Publication:

Rennpferdt, Lukas, Sven Bohne, and Hoc Khiem Trieu. "Enhancing the Applicability of Femtosecond Laser Written Waveguides in Fused Silica." *MikroSystemTechnik Kongress 2025; Kongress*. VDE, 2025.

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1. General Information

Data set Title:

Optical Profilometer Dataset for Diced Surfaces Obtained with Wafer Dicing Machine at Varying Feed Velocities

Short Description:

The dataset contains raw data generated with an optical profilometer of the surface roughness of wafer-level diced fused silica with different feed velocities. The data set can be used to display and analyze the recorded surface roughness of the diced surfaces.

Date of Data Collection:

2025-08-10

Geographical Coverage (if applicable):

Eißendorfer Straße 42, 21073 Hamburg, Germany

Keywords:

Optical Profilometer, Surface Roughness, Quartz Wafer, Waveguide Endfacet

2. Methodological Information

Data Collection and Processing:

The data were measured using a Keyence VK-X3000 optical profilometer in white-light interferometer mode with an 10x objective.

Experimental Design / Study Context:

A fused silica wafer (1 mm thickness, 100 mm diameter) was diced with a wafer dicing machine (Disco DAD3350) at different feed velocities from 0.1 mm/s to 5 mm/s. The spindle speed was set to 30.000 rpm and a diamond blade (Disco, R07-SDC600-BB101-75) was used. The wafer was diced through completely. Then the samples were placed in a sample holder and the diced surface was analyzed with the optical profilometer.

3. Data and File Overview

List of Files and Structure:

File / Folder	Description	Format	Size
data_raw/	Raw data files	`.vk7`	24.7 MB

File Naming Convention:

File naming: “Dicing_surfaceroughness_white_light_XXmms.vk7”

“XX” displays the related feed velocity. 0_1 → 0.1 mm/s; 1 → 1mm/s

Number of Records / Observations:

The dataset includes six 2D maps of the surface profile, each for a different feed velocity.

4. Access and Licensing Information

Repository and Persistent Identifier:

Published via TORE, DOI: https://doi.org/10.15480/882.15763

License for Use:

Public Domain

Text for Citation:

The dataset should be cited using https://doi.org/10.15480/882.15763.

5. Reproducibility and Software Dependencies

Software Required:

Keyence VK-X 3000 MultiFileAnalyzer (VK-A3D)

Scripts, Workflow and Reproducibility Notes:

The dataset shows a 2D map from the surface roughness for each diced sidewall. The surface roughness was measured as the line roughness in multiple-line mode.

6. Ethical and Legal Aspects

Data Protection:

-

Consent Statement:

-

7. Versioning and Updates

Version Number:

Version v1.0

Date of Release:

2026-01-28

Change Log:

-

8. Contact Information

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