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Monopoly Dataset Overview

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1 Dataset Overview

This dataset is called *V62502060 printed steel parts aka "Monopoly Hotels"* and is obtained from Robin Montoya (SIGMA-2). This XCT data contains CT images for the planar lack of fusion defects analysis and is collected by Michelle Espy (V-6) and her team.

There were 10 small L-PBF AM 316L stainless steel specimens that are designed with an engineered planar lack of fusion defect of various thicknesses. Specimen envelop is 10x20x15 mm (XYZ), the wall thickness at the defect height is 1 mm. Each specimen's data is stored in a dedicated folder named after the specimen ID. Each folder contain more than 1000 `.tif` (Tagged Image File Format) high-quality raster graphics and image files. The exact number of `.tif` files in each folder is depicted in Table 1.

Table 1: Number of `.tif` files in each Specimen ID folder.

Specimen ID	**Number of `.tif` files**
X1	1426
X2	1426
X3	1426
X4	1426
X5	1426
X6	1425
X7	1426
X8	1426
X9	1323
X10	1426

2 Directory Structure

The dataset is organized into 10 specimen-specific folders named X1 through X10 (see Figure 1). Each folder contains all image data and associated metadata for a single specimen. This directory structure facilitates modular processing and easy retrieval of data on a per-specimen basis.

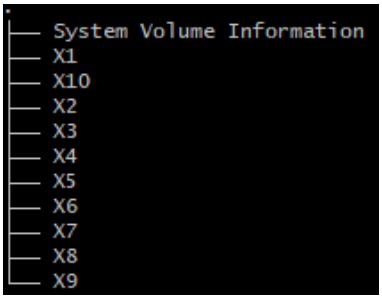

Figure 1: Directory structure of the 10 specimen.

3 2D Images

Figure 2 displays several 2D images from the dataset. The height and width of the images for different specimen varies and is summarized in Table 2.

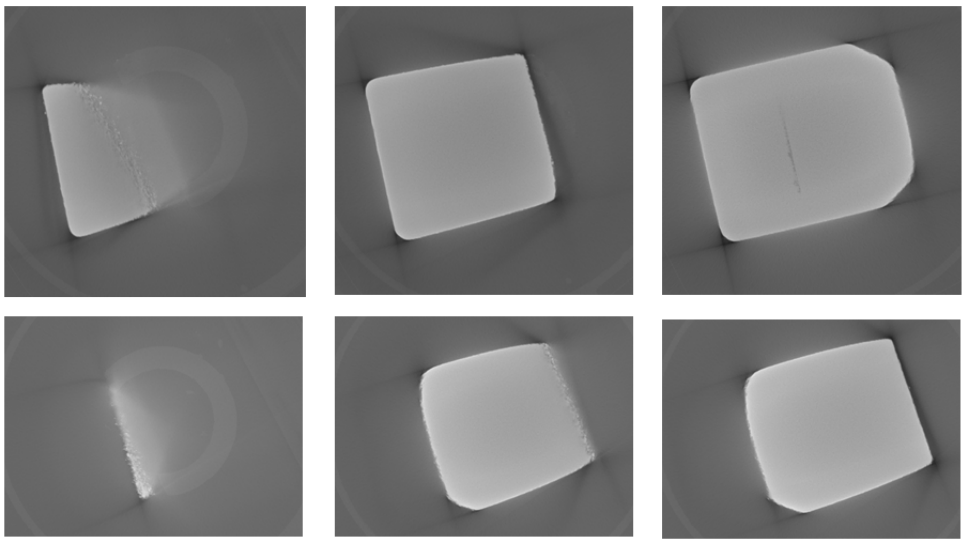

Figure 2: Example 2D Images.

Table 2: Specimen ID and image dimension.

Specimen ID	**Dimension**
X1	752 × 999
X2	752 × 999
X3	1057 × 889
X4	1057 × 780
X5	1005 × 819
X6	862 × 999
X7	758 × 941
X8	758 × 976
X9	1099 × 1005
X10	957 × 923