Copyright Notice

This dataset is a *Plastic Gear Surface Defect Dataset*, which includes comprehensive defect images of plastic gears from three perspectives: top surface (pin side), bottom surface (gate side), and side surface (tooth surface), with a total of 1165 images and 16 different types of surface defects.

The original copyright of this dataset belongs to the **Precision Measurement and Control Technology and Instrumentation Laboratory, Beijing University of Technology (Professor Zhaoyao Shi's team)**. The application and research results of this dataset have been elaborated in the following published paper:

[1] Shi Z, Fang Y, Song H. Intelligent Inspection Method and System of Plastic Gear Surface Defects Based on Adaptive Sample Weighting Deep Learning Model[J]. Sensors, 2024, 24(14): 4660.

Special thanks to Dongguan Xinghuo Gear Co., Ltd. and Shenzhen Zhaowei Electromechanical Co., Ltd. for providing platform support for the data collection of this dataset.

We welcome researchers from both academia and industry to discuss the use of this dataset with the authors. Contact: fangandyim@163.com, Dr. Yiming Fang.

Dataset Usage Terms:
This dataset is for non-commercial academic research only. For commercial or other purposes, please contact the dataset owner for permission.

The dataset can be cited in the following recommended format:
Zhaoyao Shi and Yiming Fang, *Plastic Gear Surface Defect Dataset*, version 1.0, Beijing University of Technology, 2025. Available: [DOI or URL].

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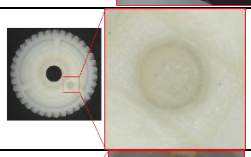
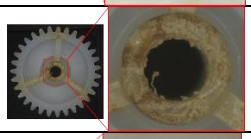
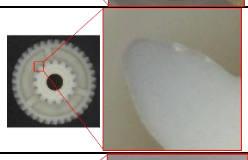
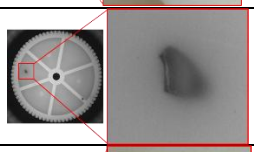
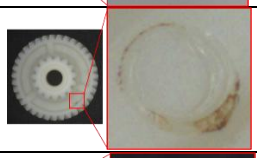
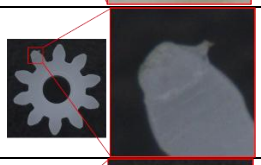
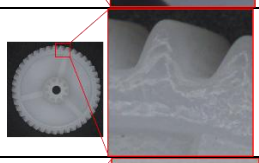
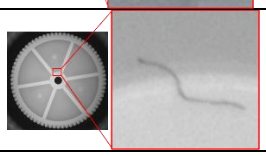
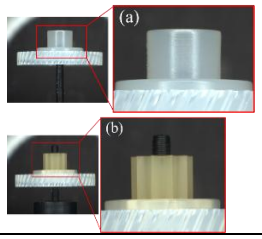
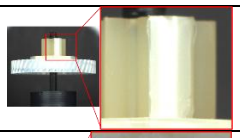
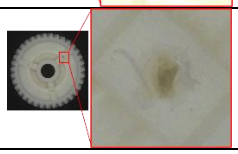
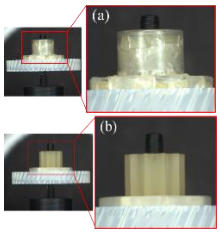
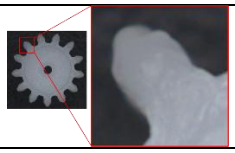
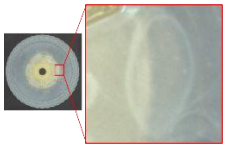
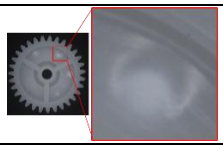
Defect Types Details

Defect Type	Example Image of Defect	Description
Broken Tooth		Broken or severely damaged teeth
Protrusion		General protrusions usually occurring at the gate
Burn		Damage caused by high temperatures, showing a charred yellow appearance
Damage		Tooth surface damage caused by impact
Dark Spot		Dark impurities on the surface
Dirt		Oil stains, dirt
Flash		Sharp protrusions on the tooth top, tooth root, tooth profile, or center hole
Flow		Defects caused by flow traces left on the surface by molding material in the mold groove
Hair		Hair adhered to the surface
Missing		A defect caused by the absence of a small tooth during secondary molding (as shown in figure a). The normal small tooth is shown in figure b

Overflow		Excess material produced due to incomplete filling of the mold cavity
Perforation		A perforation defect, usually occurring at the gate
Reverse		Similar to the missing defect, but caused by improper installation of the small tooth during secondary molding (figure a shows the reverse defect, and figure b shows the normal small tooth)
Short Shot		A defect caused by incomplete filling of the mold cavity, usually occurring far from the gate
Void		A vacuum bubble caused by rapid solidification of the material flow in thick-walled parts, leading to insufficient mold filling
White/Blanching		A defect showing clear ejector pin marks or stress blanching at the ejector pin location