Machine Vision Minimum Defect Size

How-to guide: what the workbook does, how to use it and what every number means. mfgcalcs.com

Machine Vision Minimum Defect Size

Check whether every inspection station's camera and field of view can resolve the defect it must catch, and find the field of view or camera that would.

For: Vision system engineers, quality and test engineers, automation integrators and process engineers specifying or auditing camera inspections.

Version 1.0.0 · updated 11 November 2026

Quick start

1. On Setup, type the line name and list your cameras with their horizontal pixel count.
2. On Stations, give each inspection a row: camera, horizontal field of view, your validated pixels per defect and the specified defect size.
3. Fix anything the Check column names.
4. Open the Dashboard: stations that do not resolve their defect, the headroom of each, and every camera at the station you pick.

What is in the workbook

Start Here	Read this first: what the workbook does and how to use it.
Setup	Line name and the cameras with their horizontal pixel count.
Stations	One row per inspection: camera, field of view and specification in; pixel size, minimum defect and headroom out.
Dashboard	Minimum defect against specification for every station, the headroom, and every camera at the station you pick.
Method	How every number is calculated, with assumptions, limits and sources.
Verify	Self-check: the workbook's formulas recomputed on fixed inputs against an independent reference.

What each number means

Quantity	How it is calculated	Units
Pixel size	Horizontal field of view / horizontal pixels.	mm/px
Minimum defect	Pixel size x validated pixels per defect.	mm
Pixels across defect	Specified defect x horizontal pixels / field of view.	px
Headroom	Specified defect - minimum defect.	mm
Status	Within limits when the minimum defect is no larger than the specified defect; Out of limits otherwise.	-

Quantity	How it is calculated	Units
Widest field of view	Specified defect x horizontal pixels / pixels per defect.	mm
What-if	The station shown, with each camera's pixel count: pixel size, minimum defect and status.	-

Assumptions, limitations, sources and the self-check (the Verify sheet, which recomputes the workbook's formulas on fixed test inputs) are in the workbook. The last page shows the Dashboard with the example data for Cardinal Medical, a fictional business.

Free from MFG Calcs - keep this credit when you share it.

Engineering estimates for planning and improvement work. Verify the results against your own process, data and standards before you rely on them.

Machine Vision Minimum Defect Size

Minimum defect against specification for every station, the headroom, and every camera at the station you pick.

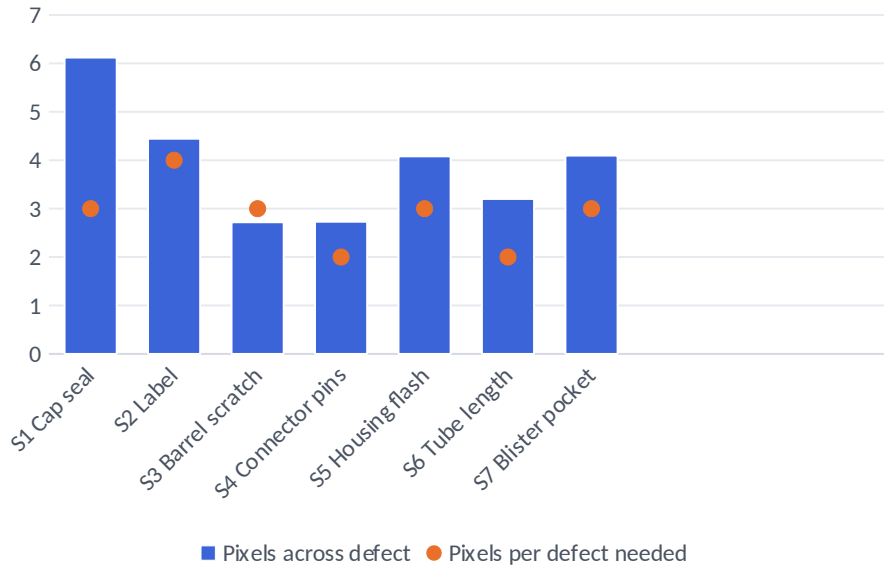
mfgcalcs.com

Station shown in the what-if: S3 Barrel scratch

Cardinal Medical, line 3 (example): 7 stations. What-if shows S3 Barrel scratch: 45.0 mm view, 0.050 mm defect.

STATIONS	STATIONS NOT RESOLVING THEIR DEFECT	SMALLEST HEADROOM (MM)	FINEST PIXEL SIZE (MM/PX)
7	1	-0.0051	0.0073
Rows on Stations	Status Out of limits	Negative = cannot resolve	Field of view / pixels

Pixels across the defect against pixels needed



Field of view against the widest that resolves (mm)

