a PRECISION MOLDED PLASTICS guide

PLASTIC INJECTION MOLDING

PART DEFECTS

DEFINITIONS, CAUSES & REMEDIES

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INTRODUCTION

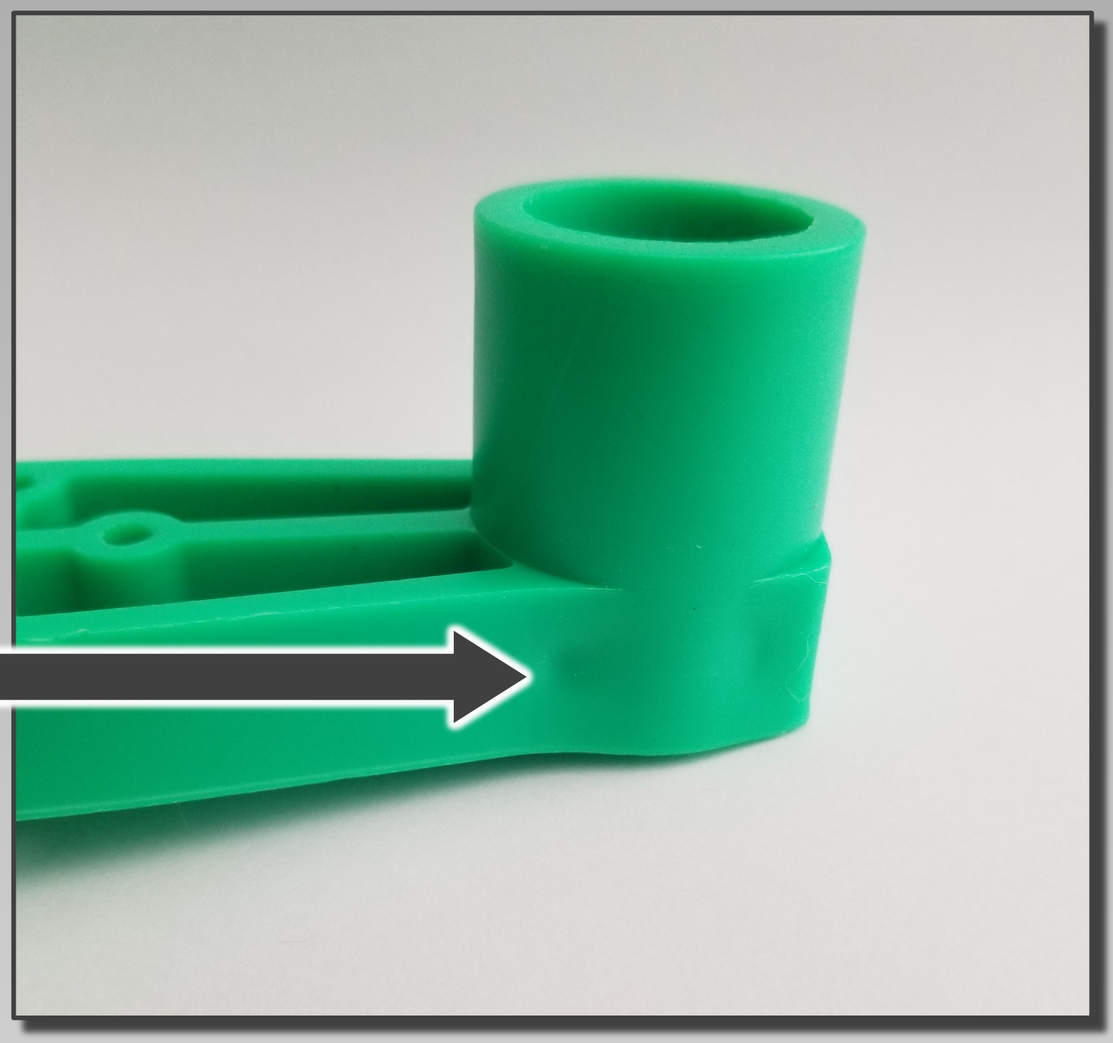
Experiencing quality issues with your plastic injection molded parts?

There are many potential causes and contributing factors for nonconformities, including part design, mold quality, and the manufacturing process.

Although an exhaustive review is outside the scope of this document, this guide gives a brief description of some of the most common part defects, their likely causes, and possible remedies.

SINK

Depressions on a part surfaces caused by internal shrinkage



LIKELY CAUSES

Part Design: Wall, rib or boss too thick

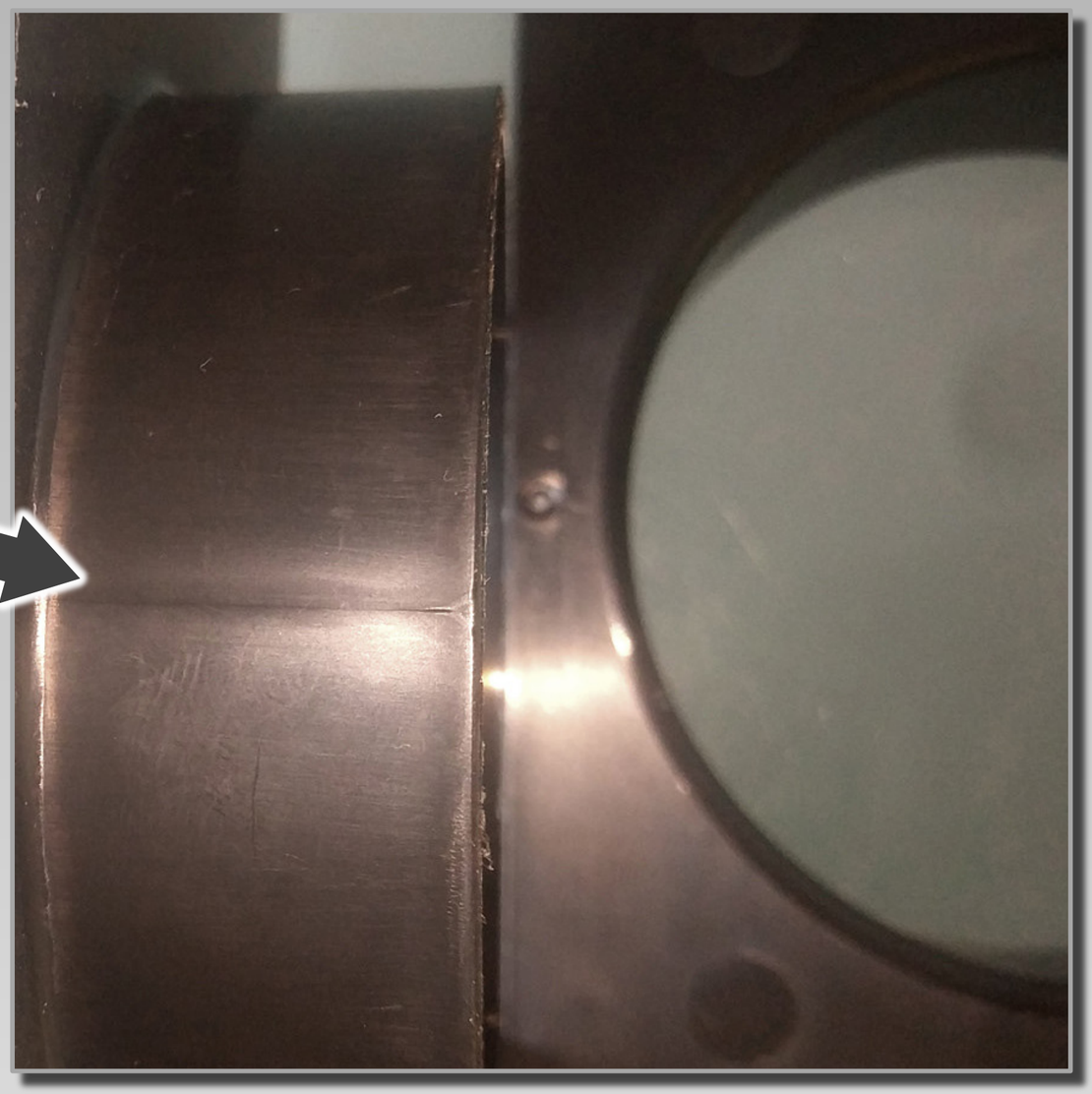
Processing: Insufficient cooling time or cavity pressure, or excessive gate temperature

POSSIBLE REMEDIES

› Decrease wall, rib or boss thickness, or make processing adjustments

WELD LINES

Lines on a part surface where molten plastic met (aka knit lines)



LIKELY CAUSES

Part Design: Holes or elements in the part around which plastic must flow and melt back together

Processing: Resin not hot enough during molding

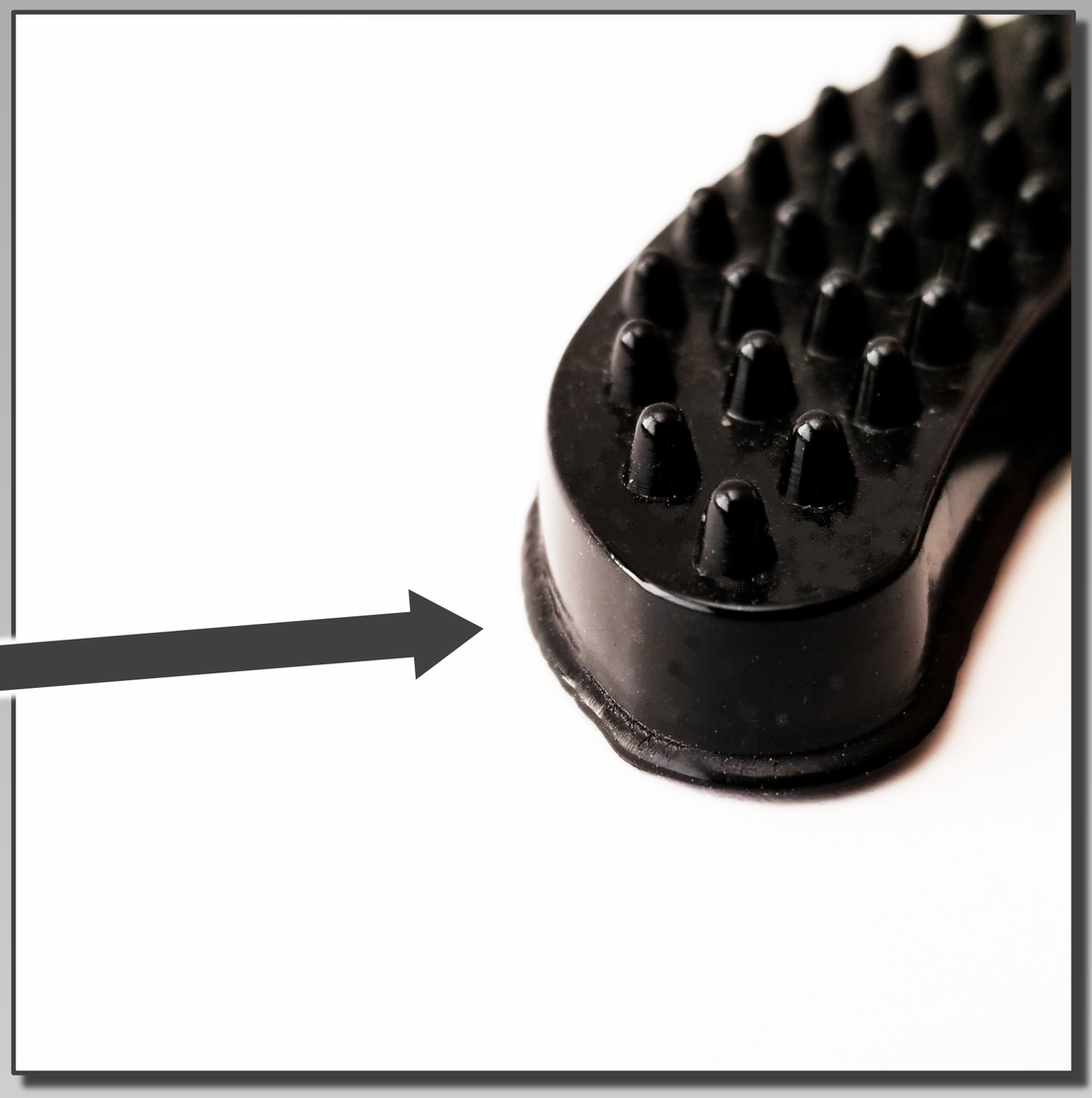
POSSIBLE REMEDIES

Part Design: Design change or add surface texture to camouflage

Processing: Increase material or mold temperature

FLASH

Excess plastic on
the edge of a part



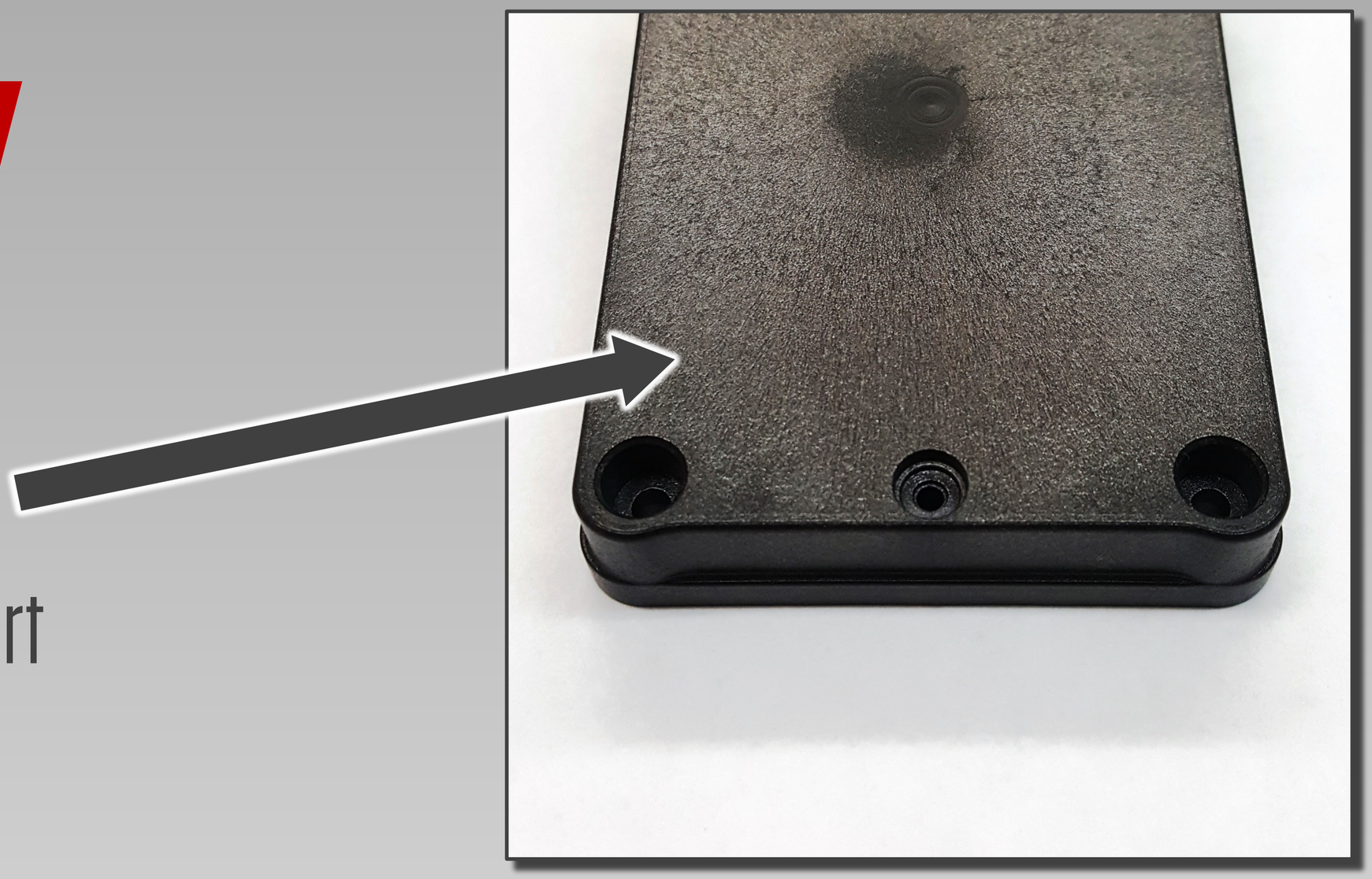
LIKELY CAUSES

Tooling: Mold not clamped together
with enough force or two mold halves not lining up properly
Processing: Excessive pressure

POSSIBLE REMEDIES

Tooling: Mold repairs
Processing: Adjustments to process

SPLAY



Spray pattern on
the surface of a part

LIKELY CAUSES

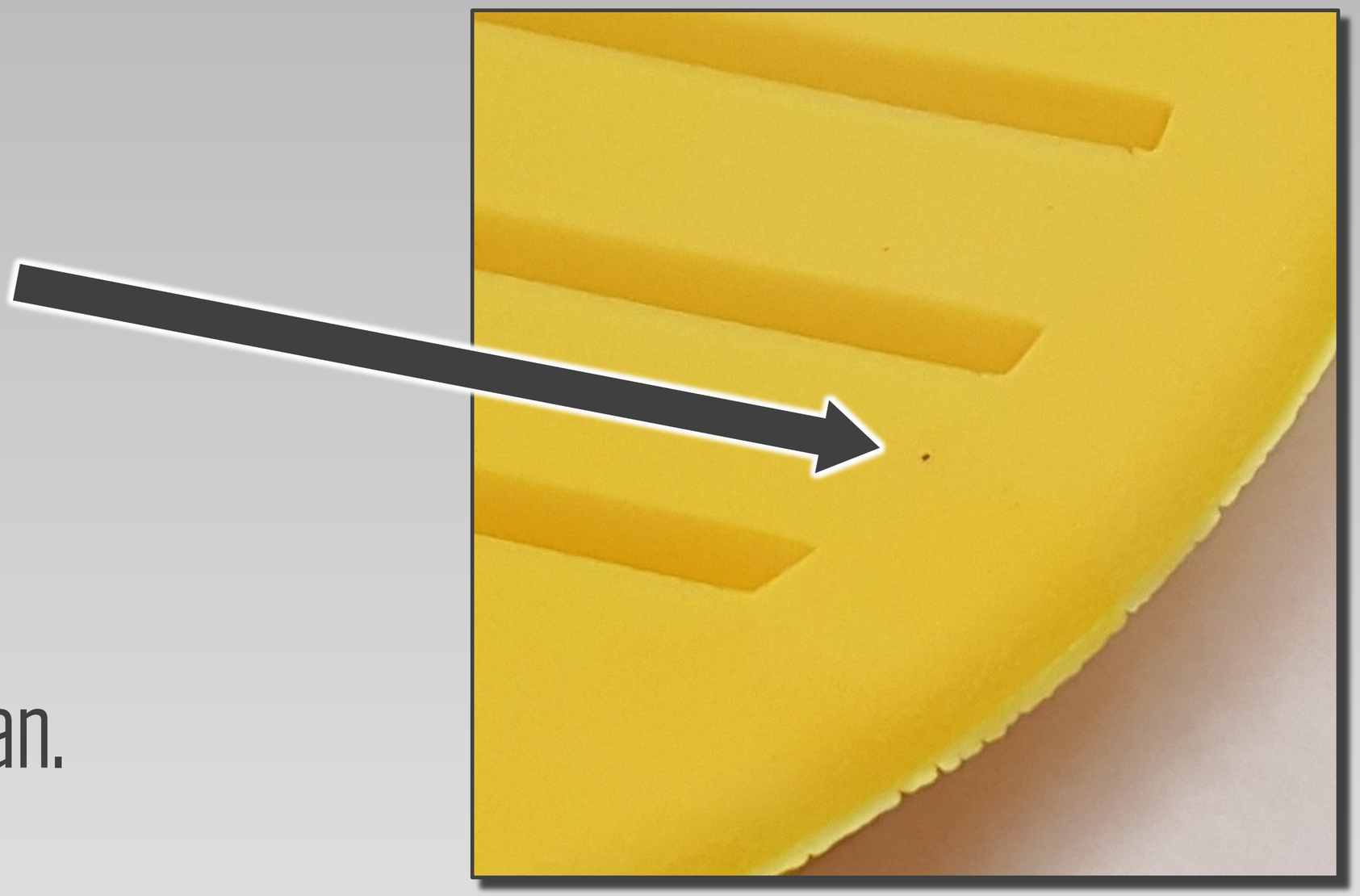
Tiny gas bubbles that are dragged
across the surface of the part when the mold cavity is filled.

POSSIBLE REMEDIES

› Dry material longer before molding
› Lower temperatures, injection speed, cycle time
› Increase gate size

CONTAMINATION

Foreign particles embedded in part



LIKELY CAUSES

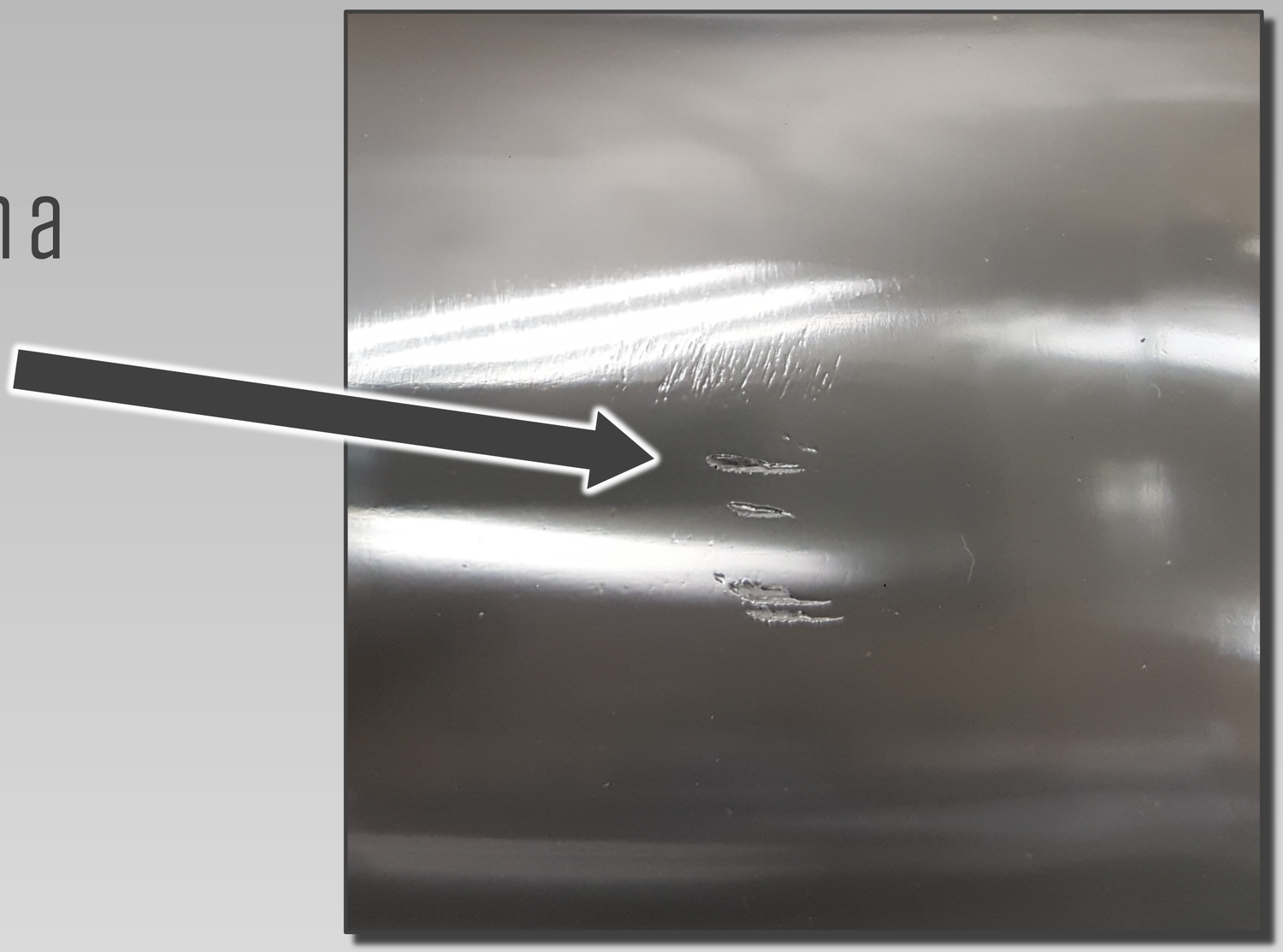
Mold, machine or material are not clean.

POSSIBLE REMEDIES

› Ensure mold, equipment and material are cleaned thoroughly

SCRATCHES

Scrapes or indentations on a part (e.g., drag marks)



LIKELY CAUSES

Part Design: Inadequate draft on part surface
Tooling: Mold damage

POSSIBLE REMEDIES

Part Design: Add draft or minimize texture
Tooling: Polish or repair mold

MISCELLANEOUS

Blister: Surface defects caused by trapped gasses
Blush: Discoloration caused by shear stress
Burn Marks: Degradation caused by excessive heat
Crazing: Whitening caused by stress or chemical reaction
Delamination: Peeling surface caused by contaminant
Flow Lines: Streaks caused by flow speed variations
Jetting: Wavy lines caused by low plastic temperature
Mismatch: Stepped parting line caused by cavity and core misalignment
Pin Marks: Stress rings caused by overpacking (although often present)
Roughness: Rough surface caused by low melt temp or clamping force
Short Shot: Portion without plastic caused by processing errors
Voids/Bubbles: Pockets of air caused by uneven solidification
Warping: Deformation caused by uneven cooling

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There are many different types of part defects, and each have various possible causes and contributing factors, not just those listed here. Consequently, troubleshooting for plastic injection molding is a complex endeavor.

If you're experiencing quality issues, our team of experts can help. Call now to start the process.

☎ 909-981-9662 ask@pmp.bz

PrecisionMoldedPlastics.com