PRINTING USING 'METAL X'

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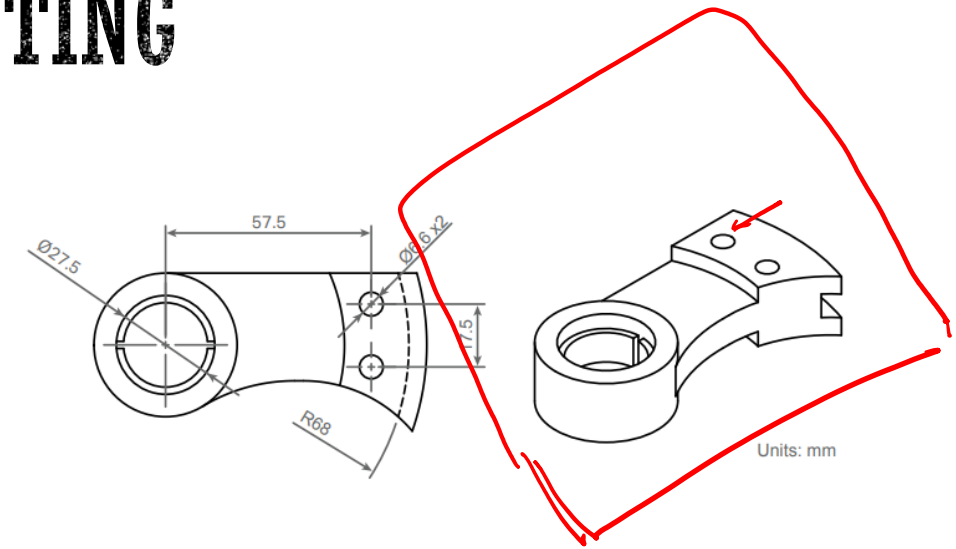
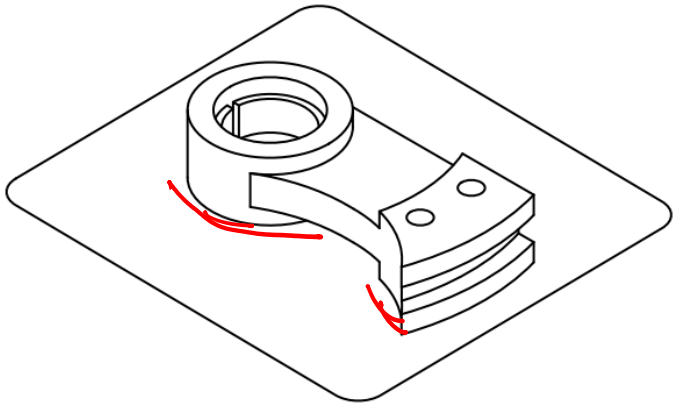
- Optimize for printing
- Optimize for washing
- Optimize for sintering
- General strategies

OPTIMIZE FOR PRINTING

Identify Critical Dimensions



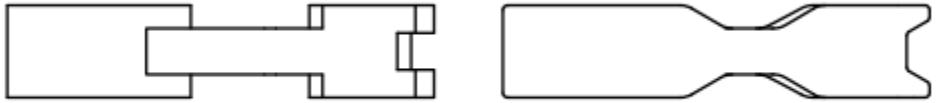
Maximize Bed Contact



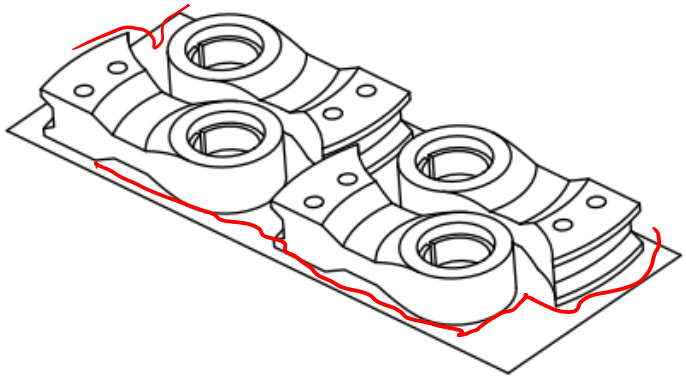
Source:
https://markforged.com/3d-printers/metal-x

OPTIMIZE FOR PRINTING

Reduce Supports



Optimize Your Production Workflow



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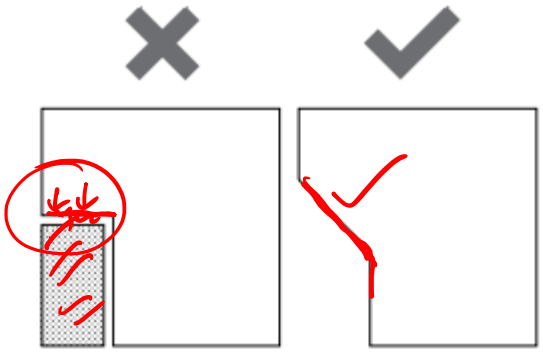
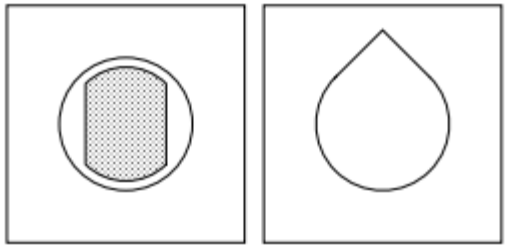
https://markforged.com/3d-printers/metal-x

MODIFY OVERHANGS TO OPTIMIZE SUPPORTS

Eliminates Supports

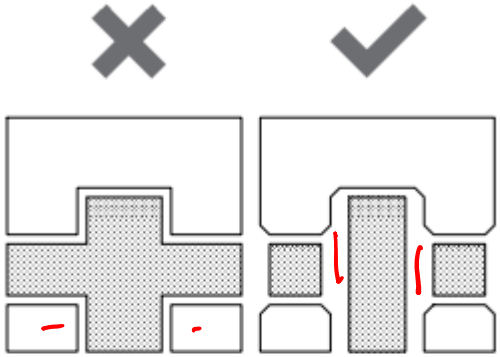


Chamfer small overhangs
Refer to Maximum Unsupported Overhang, pg 2

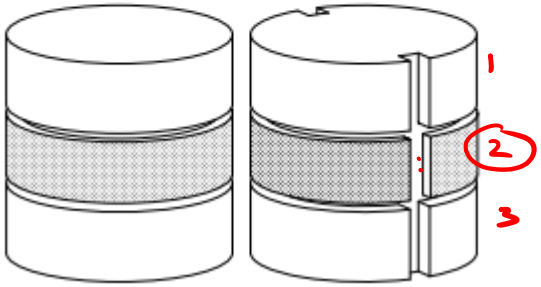


Teardrop XY holes to clear channels

Simplify Support Removal



Break up supports with chamfers on edges
Refer to Maximum Unsupported Overhang, pg 2



Add slits to separate segments

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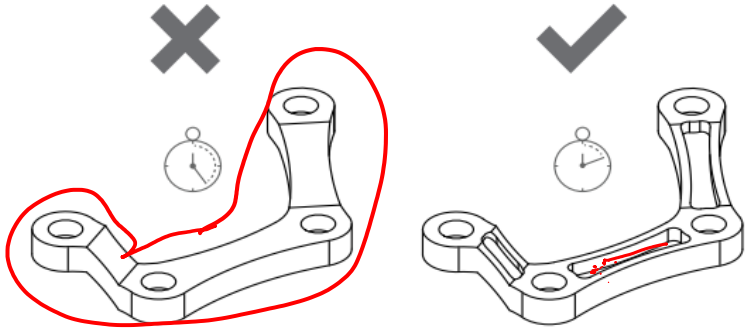
OPTIMIZE FOR WASHING

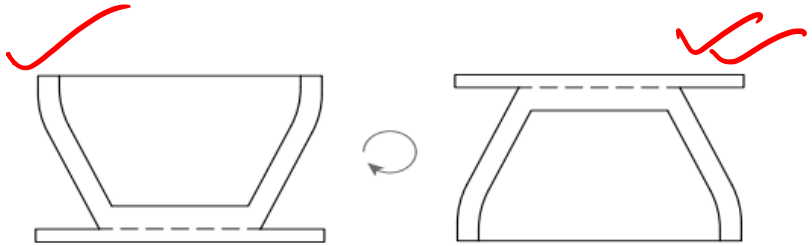
Shell Out Thick Parts



Thicker part sections increase wash time

Shell parts for a faster wash time

Wash Bowls Upside Down



Slower wash time in printed orientation

Faster wash time when inverted

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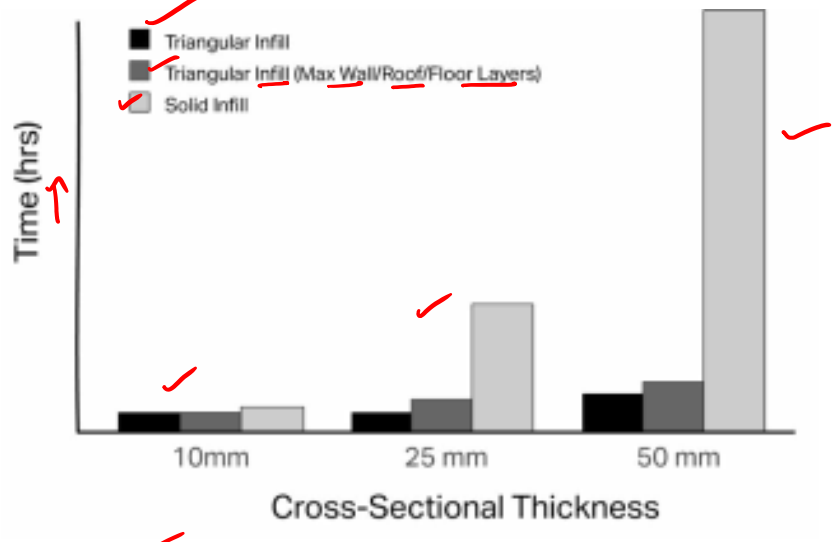
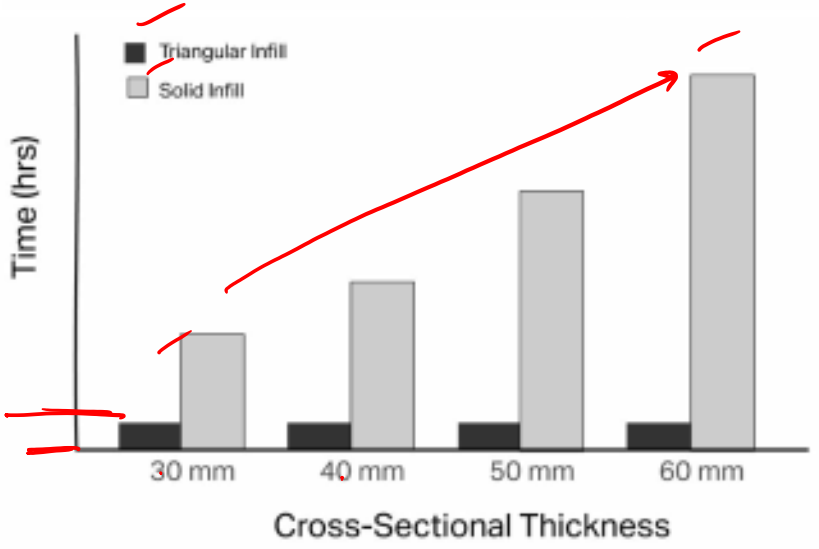
TRIANGULAR VS. SOLID INFILL VS. THICK WALLS

Solid triangular infill wash time



Solid triangular infill dry time



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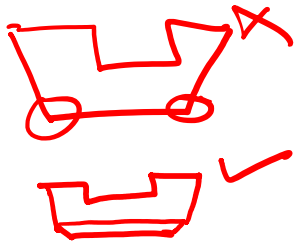
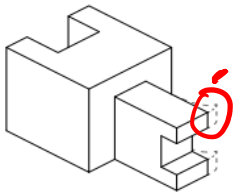
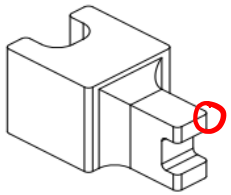
OPTIMIZE FOR SINTERING



Reduce Stress Concentrations

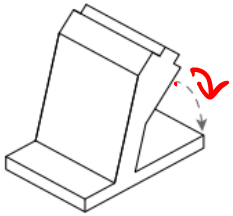


Sharp edges may cause deformation during sintering

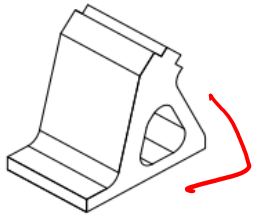


Smooth transitions reduce deformation

Ensure Features are Well Balanced



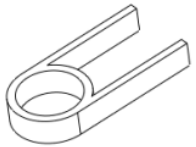
Cantilevered features may topple when sintered



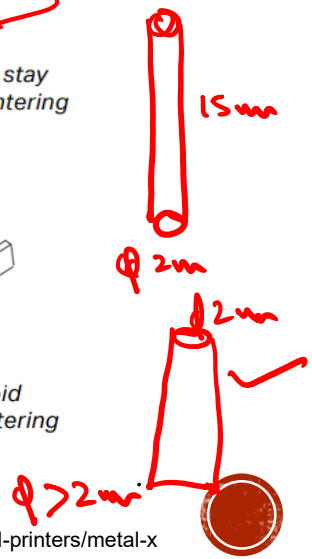
Balanced features stay supported during sintering

Disable Part Rafts

Good candidate for raftless printing



Use a raft to avoid distortion when sintering



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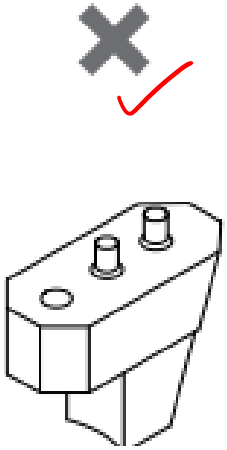
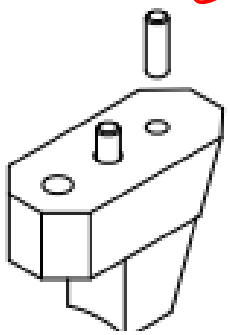
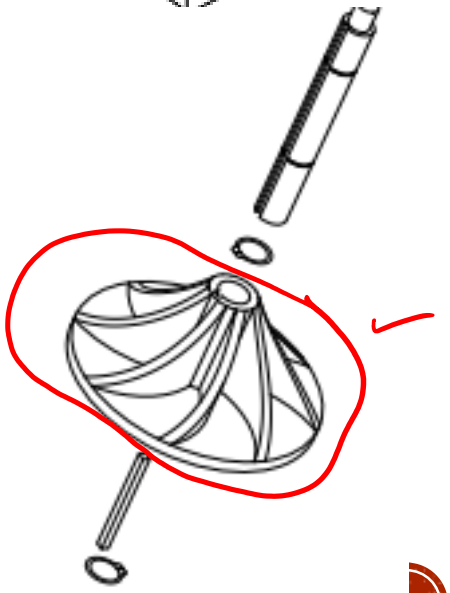
STRATEGIC METAL PRINTING PRACTICES

Use Pins for Alignment Features





Separate Printed from Simple Features



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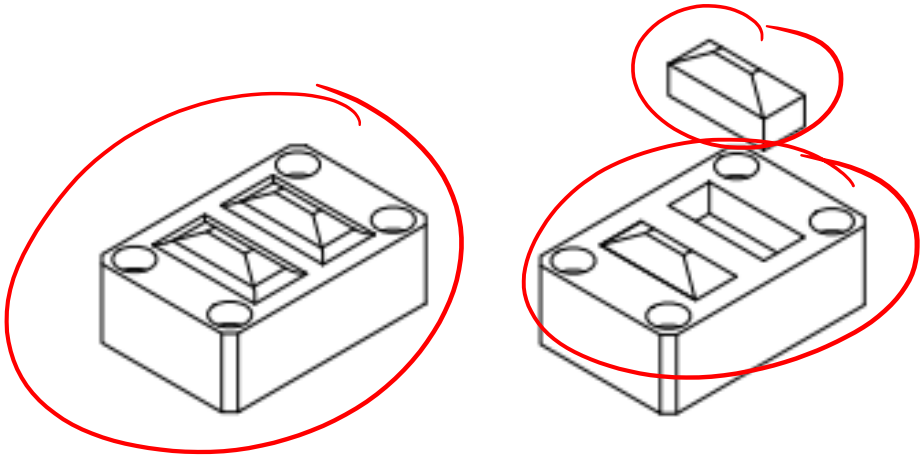
STRATEGIC METAL PRINTING PRACTICES

Isolate Properties with Modular Features



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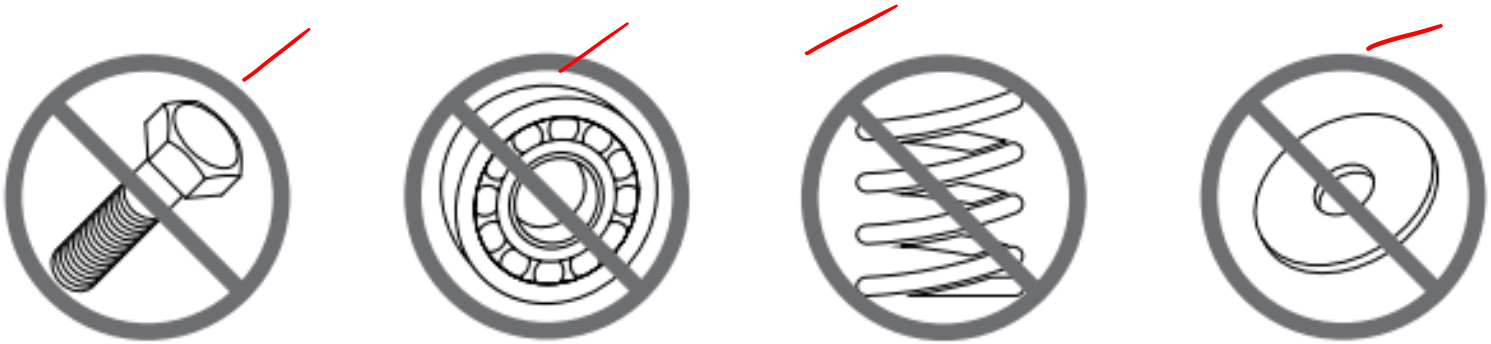
DON'T PRINT YOUR HARDWARE



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THANK YOU