

Increasing Modularity in the Medtronic Edition

Mazor X Stealth

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Background

Quantifying Tolerance Stackup
¥ Increased number of parts and complexity lead to increase in tolerance
¥ Used Coordinate Measuring Machine (CMM) to measure the position of the screws
¥ Compared with specified values from original design and precision requirements of the placement of surgical screws

Testing Results

- ¥ Mean positional error from specified center is 0.474 ± 0.063 mm, which is much larger than the specified upper tolerance limit of 0.014 mm
- ¥ Translates to unacceptable positional error for surgery when locking mechanism is engaged
- ¥ Likely a result of manufacturing methods and deformation of materials: aluminum and resin

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