

## high-speed machining systems



**FSP 300X 5 Axis**



### Case Study: 10" Diameter Aluminum Impeller

| Program ID        | Extension | Tool Ball | Taper | Spindle Speed | Cutting Feed |
|-------------------|-----------|-----------|-------|---------------|--------------|
| Roughing Shallow  | 1.75      | 0.5       | 0     | 38,000        | 282          |
| Reduce Fillet     | 2.25      | 0.3125    | 5     | 36,000        | 230          |
| Roughing Deep     | 2.25      | 0.3125    | 5     | 39,000        | 225          |
| Blade Semi-Finish | 2.25      | 0.3125    | 5     | 24,000        | 218          |
| Hub Semi-Finish   | 2.25      | 0.3125    | 5     | 38,000        | 190          |
| Hub Finish        | 2.25      | 0.3125    | 5     | 40,000        | 240          |
| Blade Finish      | 2.25      | 0.3125    | 5     | 27,000        | 216          |

Total cutting time for complete impeller:  
*2 Hours 55 Minutes*



# specifications

## FSP 300X

### Capacity

|  |                                     |
|--|-------------------------------------|
| Travel X axis                              | 420 mm (16.54 inches)               |
| Travel Y axis                              | 320 mm (12.60 inches)               |
| Travel Z axis                              | 310 mm (12.20 inches)               |
| Travel B axis                              | 230 degrees (25+180+25)             |
| Travel C axis                              | Infinite                            |
| B axis centerline to spindle nose (Z axis) | 100 mm to 400 mm (3.94 - 15.75 in.) |
| Table Load                                 | 25 kg (55 lbs.)                     |
| Maximum Swing (C axis rotary)              | 300 mm (11.81 inches)               |

### Speeds and feeds

|   |                                 |
|---|---------------------------------|
| Speed range                                 | 200 to 30,000 rpm               |
| Maximum speed (B axis swivel)               | 140 rpm                         |
| Maximum speed (C axis rotary)               | 210 rpm                         |
| Rapid feedrate (X, Y, & Z axes)             | 30,000 mm/min. (1181 IPM)       |
| Contouring feedrate (X, Y, & Z axes)        | 20,000 mm/min. (787 IPM)        |
| Maximum axis acceleration (X, Y, & Z axes)  | 16.6 m/sec <sup>2</sup> (1.7 G) |
| Maximum axis acceleration (B axis swivel)   | 130 rad/sec <sup>2</sup>        |
| Maximum axis acceleration (C axis workhead) | 300 rad/sec <sup>2</sup>        |

### Accuracy

#### Positioning: DIN/ISO 230-2

|   |                           |
|---|---------------------------|
| Positional uncertainty P: X, Y, & Z axes  | 0.004 mm (0.00016 inches) |
| Positional uncertainty P: B & C axes      | 10 arc seconds            |
| Positional uncertainty PA: X, Y, & Z axes | 0.003 mm (0.00012 inches) |
| Positional uncertainty PA: B & C axes     | 5 arc seconds             |

#### Geometric: Straightness

|               |                          |
|---------------|--------------------------|
| X, Y & Z axes | 0.005 mm (0.0002 inches) |
|---------------|--------------------------|

#### Geometric: Squareness

|                  |                           |
|------------------|---------------------------|
| XY, XZ & YZ axes | 0.0076 mm (0.0003 inches) |
|------------------|---------------------------|

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