

**Questions to Consider for Performance Reliance (for 6xxx alloys)**

A = Significant Effect    B = Possible Notable Effect    C = Minimal Effect

*1st Question: What characteristics of aluminum extrusions may be of interest to what markets?*

| Markets                   |                             |                                |                         |                   |            |          |                      |          |            | Aluminum Extrusion Characteristics | Processing Variables                      |                  |                  |                           |                         |                  |                 |                              |                 |                               |                  |                       |                               |              |                               |        |   |
|---------------------------|-----------------------------|--------------------------------|-------------------------|-------------------|------------|----------|----------------------|----------|------------|------------------------------------|---|------------------|------------------|---------------------------|-------------------------|------------------|-----------------|------------------------------|-----------------|-------------------------------|------------------|-----------------------|-------------------------------|--------------|-------------------------------|--------|---|
| Building and Construction | Transportation - Automotive | Transportation - Truck Trailer | Transportation - Marine | Structural Tubing | Heat Sinks | Aircraft | HVAC & Refrigeration | Lighting | Electrical |                                    | Billet Chemistry Variation (within Alloy) | Recycled Content | Billet Integrity | Casting Defects - Surface | Homogenization/ Cooling | Hydrogen Content | 2-piece Billets | Billet Heating and Quenching | Transverse Weld | Butt Length / Coring or Back- | Exit Temperature | Extrusion Quench Rate | Recrystallization/ Grain Size | Stretching % | Aging Oven Flow and Practices | Temper |   |
| A                         | A                           | A                              | A                       | A                 | B          | A        | B                    | C        | B          | Strength                           | A   | C                | A                | B                         | A                       | C                | B               | A                            | A               | A                             | A                | A                     | B                             | B            | A                             | A      |   |
| B                         | A                           | B                              | A                       | A                 | B          | A        | A                    | B        | A          | Formability                        | A   | C                | A                | B                         | A                       | B                | A               | A                            | A               | A                             | A                | A                     | A                             | A            | A                             | A      | A |
| B                         | A                           | B                              | A                       | C                 | A          | A        | B                    | B        | A          | Machinability                      | A   | C                | A                | B                         | A                       | B                | A               | A                            | A               | A                             | A                | A                     | A                             | A            | A                             | A      | A |
| B                         | A                           | A                              | A                       | A                 | B          | A        | A                    | B        | C          | Weldability or Brazability         | B   | C                | B                | B                         | B                       | A                | B               | B                            | B               | B                             | B                | B                     | B                             | C            | B                             | B      |   |
| A                         | A                           | A                              | A                       | B                 | B          | A        | A                    | B        | A          | Corrosion Resistance               | B   | C                | B                | B                         | B                       | C                | B               | A                            | B               | B                             | A                | A                     | A                             | C            | B                             | A      |   |
| C                         | C                           | C                              | C                       | C                 | A          | B        | B                    | B        | A          | Electrical Conductivity            | A   | C                | B                | B                         | A                       | B                | B               | A                            | A               | A                             | A                | A                     | B                             | B            | A                             | A      |   |
| B                         | A                           | A                              | A                       | A                 | C          | A        | B                    | C        | B          | Fracture Toughness                 | A   | B                | A                | B                         | A                       | B                | A               | A                            | A               | A                             | A                | A                     | A                             | B            | A                             | A      |   |
| B                         | B                           | B                              | B                       | C                 | A          | B        | A                    | B        | A          | Thermal Conductivity               | B   | B                | C                | C                         | C                       | B                | C               | B                            | C               | B                             | B                | B                     | C                             | A            | A                             |        |   |
| A                         | B                           | B                              | B                       | C                 | B          | B        | B                    | A        | B          | Surface Finish                     | A   | B                | A                | A                         | A                       | A                | A               | A                            | A               | A                             | A                | A                     | A                             | A            | A                             | A      |   |
| A                         | A                           | B                              | A                       | B                 | A          | A        | A                    | B        | B          | Anodizing Response                 | B   | C                | B                | B                         | B                       | C                | A               | A                            | B               | C                             | B                | A                     | C                             | A            | B                             | B      |   |
| B                         | B                           | B                              | A                       | B                 | A          | A        | A                    | B        | B          | Dimensional Tolerances             | B   | C                | B                | B                         | B                       | C                | C               | A                            | B               | C                             | B                | A                     | C                             | A            | B                             | B      |   |
| A                         | A                           | B                              | A                       | B                 | A          | A        | A                    | A        | B          | Ability to make Complex Shapes     | B   | C                | B                | B                         | B                       | C                | B               | B                            | C               | C                             | A                | A                     | B                             | B            | C                             | A      |   |
| A                         | A                           | A                              | A                       | A                 | B          | A        | B                    | C        | B          | Hardness                           | A   | C                | B                | B                         | A                       | B                | B               | A                            | B               | B                             | A                | A                     | B                             | B            | A                             | A      |   |
| A                         | A                           | A                              | A                       | A                 | C          | A        | C                    | C        | B          | Loading Direction                  | C   | C                | B                | C                         | C                       | C                | A               | C                            | A               | A                             | C                | C                     | B                             | B            | C                             | C      |   |
| A                         | B                           | B                              | B                       | C                 | A          | B        | C                    | A        | C          | Reflectivity                       | A   | B                | C                | C                         | A                       | C                | C               | A                            | B               | B                             | B                | A                     | A                             | A            | B                             | B      |   |
| C                         | B                           | B                              | B                       | B                 | B          | A        | A                    | C        | C          | Cryogenic Response                 | C   | C                | C                | C                         | C                       | C                | C               | C                            | C               | C                             | C                | B                     | B                             | C            | C                             | B      |   |
| A                         | A                           | A                              | A                       | A                 | B          | A        | B                    | B        | A          | Heat Treatability                  | B   | C                | B                | C                         | A                       | C                | A               | A                            | B               | B                             | A                | A                     | B                             | B            | A                             | A      |   |

*2nd Question: What processing variables affect the various characteristics of Aluminum Extrusions?*