ELIXIR INDUSTRIES
SINCE 1948
DIVISION 27

# A Simple Guide to Extrusion Designs

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The manufacturing and production process starts with the die design. It is here that the extrusion takes shape and features are built in to reduce weight, simplify assembly, add functionality and minimize finishing costs. Here we take advantage of the unique benefits of aluminum, in combination with the extrusion process, to make a cost-effective product with optimal functionality and an attractive appearance.

The Georgia Extrusion Division has a staff with over 140 years of experience in Die Design and Die correction/repair. Our talented Engineering Department is available to assist your design engineers with the specifics in extrusion design.

## Extrusion design tips:

- Wall/material thickness
- Uniform wall thickness
- Wall/material Variance
- Radius v/s Square corners
- Solid profiles if possible
- Fewer cavities in hollow profiles
- Profiles with deep channels and ratios
- Heat sinks
- Decorative Surfaces
- Run out surface

## Wall thickness:

When deciding how thick the walls of a profile should be, strength and optimum cost-efficiency are two of the main considerations.

Profiles with a uniform wall thickness are the simplest to produce. However, where necessary, wall thickness within a profile can easily be varied. For example, a profile's bending strength can be increased by concentrating weight/thickness away from the centre of gravity.

## Cost-efficient production

To optimize cost-efficiency, a profile's design should always be as production-friendly as possible. To achieve this, the profile should:

- have a uniform wall thickness
- have simple, radius corners
- be symmetrical
- have a small circumscribing circle
- not have deep, narrow channels, try to keep channels to a 3 to 1 ratio
- have as few channels, screw bosses as possible

## Recommended wall thickness - guidelines

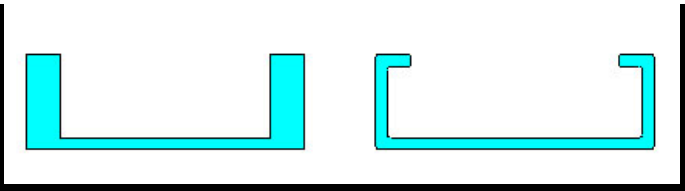
Amongst the factors having an effect on wall thickness are extrusion force and speed, the choice of alloy, the shape of the profile, desired surface finish and tolerance specifications.

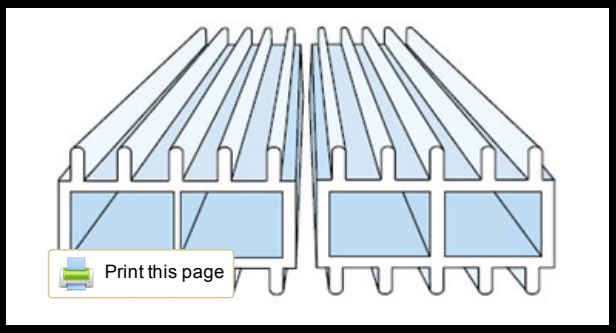
Even with these noted walls thickness due to the complexity and the press' that are available some profiles may need more material thickness.

| | |
|---|---|
| Aluminum minimum wall thickness | 6063 / 6463 |
| circle size .500 [12.7mm] to 2.000 [50.8mm] | .045 [1.143mm] |
| circle size 3.000 [76.2mm] to 4.000 [101.6mm] | .050 [1.27mm] |
| circle size 4.000 [101.6mm] to 5.000 [127mm] | .062 [1.574mm] |

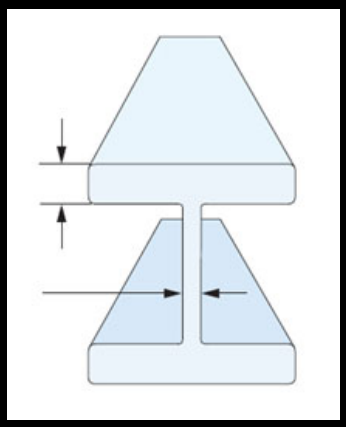
And the trend continues.

***Uniform wall thickness***

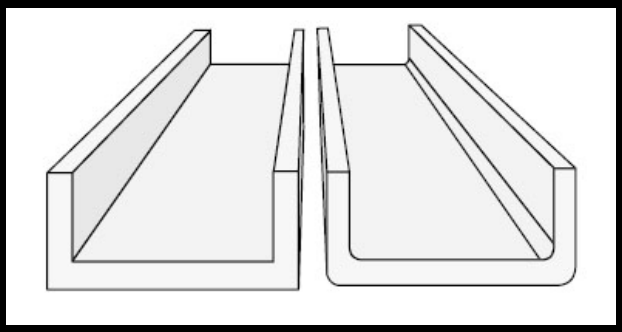


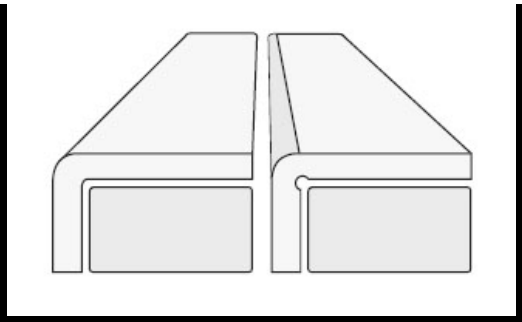


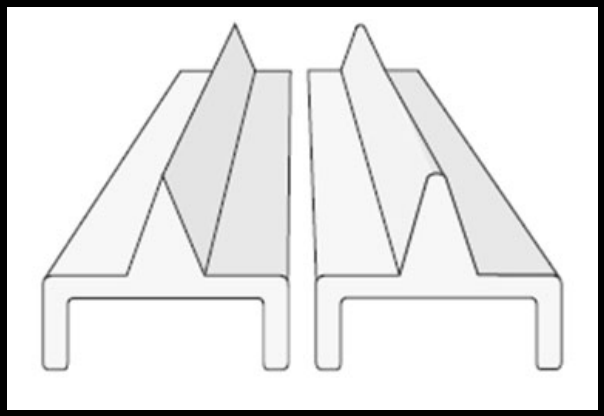

***Wall/material Variance***

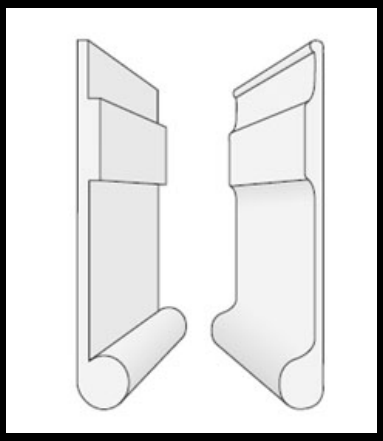


***Radius corners***

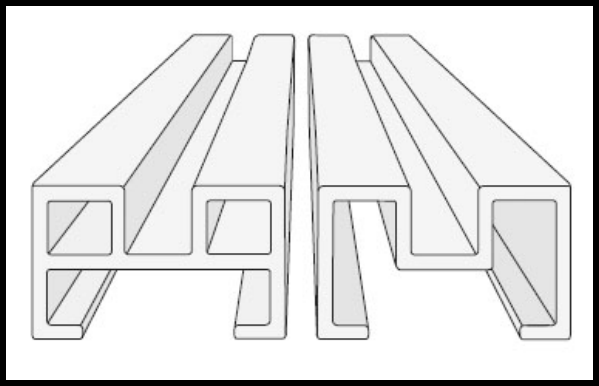




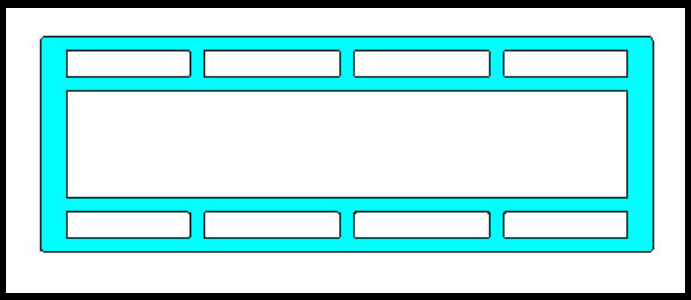


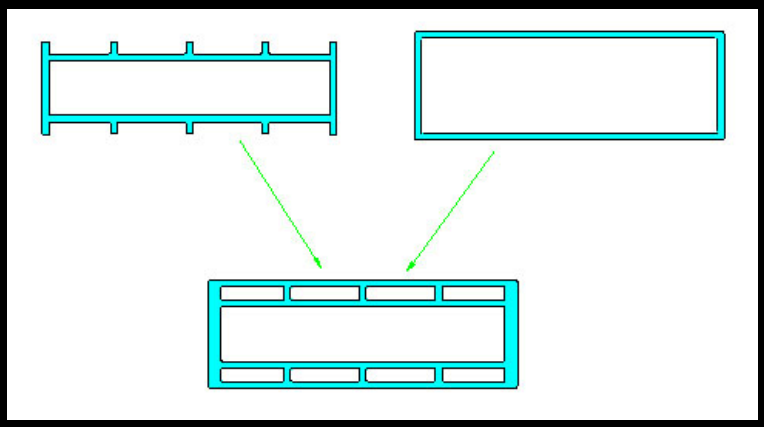


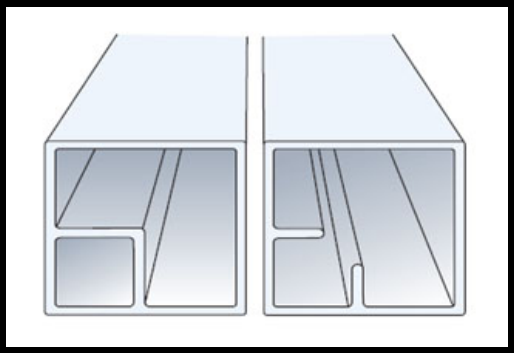
***Solid profiles if possible***



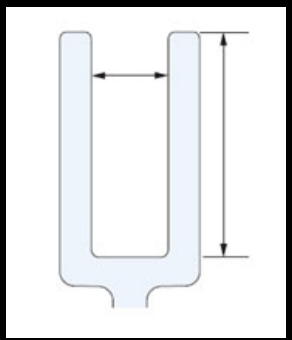
***Fewer cavities in hollow profiles***

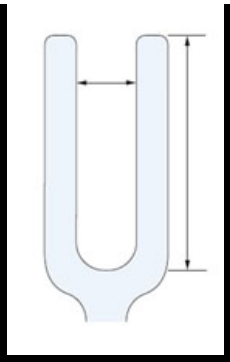


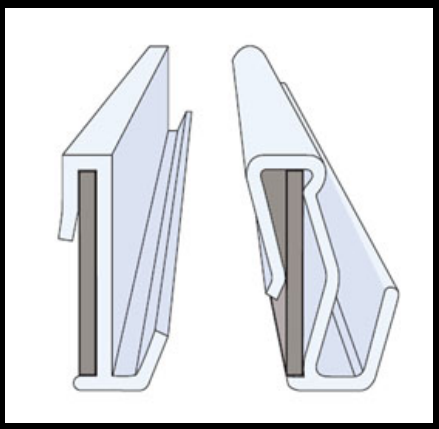


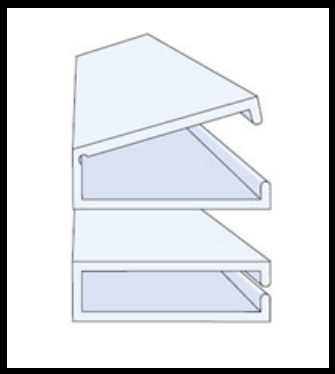


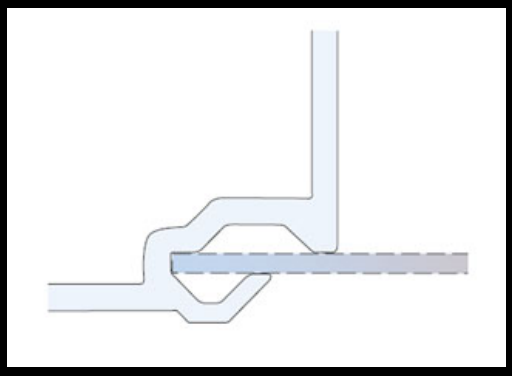
***Deep channels and ratios***

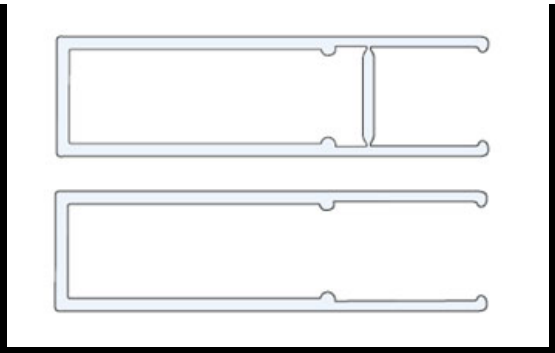




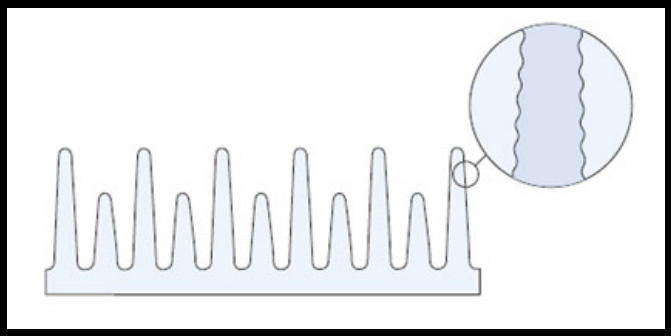




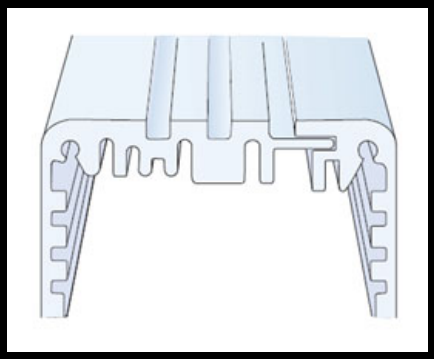




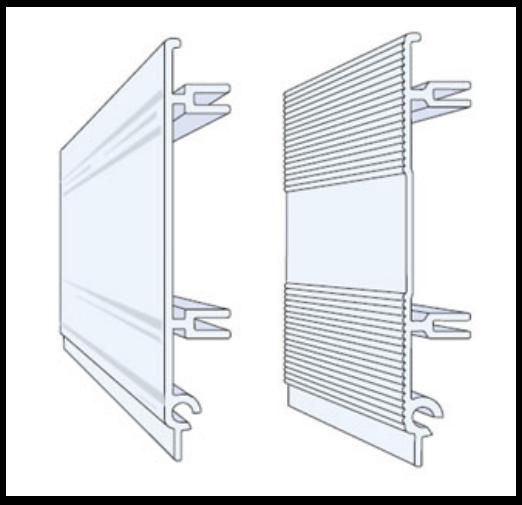
***Heat sinks***



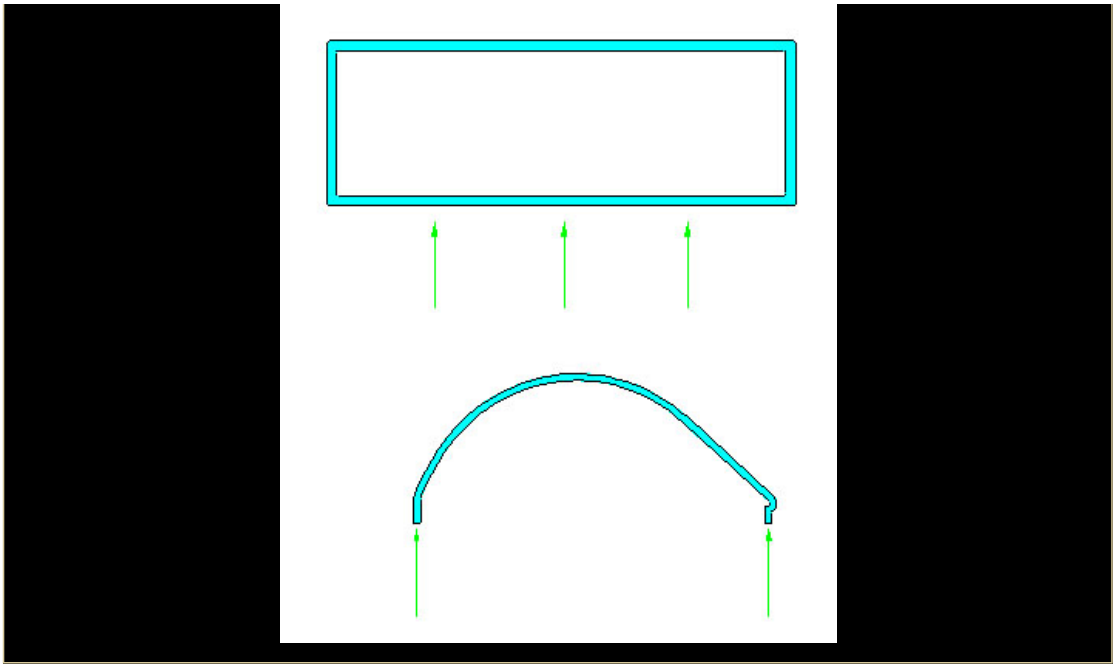
***Decorative Surfaces***



***Masking of imperfections***



***Protection against damage***



## Elixir Snapshot

**Elixir Industries** is a leader in Aluminum Extrusions, Aluminum Fabrication and Custom Metal Fabrication Products. Elixir Industries has been a leading manufacturer of manufactured housing doors since its humble beginnings in 1948. Elixir Industries has grown into a manufacturing giant that today includes two million square feet of production space and 12 divisions nationwide.

**Metal manufacturing services:** CNC Manufacturing, Laser Cutting, Water Jet Cutting, CNC Breaking, CNC Punching, Aluminum Extrusion, Extrusion Fabrication

**A glimpse of a few of our products:** Entrance Doors, Steel & Aluminum Window Guards, Door Hardware, Putty Tapes, Sealants, Cargo Trailer Doors, Aluminum Siding, Roll Roofing, Steel Framing, Sports Equipment

**Some of the industries we serve are:** Recreational Vehicles, Factory Built Homes, Cargo Trailers, Lighting, Academic and Community Athletic Programs.

## Elixir Details