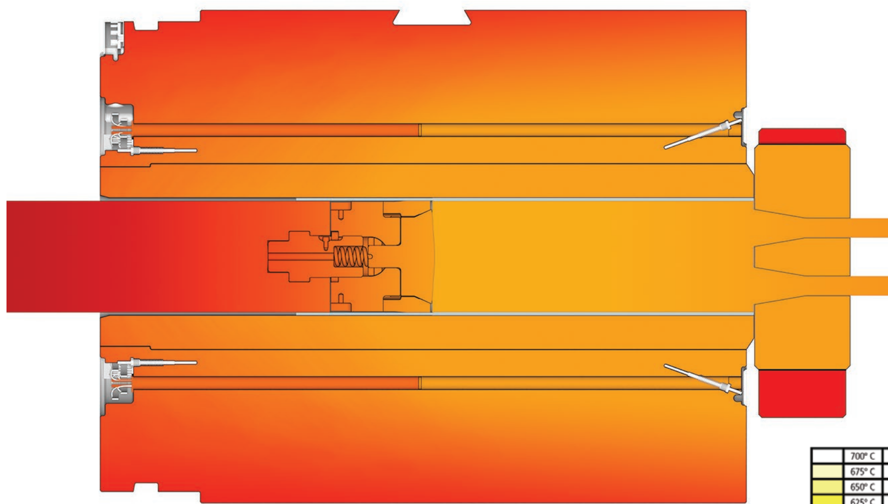
# QR CONTAINERS

CASTOOL TOOLING SYSTEMS®

The Quick Response (QR) Container reflects new knowledge of the extrusion process gained during its development, combined with the most basic laws of physics. Castool's QR container consumes less energy, has a tougher mantle, better liner temperature control and better heat dissipation.

The logic of the design of this Castool temperature controlled container is unassailable.



| | | |
|---|---|---|
| | 700° C | 1292° F |
| | 675° C | 1247° F |
| | 650° C | 1202° F |
| | 625° C | 1157° F |
| | 600° C | 1112° F |
| | 575° C | 1067° F |
| | 550° C | 1022° F |
| | 525° C | 977° F |
| | 500° C | 932° F |
| | 475° C | 887° F |
| | 450° C | 842° F |
| | 425° C | 797° F |
| | 400° C | 752° F |
| | 375° C | 707° F |
| | 350° C | 662° F |
| | 325° C | 617° F |
| | 300° C | 572° F |
| | 275° C | 527° F |
| | 250° C | 482° F |
| | 225° C | 437° F |
| | 200° C | 392° F |
| | 175° C | 347° F |
| | 150° C | 302° F |
| | 125° C | 257° F |
| | 100° C | 212° F |

## PURPOSE

- Maintain liner 30°C (50°F) below billet temperature to reduce direct billet surface inflow onto the profile, reducing scrap from surface finish
- Increase the billet/container differential towards the back end, and controlling shape, especially waving of wide thin extrusions
- Reduce container and die slide effect on die temperature and resulting profile run-out, reducing scrap from shape deformation
- Stabilize container and container housing temperatures which effect hot press alignment
- Minimize energy usage and extend life of container mantle, liner and dummy block

## FUNCTION

The container withstands extrusion pressure while billet is pushed through the extrusion die by the dummy block. The container maintains liner temperature at ±5°C of desired temperature throughout the process. When using taper heated billets intended for isothermal extrusion and higher productivity, the container liner temperatures can be set appropriately to enable best isothermal extrusion conditions.

The heating elements and control thermocouples located close to the liner makes the outside of the mantle cooler than the liner, and the container housing even cooler. This maximizes support and mantle life. The built-in thermal gradient allows heat to dissipate from the liner without using auxiliary cooling or air, making it possible to maintain the liner 30°C (50°F) below the billet temperature even when extruding hard alloy. This is intended to retard the flow of billet skin into the die, and thus reduce scrap.

With a QR container, the response to a demand for heat is therefore almost immediate. The liner is heated when and where necessary; and an improved liner temperature consistency is maintained, which is key to achieving product consistency both metallurgically and dimensionally. The QR container reduces energy usage by over 50% from standard containers. The container mantle is made of AISI 4340, which is 100% tougher, and has 80% better thermal conductivity than W.Nr 1.2344 (H13) steel. The container is tougher and better in heat dissipation. The container liner is made of W. Nr. 1.2344 (H13), which has high vanadium carbide and provides superior wear resistance.

## BENEFITS of the Castool QR Container

- Provides uniform flow of alloy through the die
- Reduces cost of operation
- Reduces scrap
- Reduces downtime
- Increases productivity
- Makes isothermal extrusion attainable
- Increases operating life

**With the QR Container, Castool again sets a new standard of excellence in the extrusion industry.**

Results may vary depending on individual press characteristics and setup.

AEC MEMBER ALUMINUM EXTRUDERS COUNCIL

ISO 9001:2015 CERTIFICATION QUALITY
ISO 45001:2018 CERTIFICATION SAFETY
ISO 14001:2015 CERTIFICATION ENVIRONMENT

**www.castool.com**

### QRC Container – Quick Response Compact

*Recommended for liner diameter 7" and under*

The QRC container is a compact design and has 2 individually controlled heating zones with 2 double casting thermocouples located equidistant between the heating elements and the liner. The top and bottom heating zones cover 2/3 from the die end. It gives the ability to control top and bottom temperature and provides natural temperature gradient from die side to stem side.

### QR Container – Quick Response

*Recommended for liner diameter from 7 - 12"*

QR container has 4 individually controlled heating zones with 4 double acting thermocouples located equidistant between the heating elements and liner. The heating zones are positioned in die end top and bottom,and entrance top and bottom. It provides the container the ability to control and maintain stable thermal gradient from top to bottom and exit to entrance for quick heat dissipation.

### QRL Container – Quick Response Long

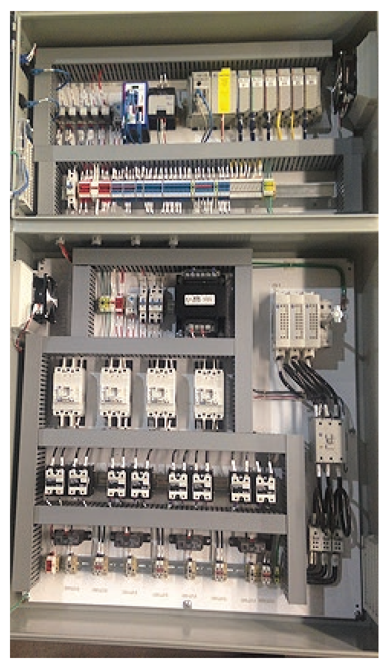
*Recommended for long containers (48 - 60")*

For such a long container, the liner will deflect more even it is under the same extrusion pressure. A 3-piece subliner design with interference fit can further reduce liner deflection by approximately 35% us using AISI 4340 at 34-38 HRc.

### QRX Container – Quick Response X Pattern

*Recommended for liner diameter 12" and over*

QRX container has 6 individually controlled heating zones with 6 double acting thermal couples. There are 4 zones, top, bottom, left and right, at the die end. There are 2 zones top and bottom at the entrance. QRX gives extruders the unprecedented ability to control extrusion profile, extrusion run-outs and extrusion surface quality while still maintaining stable thermal gradient for quick heat dissipation. All QRX containers are 3-piece design.



### Castool QR Container Controller

The Castool QR Controller is developed with Allen Bradley Logix Processors to take advantage of the PID function for individual zone control. Containers are heated with a linear and gradual heating cycle. A pre-determined offset is programmed into the controller to compensate for the temperature differential that can occur because of heat losses from the die to die carrier.

SCHMOLZ + BICKENBACH International

HOT WORK TOOL STEELS

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