

CRONITE

Better by design



Global
Excellence

100 Years of Experience in Heat,
Corrosion & Wear Resistant Castings

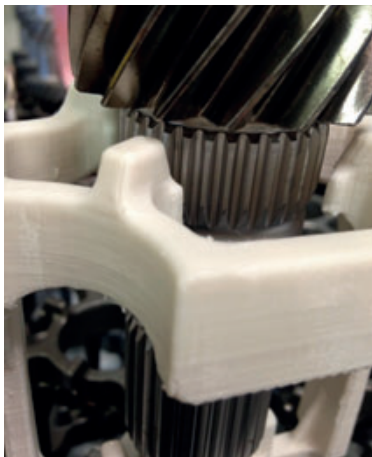


Cronite, a global supplier of heat treatment fixtures with production on 3 continents and global commercial & design network

Cronite is the world's leading designer and manufacturer of heat treatment fixtures and furnace spare parts.

More than 15,000 furnaces around the world are equipped with our products.





Function geometry verification

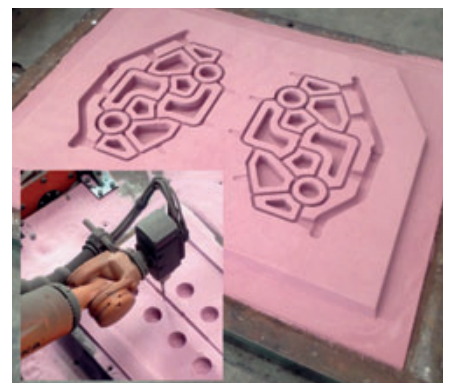
We make ideas become reality

New ideas are one of our driving forces to innovate our processes or products, and also introduce new solutions on the markets.

To support this approach, Cronite continuously reinvest over 4% of its turnover in Research & Development. Its Research & Development Centre, located in Czech Republic, is equipped with the high-tech equipment and closely cooperates with universities around the world.



Lost Wax 3D printing (patternless)



QuickMold Technology (patternless)

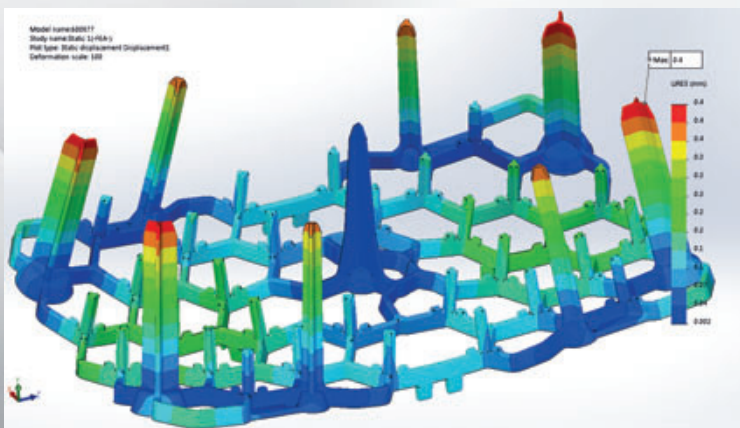
Fast product development

Rapid Prototyping

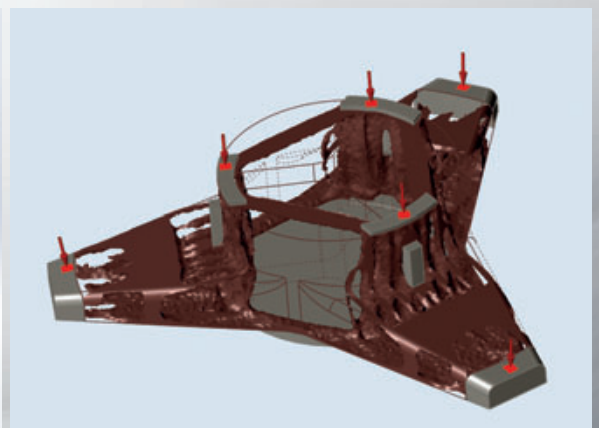
The process and parts development requires fast answers from suppliers. Therefore Cronite has invested and developed over the past years suitable equipment and processes to shorten the development phase of fixtures:

Reduce your costs - Product Optimization

We combine the FEA methodology, used at Cronite for almost 20 years, with the most recent topology optimization approach. It results in optimized shapes and smoother section transitions which enable to load heavier parts on lighter fixtures.



FEA methodology



Topology Optimisation

Cronite, the solution for every high temperature process

Cronite offers a wide range of materials and production methods to suit every process requirement:

- Ni/Cr alloy casting (sand casting, lost wax, spinning)
- Fabricated products
- Composite (graphite, CFC) including special coating

Cronite, pushing the Innovation

Cronite, with its R&D center, developed special alloys to extend the life time of fixtures and reduce your total cost of ownership.

Some of the alloys we have developed include:

- CR Alloys, latest development to extend the life time of fixture for temperatures up to 1200°C
- Mancellium, which is particularly well suited for Low Pressure Carburizing up to 1000 °C
- HRZ, alloy for conventional furnaces, offering long life despite lower Nickel content

Traditional alloys

| CRONITE | AFNOR | DIN | ASTM | JIS | C | Cr | Ni | Mn | Si | Nb/Co |
|---------------|-----------------|--------|-------|-----------|------|----|----|-----|-----|-------|
| HR 19 | Z40CN27-04 | 1.4823 | | SCH 11 | 0,4 | 27 | 4 | 1 | 1,5 | |
| HR 15 | Z20CN18-09 | 1.4825 | | | 0,2 | 18 | 9 | 1 | 1,5 | |
| HR 15 B | Z40CN22-10 | | HF | SCH 12 | 0,4 | 22 | 10 | 1 | 2 | |
| HR 19 | Z40CN28-05 | | HD | | 0,4 | 28 | 5 | 1 | 1,5 | |
| HR 7 B | Z30CN20-14 | 1.4832 | | | 0,3 | 20 | 14 | 1 | 2 | |
| HR 7 | Z40CN25-12 | 1.4837 | HH | SCH 13A | 0,4 | 25 | 12 | 1 | 1,5 | |
| HR 6 | Z40CN25-20 | 1.4848 | HK | SCH 21 | 0,4 | 25 | 20 | 1 | 1,5 | |
| HR 25 | Z40CNNb24-24-02 | 1.4855 | | | 0,4 | 24 | 24 | 1 | 1,5 | 1,5 |
| | Z40CN28-10 | | HE | SCH 13 | 0,4 | 28 | 10 | 1 | 1,5 | |
| HR 18 | Z40NC25-20 | | HN | | 0,4 | 20 | 25 | 1 | 1,5 | |
| HR 9 | Z10NCNb32-20-01 | 1.4859 | | | 0,15 | 20 | 32 | 1 | 1,5 | 1,5 |
| HR 8 | Z25NCNb38-18-02 | | HU 25 | SCH 16 Nb | 0,25 | 18 | 38 | 1 | 1,5 | 2 |
| HR 17 | Z40NC35-15 | 1.4806 | HT | SCH 15 | 0,4 | 15 | 35 | 1 | 1,5 | |
| HR 5 | Z40NC38-18 | 1.4865 | HU | SCH 15 | 0,4 | 18 | 38 | 1 | 1,8 | |
| HR 17 Nb | Z40NCNb35-15-02 | 1.4807 | HT | SCH 15 Nb | 0,4 | 15 | 35 | 1 | 1,5 | 2 |
| HR 32 | Z40NCNb38-18-02 | 1.4849 | HU | | 0,4 | 18 | 38 | 1 | 1,5 | 1,5 |
| HR 33 | Z40NC35-25 | 1.4857 | HP | SCH 24 | 0,4 | 25 | 35 | 1 | 1,5 | |
| HR 33 Nb | Z40NCNb35-25-02 | 1.4852 | | SCH 24 Nb | 0,4 | 25 | 35 | 1 | 1,8 | 1,5 |
| HR 4 | Z60NC52-17 | | | | 0,5 | 18 | 52 | 1 | 1,5 | |
| HR 4 LC | Z30NC55-15 | | HW | | 0,3 | 15 | 55 | 1,5 | 1,5 | |
| HR 29 | Z30NC66-17 | 2.4815 | HX 50 | | 0,3 | 17 | 66 | | | |
| HR 23 B | Z50NCW45-25-05 | | | | 0,5 | 25 | 45 | 1 | 1,5 | |
| HR 23 | Z50NCW48-28-05 | 2.4879 | | | 0,5 | 28 | 48 | | | |
| CRONIAL 2000 | | | | | 0,5 | 6 | 73 | | 1,5 | – |
| SUPER CRONITE | | | | | 0,5 | 18 | 55 | 1,5 | 1,5 | 1 |
| MANCELLIUM | | | | | 0,1 | 17 | 75 | 0,5 | 0,4 | – |
| HRZ | | | | | 0,25 | 25 | 22 | 1 | 1 | yes |

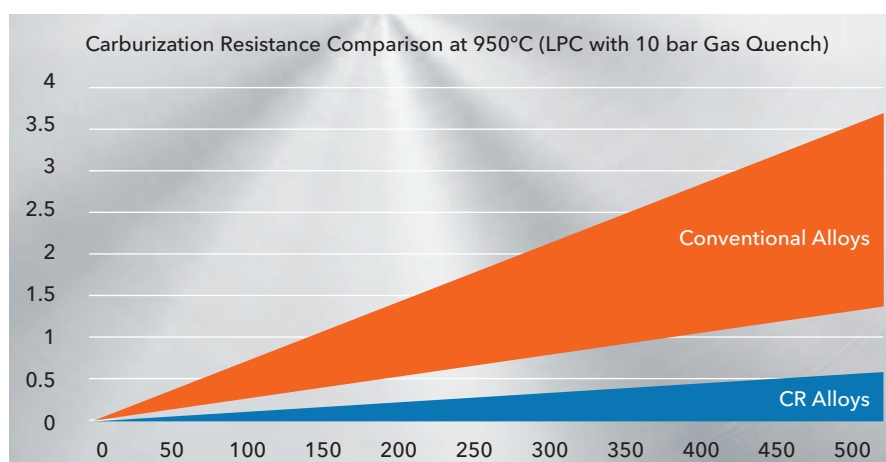


CR alloys offer a multitude of advantages:

- Excellent Carburization Resistance comparable with Manganese
- Limited elongation during the life time
- Strength of alloy depending on requirement
- No sticking
- Long Service time



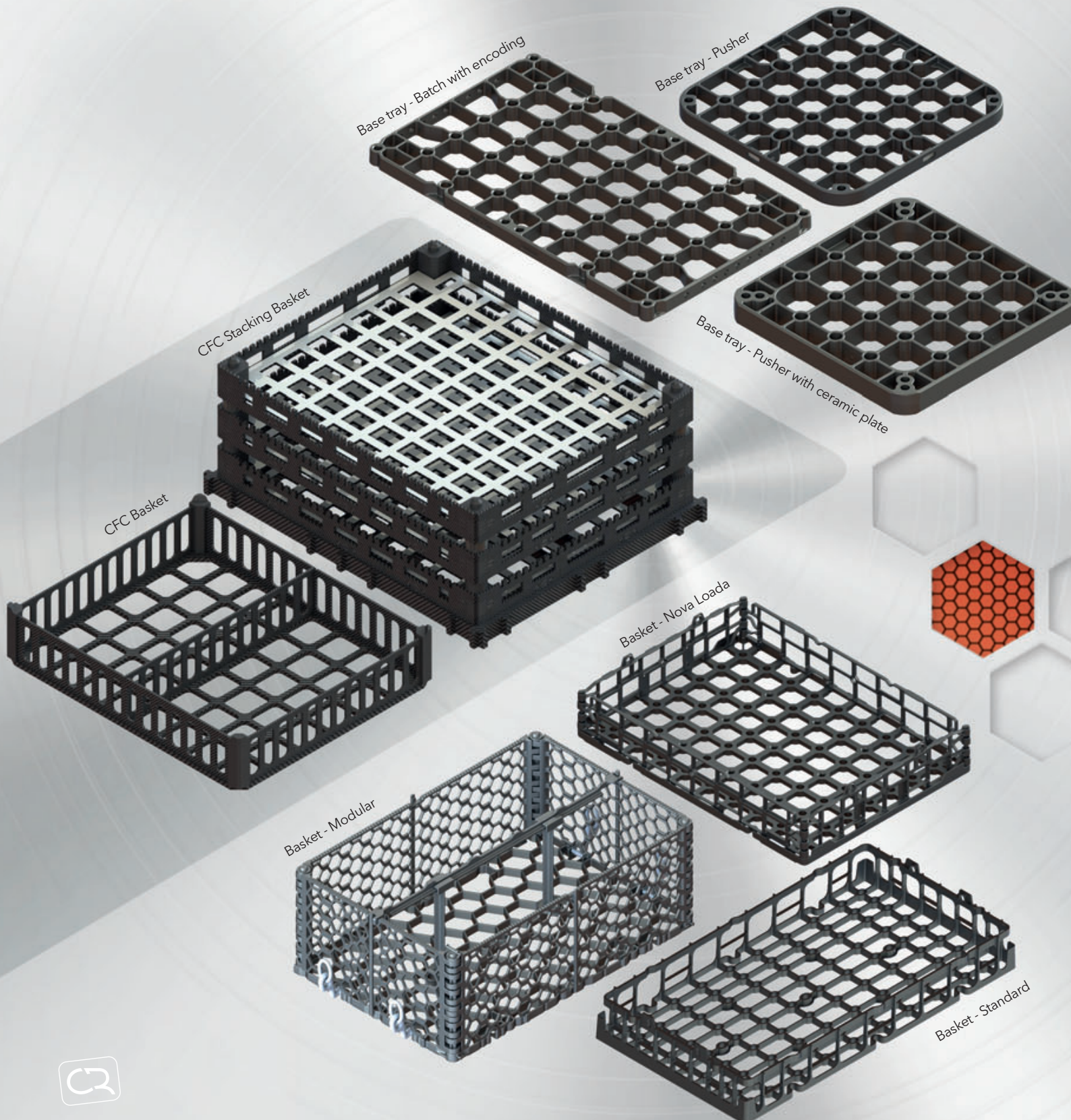
| CR Alloy | Maximum Temperature | | Strength | Quench Type | Typical Environment | |
|----------|---------------------|--------|----------|---------------|--|--------------------------|
| CR1 | 1000°C | 1830°F | Low | Air, Gas | AC 950°C / No Quench | Atmosphere Carburizing |
| CR2 | 1050°C | 1920°F | Medium | Air, Gas, Oil | AC 950°C / Oil Quench | |
| CR3 | 1050°C | 1920°F | Medium+ | Air, Gas, Oil | LPC 1000°C / Gas Quench | Low Pressure Carburizing |
| CR4 | 1050°C | 1920°F | Medium | Air, Gas, Oil | LPC 950°C / Oil Quench LPC 1000°C / Gas Quench | |
| CR5 | 1100°C | 2012°F | High | Air, Gas, Oil | LPC 1050°C / Gas Quench LPC 1000°C / Oil Quench | |
| CR6 | 1200°C | 2220°F | High | Air, Gas | LPC 1100°C / Gas Quench | High Temp LPC |



Solution for all types of furnaces

**Cronite owns thousands of standard
patterns in our factories.**

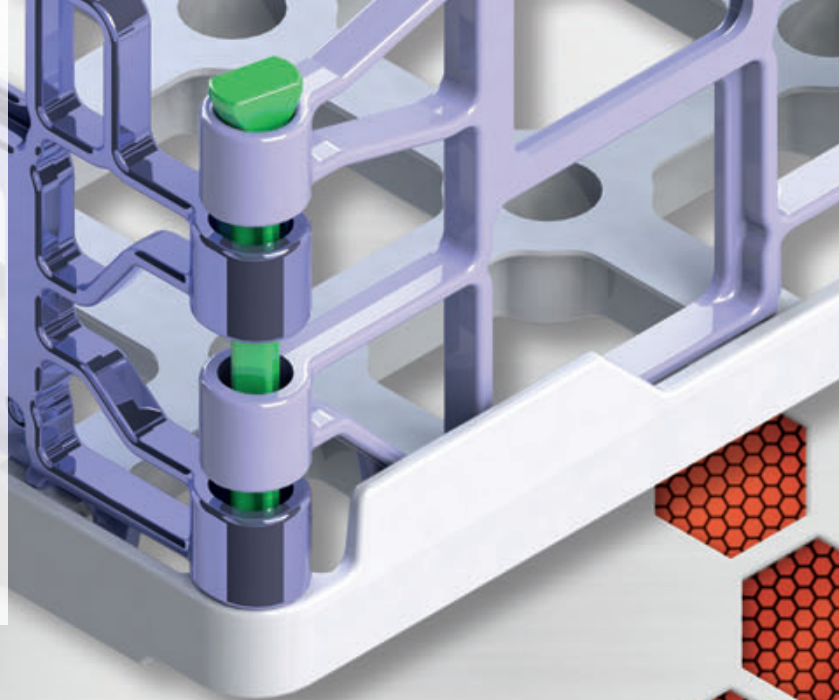
We can combine standard fixture
with some specific elements
to suit the parts you are treating.



New Generation of Stackable Baskets

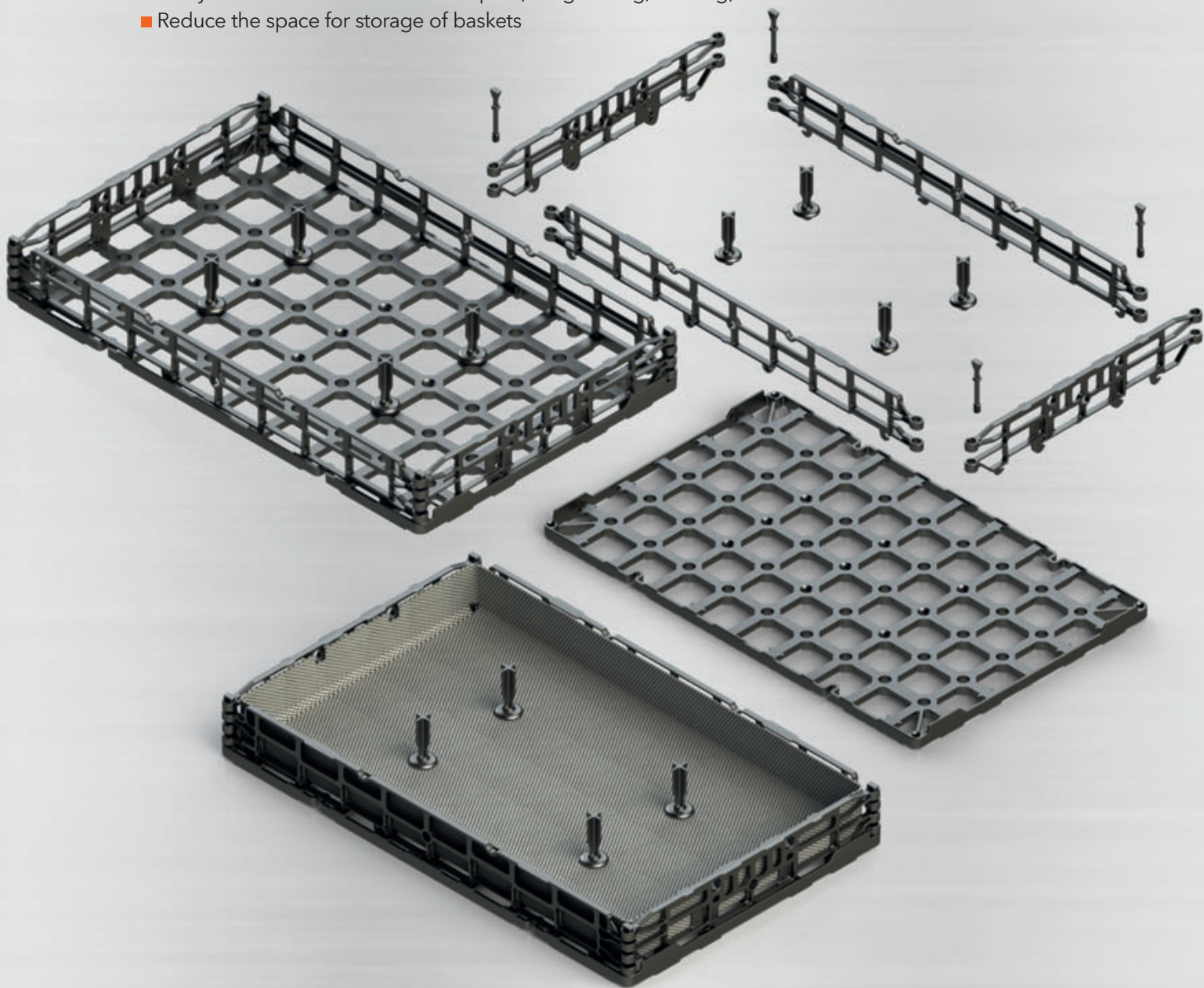
Nova Loada Baskets

New Generation of Baskets called Nova Loada Basket is solution with removable sides and Patented Locking system.



You can combine one base with different side heights:

- Choose different alloy for base and sides
- Flip the sides to extend the life (eliminate the bending)
- Easily disassemble the basket for repair (straightening, welding)
- Reduce the space for storage of baskets



Provide ergonomic handling of fixture

Customized fixtures are designed to:

- Maximize loading of customer's components
- Minimize fixture's weight
- Minimize the distortion of components
- Provide a stable fixture
- Allow maximum drainage of quench media
- Prevent shock damage of component during loading and handling
- Maximize service life of fixture

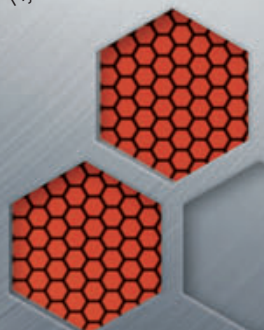
LPC fixture (gears)

LPC fixture (ring gears)

LPC fixture (shafts)

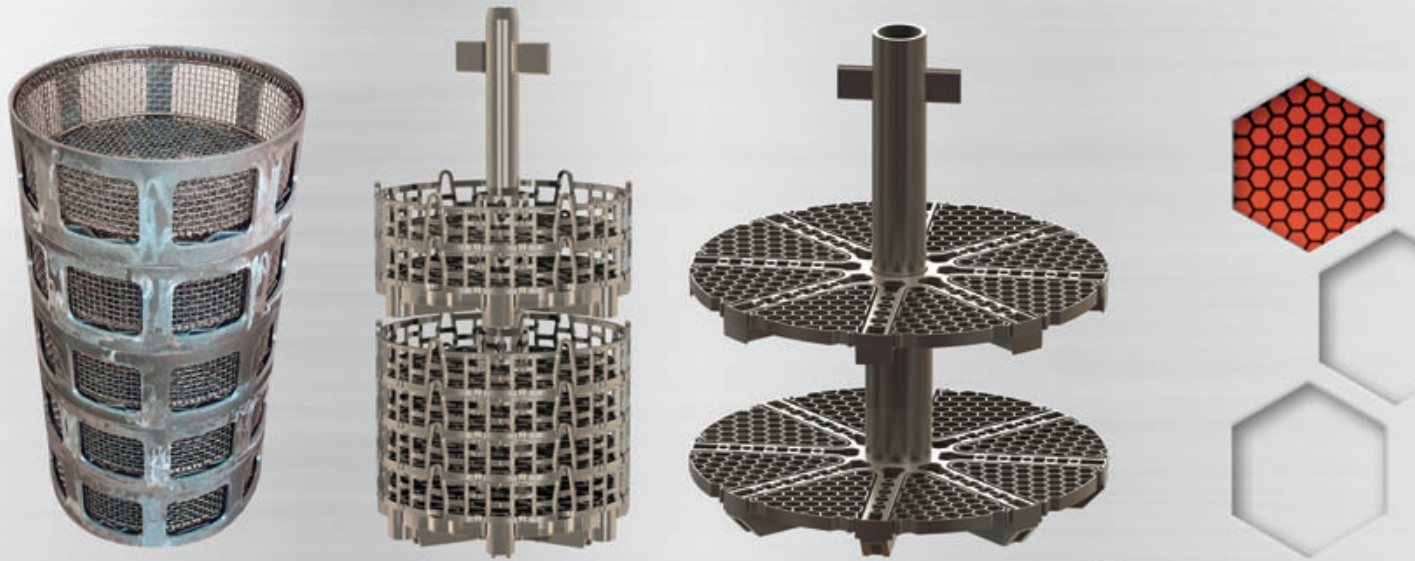
Double Decker

Hybrid CFC Casting fixture



Pit or Bell Furnaces

Cronite owns standard patterns for grids, spiders and segments as well as baskets.



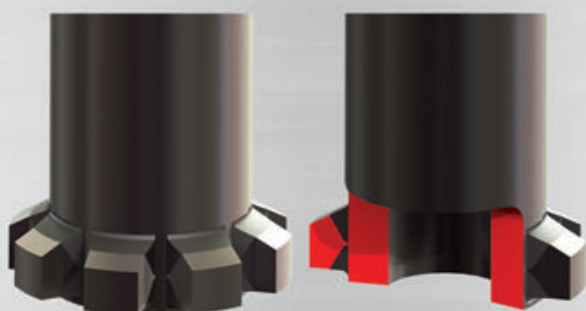
CroniStar New Generation of Pit Furnace Fixtures

New Generation of Pit furnace fixtures - CroniStar - offers:

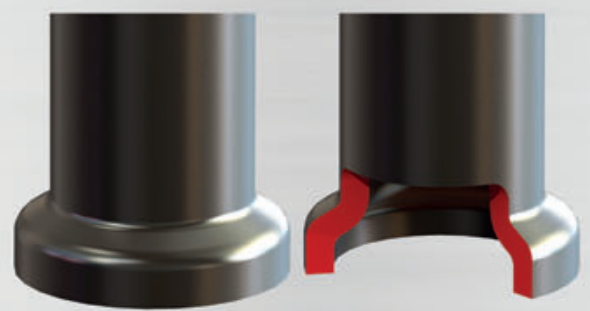
- Box shape design has superior section modulus compared to traditional solution which leads to significant weight reduction and greater strength.
- Thinner walls and spaced out hub area allow for faster and more even cooling of the spider during quench operation.
- This means smaller temperature differentials, lower thermal stresses and resulting longer lifespan.
- Base spiders and intermediate spiders are both interchangeable and reversible. This can further extend lifespan.



In order to increase the safety of the pit furnace fixtures, Cronite developed Single Piece Central Column, ie. without any welding. This leads to lifespan increase compared to traditional central column.



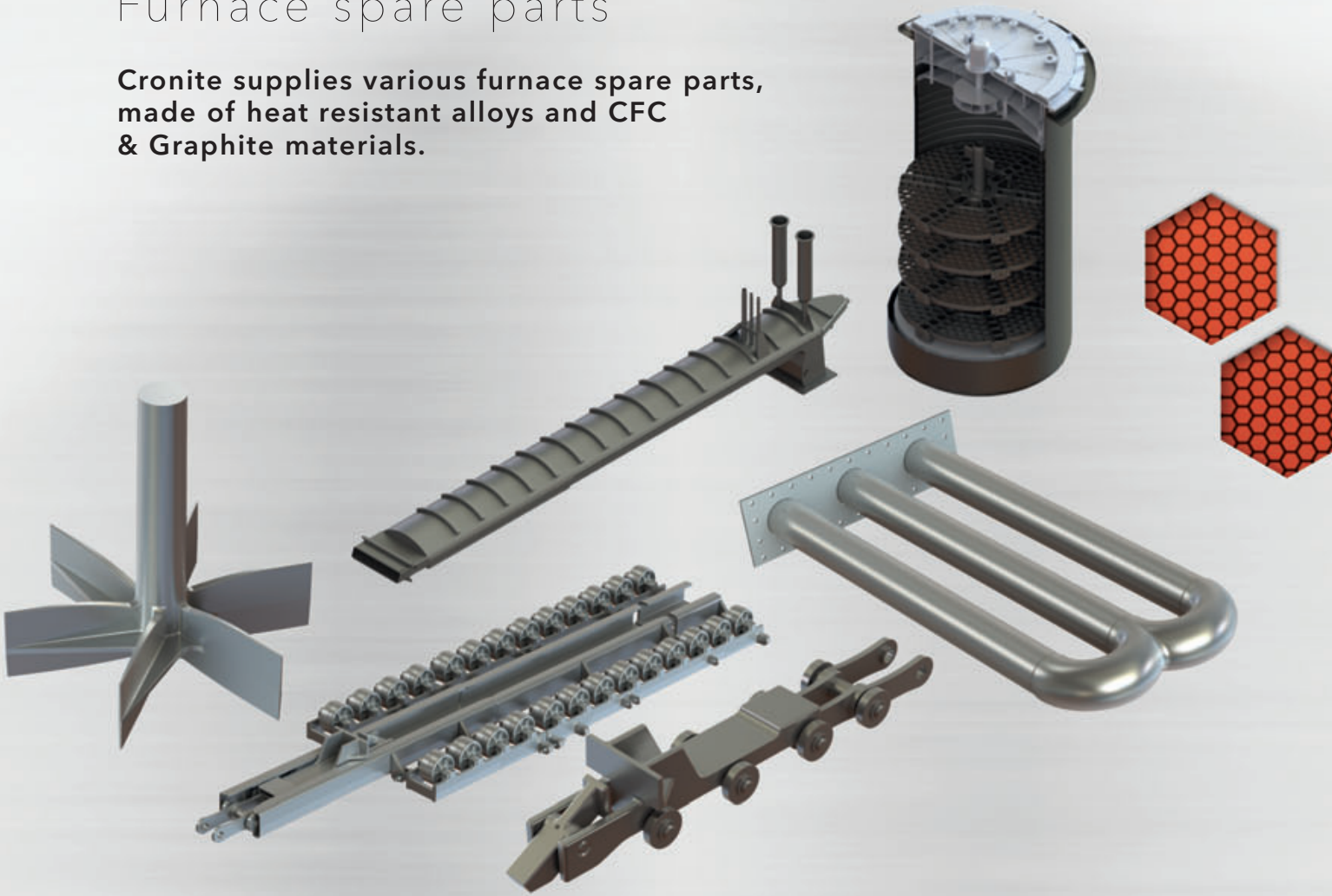
Traditional Column
Current technology



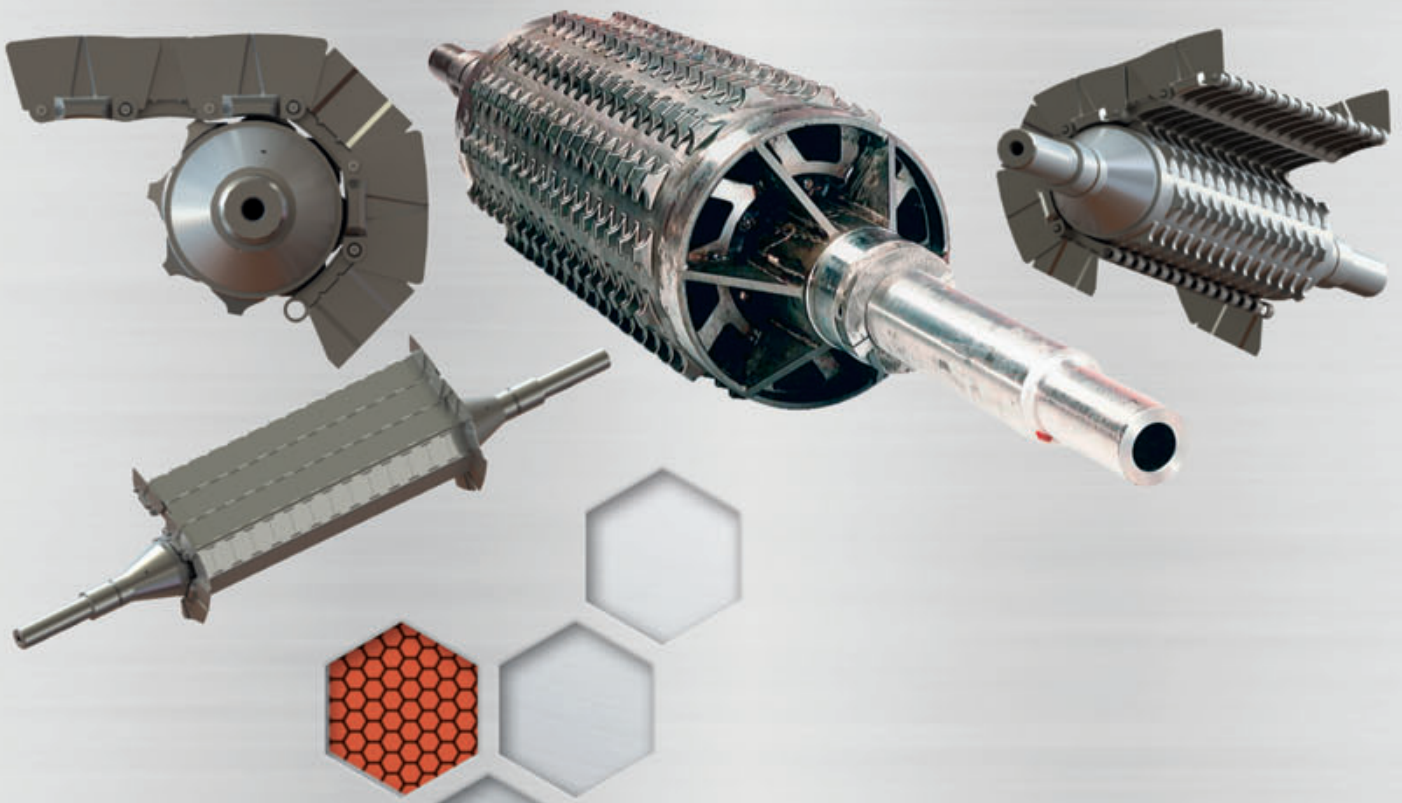
Single Piece Column
New technology

Furnace spare parts

Cronite supplies various furnace spare parts, made of heat resistant alloys and CFC & Graphite materials.



Cronite has extensive experience in design and manufacture of link belts.



Making your life easier with Cronite Rental

**To meet your economic demands, we have developed
a rental service for heat treatment fixtures called
Cronite Rental**

We can therefore help you with the investments in new fixturing.
During the period of Cronite Rental we keep the fixtures in good condition
to ensure zero downtime.

The advantages for you are numerous:

- Lower budget allocated to purchase of new fixtures
- Lower maintenance costs
- Optimization of the amount of equipment in use
- Better cash flow



Optimize your spending

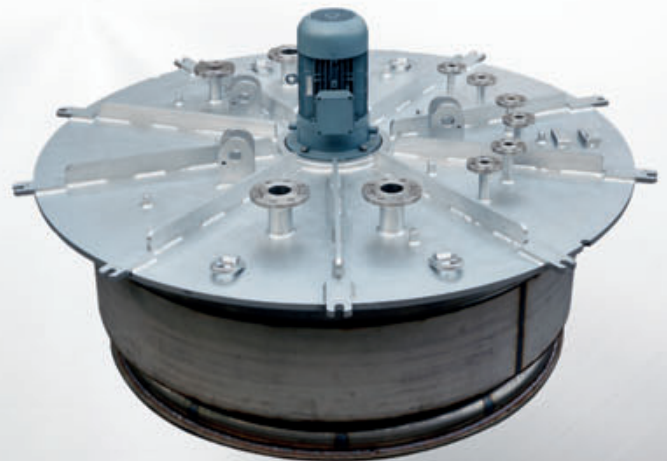
Cronite offers the repair and maintenance of the heat treatment fixtures and
furnace spare parts like retorts to extend the life time & reduce your costs.

Heat treatment fixtures - which have reached the end of their life time -
can be replaced at a favourable price by considering the scrap value.

Retort Cover before repair



Retort Cover after repair



Optimize your budget

Having foundries located in 3 continents Cronite
can offer you attractive prices for your scrap.





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