Refractories for Induction Furnaces
Capital Refractories Limited is one of the largest independent refractory companies in the UK and yet we are a privately owned, family-run business. We have been working with the metallurgical and thermal process industries for some 50 years and have the majority of UK business for induction furnace linings melting steel.

We offer a full manufacture, supply and installation service for both induction furnace and ladle linings which we produce in the UK, USA and China.

Our products are suitable for:
- All steel grades including high temperature alloys (stainless, duplex etc)
- Iron and its alloys (Ni-hard, Ni-resist etc)
- Copper and copper alloys
- Aluminium and aluminium alloys

**Hot Face Dry Rammed Lining:**
We manufacture and supply an extensive range of linings including spinel and mullite forming products. These have been specifically developed for melting a variety of metals and some allow for a mixed melting programme.

**Topping and Spout Material**
These are chemically bonded high strength materials that are compatible with our dry linings.

**Coil Screed**
High grade fine hydraulic cements are available.

**Slip Plane Material:**
We can offer mica in sheet or roll form.

**Repair Materials**
Numerous fine grained chemically bonded products are available for lining repairs and joint seals.

**Castable Materials for Lids and Bases**
Hydraulically bonded multipurpose castables.

All of the above materials have been developed through extensive testing. There are a wide range of products available in order to best meet with the specific application. Our engineers will be able to advise you on which material is appropriate for your application.
Induction Furnace Technology

Common Products for All Induction Furnaces

Capital offer specific products for lining, toppings and repair for each alloy type (which are summarised on the following pages), but many products are common to most conditions and some of these are summarised here.

### Coil Screed

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silkote 90</td>
<td>Hydraulically bonded, low-silica screed that allows for a slightly higher surface temperature than Capscreed. High strength makes it suitable for push out furnaces.</td>
</tr>
<tr>
<td>Capscreed</td>
<td>Hydraulically bonded, high alumina induction furnace coil screed. High strength makes it suitable for push out furnaces.</td>
</tr>
</tbody>
</table>

### Castable for Lids, Bases & Blocks

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silcast 1600CM</td>
<td>Aluminosilicate multipurpose castable.</td>
</tr>
<tr>
<td>Silcast 65</td>
<td>Aluminosilicate high strength castable.</td>
</tr>
</tbody>
</table>

Please see pages 8-11 for detailed analysis of the materials listed on this page.
## Hot Face Dry Rammed Lining

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coral CXL</td>
<td>General purpose lining with a wide melting temperature range.</td>
</tr>
<tr>
<td>Coral HB</td>
<td>High duty, hard wearing lining suitable for most melting applications.</td>
</tr>
<tr>
<td>Coral SXL</td>
<td>High duty for elevated temperatures.</td>
</tr>
<tr>
<td>Coral Vac</td>
<td>High duty for high temperatures</td>
</tr>
<tr>
<td>Coral SMC</td>
<td>Incorporates complex chromes for improved slag resistance.</td>
</tr>
<tr>
<td>Coral 85</td>
<td>High performance lining for large furnaces with high temperatures.</td>
</tr>
<tr>
<td>Coral GR9</td>
<td>High performance lining for general higher temperature steels.</td>
</tr>
<tr>
<td>Coral NGB</td>
<td>High performance lining for erosion resistance</td>
</tr>
<tr>
<td>Coral V40</td>
<td>Magnesia rich lining designed for vacuum melting.</td>
</tr>
<tr>
<td>Cormag 90</td>
<td>Basic ramming mix for use in continuous melting applications.</td>
</tr>
<tr>
<td>CRL 75</td>
<td>Mullite forming material suitable for mixed melting.</td>
</tr>
<tr>
<td>WS90 Rammable</td>
<td>High alumina phosphate bonded rammable for special steels</td>
</tr>
</tbody>
</table>

## Topping & Spout Material

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almacap</td>
<td>Silicate bonded high alumina hard wearing rammable.</td>
</tr>
<tr>
<td>Capram 70</td>
<td>Phosphate bonded high alumina plastic topping and repair mix</td>
</tr>
<tr>
<td>Toppatch</td>
<td>Silicate bonded aluminosilicate rammable.</td>
</tr>
<tr>
<td>Coral BDT</td>
<td>Dry topping for Coral linings</td>
</tr>
<tr>
<td>Coral V40DT</td>
<td>Dry topping for Coral V40.</td>
</tr>
<tr>
<td>Mullite BDT</td>
<td>Dry topping for CRL products</td>
</tr>
</tbody>
</table>

## Repair Materials

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D10 Plaster</td>
<td>Aluminosilicate patching plaster.</td>
</tr>
<tr>
<td>D10F</td>
<td>A finer version of D10 Plaster.</td>
</tr>
<tr>
<td>D11</td>
<td>High grade high alumina patching material.</td>
</tr>
<tr>
<td>Capram 90F</td>
<td>High grade high alumina patching and topping material.</td>
</tr>
</tbody>
</table>
### Materials for Melting Iron and its Alloys

#### Hot Face Dry Rammed Lining

- **CRL65**: Mullite forming material with excellent resistance to chemical, thermal and mechanical damage. Suitable for mixed melting.
- **CRL75**: Higher performance mullite forming material with excellent resistance to chemical, thermal and mechanical damage. Suitable for mixed melting.
- **Silica 60 grade**: Acid lining based on natural quartz with a 0.6% B$_2$O$_3$ addition.
- **Silica 80 grade**: Acid lining based on natural quartz with a 0.8% B$_2$O$_3$ chemical binder.

#### Topping & Spout Material

- **Capram 60**: Phosphate bonded high alumina zircon enriched plastic repair mix.
- **Capram 85**: Silicate bonded aluminosilicate topping mix.
- **Mullite BDT**: Dry topping for CRL linings.

#### Repair Materials

- **D10 Plaster**: Aluminosilicate patching plaster.
- **D10F**: A finer version of D10 Plaster.
- **D11**: High grade, high alumina patching material.

Please see pages 8-11 for detailed analysis of the materials listed on this page.
Materials for Melting Copper and its Alloys

Hot Face Dry Rammed Lining

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRL65</td>
<td>Mullite forming material with excellent resistance to chemical, thermal and mechanical damage.</td>
</tr>
<tr>
<td>C65 RFL</td>
<td>As CRL 65 but with a low temperature bonding system for fritting with a removable former.</td>
</tr>
<tr>
<td>CRL MCR</td>
<td>Mullite based lining with excellent resistance to alkali attack.</td>
</tr>
<tr>
<td>Silica 1 Grade</td>
<td>Acid lining based on natural quartz with a 1% boric acid addition.</td>
</tr>
<tr>
<td>Silica 17 Grade</td>
<td>Acid lining based on natural quartz with a 1.7% boric acid addition.</td>
</tr>
</tbody>
</table>

Topping & Spout Material

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capram 60</td>
<td>Phosphate bonded high alumina zircon enriched plastic repair mix.</td>
</tr>
<tr>
<td>Capram 85</td>
<td>Silicate bonded aluminosilicate topping mix.</td>
</tr>
<tr>
<td>Mullite BDT</td>
<td>Dry topping for CRL products</td>
</tr>
</tbody>
</table>

Repair Materials

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D10 Plaster</td>
<td>Aluminosilicate patching plaster.</td>
</tr>
<tr>
<td>D10F</td>
<td>A finer version of D10 Plaster.</td>
</tr>
<tr>
<td>D11</td>
<td>High grade high alumina patching material.</td>
</tr>
<tr>
<td>Capram 90F</td>
<td>High grade high alumina patching and topping material.</td>
</tr>
</tbody>
</table>

Please see pages 8-11 for detailed analysis of the materials listed on this page.
# Induction Furnace Technology

## Materials for Melting Aluminium and its Alloys

### Hot Face Dry Rammed Lining:

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRL65</td>
<td>Mullite forming material with excellent resistance to chemical, thermal and mechanical damage. Suitable for high temperature aluminium alloys.</td>
</tr>
<tr>
<td>C65 RFL</td>
<td>As CRL 65 but with a low temperature bonding system for fritting with a removable former.</td>
</tr>
<tr>
<td>C65 LS</td>
<td>Aluminosilicate mix containing low temperature bonding systems suitable for a removable former sintering. Suitable for standard grades of aluminium.</td>
</tr>
<tr>
<td>CRL MAR</td>
<td>Mullite based mix for general melting of aluminium.</td>
</tr>
<tr>
<td>CRL MASR</td>
<td>Silicon carbide enriched mullite based mix for superior non-wetting and abrasion resistance.</td>
</tr>
<tr>
<td>Corvibe 80</td>
<td>High alumina, silicon carbide enriched mix with low temperature bonding system for removable former sintering. Suitable for standard grade alumina.</td>
</tr>
</tbody>
</table>

### Topping & Spout Material:

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capram 60</td>
<td>Phosphate bonded high alumina, zircon enriched plastic repair mix.</td>
</tr>
<tr>
<td>Capram 85</td>
<td>Silicate bonded aluminosilicate topping mix.</td>
</tr>
<tr>
<td>Mullite BDT</td>
<td>Dry topping for CRL linings.</td>
</tr>
</tbody>
</table>

### Repair Materials

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D10 Plaster</td>
<td>Aluminosilicate patching plaster.</td>
</tr>
<tr>
<td>D10F</td>
<td>A finer version of the D10 Plaster</td>
</tr>
<tr>
<td>D11</td>
<td>High grade, high alumina patching material.</td>
</tr>
<tr>
<td>P12</td>
<td>High grade, high alumina patching material with non-wetting additives.</td>
</tr>
</tbody>
</table>

### Washcoat:

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D10 Zircon Washcoat</td>
<td>Zircon based paint</td>
</tr>
</tbody>
</table>
### Dry Vibration Linings

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Principle Raw Materials</th>
<th>Bonding</th>
<th>Chemical Analysis / %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Al₂O₃  SiO₂  MgO  CaO  Fe₂O₃  Other</td>
</tr>
<tr>
<td>Coral CXL</td>
<td>White fused alumina</td>
<td>Ceramic</td>
<td>85  0.2  14  0.3  0.1  -</td>
</tr>
<tr>
<td>Coral HB</td>
<td>White fused alumina</td>
<td>Ceramic</td>
<td>85  0.5  13  0.1  0.4  -</td>
</tr>
<tr>
<td>Coral SXL</td>
<td>White fused alumina</td>
<td>Ceramic</td>
<td>86  0.2  13  0.3  0.1  -</td>
</tr>
<tr>
<td>Coral Vac</td>
<td>White fused alumina</td>
<td>Ceramic</td>
<td>86  0.2  14  0.2  0.1  -</td>
</tr>
<tr>
<td>Coral SMC</td>
<td>White fused alumina</td>
<td>Ceramic</td>
<td>89  0.2  8   0.5  1.1 Cr₂O₃  1.5</td>
</tr>
<tr>
<td>Coral FG</td>
<td>Brown fused alumina</td>
<td>Ceramic</td>
<td>82  0.9  14  0.5  0.2  -</td>
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<tr>
<td>Coral 85</td>
<td>White fused alumina</td>
<td>Ceramic</td>
<td>86  0.1  13  0.2  0.1  -</td>
</tr>
<tr>
<td>Coral GR8</td>
<td>White fused alumina</td>
<td>Ceramic</td>
<td>89  0.1  10  0.1  0.1  -</td>
</tr>
<tr>
<td>Coral NGB</td>
<td>White fused alumina</td>
<td>Ceramic</td>
<td>85  0.1  15  0.2  0.1  -</td>
</tr>
<tr>
<td>Coral V40</td>
<td>Fused Magnesia</td>
<td>Ceramic</td>
<td>38  2.2  58  1.0  0.1  -</td>
</tr>
<tr>
<td>Cormag 90</td>
<td>Dead Burnt Magnesia</td>
<td>Ceramic</td>
<td>10  1.5  86  1.9  0.5  -</td>
</tr>
<tr>
<td>CRL65</td>
<td>Andalusite</td>
<td>Ceramic</td>
<td>68  29 &lt;0.5 &lt;0.5  1.0  -</td>
</tr>
<tr>
<td>CRL75</td>
<td>Andalusite</td>
<td>Ceramic</td>
<td>74  23 &lt;0.5 &lt;0.5  0.6  -</td>
</tr>
<tr>
<td>C65 RFL</td>
<td>Andalusite</td>
<td>Chemical</td>
<td>68  29 &lt;0.5 &lt;0.5  0.8  -</td>
</tr>
<tr>
<td>C65 LS</td>
<td>Andalusite</td>
<td>Chemical</td>
<td>59  36 &lt;0.5 &lt;0.5  0.8  -</td>
</tr>
<tr>
<td>Corvibe 80</td>
<td>Brown fused alumina</td>
<td>Chemical</td>
<td>81  2.5 &lt;0.5 &lt;0.5  0.4 SiC  10</td>
</tr>
<tr>
<td>Silica 60 grade</td>
<td>Quartzite</td>
<td>Ceramic</td>
<td>0.6  99   -   &lt;0.5  0.2 B₂O₃  0.6</td>
</tr>
<tr>
<td>Silica 80 grade</td>
<td>Quartzite</td>
<td>Ceramic</td>
<td>0.6  99   -   &lt;0.5  0.2 B₂O₃  0.8</td>
</tr>
<tr>
<td>Silica 1 Grade</td>
<td>Quartzite</td>
<td>Ceramic</td>
<td>0.6  99   -   &lt;0.5  0.2 H₂BO₃ 1.0</td>
</tr>
<tr>
<td>Silica 17 Grade</td>
<td>Quartzite</td>
<td>Ceramic</td>
<td>99   -   &lt;0.5  0.2 H₂BO₃ 1.7</td>
</tr>
<tr>
<td>Max. Grain Size / mm</td>
<td>Bulk Density / kg m⁻³</td>
<td>Max. Service Temp / °C</td>
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<td>------------------------</td>
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<td>1680</td>
<td>1720</td>
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<td>2850</td>
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<td>1750</td>
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<td>1700</td>
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<td>2880</td>
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<td>1650</td>
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<td>2800</td>
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<td>1550</td>
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<td>4</td>
<td>2100</td>
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<tr>
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<td>1580</td>
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</table>
## Dense Refractory Castables

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Principle Raw Materials</th>
<th>Max. Service Temp / °C</th>
<th>Max. Grain Size / mm</th>
<th>Chemical Analysis / %</th>
<th>Max Density (dried 110°C) / kg m^-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silcast 1600CM</td>
<td>Chamotte</td>
<td>1600</td>
<td>10</td>
<td>Al₂O₃ SiO₂ Fe₂O₃ CaO Other</td>
<td></td>
</tr>
<tr>
<td>Silcast 65</td>
<td>Mullite</td>
<td>1700</td>
<td>8</td>
<td>62 32 0.9 3.0 -</td>
<td></td>
</tr>
<tr>
<td>Capscreed</td>
<td>Brown fused alumina</td>
<td>1700</td>
<td>1</td>
<td>91 3.1 0.3 3.6 -</td>
<td></td>
</tr>
<tr>
<td>Silkote 90</td>
<td>White fused alumina</td>
<td>1700</td>
<td>1</td>
<td>92 0.3 0.1 7.0 -</td>
<td></td>
</tr>
</tbody>
</table>

A more comprehensive brochure for monolithics is available upon request.

## Wet Rammables, Patching & Miscellaneous

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Principle Raw Materials</th>
<th>Max. Service Temp / °C</th>
<th>Max. Grain Size / mm</th>
<th>Chemical Analysis / %</th>
<th>Bulk Density (dried 110°C) / kg m^-3</th>
<th>Type of Set</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capram 60</td>
<td>Mullite</td>
<td>1650</td>
<td>5</td>
<td>Al₂O₃ SiO₂ Fe₂O₃ ZrO₂ Na₂O P₂O₅</td>
<td>2500 Chemical</td>
<td></td>
</tr>
<tr>
<td>Capram 66</td>
<td>Mullite</td>
<td>1650</td>
<td>5</td>
<td>64 30 0.9 - - 3.6</td>
<td>2500 Chemical</td>
<td></td>
</tr>
<tr>
<td>Capram 70</td>
<td>Mullite</td>
<td>1700</td>
<td>5</td>
<td>68 25 0.9 - - 3.3</td>
<td>2700 Chemical</td>
<td></td>
</tr>
<tr>
<td>Capram 90F</td>
<td>WFA</td>
<td>1800</td>
<td>3</td>
<td>89 6.6 0.3 - - 5.0</td>
<td>2900 Chemical</td>
<td></td>
</tr>
<tr>
<td>Capram 85</td>
<td>Bauxite</td>
<td>1650</td>
<td>5</td>
<td>76 18 1.0 - 1.3</td>
<td>2550 Air</td>
<td></td>
</tr>
<tr>
<td>Toppatch</td>
<td>Bauxite</td>
<td>1650</td>
<td>5</td>
<td>73 17 1.5 - 2.1</td>
<td>2500 Air</td>
<td></td>
</tr>
<tr>
<td>Almacap</td>
<td>Bauxite</td>
<td>1700</td>
<td>5</td>
<td>74 17 1.5 - 2.0</td>
<td>2550 Air</td>
<td></td>
</tr>
<tr>
<td>WS 90 Rammable</td>
<td>WFA</td>
<td>1800</td>
<td>5</td>
<td>92 1.7 0.2 - - 5.0</td>
<td>3350 Chemical</td>
<td></td>
</tr>
<tr>
<td>WS 90ZP Rammable</td>
<td>WFA</td>
<td>1750</td>
<td>5</td>
<td>85 13 0.7 - 2.0</td>
<td>3250 Air</td>
<td></td>
</tr>
<tr>
<td>D10</td>
<td>Bauxite</td>
<td>1700</td>
<td>3</td>
<td>77 13 1.5 - - 5.0</td>
<td>2550 Chemical</td>
<td></td>
</tr>
<tr>
<td>D10f</td>
<td>Bauxite</td>
<td>1700</td>
<td>1</td>
<td>77 13 1.5 - - 5.0</td>
<td>2550 Chemical</td>
<td></td>
</tr>
<tr>
<td>D11</td>
<td>WFA</td>
<td>1800</td>
<td>1</td>
<td>94 2.0 0.1 - - 4.3</td>
<td>2750 Chemical</td>
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<td>3200 Chemical</td>
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### Induction Furnace Technology

<table>
<thead>
<tr>
<th>Material</th>
<th>Permanent Linear Change / %</th>
<th>Cold Crushing Strength / MPa</th>
<th>Bulk Density / kg m⁻³</th>
<th>Thermal Conductivity, mean 800°C / W m⁻³ K⁻¹</th>
<th>Approx Water Addition litres / 25 kg</th>
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<tbody>
<tr>
<td></td>
<td>Fired at 1000°C</td>
<td>Fired at Service Temp</td>
<td>Dried 110°C</td>
<td>Fired at 1000°C</td>
<td>Fired at 110°C</td>
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<td>Silcast 1600CM</td>
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<td>+1.1</td>
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<td>102</td>
<td>91</td>
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<tr>
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<td>-0.3</td>
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<td>69</td>
<td>63</td>
<td>26</td>
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</tbody>
</table>

* Fired to 1600°C
Gas Diffusers

For many years our area of specialisation has been the development, manufacture and supply of induction furnace linings. We have used this knowledge to develop additional materials, and have established gas diffusers suitable for integration into one of our furnace linings.

Benefits of gas diffusers:
- Reduction of inclusions and improved quality.
- Reduction in volume of rejects.
- Improved recovery of additions.
- Improved melt homogeneity.
- Cost-effective over time compared with drip-feed systems.
- Low maintenance.
- Improved melt rate.

The gas diffuser is fitted to the bottom and under the lining - the gas diffuses through the lining (coloured yellow in the illustration). In some applications it may be necessary to use a more permeable lining immediately above the diffuser. For this we supply Coral GDR which is coloured to facilitate installation.

For the safe and effective operation of any gas diffuser, we **thoroughly recommend** that one of our flow control systems is installed to regulate and control the pressure and flow of gas delivered from the source to the diffuser.

This system should be installed and operated in line with our written instructions, and the first installation should be supervised by our experts using one of our linings.
Coils and Cables is a division of Capital Refractories that complements our lining products. This division specialises in the supply and repair of induction furnace coils and water-cooled power cables, with ancillary items also available.

We appreciate how disruptive a damaged coil can be to production and we therefore work with customers to ensure any downtime is kept to a minimum.

We can repair damage incurred under many different circumstances including:

- Water leakage
- Mechanical damage
- Metal penetration
- Earth leakage problems

We are also able to repair or replace coil posts and re-screed the coil.

Where possible we will repair at your site and around shift patterns. This is possible on jobs such as:

- Local damage to a small area of the coil
- Replacing a coil post
- Repair to the insulation

If the coil does need to be removed to give clear access for the repair then, wherever possible, we will carry it out in a clean area of your works. This is in keeping with our strong policy of minimising your downtime. Should your coil need a full refurbishment, we can arrange to perform it at the expertly equipped West Midlands site.

Cables can be manufactured or repaired, and any length on all major furnace types can be catered for. Handcrafted terminations and a wide choice of sleeving materials are available.

A specific Coils and Cables brochure is available upon request.
We recommend that an individual sintering schedule is developed for each furnace—we can advise you on this. The type and size of furnace, metals melted and practices at each foundry vary greatly and so the information within this brochure should be used as a guide only.

**Spinel forming linings**
Steel-melting furnaces should be filled with a dense charge and should be typically heated at 200-300°C per hour. The height of the bath should be raised to slightly above the lining/joint line and kept at about 1680°C for 1 hour.

**Liquid Sinter**
In many cases a sintering can be carried out by pouring hot metal into the induction furnace rather than slowly bringing the temperature up. This is only possible where there is a convenient nearby supply of hot metal. For non-ferrous melting the former can be removed, however for ferrous melting the former should be left in place.

The furnace should be loaded with dense flat scrap up to 20% of the total furnace capacity. This helps to reduce the chance of erosion in the base of the furnace during metal pouring. The former temperature should be raised to 700-800°C (cherry red colour) over a 1-2 hour period. This reduces the thermal shock on the former when the metal is poured in. The temperature should not be raised any higher as this could increase the risk of deforming the former or splitting its weld.

Metal should be poured in steadily and as quickly as possible without creating too much turbulence. Typically this would be of the order of 1 tonne per minute. The minimum temperature of the metal from the donor furnace should be about 1650°C for steel or normal fritting temperature for other alloys. The remaining schedule would be identical to that of a melt-out former.
**Induction Furnace Technology**

**Guidance on Sintering an Induction Furnace Lining**

**Basic linings**
The fritting of basic linings (generally >50% MgO) is broadly similar to spinel forming linings but the sinter temperature is generally approximately 1650-1670°C.

**Acid linings**
Acid linings should be ramped at 200-400°C per hour to a temperature 50°C above the normal maximum operating temperature and held for a minimum of 30 minutes.

**Aluminosilicate (mullite-forming) linings**
Aluminosilicate linings with a melt-out former should be filled with a dense iron or copper alloy charge and ramped at 200-400°C per hour to a temperature 100°C above the normal maximum operating temperature and held for a minimum of 60 minutes.

When using a removable former the initial heat up should be performed either inductively with a removable susceptor or a thicker former, or by a gas burner to heat the former at 80-100°C per hour up to 700-800°C. Temperatures above this can lead to deformation of the former. The furnace should then be cooled to allow the former to be safely removed and then the furnace should be gently filled with dense scrap before ramping at 200-300°C per hour to the operating temperature. Covering the surface of the former with mica or cardboard will facilitate the removal of formers with a shallow taper.

---

**Typical C65LS Sinter for Aluminium**

![Typical C65LS Sinter for Aluminium](image)
Capital Refractories manufacture, supply and install an extensive range of refractory products for the foundry industry. We have developed a wide range of dry rammed induction furnace linings for melting steels, high temperature alloys, irons, copper alloys and aluminium alloys.

**Installation**
Many refractory problems, including unusual wear patterns and metal penetration, are due to poor installation techniques. At Capital we pride ourselves on our technical expertise, gained through 50 years of experience. We are able to advise, not only on the type of refractory material required for chemical and mechanical considerations, but also on the method of installation.

**Operation**
The life of a refractory lining can be severely affected by operating practices. Capital engineers are at your service to discuss how you might be able to extend the life of your furnace lining.

**Repair**
A well maintained refractory lining will be safer and last longer. We can advise on repair materials and techniques.
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For supply and additional information about Capital Refractories or CIC, or if your country is not listed, please contact Capital’s UK Head Office, see back of brochure for details.

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