

Sigma

Introduction & Application

Manufactured using the extremely advanced Isostatic Pressing Technology, these are highly engineered Clay graphite range of crucibles and accessories. Isostatic Pressing ensures homogeneous density of material along the crucible body imparting superior erosion resistance & high thermal conductivity.

Sigma crucibles are particularly designed for gas/oil fired furnaces used in copper & brass applications. Sigma crucible application can be extended to aluminium melting & holding as well.

Typical Metal Casting Temperature

700°C - 1300°C

Performance Characteristics

- High density homogeneous structure which imparts excellent thermal conductivity
- Inherent high mechanical strength allowing for the production of crucibles of large dimensions
- Excellent oxidation resistance allowing for application in very corrosive environments
- High thermal shock resistance
- For specific crucible requirement such as holding at very low temperatures for zinc distillation or for induction furnaces there are specially modified variants available

Identification

These crucibles are identified by their gray color.



Please turn over for detailed range of shapes & sizes.

We also have specifically designed Sigma range of Crucibles for their applications in induction & aluminum holding furnaces.

Crucibles used in induction furnaces are energy efficient replacement of the ram lining.

These crucibles can be used for melting of copper & its alloys including brass as well as for precious metals.

In addition, we have proprietary internally & externally glazed crucibles for low oxidising temperature applications like aluminum melting & holding.

Sigma HT

Introduction & Application

Sigma HT is a premium quality, Clay bonded, Silicon Carbide - Graphite range of crucibles offered by Morgan. These are manufactured with the world acclaimed Isostatic Pressing Technology.

These are specially developed for high temperature application like zinc distillation & copper alloy melting. They also find application in cast iron melting in small sized crucibles in coke, oil & gas fired furnaces.

Typical Metal Casting Temperature

900°C - 1400°C

Performance Characteristics

- Highest erosion resistance at elevated temperatures and hence better product life
- Faster melting through consistently high thermal conductivity, resulting in better energy efficiency
- Non wettability due to higher product density & special quality graphite
- Consistent performance & repeatability
- High mechanical strength
- Good resistance to chemical attack

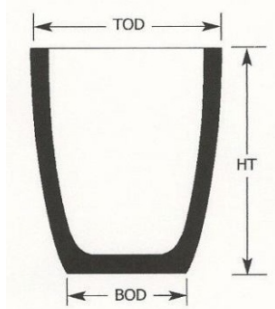
Identification

Sigma HT comes in turquoise blue colour and the models are suffixed with letters 'HT'

Sigma

Red Diamond "Sigma" Al Shape (small crucibles)

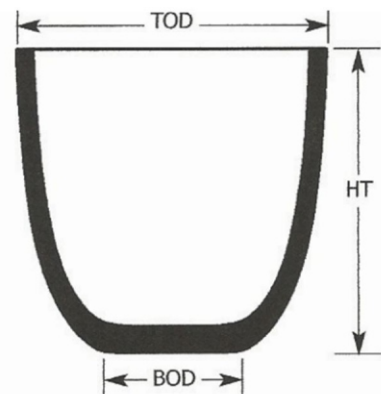
TYPE SIZE	PART DESCRIPTION	HT mm	TOD mm	BOD mm	BRIMFUL CAPACITY Water Litres
Al 0.5	A&0074H0080	80	74	50	0.160
Al 1	A&0092H0095	95	92	65	0.280
Al 1.4	A&0094H0110	110	94	54	0.255
Al 2	A&0110H0120	120	110	75	0.550
Al 3	A&0120H0135	135	120	80	0.740
Al 3.1	A&0110H0130	130	110	70	0.534
Al 4	A&0140H0155	155	140	100	1.260
Al 4.1	A&0115H0140	140	115	75	0.655
Al 4.2	A&0115H0141	141	115	75	0.596
Al 5	A&0140H0165	165	140	100	1.370
Al 5.1	A&0125H0150	150	125	85	0.859
Al 5.2	A&0127H0155	155	127	87	0.937
Al 6	A&0140H0172	175	140	100	1.480
Al 6.1	A&0106H0165	165	106	90	0.986
Al 6.2	A&0130H0165	165	130	90	1.163
Al 8	A&0155H0180	180	155	105	1.780
Al 10	A&0175H0200	200	175	120	2.368
Al 10.1	A&0162H0205	205	162	115	1.866



TYPE SIZE	PART DESCRIPTION	HT mm	TOD mm	BOD mm	BRIMFUL CAPACITY Water Litres
Al 12	A&0175H0210	210	175	120	2.526
Al 14	A&0175H0225	225	175	120	2.764
Al 15	A&0200H0200	200	200	120	3.340
Al 16	A&0200H0230	230	200	120	3.850
Al 18	A&0215H0250	250	215	130	4.360
Al 20	A&0230H0265	265	230	140	5.430
Al 25	A&0230H0280	280	230	140	5.920
Al 30	A&0255H0280	280	255	165	7.540
Al 32	A&0245H0340	340	245	175	7.750
Al 32(S)	A&0245H0325	325	245	175	7.460
Al 34	A&0245H0360	360	245	175	8.304
Al 35	A&0268H0300	300	268	185	8.630
Al 40	A&0268H0315	315	268	185	9.190
Al 41	A&0268H0330	330	268	185	9.481
Al 50	A&0305H0340	330	305	195	10.560
Al 55	A&0305H0350	350	305	195	11.560
Al 60	A&0307H0375	375	307	195	12.080
Al 70	A&0325H0385	385	325	210	14.540
Al 80	A&0325H0410	410	325	210	15.780

Red Diamond "Sigma" BUI Shape

TYPE SIZE	PART DESCRIPTION	HT mm	TOD mm	BOD mm	BRIMFUL CAPACITY Water Litres
BUI 100	BU0523H0402	402	523	305	44.21
BUI 125	BU0524H0451	451	524	305	52.14
BUI 150	BU0525H0492	492	525	305	58.82
BUI 175	BU0526H0551	551	526	305	69.71
BUI 200	BU0527H0600	600	527	305	76.84
BUI 212	BU0590H0550	550	590	360	92.40
BUI 225	BU0590H0630	630	590	360	109.50
BUI 225L	BU0590H0655	655	590	360	111.75
BUI 250	BU0590H0660	660	590	360	115.90
BUI 250L	BU0590H0685	685	590	360	117.60
BUI 300	BU0590H0700	700	590	360	124.40
BUI 300L	BU0590H0725	725	590	360	125.6
BUI 350	BU0590H0800	800	590	360	145.90
BUI 350L	BU0590H0825	825	590	360	146.4

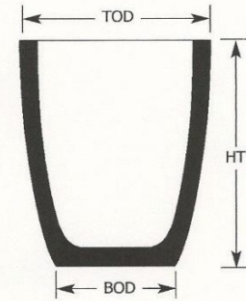


All dimensions are subject to normal manufacturing tolerances. Morgan reserves the right to change specifications at any time

Sigma

Red Diamond “Sigma” Al Shape(Big isostatic crucibles)

TYPE SIZE	PART DESCRIPTION	HT mm	TOD mm	BOD mm	BRIMFUL CAPACITY Water Litres
Al 85	A&0325H0430	430	325	210	16.54
Al 86	A&0330H0410	410	330	227	18.06
Al 90	A&0350H0405	404	350	240	20.64
Al 100	A&0350H0410	410	350	240	20.96
Al 110	A&0350H0420	420	350	240	21.75
Al 120	A&0350H0435	435	350	240	22.97
Al 135	A&0380H0450	450	380	240	25.23
Al 150	A&0380H0475	475	380	240	26.63
Al 151	A&0380H0485	485	380	240	27.19
Al 180	A&0380H0500	500	380	240	28.46
Al 185	A&0430H0500	500	430	260	33.84
Al 195	A&0410H0500	500	410	295	35.58
Al 200	A&0430H0540	540	430	260	37.63
Al 225	A&0430H0565	565	430	260	40.02
Al 250	A&0430H0590	590	430	260	42.41
Al 255	A&0440H0545	545	440	295	48.36
Al 260	A&0430H0610	610	430	260	44.33
Al 280	A&0430H0635	635	430	260	47.60
Al 300	A&0475H0585	585	475	320	55.00
Al 305	A&0440H0540	540	440	315	44.55
Al 325	A&0475H0600	600	475	320	56.65
Al 326	A&0490H0600	600	490	280	59.19
Al 350	A&0475H0640	640	475	320	61.65
Al 351	A&0490H0640	640	490	280	64.26
Al 351.2	A&0490H0670	670	490	280	68.5
Al 355	A&0560H0600	600	560	360	75.83
Al 355L	A&0560H0600	600	560	390	77.00
Al 400	A&0564H0660	660	564	360	86.63
Al 400L	A&0563H0660	660	564	390	84.60
Al 401	A&0540H0660	660	540	315	78.40



TYPE SIZE	PART DESCRIPTION	HT mm	TOD mm	BOD mm	BRIMFUL CAPACITY Water Litres
Al 402	A&0515H0620	620	515	360	72.82
Al 405	A&0540H0680	680	540	315	82.56
Al 406	A&0515H0680	680	515	360	82.30
Al 450	A&0564H0705	705	564	360	95.39
Al 500	A&0564H0720	720	564	360	97.42
Al 500L	A&0567H0720	720	567	390	94.00
Al 501	A&0545H0720	720	545	315	89.06
Al 502	A&0515H0660	660	515	360	78.77
Al 510	A&0545H0740	740	545	315	93.77
Al 525	A&0564H0740	740	564	360	101.28
Al 525L	A&0567H0740	740	567	390	96.50
Al 550	A&0564H0760	760	564	360	104.62
Al 550L	A&0567H0760	760	567	390	99.10
Al 551	A&0545H0760	760	545	315	96.36
Al 552	A&0520H0720	720	520	360	88.08
Al 600	A&0564H0810	810	564	360	113.79
Al 600L	A&0570H0810	810	570	390	110.00
Al 601	A&0548H0810	810	548	315	104.79
Al 602	A&0520H0810	810	520	360	101.61

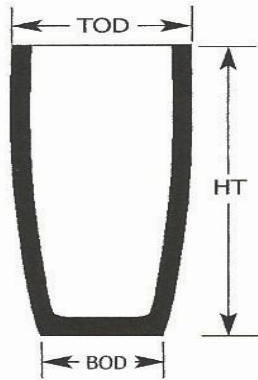
Note

- Crucible Working capacity = 90% of (Water liter capacity x Specific gravity of the metal)

Specific gravity of various metals are as below:

Aluminium = 2.72 Silver = 10.5
 Brass = 8.35 Zinc = 7.12
 Copper = 8.9 Iron = 7.85
 Gold = 19.3

Sigma

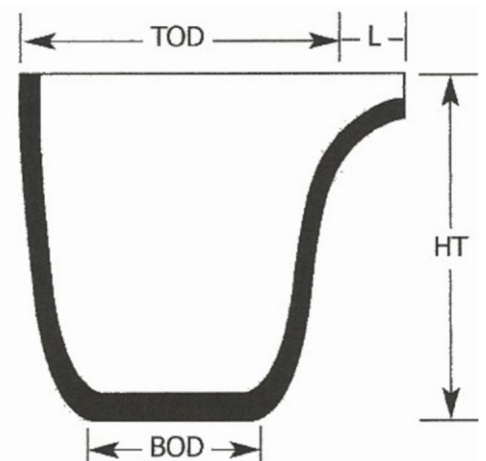


Red Diamond "Sigma" TPI Shape (Without Spout)

TYPE SIZE	PART DESCRIPTION	HT mm	TOD mm	BOD mm	BRIMFUL CAPACITY Water Litres
TPI 4	P&0360H0613	613	360	250	32.02
TPI 5	P&0360H0707	707	360	250	38.02
TPI 6	P&0360H0807	807	360	250	44.03
TPI 8	P&0440H0820	820	440	290	72.46
TPI 9	P&0440H0880	880	440	295	79.23
TPI 10	P&0440H0940	940	440	295	85.47
TPI 904	P&0360H0914	914	360	250	50.65
TPI 905	P&0360H0920	920	360	250	51.03

Red Diamond "Sigma" TPI Shape (With Spout)

TYPE SIZE	PART DESCRIPTION	HT mm	TOD mm	BOD mm	BRIMFUL CAPACITY Water Litres
TPI 150	A&0485H0380 T-LA1300	485	380	240	27.61
TPI 400	P&0360H0613 T-LA1300	613	360	250	32.02
TPI 600	P&0360H0807 T-LA1300	807	360	250	44.03
TPI 260	A&0380H0485 T-LA1300	485	380	260	44.33
TPI 325	A&0430H0672 T-LA1300	672	430	260	50.26
TPI 740	P&0440H0555 T-LA1300	555	440	295	49.06
TPI 983	P&0440H0880 T-LA1300	880	440	295	79.23
TPI 982	P&0440H0820 T-LA1300	820	440	295	72.76
TPI 287	BU0527H0600 T-LA1300	600	527	305	76.48
TPI 12	P&0440H0940 T-LA1300	940	440	295	85.47
TPI 87	A&0520H0740 T-LA1300	740	520	360	90.54
TPI 88	A&0550H0810 T-LA1300	810	550	315	104.79
TPI 89	A&0564H0810 T-LA1300	810	564	360	113.61
TPI 387	BU0590H0630 T-LA1300	630	590	360	109.50
TPI 387L	BU0590H0655 T-LA1300	655	590	360	109.50
TPI 412	BU0590H0800 T-LA1300	800	590	360	145.90
TPI 412L	BU0590H0825 T-LA1D300	825	590	360	145.90



Notes:

- The ISO pressed Sigma range of crucibles can be supplied in Morgan patented special recipes for various applications, e.g. "Z2" & "HT". Also wide range of special Coatings & Glazes can be applied for performance enhancement. Please contact our local sales managers or distributors for further details.
- The Sigma crucibles can also be made in our SIC recipe "Ultramelt", developed for high temperature corrosive applications.
- Our crucibles are recommended for non-ferrous alloys except those containing more than 30% of Nickel, Chromium or Iron.

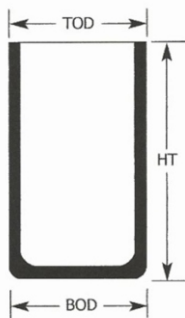
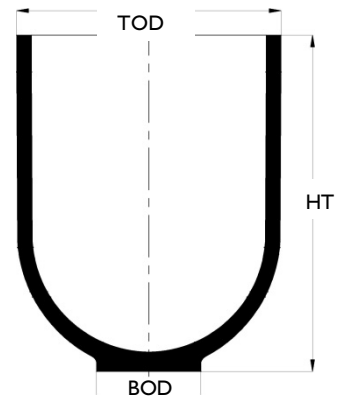
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Crucibles & Stands

Sigma

Red Diamond "Sigma" BNI Shape

TYPE SIZE	PART DESCRIPTION	HT mm	TOD mm	BOD mm	BRIMFUL CAPACITY Water Litres
BNI 700	BNI0785H0905	1000	785	310	312.000
BNI 600	BNI0785H0890	890	785	310	270.000
BNI 500	BNI0785H0750	750	785	310	217.000

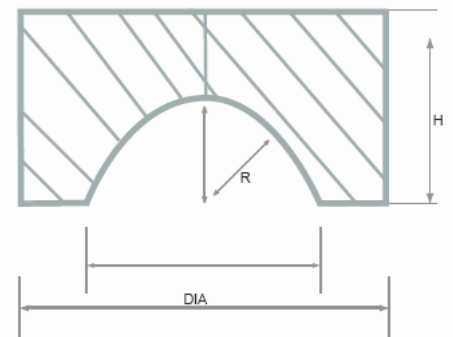


Red Diamond "Sigma" Cylindrical Crucible For introduction furnace application

TYPE SIZE	HT mm	TOD mm	BOD mm	BRIMFUL CAPACITY Water Litres
CY1 400X700	700	400	400	61.23
CY1 400X640	640	400	400	55.62
CY1 390X632	632	390	390	48.96

Red Diamond "Sigma" Stand (Cylinder Type)

TYPE SIZE	HEIGHT mm	TOP DIAMETER mm	BOTTOM DIAMETER mm
STAND AI/1	125	250	250
STAND AI/2	150	250	250
STAND AI/3	200	250	250
STAND AI/4	250	250	250
STAND AI/5	50	250	250
STAND AI/6	75	250	250
STAND BI/1	125	300	300
STAND BI/2	150	300	300
STAND BI/3	200	300	300
STAND BI/4	250	300	300
STAND BI/5	50	300	300
STAND BI/6	75	300	300
STAND CI/1	125	360	360
STAND CI/2	150	360	360
STAND CI/3	200	360	360
STAND CI/4	250	360	360
STAND CI/5	50	360	360
STAND CI/6	75	360	360



All dimensions are subject to normal manufacturing tolerances. Morgan reserves the right to change specifications at any time

Syncarb Z2e²

Introduction & Application

Syncarb Z2e² is a premium quality hybrid ceramic bonded clay graphite crucible with a high silicon carbide and graphite content that is manufactured through an advanced iso-static pressing technology.

Morgan uses a proprietary processing technology that results in a product with a very homogenous and high density structure. This allows the crucible to obtain superior thermal conductivity over its entire operating temperature range, high mechanical strength and erosion resistance along with good shock resistance. These properties translate into a durable and robust crucible with excellent performance characteristics in lower temperature environments. In addition, Syncarb Z2e² also features proprietary internal and external glazes to prevent low temperature oxidation and degradation that occur in aluminum and other low temperature alloys over extended period of life. These crucibles have specifically been designed by intensive research keeping in mind energy cost saving for the customers. The special mix of materials used to manufacture these crucibles can sustain getting oxidised for a long period of time leading to better & highly consistent performance of the crucible.

Syncarb Z2e² is designed to perform exceptionally well to melt and hold aluminum and other low temperature alloys in gas and electric resistance furnaces.

Typical Metal Casting Temperature

400°C - 1000°C

Performance Characteristics

- Extremely high oxidation resistance
- Very good thermal conductivity
- Very good resistance to chemical attack
- High mechanical strength and good erosion resistance
- Good thermal shock resistance
- High consistency in performance & repeatability

Identification

Syncarb Z2e² crucibles are finished with a gray Low Temperature Protection (LTP) coating



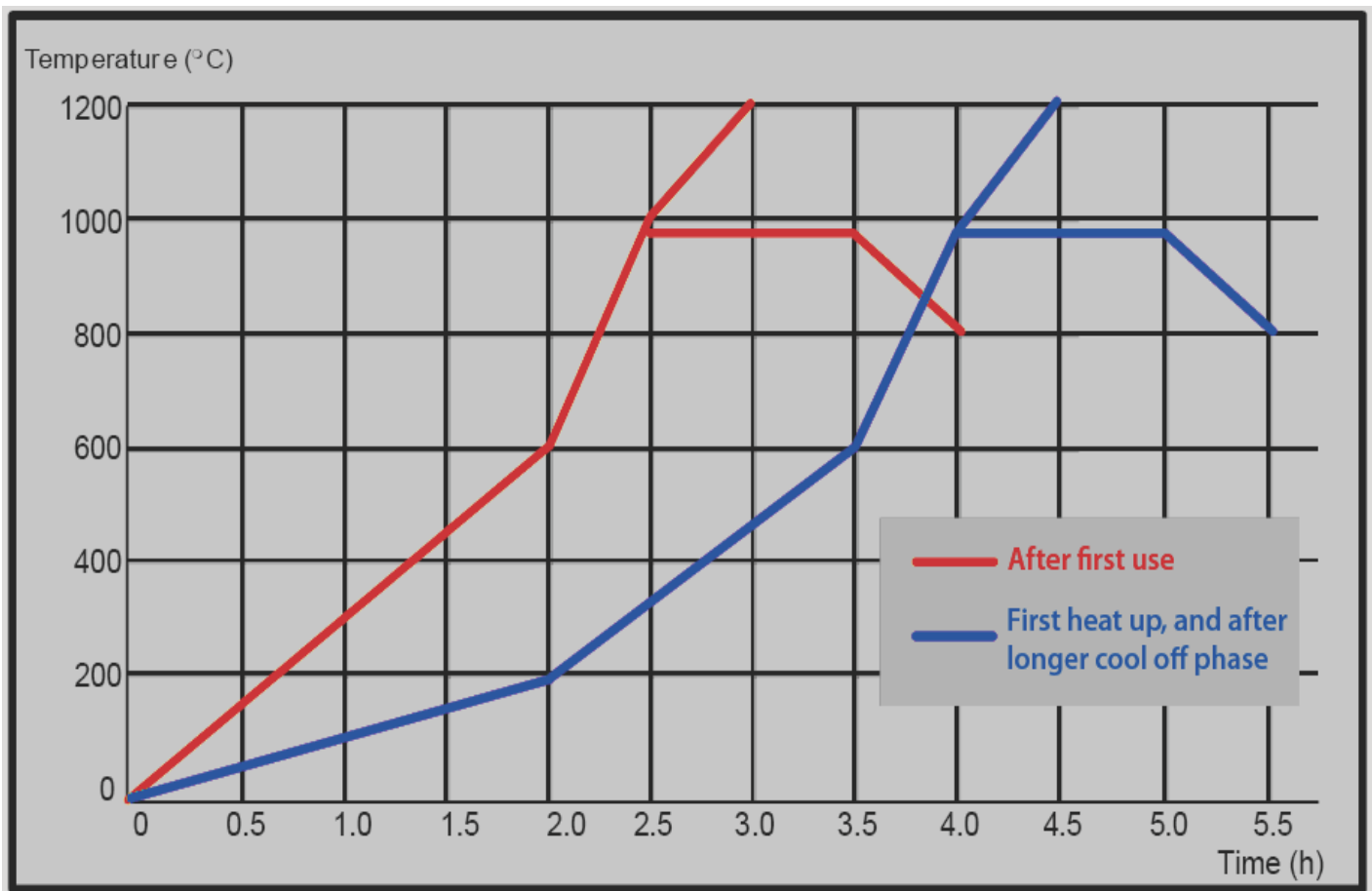
All Sigma crucible sizes and shapes can be made available in our Syncarb Z2e² recipe.

Pre-heating Recommendations

Clay Graphite Crucibles

Pre-heating cycle

- The crucible after installation in the furnace should be heated up slowly to a temperature of 200°C (392°F) over a period of 2 hours, to eliminate any moisture that may be present.
- Next, these crucibles should be heated up to a temperature of 600°C (1112°F) on low power, before the full heating rate is used to reach 950°C (1742°F).
- Clay Graphite crucibles used in a melting operation can be continuously heated up on full power until working temperature is reached. The crucible is then ready to be charged with care.
- When using Clay/Graphite crucibles for holding, the temperature of 950°C (1742°F) should be reached and held for approximately 1 hour. This ensures even melting of the glaze with the additional antioxidation coating, which is essential to achieve the maximum possible crucible life.



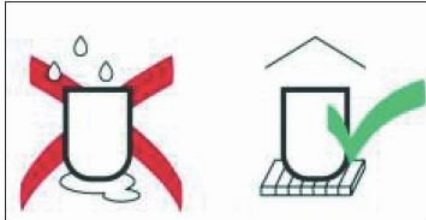
Note:

- For holding crucibles this procedure should be carried out periodically, but always before starting up again after a cool down period. This helps to compensate for the negative effects of low holding temperatures.
- Each time the crucible is heated up after a cooling down phase, it should be heated following the procedure laid down for the first installation. However, the drying time of 2 hours can be omitted. Should the Silicon Carbide or Clay Graphite crucible not be used for a long period, it will be necessary to eliminate moisture, which may have been absorbed from slag. In this case, the crucible should be heated up to a temperature of 200°C (392°F). After reaching this temperature, further heating should be continued as per the first installation.
- The above recommendations refer to the use of new crucibles in existing furnaces. When installing a new Silicon Carbide crucible into a new furnace, the heating and drying instructions of the furnace manufacturer should be followed. If the furnace manufacturer prescribes a longer heating cycle (or curve), this procedure should be carried out without the crucible. It is essential that the crucible is installed in an absolutely dry furnace.

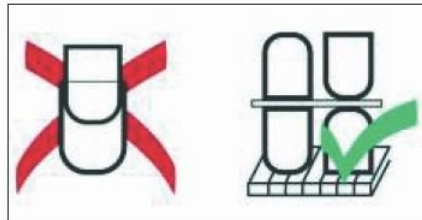
Care & Use

Recommendations for care and use of crucibles

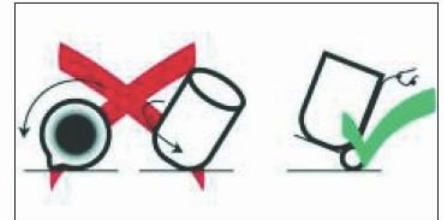
The following practices should be observed in order to achieve the maximum possible crucible life. If any further advice or information is required please contact our sales or technical staff.



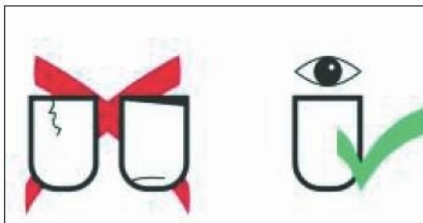
Store crucibles off the floor in a dry, warm place.



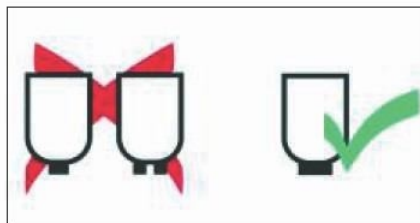
Do not nest one inside another. Separate layers with hardboard.



Do not roll crucibles. Move using a sack truck with padding.



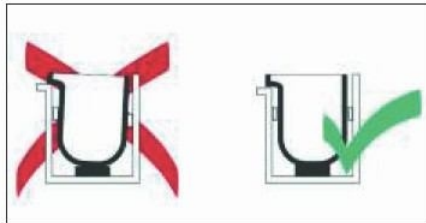
Check thoroughly for cracks or damage before use.



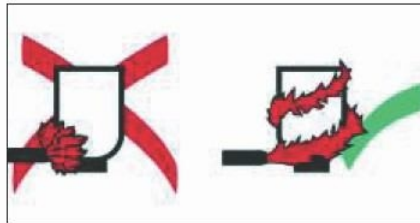
Use the correct crucible stand which must be central and support the whole base.



Allow space for expansion between crucible and furnace lining/cover.



Use correctly positioned grip bricks in tilting furnaces, leaving gaps for expansion. Do not hang crucible on spout.



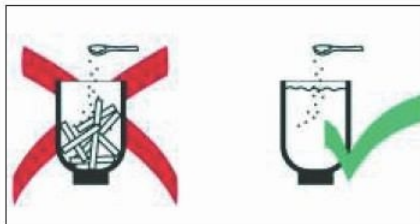
The flame path must be tangential to the crucible.



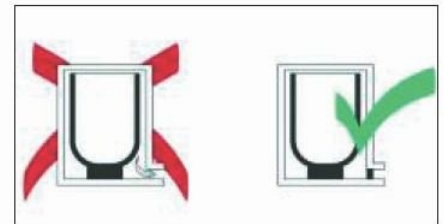
Ingots should be loaded carefully into the crucible using tongs.



First charge with light returns, as a cushion, then add ingots vertically.



Only add flux after the metal is molten.



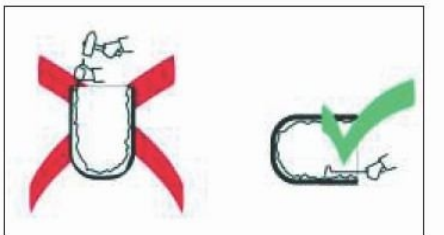
Avoid ingress of cold air by ensuring that the drain hole is sealed.



Lift-out tongs should hold crucible on its lower third and fit evenly on both sides.



The crucible must be emptied before switching off the furnace.



The crucible should be cleaned out carefully every day while still red hot.