

## DESCRIPTION

INDUX is a high quality ceramic bonded clay graphite crucible range manufactured to provide controlled graphite alignment and optimised electrical properties to suit specific frequency ranges for induction melting applications.

## APPLICATIONS

INDUX crucibles are used to provide consistent performance in medium frequency induction furnaces. INDUX crucibles are designed for furnaces operating in the frequency range from 1kHz and upwards with most installations typically operating between 1kHz and 3kHz. INDUX crucibles are typically used to melt copper alloys and precious metals.

## TYPICAL METAL CASTING TEMPERATURE

850 - 1600°C (1562 - 2912°F)

## PERFORMANCE CHARACTERISTICS

- Controlled electrical resistivity
- Good thermal conductivity
- Good resistance to chemical corrosion
- High refractoriness

## IDENTIFICATION

INDUX crucibles are coloured black and utilize the suffix IND to denote the type.

## PATTERN RANGE

INDUX crucibles are available in a range of sizes as A-shapes, F-shapes (bilge), and E-shape cylinders.

Contact MorganMMS for a specific recommendation based on your furnace specification

## QUALITY

INDUX crucibles are manufactured from premium grade raw materials to ISO9000:2000 quality standards.

## CHARGING

Follow the specified preheat procedure. Charge light scrap and returns first in order to form a cushion for heavier material. Use tongs to charge ingots and place large pieces and ingots vertically allowing space for expansion. Only add flux once the metal is molten



## PREHEATING / FIRST USE

**PUSH-UP/DROP COIL FURNACES:** The heat-up procedure is dependant on furnace frequency, coil dimensions, and the resistivity of the metal being melted.

**3 kHz furnaces:** It is recommended where possible to preheat the crucible empty. The furnace should initially be run at 20% of maximum power until the crucible shows signs of red heat. After 30 minutes the power can be increased to 50% of the maximum. Loosely charge the crucible with metal and maintain the power level at 50% until approximately half the crucible contains molten metal. The power should then be increased to maximum.

**1 kHz furnaces:** The power absorption of the empty crucible may be too poor therefore it may be necessary to pre-heat with a charge loosely in place in order to provide supplementary heating by conduction from the metal charge. Run the furnace at 20% of maximum power until the crucible shows signs of red heat. If after 7 hour the crucible shows no evidence of red heat, increase the power to 50% of maximum. Hold at 50% until half the crucible contains molten metal, then increase to maximum power.

**Tilting furnaces:** INDUX crucibles will be prone to thermal shock if the rate of temperature rise of the metal charge is too rapid. It is therefore recommended that where possible the crucible is pre-heated empty from cold using a maximum of 100Kw, or 50% of maximum power, whichever is smaller. Heat the crucible until it becomes bright red. This should take between 20 and 40 minutes. Once the metal charge is added the crucible itself will absorb very little power and will remain at red heat until the metal melts. On subsequent cycles the preheat procedure is unnecessary when the crucible is still red hot.

## FULL LINE OF CRUCIBLES AND ACCESSORIES TO MEET EVERY APPLICATION

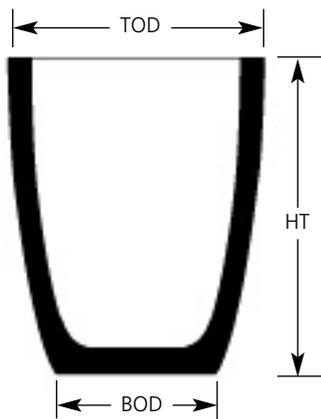


 For additional information on Morgan MMS' products & services or to find a location nearest to you, please visit:

[www.morganmms.com](http://www.morganmms.com)

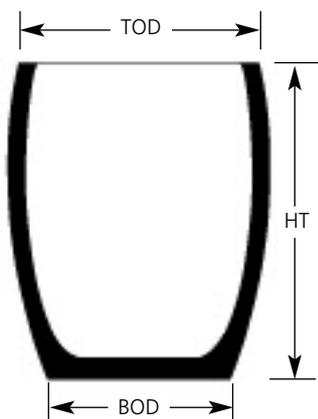
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**Crucibles for Push-up, Lift-coil and Drop-coil Induction Furnaces**

<b>INDUX A-SHAPES (A_IND)</b>	<b>TOD (mm)</b>	<b>HT (mm)</b>	<b>BTM (mm)</b>	<b>Brass Capacity (Kg)</b>	<b>Brimful Capacity (Litres)</b>
AN20IND	197	260	145	30	4.0
AN25IND	210	280	155	36	4.8
AN30IND	232	290	160	43	5.7
AN50IND	248	324	180	60	8.0
AN60IND	280	350	200	77	10
AN70IND	281	350	208	89	12
AN80IND	300	397	210	105	14
AN80IND	307	381	210	103	14
AN90IND	310	397	220	115	15
AN100IND	327	413	216	120	16
AN120IND	338	444	238	140	19
AN150IND	362	452	250	168	22
AN200IND	400	493	280	239	32

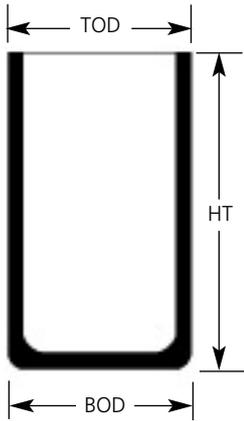


<b>INDUX F-SHAPES (F_IND)</b>	<b>TOD (mm)</b>	<b>HT (mm)</b>	<b>BOD (mm)</b>	<b>BD (mm)</b>	<b>Brass Capacity (Kg)</b>	<b>Brimful Capacity (Litres)</b>
F70IND	286	310	227	383	116	15.4
F80IND	300	325	235	400	123	16.4
F90IND	310	335	245	410	148	19.7
F100IND	321	348	249	425	152	20.2
F125IND	330	357	261	441	183	24.4
F150IND	349	378	276	467	209	27.8
F225IND	394	432	318	533	290	38.6

**Cylindrical Crucibles for Tilting Induction Furnaces**

INDUX E-SHAPES (E_IND)	TOD (mm)	HT (mm)	BTM (mm)	Brass Capacity (Kg)	Brimful Capacity (Litres)
E323IND	165	318	165	25	4.3
E375IND	205	270	195	26	4.4
E305IND	310	500	310	120	21

Additional cylindrical patterns available by special request



**Brass capacity is calculated as follows:**  
 A-Shapes and F-Shapes - 90% of brimful  
 Cylinders - 70% of brimful

All dimensions are subject to normal manufacturing tolerances

Morganite also supplies a complete range of crucible accessories

## INSTALLATION

A-shape and F-shape (bilge) crucibles are used free standing in induction push-up or drop-coil lift out furnaces. They should be supported fully on the base by a suitable refractory pedestal and must be installed centrally within the coil in order to prevent uneven heating. A thin layer of coke dust or other carbonaceous material should be sprinkled on to the stand or pedestal to prevent the crucible sticking to it.

INDUX Cylindrical crucibles are installed in tilting furnaces with a protective layer of back-up material, which should be refractory in composition (e.g. magnesite) with no sintering additives. Back-up thickness is determined by crucible size. A slip plane of mica or glass fibre wool should first be installed against the furnace wall. A layer of back-up is placed in the base of the furnace to support the crucible and establish it at the correct height in relation to the induction coil. The "star wires" are positioned to make contact with the crucible base in order to provide earth leakage protection. The crucible is lowered and centred in the furnace and back-up material is then added in layers approximately 50mm thick, de-aired and compacted using a forked tool, with each layer scored to provide a key for the next layer. The top of the crucible and back-up lining are sealed in position using plastic refractory. A pouring spout can be fashioned using plastic refractory.

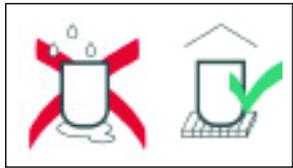
## CLEANING OUT

Crucibles should be cleaned out carefully between melts while red hot in order to remove any build-up of corrosive slag.

## SAFETY

Proper safety clothing must be worn at all times. Ensure that no moisture is introduced into the melt. Provision should be made underneath the furnace to catch metal that may be discharged.

## CRUCIBLE CARE



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.



DISTRIBUTED BY



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