



Dyson's efficient manufacturing techniques make sure our clients receive what they need, when they are needed.

In order to provide quality products Dyson delivers materials of the highest quality to the market, competitively priced and backed by the expertise of application knowledge and the resources of the DTC Research and Development Laboratory in Sheffield, England.

Material Selection

Selection of materials is made by reference to an extensive application database, which in conjunction with close liaison with end users, provides materials offering optimum performance in terms of cost and operation.

Dyson Technical Ceramics™ manufactures isostatically pressed crucibles in a wide range of materials to suit most melting requirements. The table below offers a guide to materials Dyson produces and their applications:

Dyson Technical Ceramics™ isostatically pressed crucibles are used in a wide range of melting applications from the melting of basic Carbon steels to the melting of exotic alloys such as Nickel and Cobalt based super alloys.

Dyson Technical Ceramics™ use high purity raw materials and our dedication to quality ensures our products provide optimum & consistent performance. In addition to this

DTC Isostatically Pressed Crucibles, Key Features:

- High temperature fired
- A wide range of materials to suit most melting requirements
- An extensive range of crucible sizes
- Excellent cosmetic appearance with a smooth internal finish

Zirconia Crucibles

Resistant to high temperatures with excellent erosion resistance properties, used in the melting of precious metals and exotic alloys used in the medical and aerospace industries.

Zircon Crucibles

Excellent thermal shock resistance, high erosion resistance, good resistance to acidic slags.

Alumina Crucibles

Widely used for melting basic carbon steel alloys, stainless steels and less aggressive precious metals.

AZ76

Excellent alternative to Alumina. The addition of Zirconia provides increased erosion resistance properties to extend the life of the crucible.

Dypack-ZM90 Backing Material

- >90% $ZrO_2 + HfO_2$
- Designed to prevent sintering
- Excellent thermal insulator

Dypack-Z65 Backing Material:

- 65% ZrO_2 , 34% SiO_2
- Suitable for small installations
- Good thermal insulator



Material Selection Guide

Material	Applications
Alumina (A97)	<ul style="list-style-type: none"> • Basic Carbon steel and its alloys • Palladium • Stainless Steel
Alumina Mullite (AM88)	<ul style="list-style-type: none"> • Basic Carbon steels, where thermal stress is an issue
AZ76	<ul style="list-style-type: none"> • Glass • Basic Carbon Steel and its alloys, where erosion is an issue • Alloy Steels
Zircon	<ul style="list-style-type: none"> • Non-Ferrous metals • Precious metals (e.g. Platinum/PGMs)
Magnesia Stabilised Zirconia Zirconia - M	<ul style="list-style-type: none"> • Nickel/Cobalt based superalloys • Sputter Targets • Palladium
Calcium Stabilised Zirconia Zirconia - C Zirconia - C2	<ul style="list-style-type: none"> • Platinum/Platinum Group Metals • Noble Metals • Iridium • Other Precious Metals
Yttria Stabilised Zirconia Zirconia - Y	<ul style="list-style-type: none"> • Specialist applications



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	DTC - Crucible Material Properties										Backing Material	
	Zirconia CL	Zirconia C	Zirconia C2	Zirconia M	Zirconia MC	Zirconia Y	Zircon	Alumina A97	AM88	AZ76	Dypack ZM90	Dypack Z65
Apparent Porosity (%)	18.2	17.6	17.4	19.7	21.0	22.8	18.5	22.4	20.4	21.6	-	-
Bulk Density (g/ml)	4.56	4.64	4.67	4.53	4.50	4.49	3.70	2.95	2.80	2.96	2.68*	2.32*
SiO ₂	1.3	1.3	0.8	0.7	0.9	0.9	33.0	1.4	10.5	8.4	1.7	32.6
Fe ₂ O ₃	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.2
Al ₂ O ₃	1.9	1.9	0.8	0.9	0.9	1.0	1.4	97.9	88.5	76.2	0.6	0.3
CaO	3.7	3.7	3.7	0.2	0.2	0.4	0.1	0.05	<0.05	<0.05	0.1	0.1
MgO	0.3	0.3	0.3	2.8	2.5	0.2	0.2	0.05	0.08	0.1	4.8	<0.05
ZrO ₂ +HfO ₂	92.7	92.7	94.3	95.5	95.1	90.1	64.5	<0.05	<0.05	14.7	92.5	66.0
Y ₂ O ₃	-	-	-	-	-	7.1	-	0.05	-	-	-	-

*Packing density (g/ml)

DTC Pressed Crucibles - Standard Sizes

The table below states DTC's most common crucible sizes. The external height of each design can be reduced to suit requirements. If the size required is not listed below, tooling can be obtained to meet exacting requirements.

REF.	Mid Diameter		Measured Length		Base Profile	Capacity	
	ID	OD	Int. Length	Ext. Length		lbs.	kgs.
M6 (CUT)	41	57	85	100	ROUND	1.6	0.7
M6L	41	57	121	136	ROUND	2.4	1.1
M2	48	60	100	130	ROUND	3.3	1.5
M5 (CUT)	71	87	138	150	ROUNDED	8.3	3.8
M5L	71	87	188	200	ROUNDED	11.6	5.3
M1	76	94	184	196	ROUND	12.4	5.6
M56	83	97	158	171	ROUND	12.4	5.6
M33	95	115	215	235	ROUND	22.4	10.2
M65	96	116	264	280	ROUND	28.5	12.9
M35	99	115	192	205	ROUNDED	22.9	10.4
M36	100	120	180	200	ROUND	20.4	9.3
M16L	103	120	288	300	ROUNDED	37.4	17.0
M20A	105	133	226	246	ROUND	28.6	13.0
M46	111	134	146	160	ROUND	19.7	8.9
M20	115	133	226	246	ROUNDED	36.6	16.6
M29B	120	145	267	285	FLAT	47.9	21.8
M26	124	146	254	277	FLAT	48.7	22.1
M23	125	150	230	250	FLAT	44.8	20.4
M97	125	150	315	335	FLAT	61.3	27.9
M95	135	165	352	374	FLAT	79.9	36.3
M25	138	168	259	280	FLAT	61.5	27.9
M205	143	163	310	321	ROUND	72.9	33.1
M111	150	174	345	367	FLAT	96.7	43.9
M28	155	183	266	296	FLAT	79.6	36.2
M114	183	209	360	378	ROUNDED	149.0	67.7
M115	210	237	327	354	ROUNDED	178.3	81.1
M116-450	257	286	421	450	ROUNDED	330.5	149.9
M116	257	286	486	515	ROUNDED	379.6	172.5

Illustration of Base Profiles



Round Internal Base Crucible



Flat Internal Base Crucible



Rounded Internal Base Crucible

Please Note: Sizes mentioned above are based in ISO Zirconia M Material. Due to differing shrinkage rates during the sintering process, crucible sizes may vary depending on material selection. Capacities are based on the crucible being 90% full and the material being 8,000 kg/m³ (500lb/ft³).



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