

## 01

## Clays & raw materials >

### Clays

01.2 >

Pottery crafts clays, Wenger clays, Vingerling clays, Imerys stoneware clays, Imerys porcelain clays, Earthstone clays, Coloured earthenware clays, Paper clays, Air hardening clays,

### Slips

01.10 >

Pottery crafts powdered clays, Imerys powdered clays, Powdered decorating slips (engobes), Prepared decorating slips, Casting slips, Coloured porcelain slips, Hobby slips

### Raw materials

01.15 >

Miscellaneous materials, Menders, Resists, Raw materials

### Frits

01.18 >

### Colouring oxides

01.18 >

# Clays & raw materials >

## 01.2 Clays & raw materials :: Prepared clays

### Pottery crafts clays



P1211  
Bone china



P1221  
David Leach  
translucent porcelain



P1230  
Semi porcelain



P1240  
White  
earthenware



P1260  
Ivory  
earthenware



P1311  
Red terracotta-high fire



P1321  
Grogged red



P1331  
Red terracotta-low fire



P1341  
Buff school



P1361  
Raku modelling



P1370  
Stoneware throwing



P1395  
Rich toasted stoneware



P1401  
Buff  
earthenware/stoneware



P1515  
Birch white  
smooth stoneware



P1516  
Birch white  
textured stoneware



P1521  
White throwing  
earthenware



P1530  
Light buff stoneware



P1546  
Rustic stoneware



P1551  
Ironstone



P1626  
Easycast plastic



P3150  
Garden terracotta



P3158  
Oxidising pink



R3060  
Crank clay

### Pottery crafts clays

Ref	Application	Temperature Range – °C	% Shrinkage (w-d)	% Shrinkage (d-f)	% Expansion @ 500°C	Texture 1-smooth 10-coarse	Fired Colour
P1211	Casting, machine making, flower making, fine sculpture	1230 - 1250	3 - 5	10 - 12	0.41	1	White / Translucent
P1221	Throwing, casting, machine making, flower making, fine sculpture	1240 - 1270	3 - 5	10 - 12	0.32	1	White / Translucent
P1230	Throwing, casting, machine making, coiling, hand building	1160 - 1260	4 - 6	6 - 8	0.36	1	White
P1240	Throwing, casting, machine making, coiling, hand building	1120 - 1180	4 - 6	6 - 8	0.38	1	White
P1260	Throwing, casting, machine making, coiling, hand building	1120 - 1180	4 - 6	6 - 7	0.37	1	Creamy / Grey White
P1311	Throwing, coiling, hand building, modelling, casting, machine making	1080 - 1160	3 - 5	5 - 6	0.32	5	Light / Dark Red
P1321	Throwing, coiling, hand building, modelling, machine making, casting, tile making	1080 - 1160	3 - 5	5 - 6	0.34	6	Light / Dark Red
P1331	Throwing, coiling, hand building, modelling, casting, machine making	1020 - 1160	3 - 5	6 - 8	0.31	5	Medium / Red
P1341	Throwing, coiling, hand building, modelling, tile making	1120 - 1280	3 - 5	5 - 7	0.32	6	Warm Buff / Grey
P1361	Hand building, large sculpture, large tiles	1060 - 1280	3 - 5	5 - 7	0.26	6	Buff Grey
P1370	Throwing, coiling, hand building, modelling, casting, machine making	1160 - 1280	3 - 5	6 - 8	0.31	5	Buff Grey
P1395	Throwing, coiling, hand building, modelling, casting, machine making	1160 - 1280	3 - 5	6 - 8	0.32	4	Warm Buff Grey
P1401	Throwing, coiling, hand building, fine modelling, casting, machine making	1120 - 1280	2 - 4	6 - 8	0.31	4	Buff to Grey
P1515	Throwing, machine making, casting, coiling, modelling, hand building	1160 - 1280	3 - 5	6 - 8	0.3	2	Off White
P1516	Throwing, coiling, hand building, modelling, tile making, recommended for salt glazing	1200 - 1270	3 - 5	6 - 8	0.26	5	Buff
P1521	Throwing, machine making, coiling, casting, modelling, hand building	1080 - 1180	3 - 5	4 - 6	0.39	3	White
P1530	Throwing, machine making, casting, coiling, modelling, hand building	1180 - 1280	3 - 5	5 - 7	0.30	3	Light Buff
P1546	Throwing, coiling, hand building, tile making, modelling, machine making	1180 - 1280	3 - 5	7 - 9	0.26	4	Buff
P1551	Throwing, machine making, casting, coiling, modelling, hand building	1140 - 1280	3 - 5	7 - 9	0.23	3	Dark Buff Grey / Speckled
P1626	Throwing, modelling	1060 - 1100	2 - 4	2 - 4	0.40	4	White
P3150	Throwing, hand building, modelling, tile making	1060 - 1160	3 - 5	5 - 7	0.34	5	Red / Dark Brown
P3158	Throwing, hand building, coiling, modelling, machine making, tile making	1140 - 1280	3 - 5	4 - 6	0.26	4	Light Buff / Grey fine speckled
R3060	Throwing, hand building, sculpture, large tiles	1150 - 1280	3 - 5	5 - 7	0.22	10	Warm Buff

# Clays & raw materials >

## 01.4 Clays & raw materials :: Prepared clays

### Pottery crafts clays



**P1564**  
Black earthenware



**P1565**  
Medium grogged crank



**P1566**  
Highly grogged crank

Ref	Application	Temperature Range – °C	% Shrinkage (w-d)	% Shrinkage (d-f)	% Expansion @ 500 °C	Texture 1-smooth 10-coarse	Fired Colour
P1564	Throwing, hand building, coiling, modelling, machine making	970 - 1025	3 - 5	3 - 5	0.35	3	Chocolate Brown / Black
P1565	Throwing, hand building, tile making, sculpture	1240 - 1300	3 - 5	5 - 7	0.33	7	Toasted Warm Buff
P1566	Hand building, large sculpture, large tiles	1240 - 1300	3 - 5	5 - 7	0.32	9	Toasted Warm Buff

### Wenger clays



**PW101**  
Traditional parian



**PW111**  
Standard red



**PW121**  
Stoneware body



**PW131**  
Super white



**PW131**  
Grogged white earthenware

Ref	Application	Temperature Range – °C	% Shrinkage (w-d)	% Shrinkage (d-f)	% Expansion @ 500 °C	Texture 1-smooth 10-coarse	Fired Colour
PW101	Self glazing body ideal for making dolls and figurines	1240 - 1280	3 - 5	8 - 10	0.29	1	White Translucent
PW111	Throwing	1080 - 1160	3 - 5	8 - 10	0.32	5	Light / Dark red
PW121	Throwing and modelling, good general purpose clay	1180 - 1280	3 - 5	8 - 10	0.25	5	Buff / Grey
PW131	Throwing, coiling, machine making, tile making and hand building	1220 - 1280	3 - 5	4 - 6	0.30	5	Off White
PW141	Throwing, casting, machine making, coiling, hand building	1100 - 1160	3 - 5	4 - 6	0.36	3	White / Ivory

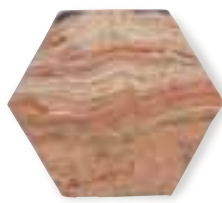
## Vingerling clays



**K112**  
White  
Grogged earthenware



**K120**  
Surprise marbled



**K120**  
Surprise marbled



**K120**  
Surprise marbled



**K129 C material**



**K130**  
White  
Grogged sculptors



**K133**  
Terracotta  
Grogged sculptors



**K134**  
Black  
Grogged sculptors



**K148**  
White  
Stoneware

Ref	Application	Temperature Range – °C	% Shrinkage (w-d)	% Shrinkage (d-f)	% Expansion @ 500°C	Texture 1-smooth 10-coarse	Fired Colour
K112	Throwing, machine making, casting, coiling, modelling, tile making, hand building	1020 - 1150	3 - 5	8 - 10	0.31	4	White
K120	Hand building, tile making, machine making	1120 - 1150	3 - 5	10 - 12	0.31	3	Marbled Red
K129	Hand building, large sculpture, large tiles, recommended for raku	1150 - 1280	3 - 5	10 - 12	0.22	10	Off White
K130	Hand building, large sculpture, coarse tiles	1020 - 1280	3 - 5	10 - 12	0.27	10	Off White
K133	Hand building, large sculpture, coarse tiles	1020 - 1120	3 - 5	10 - 12	0.32	8	Red / Brown
K134	Hand building, large sculpture, coarse tiles	1020 - 1100	3 - 5	10 - 12	0.33	8	Red / Black Brown
K148	Throwing, machine making, coiling, casting, modelling, tile making, hand building	1180 - 1280	3 - 5	11 - 13	0.29	3	Off White

# Clays & raw materials >

## 01.6 Clays & raw materials :: Prepared clays

### Imerys stoneware clays-St Amand en Puisaye



**P1215 (GT100Y)**  
Grogged buff



**P1216 (GT100X)**  
Fine Grogged clay



**P1217 (GT100P)**  
Fine textured buff



**P1218 (GT102P)**  
Fine buff with iron specks

Ref	Application	Temperature Range – °C	% Shrinkage (w-d)	% Shrinkage (d-f)	% Expansion @ 500°C	Texture 1-smooth 10-coarse	Fired Colour
P1215	Hand building, sculpture, large tiles	1240 - 1280	4 - 6	10 - 12	0.27	6	Pale Buff
P1216	Throwing, hand building, coiling, modelling, tile making	1240 - 1280	4 - 6	10 - 12	0.28	3	Cream
P1217	Throwing, handbuilding, coiling, modelling and tile making	1240 - 1280	4 - 6	10 - 12	0.27	5	Buff
P1218	Hand building, sculpture, large tiles	1260 - 1280	4 - 6	9 - 11	0.28	5	Buff / Fine speckle

### Imerys porcelain clays



**R3012 (PT010DB)**  
Limoges porcelain



**R3014 (PT298B)**  
Limoges special porcelain

Ref	Application	Temperature Range – °C	% Shrinkage (w-d)	% Shrinkage (d-f)	% Expansion @ 500°C	Texture 1-smooth 10-coarse	Fired Colour
R3012	Throwing, machine making, casting (powder only), flower making, fine modelling, recommended for reduction firing	1230-1280	3 - 5	9 - 11	0.26	1	White
R3014	Throwing, machine making, flower making, fine modelling, recommended for reduction firing	1280-1350	3 - 5	10 - 12	0.23	1	White

## Earthstone clays



**P1480 (ES40)**  
Handbuilding



**P1481 (ES5)**  
Original body



**P1482 (ES20)**  
Smooth texture



**P1483 (ES10)**  
Extra smooth



**P1484 (ES50)**  
Crank



**P1485 (ES60)**  
Smooth  
texture crank



**P1486 (ES65)**  
Terracotta crank



**P1487 (ES80)**  
Reduction stoneware



**P1488 (ES90)**  
Flecked stoneware



**P1489 (ES160)**  
Special

Ref	Application	Temperature Range – °C	% Shrinkage (w-d)	% Shrinkage (d-f)	% Expansion @ 500°C	Texture 1-smooth 10-coarse	Fired Colour
P1480	Hand building, large sculpture, recommended for Raku	1200 - 1300	3 - 5	4 - 6	0.23	8	Off White
P1481	Throwing, coiling, hand building, tile making, modelling, recommended for salt glazing	1180 - 1280	3 - 5	7 - 9	0.26	3	Off White
P1482	Throwing, hand building, sculpture, large tiles	1180 - 1290	3 - 5	5 - 7	0.26	6	Off White
P1483	Throwing, Machine making, fine modelling, casting	1150 - 1280	3 - 5	7 - 9	0.24	1	Off White
P1484	Throwing, hand building, sculpture, large tiles	1160 - 1300	3 - 5	5 - 7	0.22	10	Warm Buff
P1485	Throwing, hand building, sculpture, tiles and Raku	1160 - 1300	3 - 5	5 - 7	0.24	7	Warm Buff
P1486	Hand building, sculpture and large tile making	1080 - 1220	3 - 5	4 - 6	0.25	10	Medium Red
P1487	Throwing, ideal for reduction firing and machine making	1220 - 1300	3 - 5	6 - 8	0.25	6	Warm Buff
P1488	Throwing, sculpture and tiles	1200 - 1300	3 - 5	10 - 12	0.27	6	Speckled Off White
P1489	Throwing, ideal for Salt glazing and reduction firing, machine making, tiles	1200 - 1300	3 - 5	5 - 7	0.26	6	Off White

### Coloured earthenware clays



P1650 (CF550BL)  
Blue



P1651 (CF570V)  
Green

Ref	Application	Temperature Range – °C	% Shrinkage (w-d)	% Shrinkage (d-f)	% Expansion @ 500°C	Texture 1-smooth 10-coarse	Fired Colour
P1650	Throwing, casting, machine making, coiling, hand building	980 - 1080	2 - 4	5 - 7	0.4	1	Blue
P1651	Throwing, casting, machine making, coiling, hand building	980 - 1080	2 - 4	5 - 7	0.4	1	Green

### Paper clays



P1224 (ES200)  
Smooth body



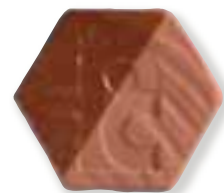
P1225 (ES300)  
Grogged body



P1226 (ES400)  
White earthenware



P1227 (ES600)  
Porcelain



P1228 (ES800)  
Terracotta

Ref	Application	Temperature Range – °C	% Shrinkage (w-d)	% Shrinkage (d-f)	% Expansion @ 500°C	Texture 1-smooth 10-coarse	Fired Colour
P1224	Model making, tile making (thin sections) and coiling. Ideal for reduction and oxidising firing	1100 - 1280	3 - 5	4 - 6	0.24	2	Off White
P1225	Model making, tile making and coiling. Ideal for reduction and oxidising firing	1100 - 1280	3 - 5	4 - 6	0.21	6	Off White
P1226	Model making, tile making (thin sections) and coiling. Ideal for reduction and oxidising firing	1080 - 1200	2 - 4	3 - 5	0.33	2	Off White
P1227	Model making, tile making (thin sections) and coiling. Ideal for reduction and oxidising firing	1220 - 1280	3 - 5	11 - 13	0.26	2	Off White
P1228	Model making, tile making (thin sections) and coiling	1060 - 1200	4 - 6	4 - 6	0.29	4	Light / Dark Red

## Air hardening clays



**P1608**  
Newclay white



**P1609**  
Newclay red



**P1612**  
Self hardening white



**P1613**  
Self hardening terracotta



**P1614**  
Smooth red



**P1615**  
Smooth white

**P1608** – A white clay containing fine non-toxic nylon fibres that help to give the clay its strength. Can be used for a variety of building techniques, as well as throwing. Can be fired to earthenware temperature and glazed **Not food safe**.

**P1609** – A terracotta clay containing fine non-toxic nylon fibres that help to give the clay its strength. Can be used for a variety of building techniques, as well as throwing. Can be fired to earthenware temperature and glazed **Not food safe**.

**P1612** – A fine smooth white clay ideal for fine work.

**P1613** – A fine smooth red clay ideal for fine work.

**P1614** – Smooth red modelling clay, easy to shape with for either small or large pieces (gently wet your hands and mix the clay prior to shaping) allow to dry to 24 hours and decorate with non firing colours.

**P1615** – Smooth white modelling clay, easy to shape with for either small or large pieces (gently wet your hands and mix the clay prior to shaping) allow to dry to 24 hours and decorate with non firing colours.

**R3171** – Powder to be mixed with water prior to painting onto finished ware. 2-3 coats are recommended. **Not food safe. DO NOT FIRE.**

**R3172** – Wedge this product into your clay (2% by weight) prior to use in order to give a stronger finished article. Use the same day, as the hardening process is irreversible **Not food safe. DO NOT FIRE.**

For details of modelling clay kits, please refer to our craft section

## Pottery crafts powdered clays



**P1636**  
Easycast powder



**P3100**  
White earthenware



**P3101**  
Buff stoneware



**P3102**  
Red terracotta

Ref	Application	Temperature Range – °C	% Shrinkage (w-d)	% Shrinkage (d-f)	% Expansion @ 500°C	Texture 1-smooth 10-coarse	Fired Colour
P1636	Slip casting	1060 - 1100	4 - 6	2 - 3	0.40	1	White
P3100	Slip casting	1060 - 1100	2 - 4	5 - 7	0.37	1	White
P3101	Slip casting	1120 - 1200	2 - 4	6 - 8	0.31	4	Buff
P3102	Slip casting	1050 - 1160	3 - 5	8 - 10	0.36	3 - 4	Red / Brown

## Imerys powdered clays



**P3103**  
Porcelain



**P3201**  
Earthenware

Ref	Application	Temperature Range – °C	% Shrinkage (w-d)	% Shrinkage (d-f)	% Expansion @ 500°C	Texture 1-smooth 10-coarse	Fired Colour
P3103	Slip casting	1230 - 1270	2 - 4	5 - 7	0.28	1	White
P3201	Slip casting	1040 - 1080	2 - 4	2 - 4	0.39	3	White

## Powder clay mixing chart for 50kg of product

Ref	Description	Water (ltr)	P3342 Soda ash (g)	P3344 Soda sil (g)
P1636	Easycast powder	17.5	27.5	65
P3100	WB White earthenware	20	17	51
P3102	Buff stoneware	20	64	130
P3102	Red terracotta	19	100	240
P3103	Limoges porcelain	18.5	-	-
P3202	Limoges earthenware	18	-	110

## Powdered decorating slips - Engobes



**P1980**  
White



**P1981**  
Light Blue



**P1982**  
Dark Blue



**P1983**  
Yellow



**P1984**  
Lilac



**P1985**  
Terracotta Red



**P1986**  
Black



**P1987**  
Orange



**P1988**  
Blue/Green



**P1989**  
Green



**P1990**  
Grey

### Mixing instructions

For slip trailing and hand painting - 100g powder to 80ml water  
For dipping – 100g powder to 90ml water

Ref	Application	Temperature Range – °C	% Shrinkage (w-d)	% Shrinkage (d-f)	% Expansion @ 500°C	Texture 1-smooth 10-coarse	Fired Colour
P1980	Slip & engobe	1000 - 1150	2 - 4	5 - 7	0.37	1	White
P1981	Slip & engobe	1000 - 1150	2 - 4	5 - 7	0.37	1	Light blue
P1982	Slip & engobe	1000 - 1150	2 - 4	5 - 7	0.37	1	Dark blue
P1983	Slip & engobe	1000 - 1150	2 - 4	5 - 7	0.37	1	Yellow
P1984	Slip & engobe	1000 - 1150	2 - 4	5 - 7	0.37	1	Lilac
P1985	Slip & engobe	1000 - 1150	2 - 4	5 - 7	0.37	1	Terracotta red
P1986	Slip & engobe	1000 - 1150	2 - 4	5 - 7	0.37	1	Black
P1987	Slip & engobe	1000 - 1150	2 - 4	5 - 7	0.37	1	Orange
P1988	Slip & engobe	1000 - 1150	2 - 4	5 - 7	0.37	1	Blue/green
P1989	Slip & engobe	1000 - 1150	2 - 4	5 - 7	0.37	1	Green
P1990	Slip & engobe	1000 - 1150	2 - 4	5 - 7	0.37	1	Grey

## Prepared decorating slips

Strong coloured slips for decorating earthenware. For a traditional slipware look, coat with a honey glaze



P1940  
White



P1945  
Light Blue



P1950  
Dark Blue



P1955  
Green



P1960  
Black



P1965  
Red



P1970  
Yellow

Ref	Application	Temperature Range – °C	% Shrinkage (w-d)	% Shrinkage (d-f)	% Expansion @ 500 °C	Texture 1-smooth 10-coarse	Fired Colour
P1940	Slip trailing & engobe	1060 - 1150	2 - 4	5 - 7	0.37	1	White
P1945	Slip trailing & engobe	1060 - 1150	2 - 4	5 - 7	0.37	1	Light Blue
P1950	Slip trailing & engobe	1060 - 1150	2 - 4	5 - 7	0.37	1	Dark Blue
P1955	Slip trailing & engobe	1060 - 1150	2 - 4	5 - 7	0.37	1	Green
P1960	Slip trailing & engobe	1060 - 1150	2 - 4	5 - 7	0.37	1	Black
P1965	Slip trailing & engobe	1060 - 1150	2 - 4	5 - 7	0.37	1	Red
P1970	Slip trailing & engobe	1060 - 1150	2 - 4	5 - 7	0.37	1	Yellow

## Casting slips



**P1213**  
Bone china



**P1223**  
Porcelain



**P1243**  
White earthenware



**P1313**  
Smooth red terracotta



**P1403**  
Buff earthenware /  
stoneware

Ref	Application	Temperature Range – °C	% Shrinkage (w-d)	% Shrinkage (d-f)	% Expansion @ 500°C	Texture 1-smooth 10-coarse	Fired Colour
P1213	Slip casting	1230 - 1250	3 - 5	10 - 12	0.41	1	White / Translucent
P1223	Slip casting	1240 - 1270	3 - 5	10 - 12	0.32	1	White / Translucent
P1243	Slip casting	1120 - 1180	4 - 6	6 - 8	0.38	1	White
P1313	Slip casting	1020 - 1160	3 - 5	6 - 8	0.31	5	Red / Dark Red
P1403	Slip casting	1120 - 1280	2 - 4	6 - 8	0.31	4	Buff / Grey

## Coloured porcelain slips

Ideal for dolls head, jewellery or small items, these slips fire with a satin finish



**R3210**  
Arctic white



**R3211**  
Suntan



**R3212**  
Oriental



**R3213**  
Satin rose



**R3214**  
Dark brown

Ref	Application	Temperature Range – °C	% Shrinkage (w-d)	% Shrinkage (d-f)	% Expansion @ 500°C	Texture 1-smooth 10-coarse	Fired Colour
R3210	Slip casting	1200 - 1220	2 - 4	9 - 11	0.37	1	White
R3211	Slip casting	1200 - 1220	2 - 4	9 - 11	0.37	1	Suntan
R3212	Slip casting	1200 - 1220	2 - 4	9 - 11	0.37	1	Oriental
R3213	Slip casting	1200 - 1220	2 - 4	9 - 11	0.37	1	Satin Rose
R3214	Slip casting	1200 - 1220	2 - 4	9 - 11	0.37	1	Dark Brown

## Hobby slips



Ref	Application		Temperature Range – °C	% Shrinkage (w-d)	% Shrinkage (d-f)	% Expansion @ 500°C	Texture 1-smooth 10-coarse	Fired Colour	
A	P1616	Easycast	Slip casting	1060 - 1100	4 - 6	2 - 3	0.40	1	White
B	R3019	Excel slip	Slip casting	1060 - 1100	4 - 6	2 - 3	0.40	1	White
C	R3200	Limoges white earthenware	Slip casting	1060 - 1100	2 - 4	5 - 7	0.37	1	White



## Miscellaneous materials

P1208	Cellulose Fibre (for making paper clay)	Chopped paper fibres for the production of paper clay. No soaking or mashing required, mix directly with clay slip.
P3380	Batt Wash (Zircon based)	A multi purpose refractory wash for painting onto kiln shelves to reduce the risk of pots sticking to the shelves.
P3382	Gum arabic	An alternative to glaze binder it may also be used as a plasticiser – (2.5 % of the dry weight of the clay) for increasing the dry strength of bodies.
P3386	Mouldmakers size	A high quality size used in the production of plaster moulds to prevent sticking of the two plaster faces. Mix half/half with hot water. Allow to cool; apply with a brush; wipe off excess with soaped natural sponge. Apply 3 coats, allowing to dry between each coat
P3390	Dispersing agent (Dispex)	A sodium based polymer type deflocculent used to increase fluidity / reduce viscosity of casting slips. Normal additions range between 0.1 - 0.3% of the dry weight of the clay.
R1036	Glaze binder (Peptapon - SCMC)	Additions of up to 2% of the dry weight of glaze increases the viscosity, adhesion and surface hardness of the unfired glaze.

## Menders

P0596	Mender friend	Ceramic cement for greenware and biscuit suitable for earthenware temperatures. Brush on edges and hold together while setting. Apply a further coat and allow to dry. Fettle and fire.
P3397	Aluminide X repair kit	A polymer type pottery cement specially formulated to repair pottery prior to glazing in either greenware or bisque, suitable for high temperatures (Stoneware).
SY545	Patch-a-tatch	A DUNCAN ceramic cement, used to attach or repair greenware or bisque. Brush on edges and hold together while setting. Apply a further coat and allow to dry. Ideal for earthenware.
SY4416	Fixall	GARE Fixall is a speciality product used to mend greenware or to attach stick-ons. Typically earthenware.

## Resists

P3384	Wax emulsion resist	A pre-mixed water based masking medium used to coat areas on which no glaze is required. The wax burns off during firing.
SY547	Wax resist	DUNCAN wax emulsion especially created to repel underglazes and glazes when dipped over it. The wax burns off during firing.
SY548	Mask 'n Peel	DUNCAN water-based emulsion formulated to protect design areas or colours, making application of background or adjoining colours faster and easier. Mask 'n Peel can be used under or between opaque underglazes, glazes or non-fired acrylic colours, and under translucent underglazes. It is an excellent aid for beginner ceramists. Can be left on or peeled off prior to firing.
SY4433	Wax resist	GARE Wax Resist. – a water-based emulsion to protect one surface from another. When completely dry, the wax resist will resist any colour or material placed over it. Wax Resist must be fired off to remove.

## Raw materials

Name	Analysis	Ref	Comments
Alumina Calcined	Al <sub>2</sub> O <sub>3</sub>	P3300	Increases glaze viscosity, firing range and resistance to crystallisation
Basalt	48.6% SiO <sub>2</sub> 14.1% Al <sub>2</sub> O <sub>3</sub> 11.2% Fe <sub>2</sub> O <sub>3</sub> 1.6% TiO <sub>2</sub>	P3299	Useful in the production of textured bodies and brown-black glazes. More fusible than feldspar. It gives a dark brown glaze at 1250°C
Black Ball Clay	32% Al <sub>2</sub> O <sub>3</sub> 47% SiO <sub>2</sub> 1% Fe <sub>2</sub> O <sub>3</sub> 2.1% K/Na <sub>2</sub> O	P3301	Comparatively white firing clay, very plastic Devon Ball Clay
Blue Ball Clay - Puraflo AK	32% Al <sub>2</sub> O <sub>3</sub> 50% SiO <sub>2</sub> 1.1% Fe <sub>2</sub> O <sub>3</sub> 2.1% K/Na <sub>2</sub> O	P3302	A Devon Ball Clay, more plastic than P3301, high unfired strength, firing to a buff colour
Ball Clay Imerys Kentucky Clay	60.5% SiO <sub>2</sub> 25.8% Al <sub>2</sub> O <sub>3</sub> 1% Fe <sub>2</sub> O <sub>3</sub> 1.9% TiO <sub>2</sub>	P3351	A fast casting Ball Clay used in all types of applications, but primarily used in artware.
Hymod AT Ball Clay	29% Al <sub>2</sub> O <sub>3</sub> 55% SiO <sub>2</sub> 2.3% Fe <sub>2</sub> O <sub>3</sub> 3.6% K/Na <sub>2</sub> O	P3352	A Dorset Ball Clay. Its special feature is a high iron content, high strength – useful in the production of warm coloured textured bodies
Hyplas 71 Ball Clay	20% Al <sub>2</sub> O <sub>3</sub> 70% SiO <sub>2</sub> 0.8% Fe <sub>2</sub> O <sub>3</sub> 2.3% K/Na <sub>2</sub> O	P3354	A Devon Ball Clay, giving good plasticity with medium strength and a low iron content
Barium Carbonate (Precipitated)	BaCO <sub>3</sub>	P3303	Used in casting slips (up to 0.5%) to prevent “scumming” due to the presence of soluble salts. A flux in high temperature glazes it also produces matt and semi-matt surfaces at earthenware temperatures
Bentonite	Al <sub>2</sub> O 2H <sub>2</sub> O 2SiO <sub>2</sub>	P3304	Extremely plastic colloidal clay, used in bodies (up to 5%) to increase plasticity, and in glaze (up to 2%) as a suspending agent
Bone Ash (Calcined)	Ca <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub>	P3305	Essential constituent of Bone China, imparting the characteristic translucency. Also used as a secondary flux in glazes giving a milky quality
Calcium Chloride	CaCl <sub>2</sub> 6H <sub>2</sub> O	P3308	Used as a flocculent (0.05% addition) or in conjunction with Bentonite as a suspending agent for glazes
China Clay - Treviscoe	36% Al <sub>2</sub> O <sub>3</sub> 49% SiO <sub>2</sub> 0.83% Fe <sub>2</sub> O <sub>3</sub> 2.3%K <sub>2</sub> O	P3293	A Cornish kaolin, white firing, good strength and good rheological properties
China Clay - Standard Porcelain	37.2% Al <sub>2</sub> O <sub>3</sub> 47.7%SiO <sub>2</sub> 0.68%Fe <sub>2</sub> O <sub>3</sub> , 1.65% K <sub>2</sub> O	P3297	A Cornish kaolin. Very white firing and high strength
China Clay - Grolleg	36% Al <sub>2</sub> O <sub>3</sub> 49% Si O <sub>2</sub> 0.75 Fe <sub>2</sub> O <sub>3</sub> 1.85% K <sub>2</sub> O	P3298	A Cornish Kaolin. White firing, good strength. Performs well in casting applications
China Clay - CC50 Puraflo	36% Al <sub>2</sub> O <sub>3</sub> 48%SiO <sub>2</sub> 1%Fe <sub>2</sub> O <sub>3</sub>	P3309	A good general purpose kaolin sufficing most applications
Colemanite	43.9% B <sub>2</sub> O <sub>3</sub> 26% CaO 4.5% SiO <sub>2</sub>	P3311	A naturally occurring source of Boron. A powerful primary or secondary flux in glazes. It intensifies the effect of colouring oxides and increases craze resistance of glazes. P2954 (Calcium Borate Frit) may be used as an alternative
Cornish Stone	3.8%K <sub>2</sub> O 4%Na <sub>2</sub> O 15.3% Al <sub>2</sub> O <sub>3</sub> 72.9% SiO <sub>2</sub>	P3314	An alternative to feldspar as a high temperature flux. This partially decomposed granite is used widely as a flux in bodies. Mineral flux could be used as an alternative
Cryolite	Na <sub>3</sub> AlF <sub>6</sub>	P3355	For use in alkaline glazes as a flux
Dolomite	31.4% CaO 20.8% MgO <sub>3</sub>	P3315	Natural source of calcium and magnesium Useful as a secondary flux in Stoneware glazes and bodies
Feldspar (Soda)	2.8% K <sub>2</sub> O 8.5%Na <sub>2</sub> O 18.5% Al <sub>2</sub> O 69.5% SiO <sub>2</sub>	P3317	Norwegian sourced. The strongest flux, more suitable for low temperature bodies and glazes.
Feldspar (Potash)	11.3% K <sub>2</sub> O 3.2% Na <sub>2</sub> O 18.5% Al <sub>2</sub> O 65.8% SiO <sub>2</sub>	P3296	Norwegian sourced. Principal body flux having a wide vitrification range. It can also be used as flux in mainly stoneware glazes
Feldspar (FFF)	7.5% K <sub>2</sub> O 5%Na <sub>2</sub> O 18.5% Al <sub>2</sub> O 67.5% SiO <sub>2</sub>	P3316	Finnish sourced. A medium strength flux sufficing both body and glaze applications.
Flint	SiO <sub>2</sub>	P3319	Used in glazes and in bodies as a source of calcined silica
Grog Buff (5-30's Mesh)		P3320	Fireclay based, pre-fired and crushed to mesh size 5-30s. Used as a grog in bodies
Grog Buff (5mm To Dust)		P3353	Fireclay based, pre-fired and crushed to mesh size 5mm-dust used as a grog in bodies where tight control of grog size is not required
Ilmenite (Fine)	FeO TiO <sub>2</sub>	P3324	Used to 'seed' crystalline glazes (up to 1%)
Lithium Carbonate	Li <sub>2</sub> CO <sub>3</sub>	R1063	Purest way of introducing Li <sub>2</sub> O to glaze recipes
Molochite (-200s)	37% Al <sub>2</sub> O <sub>3</sub> 48%SiO <sub>2</sub>	P3310	Cornish sourced. A high temperature calcined kaolin used to raise maturing temperature of glazes. Reduces crawling tendency in glazes which have a high clay content
Molochite (-120s)	37% Al <sub>2</sub> O <sub>3</sub> 48% SiO <sub>2</sub>	P3389	Cornish sourced. A medium to fine sized grog for white bodies
Molochite Fine (-80's)	37% Al <sub>2</sub> O <sub>3</sub> 48% SiO <sub>2</sub>	P3358	Cornish sourced. Use as a grog to introduce openness of texture in bodies
Molochite Coarse (16's-30's)	37% Al <sub>2</sub> O <sub>3</sub> 48% SiO <sub>2</sub>	P3359	Cornish sourced coarser than P3358 and best suited as an addition to Raku and modelling bodies to introduce a more open texture

## Raw materials

Name	Analysis	Ref	Comments
Magnesium Carbonate	MgCO <sub>3</sub>	P3331	Used as a high temperature flux in stoneware glazes (up to 10%) producing a semi matt surface. Larger quantities give an opaque dry appearance BUT may cause crawling and pin holing - CAUTION
Magnesium Sulphate	MgCO <sub>4</sub> 7H <sub>2</sub> O	R1093	Sometimes known as Epsom Salts. Used as a flux in stoneware glazes and as a flocculent (1%) in a glazes – an alternative to Calcium Chloride
Mineral Flux No 4		P3349	A synthetic replacement for DF Cornish Stone in bodies (defluorinated)
Mineral Flux No 10		P3339	A synthetic replacement for P3314 Cornish Stone in bodies
Nepheline Syenite (North Cape)	9.1% K <sub>2</sub> O 7% Na <sub>2</sub> O 24.9% Al <sub>2</sub> O <sub>3</sub> 56% SiO <sub>2</sub>	P3332	A stronger flux than Feldspar for uses both in glazes and bodies, a fairly narrow vitrification band typically used in vitreous bodies
Petalite	0.2% K <sub>2</sub> O 1.6% Na <sub>2</sub> O 4% Li <sub>2</sub> O 15.7% Al <sub>2</sub> O <sub>3</sub> 76.1% SiO <sub>2</sub>	P3333	A secondary a flux in high temperature bodies and glazes. It may also be used to alter colour response and to reduce thermal expansion
Potters Plaster	CaSO <sub>4</sub> 0.5H <sub>2</sub> O	P3335	A high grade plaster used for producing working moulds. Mixing ratio 940g plaster to 565cc of water
High Density Plaster	CaSO <sub>4</sub> 0.5H <sub>2</sub> O	P3336	A dense, hard setting plaster used for producing block and case moulds. Mixing ratio 1.3kg plaster to 565cc of water
Lafarge Classic	CaSO <sub>4</sub> 0.5H <sub>2</sub> O	P3391	A dense harder setting plaster used for producing working moulds mixing ratio of 850g plaster to 568cc water
Quartz	SiO <sub>2</sub>	P3337	Find ground Silica Sand for use in bodies and glazes
Rutile Light	TiO <sub>2</sub>	P3338	A Titanium ore with an Iron impurity. As a addition in glaze (>8%) it gives a buff or brown reactive colour.
Silicon Carbide Fine	SiC	P3340	A 5% addition to a glaze gives a localised reduction effect in an electric kiln. The effect requires a leadless Tin based glaze and aids colour development. CAUTION: Large quantities will cause severe blistering
Silicon Carbide - Coarse	SiC	R1067	Used for specking and reaction type glazes
Sodium Carbonate (Soda Ash)	Na <sub>2</sub> CO <sub>3</sub>	P3342	A deflocculent used in the preparation of casting slips (0.05%) in conjunction with Sodium Silicate. Also as a source of Sodium in alkaline glazes
Sodium Silicate 75	Na <sub>2</sub> SiO <sub>2</sub>	P3343	A deflocculent used in the preparation of casting slips (>0.3%). Note the Volume (ml) can be converted to weights (g) by multiplying by 1.3. typically used in bone china slip
Sodium Silicate 140	Na <sub>2</sub> SiO <sub>2</sub>	P3344	A stronger deflocculent used in the preparation of casting slips (>0.3%). Note the Volume can be converted to weights (g) by multiplying by 1.7, typically used in earthenware slips
Strontium Carbonate	SrCO <sub>3</sub>	P3347	A flux for glazes above 1090°C with effects similar to Whiting and Zinc oxide. Non poisonous alternative to Lead oxide. Typically used in Stoneware glazes. Excess additions will precipitate a crystalline matt surface
Spodumene	7.6% Li <sub>2</sub> O 26% Al <sub>2</sub> O <sub>3</sub> 64.5% SiO <sub>2</sub>	P3357	A very active flux used in small amounts in glazes. Also as a body addition (>5%) where its low expansion properties help thermal shock resistance
Silica Sand	SiO <sub>2</sub>	P3387	A medium sized silica sand suitable for ware placing and as a grog
Talc	32.4% MgO 46.3 SiO <sub>2</sub> 9.5% Al <sub>2</sub> O <sub>3</sub>	P3345	Used as a body flux in conjunction with feldspar to reduce thermal expansion and increase thermal shock resistance. It can also be used as a secondary flux in glazes giving an opaque semi-matt / vellum finish
Tin Oxide	SnO <sub>2</sub>	P3361	Used primarily as a white opacifier in glazes. Additions of 4-6% produce a semi-opaque glazes whilst additions of 8-10% produce a fully opaque glaze
Titanium Dioxide	TiO <sub>2</sub>	P3362	Used as a glaze opacifier. Additions of up to 10% produce a creamy white glaze with a matt or semi matt surface. Slow cooling assists the crystallisation
Ash - Lavender		P3294	Crushed and washed. As an addition in glazes (>10%) gives a different effect to wood ash
Wood Ash - Oak		P3295	Used as an addition to achieve specialised effects in glazes
Whiting	CaCO <sub>3</sub>	P3346	Principal source of lime in glazes. Under reducing conditions it assists in celadon colour development but an excess gives matt, dull or rough surfaces
Wollastonite	47% CaO 50% SiO <sub>2</sub>	P3348	Primarily used as a secondary flux. An alternative source of calcium and used in both earthenware and stoneware glazes
Zinc Oxide	ZnO	P3350	A secondary flux but above 10% tends to produce a frost-like matt surface with some opacity and can cause occasional pinholing. Also makes glazes susceptible to crawling - CAUTION
Zircosil 5	ZrSiO <sub>4</sub>	P3365	A fine grade of Zirconia used as an opacifier for white and coloured glazes, imparting high opacity, craze resistance and stability. 4-7% produces semi opaque, 8-12% full opacification
Zirconium Oxide	ZrO <sub>2</sub>	R1026	A refractory oxide with similar opacifying powers to that of Zirconium Silicate. Used extensively in the manufacture of ceramic stains.

## Frits

Ref	Description	α *	Firing range °C	% Analysis												
				SiO <sub>2</sub>	B <sub>2</sub> O <sub>3</sub>	ZrO <sub>3</sub>	MgO	Al <sub>2</sub> O <sub>3</sub>	PbO	Na <sub>2</sub> O	K <sub>2</sub> O	CaO	Li <sub>2</sub> O	ZnO	BaO	
P2950	Lead Bisilicate	6.5	900 - 1100	29.0				12.0	59.0							
P2953	Borax (E)	8.3	900 - 1100	49.6	18.0		0.1	7.5		8.8	1.7	14.1				
P2954	Calcium Borate	6.1	1050 - 1160	17.9	50.3		0.1	4.9			0.3	26.5				
P2955	Borax (J)	10.9	920 - 1050	48.9	13.5			9.1		10.9	8.8	8.8				
P2957	Borax (H)	5.9	1000 - 1100	62.0	14.8		0.2	9.4		3.6	2.7	7.3				
P2960	Low Expansion Frit	3.8	1020 - 1150	63.4	17.6		2.2	8.5			0.2	3.7	1.1	3.2		
P2961	Alkaline (Standard)	6.9	900 - 1100	50.4	25.2		0.1	7.3		12.1	3.4	0.2				
P2962	High Alkali (T)	13.4	880 - 1060	52.5	3.4			5.2		18.6	10.3	2.9				6.9
P2963	Soft Alkaline	14.5	850 - 1000	52.7	10.8		0.1	4.9			0.3	26.5				
P3110	Low boro silicate Ferro	10.1	920 - 950	69.8	2.6			3.7		15.3	2.3	6.3				
P3124	Standard boro silicate Ferro	7.9	1000 - 1020	55.3	13.7			9.9		6.3	0.7	14.1				
P3134	High Alkaline Ferro	9.6	980 - 1000	46.5	23.1					10.3		20.1				
P3195	High Boro Silicate Ferro	6.5	920 - 950	47.44	22.99			12.39		5.99		11.2				
R1122	White Zircon Borax	7.1	960 - 1080	55.9	13.5	12.1	0.7	4.4		6.1	0.2	6.0	1.2			

\*expansion details (x10-6/°C)

## Colouring oxides

Many different colours and effects are available when oxides are combined or used separately with different glazes, bodies and slips and with varying firing procedures. The illustrations show the raw oxides mixed with a small amount of frit on its own in each case, to illustrate the colour of the basic material

Note percentages are shown as guidance

### Copper compounds

These strong colouring oxides and compounds give an apple green colour under neutral or oxidising conditions, except in alkaline glazes when a turquoise blue is obtained. Whilst in reducing conditions a copper red colour is produced sometimes known as sang-de-boeuf. The carbonate form gives an evenly textured green glaze due to its fine particle size ( 3 - 7%)

**NOTE** – when added to low solubility glaze, copper causes the solubility of the lead to be greatly increased, making the glaze unsuitable for use on vessels containing food stuff or beverage.

#### P3404 Copper Carbonate CuCO<sub>3</sub>

3 - 7% addition

#### P3405 Copper Oxide Black CuO

1 - 5% addition

### Manganese compounds

Gives brown colours in glazes. Pink, purple or plum colours can be obtained in alkaline glazes. When mixed with iron, it produces brown; when mixed with cobalt, it produces violets.



#### P3414 Manganese Carbonate MnCO<sub>3</sub>

0.2 - 5% - giving pink to brown colours

#### P3415 Manganese Dioxide MnO<sub>2</sub> (fine)

0.2 - 5% giving pink to brown colours

#### P3416 Manganese Dioxide MnO<sub>2</sub> (coarse)

2 - 10% giving speckled effects in both bodies and glazes

## Iron compounds

These oxides generally give a wide range of colours ranging from honey yellow, brownish reds, brown, black, yellow and purple dependant on firing conditions. Under reducing conditions a blue colour can be obtained

### R1011 Iron Chromate

In its coarse form it is used as a blue brick stain. The fine version (2 – 5%) exhibits a grey/brown to black colour in glazes. In reduction conditions the colour will be blue to grey.

### P3408 Iron Black Oxide FeO

4 - 8% gives darker shades than the red (P3410/P3441)

### P3410 Natural Red Iron Oxide Fe<sub>2</sub>O<sub>3</sub>

2 - 10% produces colours from honey to dark brown

### P3412 Iron Oxide Spangles (magnetite) Fe<sub>2</sub>O<sub>4</sub>

1 - 5% a coarse grade producing crystalline black specks

### P3441 Iron Oxide, Red synthetic Fe<sub>2</sub>O<sub>3</sub>

2 - 10% a very finely divided form, producing even shades ranging from ambers to brown.

### P3423 Iron Oxide (Yellow Ochre) Fe<sub>2</sub>O<sub>3</sub>

3 – 8% a form of iron oxide producing yellow to brown colours

### P3429 Iron Oxide (Yellow Ochre)

A different source of materials, producing slightly different colours to P3413

Approximately half the strength of P3423



P3408



P3441



P3423 - P3429



P3410

## Cobalt compounds

The most powerful colouring oxide. This oxide produces a deep blue or blue-black colour in lead and leadless glazes and a vivid blue in alkaline glazes. The presence of magnesium gives a more purple colour.

### P3402 Cobalt Carbonate CoCO<sub>3</sub>

1 - 3% to obtain a blue glaze

### P3403 Cobalt Oxide Black Co<sub>3</sub>O<sub>4</sub>

1 – 1.5% for a deep blue black



## Chromium compounds



### P3401 Chromium Oxide Cr<sub>2</sub>O<sub>3</sub>

Normally green in colour but in some lead glazes will give red and yellow. A pink is produced in the presence of tin oxide. Normally additions of 1-3% is used. A 1% addition to low firing leaded glazes with a soda content gives a brilliant yellow.

## Nickel oxide black

### P3417 Nickel Oxide Black Ni<sub>2</sub>O<sub>3</sub>

1 - 3% giving brownish greens to grey. In high zinc content stoneware glazes a yellow or blue is obtained under reducing conditions



## Yellow oxides

### P3400 Antimony Oxide Sb<sub>2</sub>O<sub>3</sub>

Additions of 1-2% to a high leaded glaze give the characteristic Naples yellow

### R1042 Vanadium Pentoxide V<sub>2</sub>O<sub>5</sub>

Up to 10% addition – gives a weak yellow as a stain. Can be used at higher temperatures than antimony oxide, giving a stronger colour when used in conjunction with tin