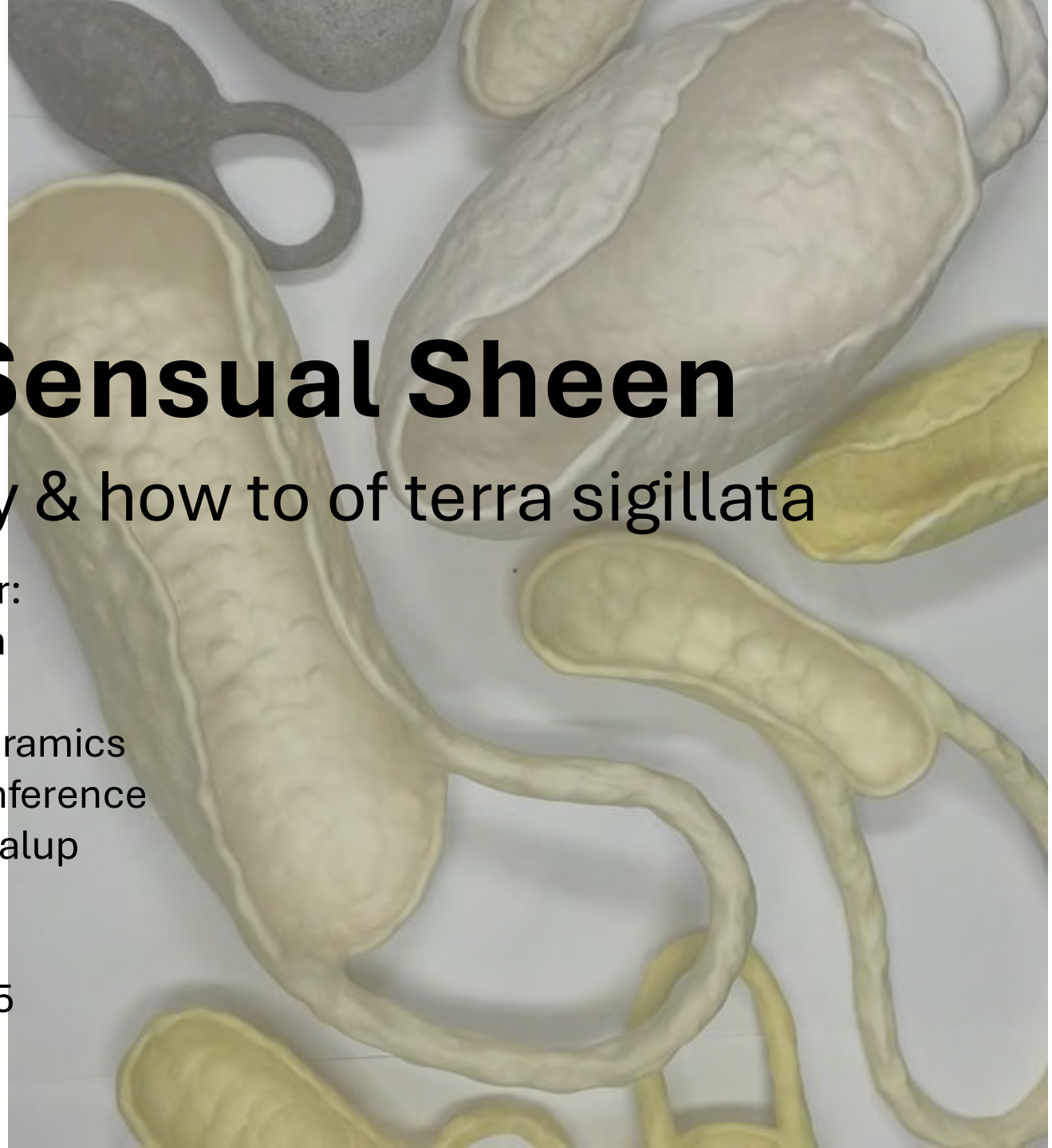
The Sensual Sheen

The why & how to of terra sigillata



Demonstrator:
Robyn Phelan

Australian Ceramics
Triennale Conference
WEDGE Walyalup
(Fremantle)

October 2025

Link to preentation

Intro Song : 'It's a trick of the light', 1986, The Triffids, West Australian

Acknowledgements

Unceded lands of Woiwurrung, Boon Wurrung, Taungurung People of Eastern Kulin Nation, thank you to elders past and present for custodianship of this land.

How to hold, how to carry and how to care, 2023, range of hand formed clays, terra sigillata, ceramic stain, hand-woven t-shirts, tea towels & pillowcases, h. 60 w. 36 d. 22 cm

What is terra sigillata?

Creativity, Uniqueness, Nerve & Talent:

- Single clay sources – each clay body is distinctive, refined surface to you forms
- Versatility of firing temperatures
- Potential to combine with other ceramic surface treatments
- Direct application and immediate result /response
- Satin/way sheen to surface with or without burnishing.

Robyn's love affair with sig

- For lovers of the leatherhard stage
- Skin-like finish
- In the round forms without a glaze foot/ring
- Retains & highlights making marks
- Versatile

What is terra sigillata? Material definition:

The "**colloidal** or **suspension** effect" in terra sigillata is achieved by using a **deflocculant** to separate the finest clay particles from coarser ones. Finer particles stay **suspended** (electrically repelled) in the water and heavier **sediment** particles to the bottom.

This allows the potter to **decant and use only the highly refined, colloidal-sized clay for a smooth, glossy, and polished surface when fired**.

A colloidal liquid has very fine particles that form a dense layer after firing, resulting in the characteristic lustrous, glaze-like finish of Roman-era terra sigillata pottery and continues to be utilised as an aesthetic effect today.

What is terra sigillata?

Clay body definition:

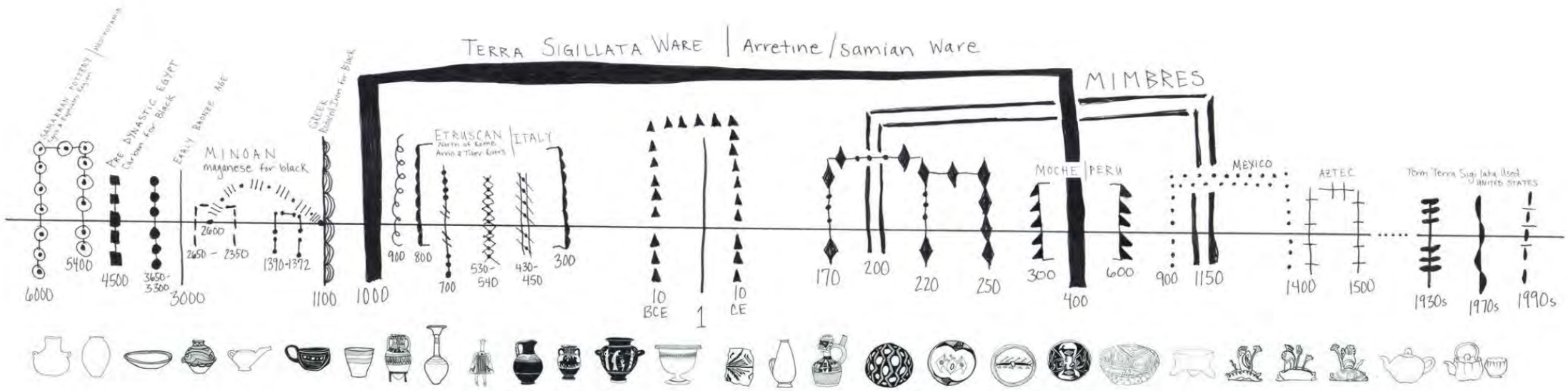
- Kaolin clays – such as a white stoneware clay will burnish well
- Ball Clay – highly plastic mineral, warm & bright colour results
- Red earthenware/terracotta – endless options
- Self sourced clay – often lack workability and have associative extractive issues. A sig surface offers site specific colours without forming challenges

Terra sigillata hiding in plain sight – museum collections – ‘history & change’

Neues Museum Berlin July 2025

An ancient technique

Timeline acknowledgement Rhona Willers

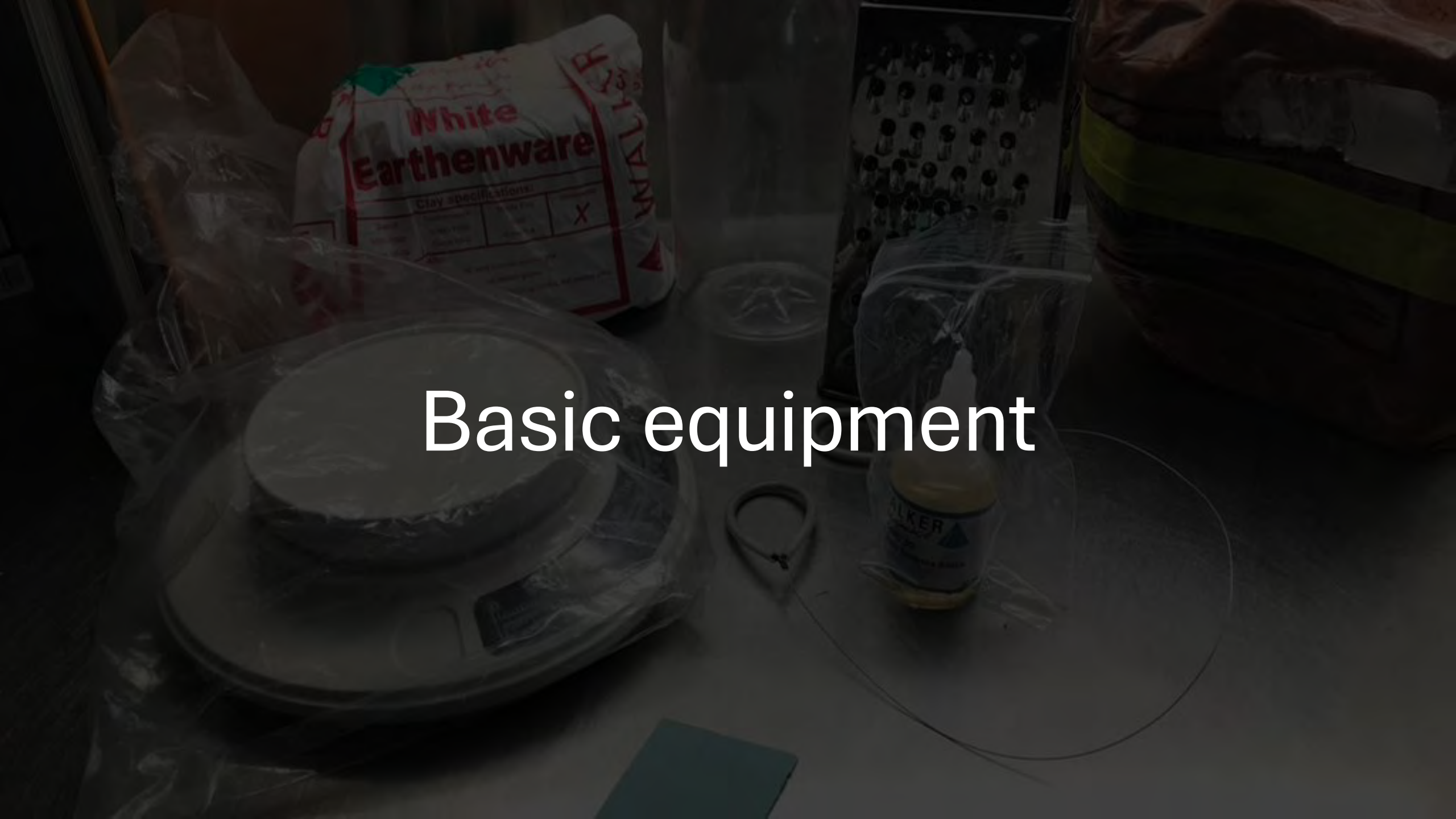


Peter Pinnell & Rhonda Willers Terra Sigillata NCECA lecture 2018

An ancient technique

Collection of National Gallery of Victoria, June 2025

- Predynastic Egyptian (Nile River silt)
- Attic red figure-ware Skyphos
- Neolithic Chinese pot



Basic equipment

Making Process & Equipment

EQUIPMENT

Large bowls/buckets ~ 8 litres, clear plastic bottles ~1-2 litres, grater, cutting wire, stick mixer, small and medium size scales, graduated cylinder or clear container~200mls.

PROCESS - MIXING INGREDIENTS

Allow plastic or wet clay to dry to leather or cheese hard.
Grate, slide into thin pieces.
Leave to dry to greenware
Slake greenware with measured water (mask on) ~20 minutes
Mix your preferred deflocculant into remaining warm water
Mix with a stick blender or paint mixer depending on scale
Leave sit undisturbed for 24 hours.

Process of Making & Equipment

DECANTING

Observe lines of sludge, terra sigillata and sig water

Decant using preferred method: siphon, pin hole, pour

SPECIFIC GRAVITY (the weight of clay particles in your liquid sigillata)

Tare your scale with cylinder of container on top.

Using a graduated cylinder weigh 100mls of tap water. Mark level if using a clear container.

Pour terra sig into same contain to 100mls mark. Check scale for weigh in grams.

Terra Sig likes specific gravity measurement in the range from 1.10 – 1.20 ideally 1.5

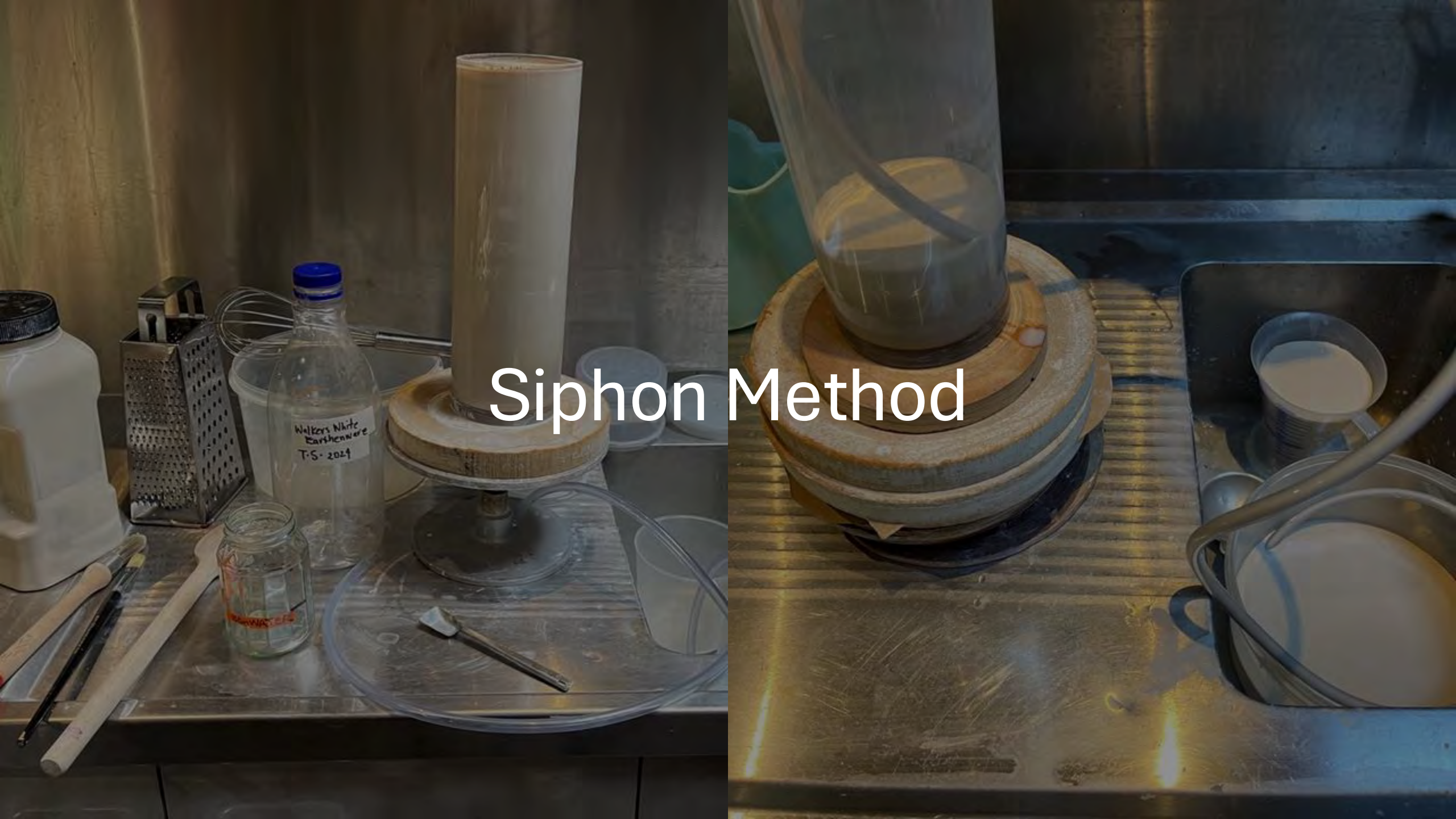
Formula: if your sig weighs 15 grams at the 100mls mark then your specific gravity is 1.5. (Just shift the decimal point across)

Demonstration clay

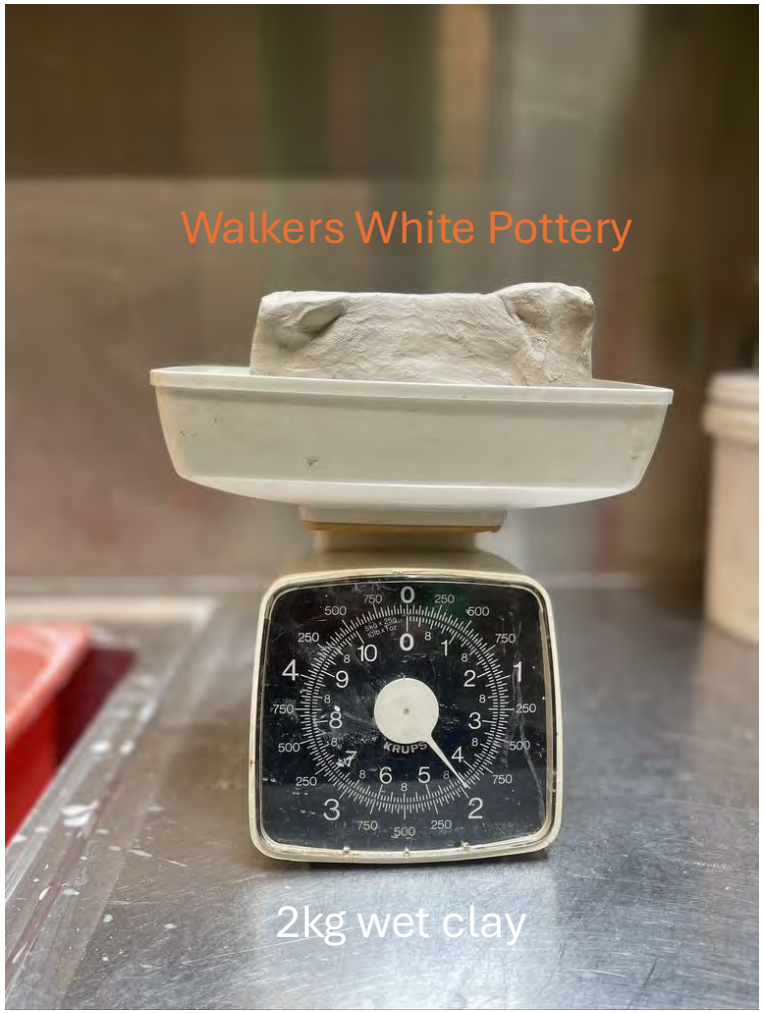
Bennetts Potters
Clay South Australia

Terracotta

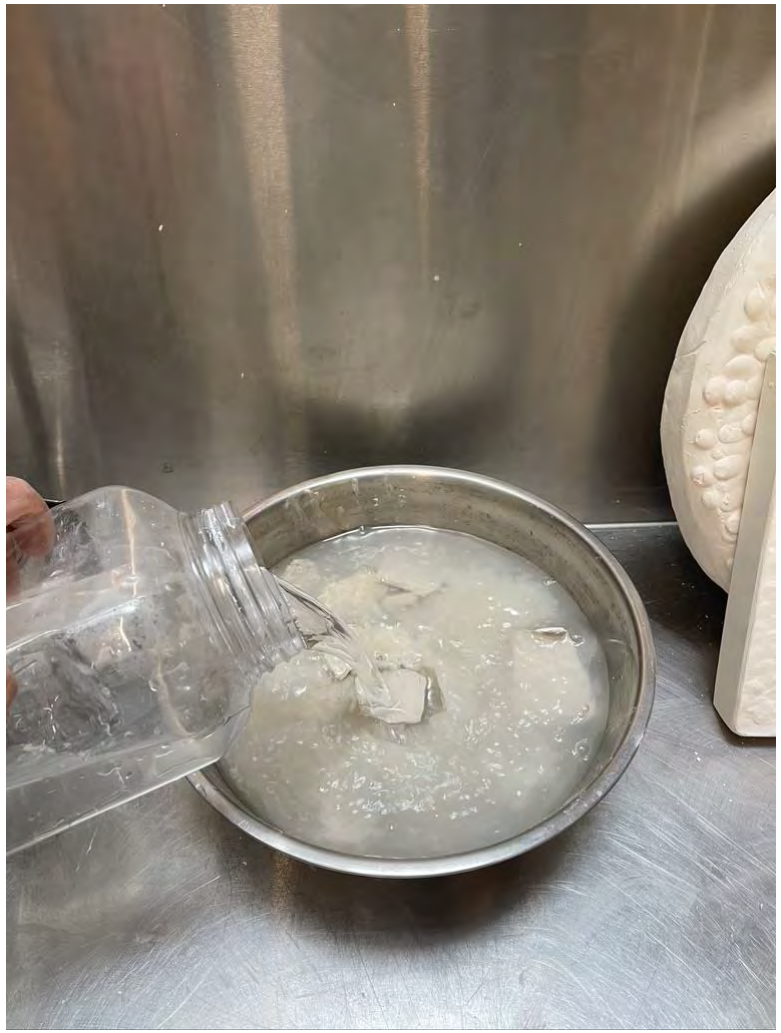
Basic process steep, settle, decant

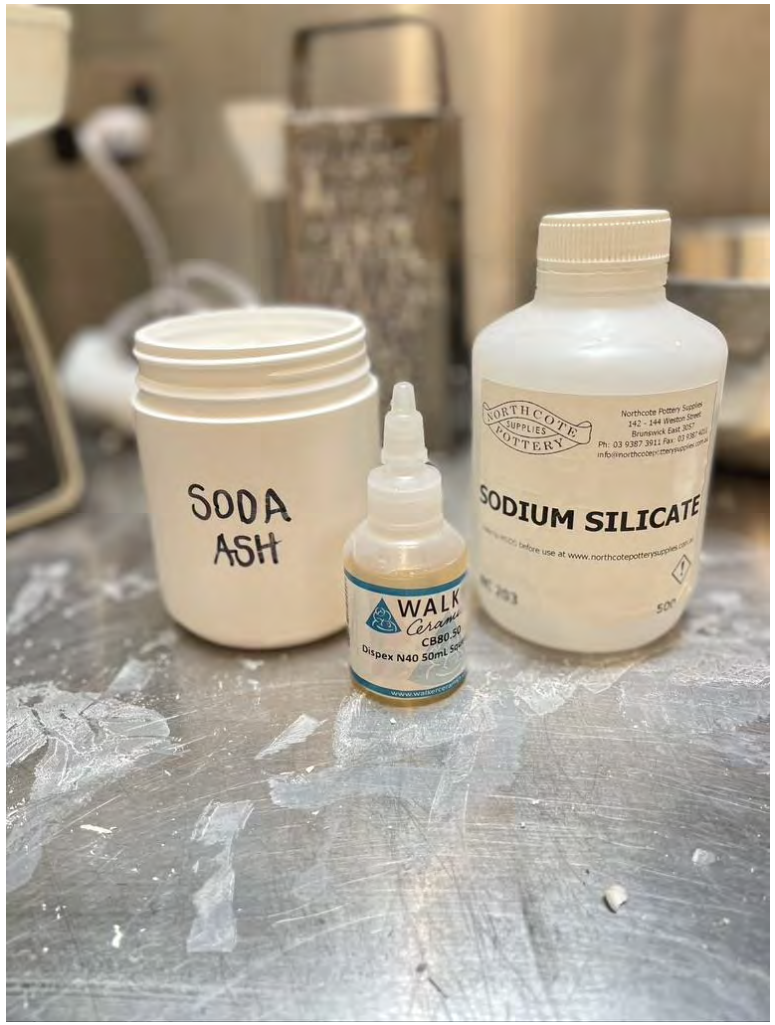


Siphon Method



Step by step process

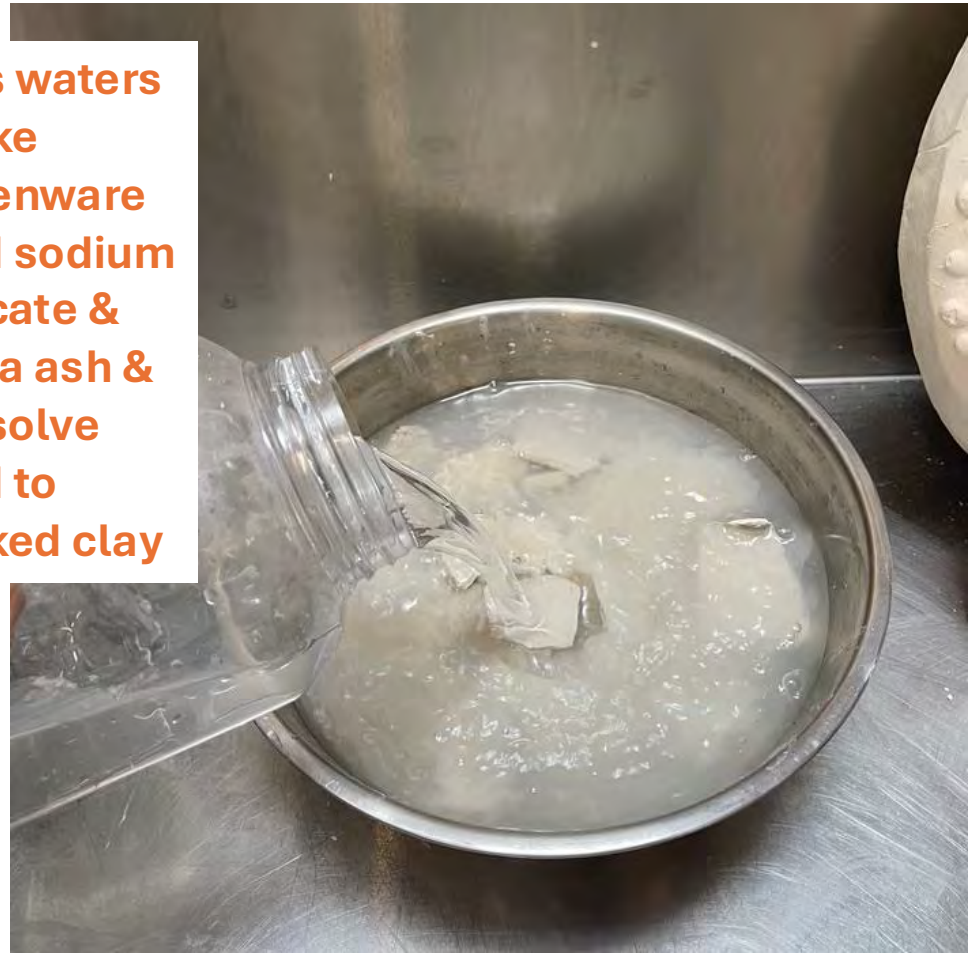




Step by step process

4 litres waters

- Slake greenware
- Add sodium silicate & soda ash & dissolve
- Add to slaked clay



Blend into an ‘oily’ mix

Step by step process

2000 grams plastic clay + 4 litres of warm water + 8 grams Sodium Silicate & 8 grams Soda Ash

Step by step process

Siphon or pin hold decanting

100mls terra sigillata weighs 128 grams (best between 110-120 grams)

1.3 specific gravity(a little heavy)

Step by step process

Specific gravity (1.1 -1.50)

Step by step process – pouring

If you see grit, stop pouring, clean out bowl and resettle to remove sediment

Making Sig – trouble shooting

WATER QUALITY	If you have hard or heavy mineralised water you may have trouble with the deflocculation action. Distilled water can be an option if small amounts.
SETTLING TIMES	8 hours minimum, 24 hours good rule of thumb, ball clays or white commercial clay up to 48 hours
TOO THIN	Evaporate by pouring into an open bowl and tray.
TOO THICK	Add water!
TOO GRITTY	Resettle and decant. Add 50% more deflocculant, resettle 24 hours and decant carefully.
WASTE	Thin top layer can be used as an undercoat. Sludge can be used as a textural finish> Add to recycle after adding a 30% Epsom salt and water solution to reverse deflocculant

Demonstration Clay

Walkers Clay Victorian White Pottery
Hammered not filtered

RECIPES – materials in different ratios for stoneware clay

2000 grams plastic clay

4 litres of warm water

8 grams Sodium Silicate &

8 grams Soda Ash

1000 grams plastic clay

2 litres of warm water

4 grams Sodium Silicate &

4 grams Soda Ash

500 grams plastic clay

1 litres of warm water

2 grams Sodium Silicate &

2 grams Soda Ash

QR code for recipes via my website homepage

RECIPES – ball clay & self sourced clay

600 grams **ball clay**

1000 ml water

6 grams Sodium Silicate

1200 grams **ball clay** Ref. Jeremey Randall & Peter Pinnell, USA (quartered & rounded into metric)

2000 ml water

11 grams Sodium Silicate

400 grams sourced clay

I litre water

6 grams Sodium

or

3 grams Sodium Silicate

3 grams Soda Ash

Robyn's In the Field Method

1 part clay

2-3 parts water (more water for heavier clay bodies)

½ teaspoon/drip per litre of water Sodium Silicate

½ teaspoon per litre of water Soda Ash

Drying & testing underway

Self Sourced
Clay

Neighbourhood
foundation
digging
opportunity

Preparing self source clay as a sig and body

Process underway.

SLAKE: remove floating organic matter | SIEVE: 2 times 2 meshes | SETTLE: | SIEVE: through cloth

Self Sourced Clay

Fitzroy renovation

Testing:
terra sig
body
gravel melt

Fired to 1280°C in White Raku coaster

SUITE OF SIGS – brown, cream, white

Adding colour – stains

Stain in a modified oxide commercially made & a vast variety are available:
Walkers Ceramics Online

Stains offer pure colour but each colour as its own burnt our temperature ~ 1200C, this is a bonus for sig which is a low fired technique.

Add to: slip & clay body >15%, glazes 5-10%, terra sigillata >15%

COLOUR INTENSITY ⬆ ⬇ SATIN FINISH WHY?

Stains colours are held stable and clean in refractory material, these are hard minerals (eg. zirconium silicate) which melt at high temperatures (1300 °C). High percentages of stain in sig (over ~4%) for bolder colours is the introduction of 'hard' material rather than deflocculated / colloidal 'soft' materials.

TEST Hours of grinding in a mortar & pestle with no observable 'softening'

Terra Red
WAX

Application

- ON GREENWARE
- 1-5 LAYERS – increasing layers offer richer satin finish
- BRUSHES – soft & fine!
- DIPPING – quick at thin (1.2–ish specific gravity)
- SPONGING – for difficult to reach or highly textured, can overlap and build up layers
- SPRAYING – try it & get back to me!

Application: troubleshooting / testing

BASKET

2 layer on greeware

+ 3 layers on bisqueware

TEST TILE

6 layers on

~ no peeling or flaking

~ multiple layers & colours

Porosity – to burnish or not ?

WHAT?

Burnishing is rubbing action applied to the smooth form that compresses the fine, surface particles.

WHY?

Burnishing sig creates a glossy sheen. Can increase watertight-ness. Build up layers of burnishing based on aesthetic needs.

TOOLS?

Soft plastic, smooth stones, cutlery (metal traces will burn out) chamois, microfibre cloth, fingers.

HOW?

Burnish or ‘rub’ when clay ‘looks’ leather hard.

Treating porosity – chemical sealants

Liquid Quartz	- food safe sealant specifically for low fired ceramics - 50/50 video
Nanoman	- Stone + Brick Protective Coating
Boncrete	– sealing concrete
Silasec	– permanent waterproof for masonry & concrete

All Australian made, non-hazardous, range of chemical actions

Sealed pottery-sculptural work

Rona Rubuntja b.1970, Panangka, Hermannburg Pottery.
Language: Auslan & Western Arand Language

Koprillia Day at Hermannsburg 2007. Earthenware, hand-built terracotta clay with underglaze colours and applied decoration

Old school chemical sealants

[Renaissance Micro-Crystalline Wax Polish]

- From the jewellers and conservation world for sealing marble, ivory, metals, gemstones, paintings.
- Reversable?
- Strong smell (white spirit) which dissipates, wear gloves apply in good ventilation

SAFETY DATA SHEET

Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II
Version 1 Revision Date 20.6.2018

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers
Product name : Renaissance Wax

1.2 Relevant identified uses of the substance or mixture and uses advised against
Identified uses : Microcrystalline wax

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture
Not a hazardous substance or mixture according to Regulation (EC) No. 1272/2008.

2.2 Label elements
The product does not need to be labelled in accordance with EC directives or respective national laws.

2.3 Other hazards - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Mixtures

CAS No.	EC No.	Index No.	Classification	Concentration
White Spirit (contains less than 0.1% benzene by weight)				
64741-92-0	265-095-5	649-279-00-6	Flam. Liq 3, Asp.Tox.1, Chronic Aquatic 2 H226, H304, H411	80%
Also contains microcrystalline wax				

N.B. The extraordinary absorptive capacity of the Renaissance blend of waxes ensures freedom from solvent despite the high liquid content. In its can the wax remains a dense solid. As such, Renaissance wax is classified as a solid material which does not meet the UN criteria for a flammable solid. As the white spirit is present in a form that is not available to the aquatic environment a classification as an environmental hazard is not deemed to be appropriate.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available on mixture. Not expected to have any acute toxic effects.

Skin corrosion/irritation
No data available on mixture. Not expected to cause any acute skin corrosion or irritation.

Serious eye damage/eye irritation
No data available on mixture. Not expected to cause any acute eye damage or primary irritation; mild reversible eye irritation may be possible following exposure.

Respiratory or skin sensitisation
No data available on mixture. Not expected to have sensitisation potential.

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity

No data available.

Specific target organ toxicity - single exposure
No data available on mixture. Inhalation of significant vapours or mists may cause transient respiratory irritation

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available on mixture. Not expected to pose an aspiration hazard.

Potential health effects

Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Ingestion	May be harmful if swallowed.
Skin	May be harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.

Signs and Symptoms of Exposure
To the best of our knowledge, the chemical, physical, and toxicological properties of this mixture have not been thoroughly investigated.

Additional Information
Not available.

Porous pottery – burnishing traditions

MARIA MARTINEZ c.1887-1980, Tewa linguistic group and lived at San Ildefonso Pueblo, Santa Fe.

CRYSTAL BURNISH TOOL handed on from mother to daughter: cultural, spiritual, generational.

Storage Jar c. 1940
polished blackware with matte black decoration

Old school chemical sealants

- **Mexican traditions**
- Burnishing stones, drenching oil and water, manganese slip, graphite and diesel plus stone burnishing.

- Andy Ward's Pottery You Tube
- - tests linseed oil, pine pitch, bees wax
- - a 'replicator' of traditional pottery skills

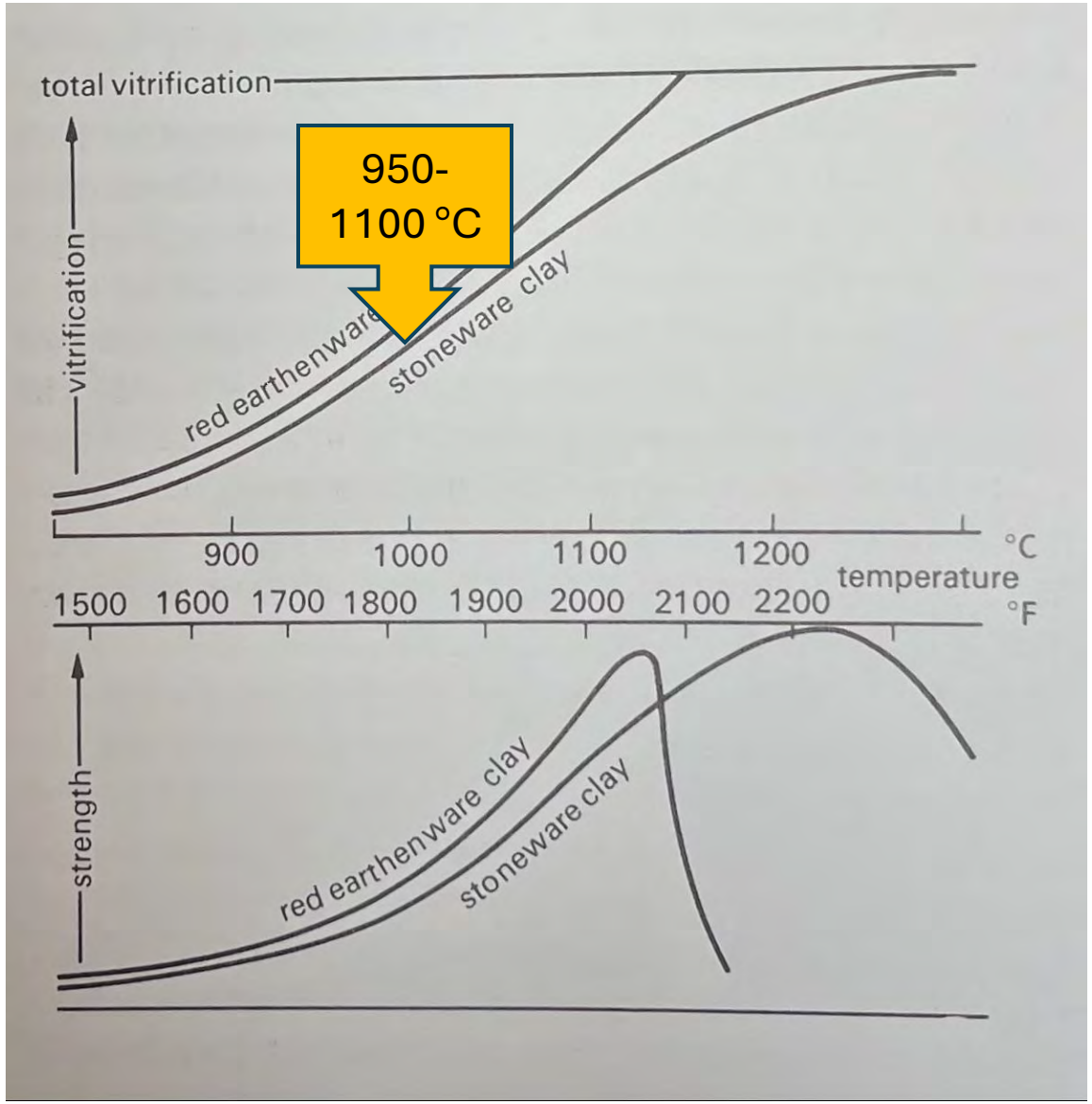
Porosity – vitrification definition:

Is the furthest stage to which a body can be taken without deformation.

At the vitrification point in the firing a body is usually in a malleable state…and is the result of melting and free silica in the clay body.

This molten silicate flows into the interstices between the clay particles and…begins to flux or fuse them.

(Ref Hamer's Potters Dictionary 2004)



Porosity – sintered temperature

To fasten together by mutual adhesion without apparent fusion. From German language for cinder. This explains its link with the partial action (partly burnt or partly fused)… All ceramic material pass through a stage of sintering before melting. There is no liquid phase involved and yet the individual particles stick to each other…The result is that materials which start as powders become solid at a temperature which is only half-way to the melting point…its actions can be seen in clays which melt above 1200°C and yet have cohesion after being fired to only 600°C…historically … and present day first nations societies use a low firing to produce cooking pots.

There is undoubtably some fusion of low-melting constituents, like fluxes but the strength is due to sintering and therefore has an elasticity not associated with glassy vitrification…used for cooking directly on fire…pots can be piled up in bisque firing without crushing. (Ref Hamer's Potters Dictionary 2004)

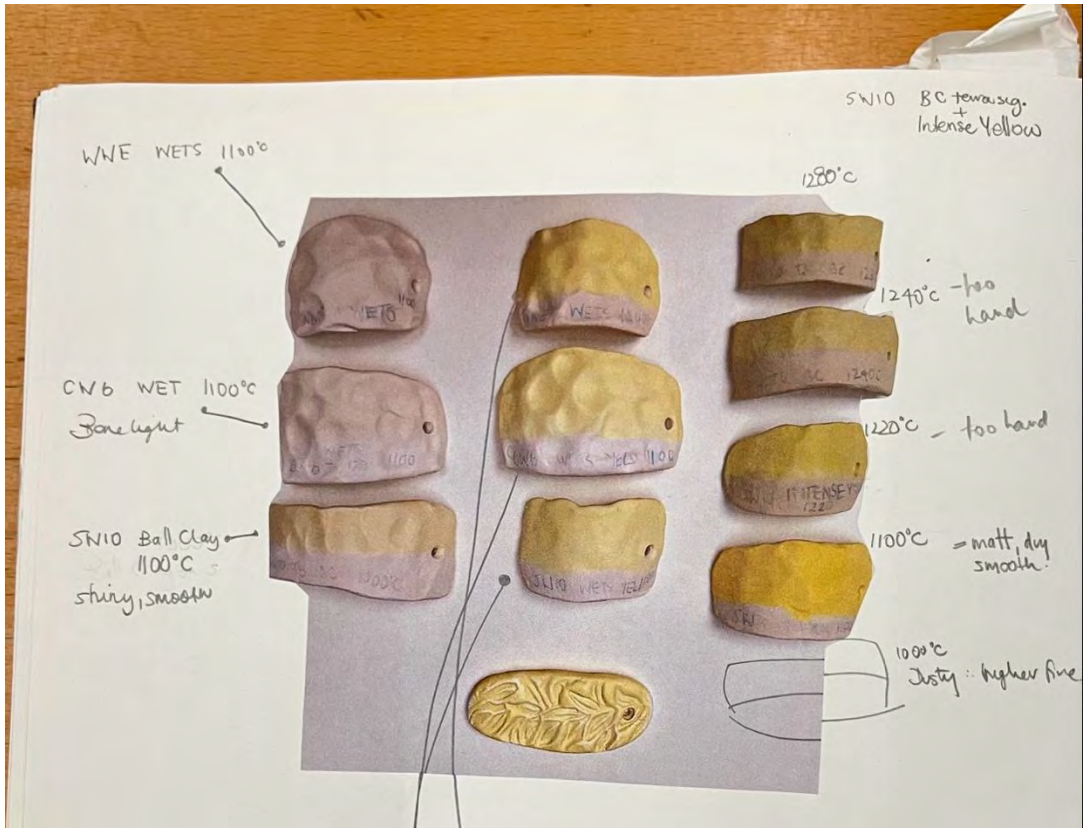
Firing range potential to manage porosity

Testing
Walkers Stoneware
10 body with
Keanes Earthenware
Sig

1000 °C
1100 °C
Sintered & porous

1220 °C
Towards vitrified

1240 °C
1280 °C
Vitrified non-porous



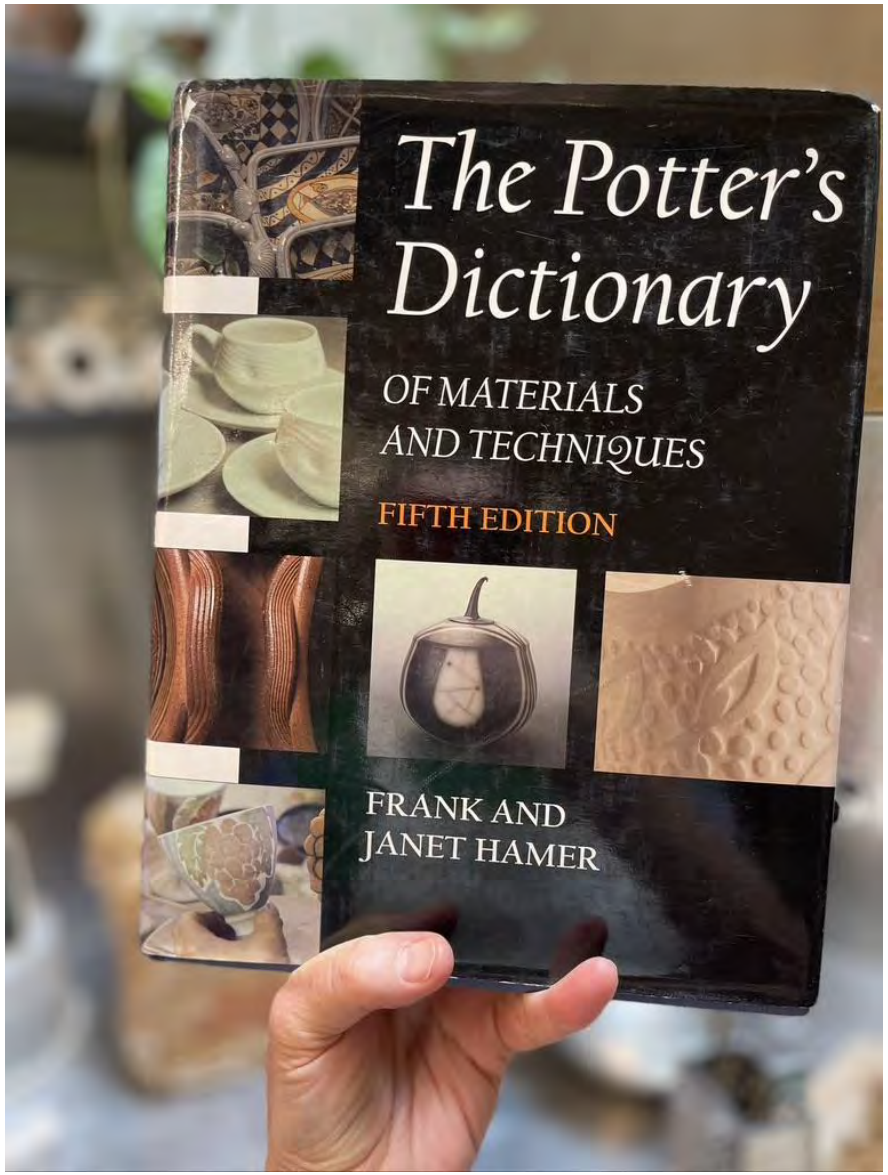
Terra Sig – your own research

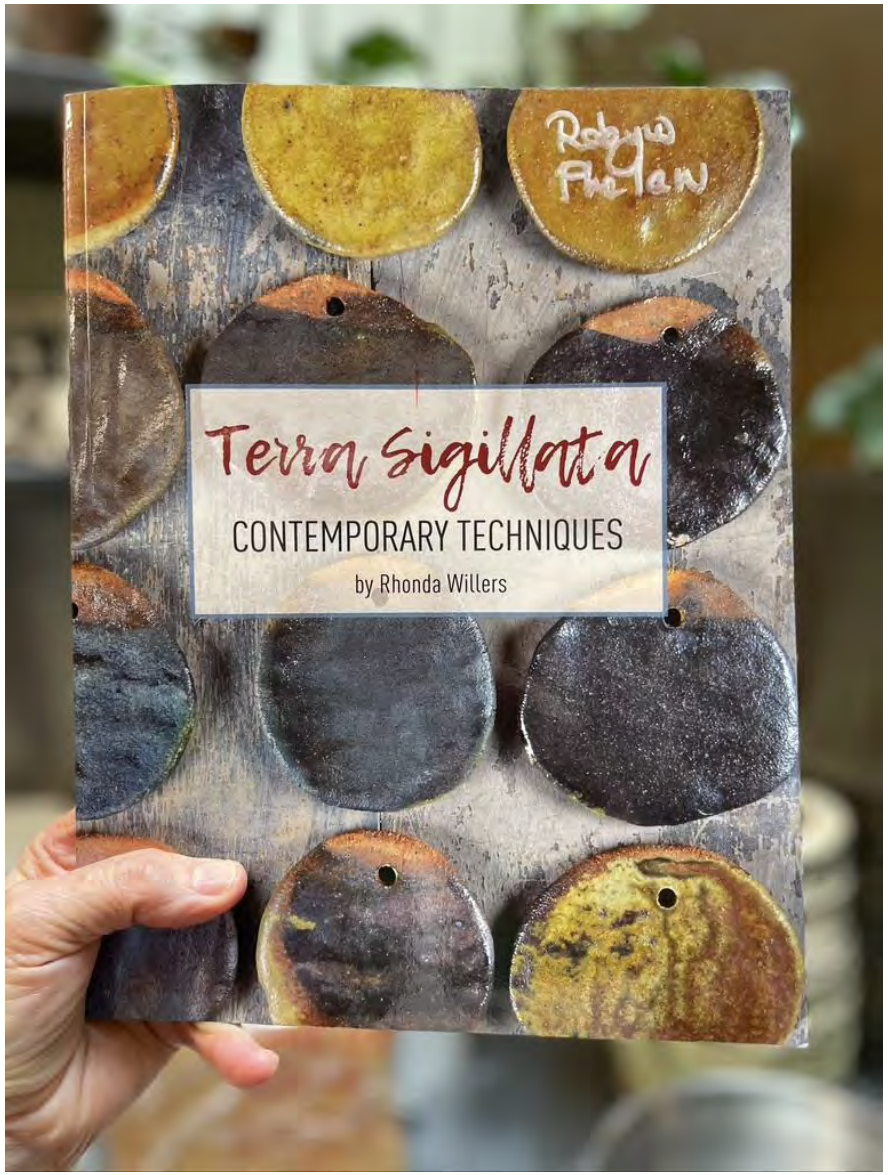
Test tiles – match your form/texture/clay body

Horizontal format – no glaze melt

Application variety – 1, 2, 3 + layers

Documentation – photograph & note in journal


The Potter's Dictionary
OF MATERIALS AND TECHNIQUES
FIFTH EDITION
FRANK AND JANET HAMER


Terra Sigillata
CONTEMPORARY TECHNIQUES
by Rhonda Willers

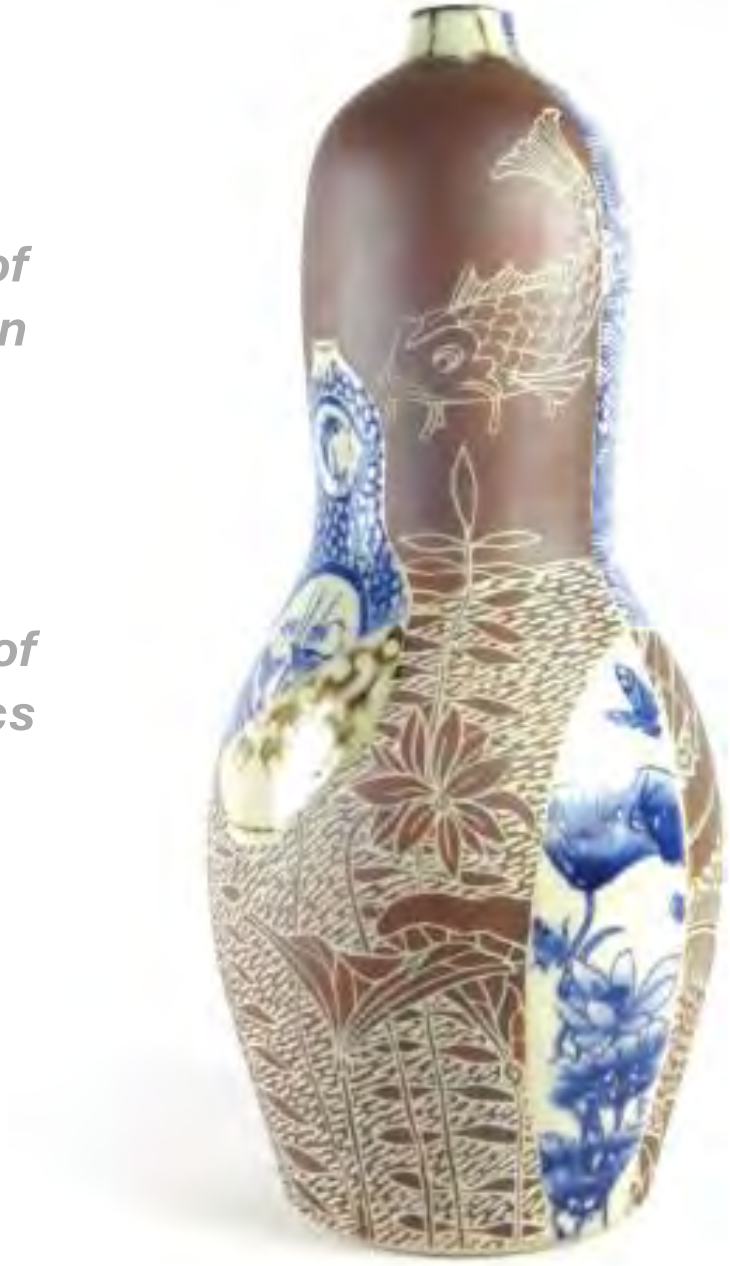
Anton Reijnders

2006-2010 fired clay, terra sigillata, tea cloth, glaze, rubber band, canvas

Anton Reijnders (NL) *Because a medium mediates intrinsic meaning and assumptions we somehow have to deal with whether we like it or not. Probably because ceramics is a medium with a l ong history, it brings with it a wide range of meanings and assumptions like:*
dirt, earth, affordable, low-status, hygienic, domestic, durable, non-heroic, sensual, responsive, fixed, identity-less, craft, hobby, high-tech, pleasing, precious, mass-produced. It is this large and partly conflicting range of meanings and assumptions that makes ceramics as an artistic medium so interesting.

Janet De Boos, AUS

...enjoy(s) using iconic imagery from the high point of Chinese porcelain decoration (Qing over glaze), colour & line from the deserts of Australia (Ernabella terra sigillata, Australian flora) and that most ancient of techniques from the ceramics lexicon (sgraffito or 'scratching') to create my hybrid pottery works that are both contemporary and timeless, culturally specific and yet borderless.



Qinghua Series, 2018
thrown Australian porcellaneous stoneware, Ernabella terra sigillata, Qinghua underglaze decals, blue underglaze, sgraffito, clear glaze, h. 53 d. 23cm

Janet Deboos (AUS) – referencing surface treatments via ceramic history

Image courtesy: Janet De Boos, road into Ernabella, South Australia

Janet DeBoos
Bundjalung Heathland
2016

CLAY MATTERS
Clay Workers for the Environment

CLAY MATTERS
About Us

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> What Do You Do With Your Seconds?

Events & Exhibitions
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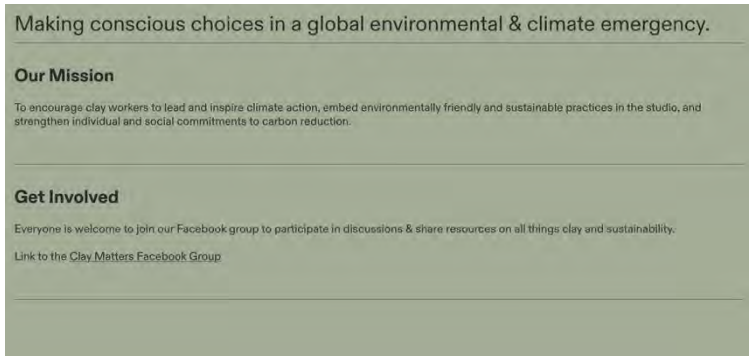
> Exhibition: Clay Matters 1
> Pottery Expo: Tent Talks
> Community Conversations

Resources
> Things to Read

Clay Matters


Making conscious choices in a global environmental & climate emergency.

Our Mission

To encourage clay workers to lead and inspire climate action, embed environmentally friendly and sustainable practices in the studio, and strengthen individual and social commitments to carbon reduction.

Get Involved

Everyone is welcome to join our Facebook group to participate in discussions & share resources on all things clay and sustainability.

Link to the Clay Matters Facebook Group

Clay Matters is a group of Australian ceramicists concerned about the environmental impact of our activities.

We came together during a hard Covid lockdown in August 2020 via a Zoom session hosted by The Australian Ceramics Association. We now meet by Zoom to share thoughts, educate ourselves and discuss how we can create positive change.

We acknowledge and pay our respects to the country on which we create and to Aboriginal and Torres Strait Islander peoples who have never ceded ownership. We acknowledge that sustainability is not a new concept for First Nations people and that areas of thinking sustainably are built on indigenous thinking and practice.

The Potter's Pledge was our first project. We are also working on green energy deals for potters. We acknowledge our limitations and are open to positive discussion and change.

Current Members of the Clay Matters group – Pattie Beerens, Amelia Black , Amanda Bromfield, Katrina Carling, Claire Ellis, Vicki Grima, Cinda Manins, Elnaz Nourizadeh, Dr Robyn Phelan and Jane Sawyer.

Former members – Pie Bolton, Lene Kuhl Jakobsen, Kate Jones, Holly Macdonald, Montessa Maack, Sophie Morris, Judith Roberts, Madeleine Thornton-Smith, and Ri Van Veen.

THE POTTER'S PLEDGE

As clay-workers we connect directly with the earth in the making of our forms. Molecules of clay matter take billions of years to evolve, and we acknowledge our practice builds on this history through human interaction as clay passes through our hands.

We advocate for the social and cultural value arising from our ceramics practices and our active choice to work with clay carries with it a responsibility to respect the earth's finite resources by identifying where materials are sourced, how they are packaged, transported and processed, and to minimise the negative social and environmental impacts of their consumption in our studios.

We pledge to make informed sustainable and ethical choices concerning the materials and energy required to create our work with respect for environmental consequences and invite you to consider the following points.

MATERIALS

Be informed and ask questions.

- Find out the origin of your materials and use local where possible to avoid excess transportation.
- If extracting your own clay, do so with care for the land. You may need to ask permission from landowners and/or indigenous custodians.
- Identify the social and cultural impact of the material extraction.
- Only take what you need.

FIRING KILNS

Take steps to mitigate the environmental impact of firing kilns:

- Edit your work before firing and recycle sub-par pieces. Your critical eye is a powerful tool of sustainability.
- Only fire the kiln when it is full.
- Develop efficient firing schedules – short soaks below temperature can reduce your fuel consumption at top temperature (half your fuel is consumed to achieve the last 100 degrees).
- Consider raw glazing or firing once.
- Source renewable energy to fire your kiln, i.e. purchase wind or solar electricity, fire with wood and plant more trees.
- Buy emission off-sets.

ENVIRONMENTAL GOALS

Reduce, reuse, reclaim, recycle, repurpose

This mantra applies in the studio and can lead to an authentic and resourceful practice by following these guidelines:

- Reclaim and recycle clay turnings and scraps.
- Wash and reuse plastics.
- Donate seconds to charity; failed pieces can be used for mosaic or let someone else use them.
- Failed work can be crushed and used for horticultural drainage or consider finely grinding scrap ceramics for inclusion into new sculptural clay bodies.
- Use recycled paper and cardboard for packing pots. When bubble wrap is the only option secure with rubber bands to promote easy reuse.
- Capture wastewater responsibly and treat/dispose/reuse where possible.
- Reclaim scrap glaze by installing a scrap glaze bucket in your studio. Adjust as necessary to make a liner glaze for closed forms or garden pots.
- Be efficient when using transport for studio practice. Public transport or carpooling for delivery can consume less transportation fuel.
- Employ environmentally safe disposal methods. Bind waste materials into fired tiles or pebbles for yard use rather than disposing of it into the ground, and subsequently our waterways.

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Signed by Clay Matters group members – Pia Bolton, Amanda Bromfield, Katrina Carling, Vicki Grima, Lene Kuhl Jakobsen, Kate Jones, Holly Macdonald, Cinda Manins, Montessa Mawk, Sophie Morris, Judith Roberts, Jane Sawyer, Mads Thornton-Smith and Ri Van Veen.

www.claymatters.com.au

We invite you to join us on Facebook: Clay Matters
(facebook.com/groups/802327510544808)

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Farewell Song : Feels like We Only Go Backward, 2012, Tame Impala, West Australian