

## STONEWARE

STONEWARE clays are abundant in nature, although less plentiful than terra cotta deposits.

- secondary clay of sedimentary origin
- matures cone 7-11 to serviceable hardness and density
- buff, tan, grey, or brown-black in color

Usually stoneware clays are blended. Small deposits occur naturally, but the commercial market is small (more market for kaolin and ball) and mining limited. Stoneware clays are similar to fire clays, but more plastic and less refractory.

### GOOD BODY CHARACTERISTICS:

- Good plasticity for forming method but with enough tooth to make large shapes w/o slumping.
- Body open enough to dry w/o undue warping or cracking.
- Shrinkage controlled in drying and firing: no tendency to cracking.
- Does not warp or slump much in firing to maturity
- Desired degree of vitrification
- Color desired
- Freedom from alkalies (soluble salts) that cause scumming.

Base clay for body formulation:

**WHITE/BUFF STONEWARE** - May begin with kaolin. Refractory: adjust for vitrification at firing temperature by adding flux. Most kaolins lack plasticity: adjust w/ball clay additions. Non plastic kaolins have acceptable shrinkage. **EPK, Tile 6, Pioneer, Georgia Kaolin** are good choice. **EVERY** should be reserved for salt/wood slips (this is no longer mined and largely unavailable), and the more \$\$ **GROLLEG** saved for porcelain. **FOUNDRY HILL CREME** is a buff stoneware clay with high plasticity. Adjust to counter high shrinkage.

**TOASTY ORANGE/BROWN STONEWARE** - begins with an iron-bearing stoneware clay like **CEDAR HEIGHTS GOLDART** or Carbondale Red Fireclay. Kaolin can be added to lighten the color. Adjust plasticity. Additions of non-plastic ingredients (fluxes, silica) may need to be countered with ball clay additions. If no stoneware clay is available, begin tests with ball and fireclay mixes.

**USUAL LIMITS FOR STONEWARE BODIES:** Most multi-purpose bodies for throwing and handbuilding should be 75% clay, 25% non-plastics. Flux is the ingredient with the least latitude in adjustment. Color will vary from firing method and location in the kiln. Fire clays are more likely to iron spot. Additions of rust scale, steel wool, granular illmenite, or granular rutile will also speck. Body impurities that cause flecking may also influence glazes. Color and texture may also be added with grog. Yixing teapots (Chinese) use light grog in a dark body for a pear skin effect. If you need colored grog, you can make your own.



**Korea. Silla. 5th c C.E. Cart w/2 jars. Stoneware. Asian Museum, San Francisco.**

Ball-park parameters for compounding stoneware bodies

Material up to	%
Stoneware clay	100%
Ball	50
Kaolin	30
Fire clay	75
Sagger clay	75
Red earthenware	25
Grog	30
Flint	25
Spar or Neph Sy	25
Talc	10
Pyrophyllite	20

<b>Plastic Stoneware C 9-10</b> absorption 1%, shrinkage 11.5%		<b>Brown Stoneware based on kaolin &amp; ball clay c9-10</b> absorption 1%, shrinkage 12.5%		<b>Brown Stoneware based on fire clay c9-10</b> absorbency 1.5%, shrinkage 10%	
Stoneware clay	60	EPK	25	Fire clay	40
Ball	20	Ball	30	Ball clay	30
Flint	10	Red clay	10	Red clay	10
Feldspar	<u>10</u>	Fire Clay	15	Flint	10
	100 %	Flint	10	Spar	<u>10</u>
Plus grog 5-20%		Spar	<u>10</u>		100%
		Plus grog	100%		
<b>Grey Stoneware c10</b>		<b>Stoneware Buff Snair's c10</b>		<b>Scott Goldberg Brown Stoneware c10</b>	
Foundry Hill Creme	40	GoldArt	65	A.P. Green	47
Tile 6 clay	20	A.P. Green	13	GoldArt	23
Kentucky OM #4	20	Ball clay	13	Kentucky OM #4	20
Custer feldspar	15	Custer feldspar	<u>9</u>	Redart	5
Flint	5	+ grog if desired	100	Feldspar	<u>4</u>
			6		99
<b>Betty Woodman's White Stoneware c10</b>		<b>White Stoneware Nelson c10</b> Creamy off-white in oxidation		<b>Stoneware for Wood, Salt, or Soda – Nancy Barbour c10</b>	
XX Sagger	15	Custer feldspar	10	A.P. Green	33
EPK	13	Tile 6 clay	25	XX Sagger	26
Tennessee ball clay	12	XX Sagger	30	Tile 6 clay	15
Tile 6 clay	25	Kentucky OM #4	20	EPK	19
Kaopaque	10	Flint	15	Custer feldspar	<u>7</u>
Custer feldspar	10				100
Flint	<u>10</u>			Grog	15
	95			Kyanite	7
Molochite	8				
Macaloid	1				