WALKER Ceramics

Clays Glazes Colours

Superior White Porcelain Slip Recipe June 2023

	minimum	maximum
powdered clay	25 kilos	25 kilos
water	11 litres	12 litres
N42 Sodium Silicate	180gm (135 mL)	210gm (158 mL)
N40 Dispex	10gm (7 mL)	20gm (14 mL)

litres of slip produced	20
aim litre weight / grams per litre	1755 - 1770
biscuit (minimum)	1000°C / Orton Cone 06
glost	1280 - 1300°C Orton Cone 8 - 9

❖ *Full contents of bag must be used in each mix* ❖

(Raw materials are NOT mixed)

Recommended Method.

1. Add water to mixer
2. Add minimum Sodium Silicate N42 diluted 50/50 with warm water
3. Mix and put aside minimum Dispex diluted 50/50 with warm water
4. Agitate mixer as you add some of the clay
   the slip will gradually thicken
   add a small amount of Sodium Silicate mixture to maintain fluidity add Dispex after this….
   then add more clay
   continue this process until all the clay is in the mixer and a smooth creamy consistency is obtained
   the maximum amount of Dispex should **not** have been needed to this stage
5. Check the litre weight
   if litre weight is higher than the aim add water
   if litre weight is lower than the aim add clay

For accurate litre weight measurement contact Walkers for a **litre weight bottle and calculation chart**

6. Mix for 1 hour (more for multi bag mixes) then check if more Dispex mixture is required for pouring fluidity
7. Allow slip to "wet" for 48 hours and mix again for 1 hour. Check for very small specks of undissolved clay and if present, repeat step 7 until no longer present.

Slip must be sieved through an 80 mesh screen before use

For multi bag mixes proceed as above but leave addition of Dispex until final adjustment

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TECHNICAL INFORMATION

Deflocculants

The amounts of Sodium Silicate or Dispex added to a casting slip are very critical and too much or too little may each result in the slip being too thick. If this happens, take a 1 litre sample of the slip and add one or two drops of Dispex.
If the slip becomes thinner after stirring then this shows that more is required to achieve good fluidity. If the slip becomes thicker then this shows that too much has been added already. Therefore more clay and water needs to be mixed into the slip in the same proportion as given in the casting recipe – no more Sodium Silicate or Dispex. The recipe can depend on the quality of the water supply, which may vary from one location to another and also may be affected by minor variations in the body's raw materials.

Maturing the slip

On standing overnight the slip may thicken up slightly. This will easily re-blend when mixing is resumed, even by hand. We recommend that a film of water, approximately 2mm deep, is placed on top of the slip after mixing. This will reduce water evaporation from the mix, especially in warmer weather.

Litre Weight Checks

The most important part of successfully mixing casting slips is getting the correct litre weight. For accurate and easy litre weight measurement contact **Walker Ceramics** for a **Litre Weight Bottle and Chart.**

Recycling Scrap

Great care is needed to avoid contamination, particularly from plaster moulds. Scrap should be kept in sealed containers in a plastic condition. Dry scrap will promote air inclusion in the slip. Recycle by adding a maximum of 20% of scrap. More than 20% can effect the quality of the slip. We recommend adding Barium Carbonate ($BaCO_3$) to the slip to remove sulphates, which may cause peeling faults. The amount of Barium Carbonate to add should be 0.1% (25gm per 25 kg bag) of the total dry weight of clay and scrap.

Faults and Remedies

Everybody who casts suffers from time to time from some form of casting trouble. Experience throughout the industry, combined with the extensive work done on casting slips in our laboratory has enabled us to connect the various faults with measurable properties of the slip. Of course, other factors besides slip properties can cause casting faults, but usually they can be easily noticed; for example, wet moulds causing slow casting, careless filling causing 'pinholes' or 'casting-spot', etc.
The table shown gives a brief description of each of the common troubles and the suggested remedies. This only gives the direction in which to move and it is up to the individual to determine how far they need to go.
Say you were suffering from flabbiness and you increased the dispex addition to correct this then found that you began to get brittle ware with casting spot, then you would know you had gone too far.
The following table will help you in recognizing and fixing common problems.

***In all our slip recipes we recommend a maximum of Sodium Silicate - adjustment should only be made to Dispex*.**

Before making any adjustments make sure the litre weight is within the stated limits for the body . Use our easy Litre Weight Bottle and chart

Fault	*Description*	*Cause*	*Remedy* *Always check Litre weight first!*
bad draining	*slip failing to drain from narrow sections uneven surface on slip side of cast piece*	*fluidity too low or thixotropy too high (slip thickens too quickly)*	*increase water addition (if litre weight is too high) or increase dispex addition*
brittleness	*difficult to fettle or cut – giving jagged edges*	*thixotropy too low (slip too fluid)*	*decrease dispex addition*
Casting spots scumming	*discoloured patch appearing on the mould side of the article after firing, scum on surface of slip*	*thixotropy too low (slip too fluid)*	*decrease dispex addition or decrease water addition*
cracking	*small cracks on edges or where handles join the body of the article*	*thixotropy too low (slip too fluid)*	*decrease dispex addition*
flabbiness	*soft casts difficult to handle without distortion*	*thixotropy too high (slip thickens too quickly)*	*increase dispex addition*
pin holing	*small holes just beneath the surface on the mould side of the article*	*fluidity too low – air in slip*	*increase water addition (if litre weight is too high) or increase dispex addition*
slow casting	*casting time too long*	*fluidity too high or thixotropy too low (slip too fluid)*	*decrease water addition or decrease dispex addition*
wreathing	*small uneven ridges on the slip side of the article*	*thixotropy too low (slip too fluid)*	*decrease dispex addition*

Thixotropy is the property of slips becoming thicker when they are at rest i.e. "thixotropy too high" means that the slip thickens up very quickly!