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Vinamould User Guide

INTRODUCTION
Vinamould Hot Melt Compounds are a series of vinyl based flexible mould making materials, which are tough and need no release agents. They are designed for the manufacture of flexible moulds for casting concrete, plaster resins (GRP), plasters and waxes. They have good tensile strength, and are available in grades varying from high flexibility to hard (but resilient) compounds with melting temperatures of about 150°C and 170°C.
Vinamould Hot Melt Compounds are proof against water and many chemicals, and are not affected by climatic conditions; consequently changes of humidity in the air do not alter the shape of the moulds, nor do they fry out.
All Vinamoulds melt to Pourable liquids and since the two grades of the low melt group may be mixed, compounds with intermediate flexibilities can be obtained.Multiple casts can often be made from one mould (depending on the casting material); the mould may then be re-melted, re-cast and used again. The softening temperature of Vinamould is sufficiently high for temperatures of up to 80°C not to significantly affect them.

WARNING – BEFORE HANDLING OR USING Vinamould, READ THE SAFETY NOTES.

The information and data in this Technical Booklet are based on our experience and tests, and on information gathered, we believe it to be reliable. However, we cannot accept responsibility for accident, loss, infringement of Patents, or for operations not directly under our control. You should thoroughly test any application and independently conclude satisfactory performance. Suggestions of uses should not be taken as inducement to infringe any particular Patent, or to violate any particular laws or regulations.

HEALTH AND SAFETY NOTES
Vinamould grades are prepared using only constituents recognised as having a very low order of toxicity, and are formulated to meet the Safety Requirements for Children's Toys and Playthings, BS. 3443. We therefore feel that this material is ideal in this respect for use in School and Home environments.

HANDLING
Vinamould is generally quite harmless to handle, provided certain simple precautions are taken. Used and unused materials must not, for instance, be allowed to come into contact with skin, since people with sensitive skins may be affected. The use of barrier creams or gloves is advised, and the skin should be thoroughly cleansed with soap and water at the end of the working period.

MELTING
During the melting stage, avoid breathing fumes at all times. The somewhat unpleasant fumes associated with the melting of Vinamould are caused by the volatility of the plasticising compounds used in the material. None of the plasticising compounds are considered toxic, so the vapours produced during the heating of Vinamould are a nuisance rather than a hazard. Nevertheless, for the comfort of the user, and to avoid any possible irritation of the respitory tract, we would always recommend adequate ventilation and extraction as necessary in the area where Vinamould is being heated, to remove fumes. If dense fumes are given off (usually because of overheating) during the mould pouring, then the use of a face breathing mask is recommended.

OVERHEATING
If melted at the correct temperature in a ventilated room, it should be hardly possible to smell Vinamould. However, neglect by serious overheating will lead to fumes and decomposition, and if prolonged can cause respitory irritation, whereby possible damage to health cannot be excluded. In order to avoid overheating, check the melting compound by using a thermometer graduated to 200°C; if using an electric melting pot, adjust the thermostat if necessary, after checking the melting compound with a thermometer from time to time (eg. weekly). Overheating is indicated when the material fumes heavily, and changes colour to dark brown or black; in which case remove from the heat and the working area and discard from use. New Vinamould should not be mixed with burned or very old Vinamould.

HOW TO USE Vinamould
CHOICE OF GRADE – TEMPERATURE AND FLEXIBILITY

The most suitable grade depends largely on the shape and size of the original to be moulded, the type of mould (two-piece, open relief), the kind of casting material (plaster, resin, concrete etc), and the composition of the master. The relatively high pouring temperature does sometimes present a problem – e.g. moulding wax originals, porcelain and porous surfaces; but conversely, it is often an advantage because it allows castings to be made with materials where heat is required. Temperatures of 80°C can be reached using Vinamould.

LOW MELT RED AND YELLOW

These two grades are easily distinguished by the ease with which they can be melted at temperatures 150°C – 170°C and poured between 140°C – 150°C. They are designed to meet the need for stable and non-distorting mould materials able to withstand prolonged heating cycles – an important factor with certain resins, such as polyester, which produce high exotherm in a lengthy curing cycle, and in the cases of certain higher melt waxes which take some time to cool down before removal from the mould. Small objects up to 6" (150mm) in height require low pouring temperatures of 140°C. This is because their small bulk warms quickly, and the hot Vinamould does not have far to travel, premature gelling is no problem. Larger work will require a pouring temperature of 160°C – 170°C: this allows the Vinamould to flow without causing flow marks, and also avoids trapping air.

Most moulds can be made with Red, but in some cases the yellow may be more suitable. A flat open mould would not require a rigid case made in yellow Vinamould. Sometimes a large mould with a lot of overhang would be more self-supporting if made in the more rigid yellow Vinamould.

Great care must be taken to prevent overheating and decomposition: then the resulting moulds are more resilient to tearing, owing to their high tensile strength. red yellow may be melted down together to produce intermediate flexibilities.

MELTING Vinamould – AIR BATH METHOD

Small quantities of Vinamould (up to 10lb) can be melted in an air bath, similar to a glue pot or porringer, but without the water (otherwise the temperature will not go above 100°C). An air bath can easily be made from two cans of different sizes, the smaller being suspended inside the larger, leaving a space between them of at least ½" (12.5mm). A well fitting (but not airtight) lid should be used. The inner container should be aluminium, stainless steel, or tin: copper and zinc are not suitable. Specifically made Vinamould melting pots are available for quantities of 2 ½ lb and 5 lb, and if Vinamould is to be used frequently, these are strongly recommended. The only other item required is a thermometer with a range of 100° to 200°C.

The Vinamould should be cut into small pieces and a small quantity placed in the pot. Commence with a moderate heat, and stir immediately as the Vinamould begins to melt. When this first lot begins to liquefy, some more pieces should be added and the procedure repeated until all the Vinamould has been melted. The contents must be stirred frequently from the bottom of the pot throughout the melting cycle and the temperature checked with a thermometer, the heat being adjusted if necessary. Take care the thermometer does not touch the side or the bottom of the pot and so give a false reading. Do not stop stirring from the bottom until the Vinamould is completely liquid. At this point, remove from the heat and allow the Vinamould to come to its pouring temperature.

Excessive smoking during the melting process indicates overheating, leading to decomposition. Melting time of Vinamould is approximately 30 minutes for 500grams, 60 minutes for 2 kg. and 90 minuted to 2 hours for 3 kg.

MELTING Vinamould – ELECTRIC MELTING POT

Electrically heated, thermostatically controlled melting pots are available to melt Hot Melt Vinamould Compounds in various capacities up to 20kg at one time. These appliances are very safe, efficient and easy means of melting Vinamould, without danger of overheating and burning. The controlled heating of the compound results in the re-melt life of the Vinamould being increased by up to 40%.

MELTING Vinamould – MICROWAVE

Although this method yeilds very quick results is can also go cause damage to the vinamould. While we do not recomend the use of a microwave to melt the vinamould for those customers that do we would recomend that you set the microwave to a low setting. Try and avoid the vinamould getting too hot as it will start to smoke and degrade. Cut the vinamould into VERY small pieces, this will help the vinamould melt quickly. DO NOT use a microwave that is also used for food.

TREATMENT OF THE MODEL

Models must be perfectly clean and all paint and decorations removed. Almost any rigid material can be used, provided it does not soften at the melting temperature of the compound. Metal or non-porous objects do not require any treatment, but can be given a thin coating of oil (such as Three-in-One) to act as a mould lubricant. Bulky metal parts should be warmed to counteract any chilling of the Vinamould. China and glass objects should be well warmed beforehand to prevent breaking when the hot compound is poured: in the event such objects are fragile or very valuable, it may be safer to make a gelatine mould, make a plaster cast, and then make a Vinamould mould from the plaster cast.

Porous objects hold a lot of air, and if precautions are not taken, the air will expand, escape from the model and ruin the mould face with air bubbles. Air must therefore either be sealed in, or displaced. Small plaster objects of any great size should be sealed. Good results have been obtained using the G4 Varnish at temperatures up to 170°C. Three coats should be applied, each being allowed to dry thoroughly before the application of the next. The sealed model should be allowed to dry thoroughly (say overnight) before pouring the hot Vinamould.

Wooden objects present more of a problem. In some cases, depending on the wood, it can be used water wet, but generally, sealing with G4 Varnish should be carried out as for plaster. Cement and stone objects are generally best used water wet; they should be soaked for a few hours, the excess water taken off, and then Vinamould poured without further preparation. The alternative is sealing with G4 Varnish.

Wet clay generally needs no preparation at all, but it would pay to pour the Vinamould at as low a temperature as possible – 140°C. Dry Clay presents a problem; to pour hot Vinamould on to it would be to invite disaster. It is often possible to soak the clay originals to soften them down (and so replacing the air with water), and if this is possible it should be done. Where this is not possible, seal with G4 Varnish, but bear in mind that you could still crack the clay original.

Plasticine may need no preparation, particularly in the bulkier models, and again it would help to pour the Vinamould at its lowest possible temperature of 140°C. Thin sections of Plasticine will need sealing with G4 Varnish to help reduce the effect of the hot compound softening the Plasticine; a top heavy model (such as a horse) could collapse if the Plasticine softened too much and the armature were a little weak. Polyester Resin (GRP) does not need sealing, but make sure it is fully cured before pouring the Vinamould.

POURING

Use the thermometer to make sure the temperature of the liquid Vinamould is correct for pouring; do not guess at the temperature, because 20°C too hot may well ruin the mould because of air bubbles. The entire quantity of Vinamould should be poured at one go, quickly and in a continuous stream. Pour between the model and its container, or against the side of the case, to avoid splashing and also trapping air. On no account should Vinamould be poured directly on to the model. By allowing the Vinamould to rise, it should drive all the air from the detail. It is essential that any retaining walls are well secured, otherwise the hot liquid Vinamould will seep underneath.

EXTRACTION FROM THE MOULD

The mould should be allowed to cool down completely before the model is removed. Let the mould cool naturally, if possible overnight; nothing is to be gained by force cooling in water. It may be necessary to slit the mould where there are excessive undercuts. Normally, a plaster jacket will be found advantageous in holding the flexible mould together.

TREATMENT OF THE MOULD

If the mould is faulty, owing to blemishes on the master, or where air has come out of the model, the blemish can often be repaired by touching up carefully with a hot metal tool such as a soldering iron or similar. Moulds can be washed with hot soapy water to remove dust or the remains of previous castings. The oil surface makes it unnecessary to treat moulds before casting. Since it acts as a mould release, and care should be taken to avoid excessive use of strong detergents which may remove the oil film. Organic solvents should not be used to clean moulds, because even if they do not dissolve the Vinamould, they may be absorbed in small quantities sufficient to cause the mould to swell and distort.
When Vinamould moulds are fitted in plaster jackets or cases, the inside of the case should be well coated with shellac or varnish to prevent exudation from the Vinamould being absorbed by the plaster.

RE-MELTING Vinamould

Discarded Vinamould moulds should be inspected for cleanliness, all dirt washed off, and stored in polythene bags or waxed paper ready for re-melting. It is not normally advisable to mix used, discoloured or burned Vinamould with new Vinamould. With careful use, Vinamould can sometimes be re-used seven to ten times. The use of thermostatically controlled melting pots helps to prolong the life of Vinamould.

MOULD MAKING WITH Vinamould

There are basically three ways of making moulds with Vinamould – simple one-piece moulds, open-backed moulds, and two-piece (or multi-piece) moulds. Whichever type of mould is made, workmanship should be neat and tidy: a mould is a tool, and a well made tool is not only a pleasure to use, but will do a much better job than a bad tool.

SIMPLE MOULDS

Small models are easily moulded. Build up a retaining wall using brass fencing rolled into a cylindrical shape, and tied round to prevent it unrolling while making the mould. The wall should be about 2" higher than the model, and should be secured to the base by means of clay or Plasticine to prevent the hot liquid from leaking underneath. The model should be fastened to the base to prevent floating when the Vinamould is poured. The model should be prepared, if necessary, in accordance with the paragraph Treatment of the Model.
Pour the hot liquid Vinamould (making sure that it is the correct pouring temperature), at one go, in a continuous stream,

between the model and the base, allowing the liquid Vinamould to rise round the model. Leave to cool down. When the mould has cooled down, take away the fencing and remove the model from the mould. It may in some cases be necessary to cut a small slit in the back of the mould to allow easy extraction of the model. In this event, it will be found advantageous to use a rubber band to hold the slit correctly together when subsequently casting.

OPEN BACKED MOULDS

Moulds for reliefs and panels are simple open backed moulds. They can be made in two ways.

A) Lay the panel on a flat surface, ensuring that it is in contact all the way round: if not, fill any gaps with clay or Plasticine, which will prevent any Vinamould going underneath the panel. Treat the model, if necessary, in accordance with the paragraph Treatment of the Model. Now build a clay or wooden wall round the panel, leaving a gap of at least ½" (12mm) and at least 1" (25mm) higher than the highest point of the model. Vinamould is then poured between the wall and the model in a continuous stream until the whole model is covered and level with the top of the wall. This mould can either be used as it is, or a plaster case made for it before it is removed from the model. Vinamould Yellow would be the more suitable for a caseless mould.

B) The panel is lain on to a wooden box which is sufficiently large enough to have ½" clear all round and be 1" above the highest point on the model. Again, make sure that the whole of the bottom edge of the mould has cooled, remove from the box, remove the model, then replace the mould face upwards in the box which now forms a case for the mould. Remember the varnish the wood afterwards (also the plaster in (a) above) so that is does not draw the oil from the Vinamould mould.

MAKING A TWO PIECE MOULD OF A LIFE SIZED HEAD

The use of Vinamould to cast from clay into plaster is a very accurate method of reproduction provided the operation is carried out with care. Most people shy away from what at first sight seems an elaborate procedure, though it is a procedure that, with a little practice, can be far quicker than making a waste mould, and certainly more satisfactory. Briefly, the technique is to construct a plaster case in two parts to surround the head closely, and into which, one side at a time, the molten Vinamould is poured. This rubber takes an exact copy in the negative of the head, and once the cases have been removed can be flexed off.

Materials required are Vinamould red, yellow, grey clay, superfine casting (or Dental) plaster, polythene film, shellac or varnish, oil, Vaseline, French chalk and scrim. Any grade of Vinamould can be use, but for our purposes here, two grades only will be considered. Vinamould Red is soft in texture, whilst Vinamould Yellow is hard. By mixing these two grades in equal proportions a good balance between flexibility and hardness is produced. The balance can, of course, be varied according to the job to be cast and the strength of the casting material. Before commencing, it is important that the clay of the head has reached the correct consistency – it must not be too wet or it will be liable to damage easily – if it is too dry, it may crack or contain air that will expand and spoil the Vinamould surface. The ideal is a stiff damp surface. As clay is used in constructing the cases, the head should be of one colour, and the working clay in another (the head used in the photographs is of red clay, and the working clay is grey), to allow clear differentiation through the operation. A firm armature is useful when making the head, and when casting it enables easy handling of the delicate clay.

Lay the head down on a wad of soft clay that has been previously covered with polythene film. A clay surround is constructed (use wooden blocks to build up the height), with a gap of about ¼" between this and the head, the surrounds should be 1 ½" – 2 ½" wide. A vertical fence is made around the neck. Undercuts should be dealt with first by filling the holes very gently with small pieces of clay that have been dusted well with French chalk. The face is covered with thin polythene film cut to shape, then very carefully overlaid with a thickness of clay ¼"- 3/8". Sheets of clay can be rolled out on a flat surface using a large bottle as a roller and dusting surfaces with French chalk to avoid sticking. The pouring hole and risers are made up as truncated cones. It is best to place the pouring hole centrally and a riser will be needed wherever there is a high point, to avoid air-traps forming in the case when the rubber is poured. An inverted "V" key edge is laid round the head that will provide the rubber mould with a locating groove in the finished case. The surface of the clay should be smooth and free from undercuts. This construction will be replaced by rubber after the pouring; the plaster cast must lift off freely. Making the plaster case is the next step, and can be a messy business. Half a bucket of plaster is prepared, and an initial layer flicked on to the surface. Further layers are added as the plaster begins to set. Concentrate on obtaining an even thickness (1/2" – 1") and develop the thickness around the edge and surrounding cones rather more (1" – 1 ½"). Scrim is laid in as reinforcement. With practice, each half of the case can easily be made in one mix (about a bucketful). When the plaster has nearly set, the edges and cones are trimmed off. A neat, light cast is desirable combined with a considerable degree of strength. The thickness should be similar to that shown in the diagram.

The plaster is soon hard enough for the next stage. The bricks and clay are removed and the whole head and case turned over. The entire clay surround is removed and the surface exposed and trimmed to remove defects, before making depressions at 4" intervals around this border to provide a key for the other half of the border, now shellac.

A clay layer, cones, and a "V" edge are now laid over the polythene film on the back of the head, exactly as before, first ensuring that all undercuts are filled. Having greased the lower case edge with Vaseline, the upper case is shaped from plaster, trimmed and allowed to set.

Now after allowing some two or three hours, the head is turned back so that the first case is uppermost. Very gently insert a chisel between the cases, tap lightly and repeat at four or six points, evenly around the edge until the case lifts. The largest and most complex piece – invariably the face – is being dealt with first, for its removal from the clay and the case is easiest whilst the clay cover is still damp. Clay and case lift off together – slight grazing from the model surface may occur but you can always retouch. Peel the clay from inside the case, and using a knife, straighten surface irregularities. The head must be "bedded in", that is, the gap between the head and the case it lies in is filled with clay. This must be done very carefully, right up to the surface of the head – the latter being French chalked before commencing, so that the two clays do not stick. A small flat boxwood spatula is the tool for this job. The clay bedding having been smoothed is keyed at 2" intervals around the head by indenting with a suitably shaped tool. The case should now be soaked in water before pouring the Vinamould to avoid adhesion and air bubbles, though if the pouring follows closely upon the construction of the cases these latter should prove damp enough.

Great care should be taken when placing the cleaned case over the face, to avoid knocking or scraping the clay model. It is extremely annoying to find that one has cast through perfectly, a face with a bent nose, since little can be done to correct it other than re-touching each finished cast. Securing the cases if facilitated by use of "dogs" – these are U-shaped pieces of ¼" steel rod (4"-6" in length) – hammered into place around the case edge. The value of shaping the cases correctly will now be evident: the edge should be of a consistent thickness right the way around to enable the '"dogs" to hold. The opening at the neck is covered with clay leaving the riser at this point open. For pouring the Vinamould a temperature of 160° - 170°C is desirable, though not critical. One can certainly pour at too low a temperature, where the rubber gels before reaching crevices farthest from the pouring hole. The mix of Vinamould grades should be prepared so that it is firm as is consistent with flexibility. If the sculpture has many undercuts, then the hardness must be sacrificed or difficulty will be encountered when attempting removal of a cast from the mould. An extension should be constructed over the pouring hole to raise the height of the pouring point. (A tin with the bottom cut cleanly out and set into a ring of clay is the simplest, and can be re-used.) Pieces of clay are set ready to block the outflow of rubber from the risers. Pouring once commenced should be steady and uninterrupted, allowing the case to fill slowly from the bottom upwards. It is wise to have assistance in blocking the risers, so that steady flow can be maintained.

Three hours at least should be allowed for the rubber to set; leave overnight if possible. The thickness in the pouring hole is usually the last part to set, which is a good guide. Excess rubber is trimmed off. Turn the head over and lift the rear case, which is cleaned before setting back into place. No separation is required for the Vinamould beyond a light dusting of French chalk. Pour the second Vinamould half as before, and allow it to set. It should then be possible to remove both cases. Peel the Vinamould halves away from the clay and wash them thoroughly. Shellac or varnish the plaster case interiors, otherwise as the cases dry out they will draw constituent oils from the rubber and cause deterioration.

Keep the original model as intact as possible so that the quality of the casting from the mould can be checked. It sometimes happens that where the Vinamould is a little too thick it distorts as it cools by contracting away from the clay master and causing a lump or subtle swelling on a finished cast. If this is seen in time, it can generally be retouched.