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MIXING OF MULTIPLE COMPONENT ALLUVIUS POLYMERIC MATERIALS

In order to achieve a completely cured and cross linked product, all components must be thoroughly mixed as specified. Components that are not mixed in the correct ratios or are not mixed in a suitable manner will yield unexpected results which may lead to inferior chemical or solvent resistance, wrinkling of the surface, wet or uncured components, inferior colour retention, inferior wear properties, poor adhesion, brittleness, etc. In some cases, these results may not be apparent initially but can expose themselves over time. To avoid these circumstances, mixing of multiple component systems must be wholly understood and followed as specified.

Following the correct techniques and setting up a suitable “mixing station" prior to commencing mixing of multiple component material will greatly reduce the likelihood of inadequately mixed systems and worksite errors. Work statin organisation and clear communication between the individual that is mixing and the material applicator(s)/installer(s) is fundamental and will result in a smooth flow of production and application.

MIXING STATION SETUP

A suitable material mixing station should be prepared with the following equipment and conditions present;

- Select a location closest to the area to be coated as possible without being in the way of application. This will help to avoid leaving the material in the container (often referred to as “pot”) for too long before being applied, allowing for longer working time of the material after it has been poured or applied on the host surface.

- Cardboard or a non slip plastic barrier that cannot be easily teared should be taped to the ground. This will be the surface area to setup a suitable mixing station and will help to contain any drips, splashes or spills.

- All required safety equipment as outlined in the Safety Data Sheets (SDS) should be available and used. Extra chemical resistant gloves, lint free rags, suitable roller covers, roller frames and poles should also be on hand as well as any other required application tools.

- Clean pre marked containers (transparent when possible) should be readily available and staged as necessary to make the flow of material delivery steady and without delay. An accurate, trade approved scale should also be present if components are being mixed by weight. Bathroom floor scales are not an acceptable means of measurement.

- Mechanical mixers with helical mixing blades or an otherwise specified mixing blade should be used and should be clean and free of any foreign material prior to mixing any of the components of a polymeric system. Having extra mixing blades or battery operated drills on hand can be beneficial in reducing the amount of time between mixes of various components or in the unexpected event of a power failure or equipment malfunction.

- Paint sticks or spatulas can be used to clean out residual material left in the container to make sure that a truly accurate mixing volume is met.

- A solvent such as xylene or an other suitable equipment cleaning material should be present, ready for use and clearly marked.

- Stage each component of material in their own designated area so as not to be confused with similarly packaged materials. Avoid bringing materials to the mixing station that will not be used in the current phase of application. Staging of materials should follow their sequence of use.

- Quick reference notes or cheat sheets of required mixing amounts and ratios, product coverage rates, aggregates, fillers, batch numbers, pigments, etc. should be written and placed in line of sight. Product Safety Data Sheets (SDS) and Technical Data Sheets (TDS) should also be on hand.

- A stop watch or other time recording device should be used to make certain that the required mixing time has been reached.

MIXING PROCEDURE

Mixing errors can become very costly and time consuming, therefore it is highly recommended that all components are staged and clearly marked prior to use to avoid mixing errors and confusion during the installation of the polymeric system. It is beneficial to the individual that is mixing to use this Technical Bulletin as a Checklist on each and every project.

The following steps and procedures will help to eliminate mixing errors and make for a more organised and successful installation:

- Consult with the Safety Data Sheet (SDS) for each component to be used prior to use. Individual Protective Measures (IPM) including Personal Protective Equipment (PPE) is paramount for the safety of the user(s).

- Consult with the Technical Data Sheet (TDS) of the material or system to be used for the required mixing ratios, mixing RPM, product working times, application techniques and product limitations.

- Mechanically premix all components prior to use with a designated mixing blade that is clean and free of any foreign material. Over mixing or mixing the materials too fast can result in air raiding, giving undesired results. Consult with the TDS for the required RPM of the mixing blade for the product in use. Contrary to mixing too fast, mixing too slow can lead to poorly cross linked materials.

- Using clean, uncontaminated mixing containers (preferably transparent when possible) that are clearly marked, strictly and precisely measure the required amount of components to be used. Note that some materials will require agitation prior to use. Consult with the TDS as necessary.

- When mixing by volume (v/v) rather than weight (w/w), combine the correct volume of material for each component of use in a clean, clearly marked and unused container (It may be necessary to scrape out material with a paint mixing stick or spatula to ensure that the exact volume is mixed in the new container). This will help to eliminate unmixed residual materials that can be left in the crevices of containers or accidentally poured or splashed on the side wall of the mixing container. Note that this is a very common mixing error that can go unnoticed until the inadequately cross linked material is found still soft or wet days after the remaining surface area has cured.

After priming and staging the material the following steps should be followed in sequence:

1. Start by mechanically mixing with the specified mixing blade at a slow rate while gradually increasing to the required RPM. By starting the mixer slowly, you will avoid splashing materials on the side wall of the mixing container. Make certain the mixing wand reaches the bottom of the container.

2. After mixing for half of the required time as noted in the TDS, stop the mixer and scrape the side walls and bottom of the container to ensure that no material is unmixed on the side walls and crevices of the mixing container.

3. Continue to mix for the remaining required time. A recommend but not always necessary step is pouring the mixed material into a new container, often referred to as a "transport container" and then mixing for the remaining specified time. If following this step, it is recommend to pour into the transport container at the 3 quarter mixing time and mixing in the transport container for the remaining quarter. Pouring the 3 quarters mixed material in a transport container helps to eliminate the likely hood of unmixed material on the sidewalls and crevices of the mixing container that can often be a problem with higher viscosity materials.

4. Transfer the mixed material to the area of application. It is import to pour the material from a container that does not have residual unmixed material on the side walls. Minimise dripping by wiping off excess material.

ADDITIONAL NOTES OF VALUE WHEN MIXINGMULTIPLE COMPONENT POLYMERIC MATERIALS

- In a multiple component system, every single gram of material must be fully cross linked with its counterpart in order to achieve optimal performance.

- **Never** scrape the sides of a mixing container that is to be poured on to the surface to be coated. This is a very common error that results in soft or wet spots on the surface days after the rest of the system has cured. By scraping the sides of the container and trying to get the last drop out onto the surface to be coated, you are risking and greatly increasing the chance of applying a component that is not fully cross linked.

- **Never** leave a mixing container upside down on the floor in order to entirely empty the container. This is a very common error that results in soft or wet spots on the surface days after the rest of the system has cured. By leaving a mixing container upside down on the surface to get the last drop out onto the surface to be coated, you are risking and greatly increasing the chance of applying a component that is not fully cross linked.

- To visualise thorough mixing, assume that component "A" is Red and component "B" is White and that you are trying to blend these two components to make the material a homogeneous Pink.

- If you have to use the same container multiple times when mixing, it is beneficial to pour the material from the same side of the container each time to control excessive dripping.

- **Do not mix** more material than can be used within the limitations of the products working time. Always take atmospheric temperature, substrate and mixing times into consideration when estimating the product working time. Humidity can play a large role on working times with some specific materials. Always refer to the Technical Data Sheet (TDS) if unsure.

- Some materials may settle during storage or transport and therefore need to be reincorporated though out the material. This is why it is necessary to premix individual materials prior to use.

- While mixing it is a healthy habit to take a spatial or paint mixing stick and scrape the sidewalls and bottom of the mixing container in order to thoroughly incorporate all materials.

- Length of mixing blade shaft must sufficiently reach the bottom of the container.

- Use of separate mixing blades for all components should be encouraged.

- If temperatures and humidity are within the product specifications, soft or uncured materials are likely a strong indication of improper mixing technique which is most commonly related to scrapping excess material from the mixing container to the surface to be coated.

- Always check to be sure mixing ratios are by volume (v/v) or by weight (w/w) as this can greatly differentiate from the formulated stoichiometry of the system leading to undesirable results or in some cases complete failure.

- Materials that are not mixed accurately will not perform as specified and will not develop to their full capability. 100% accuracy and concentration must be applied when mixing multiple component polymeric systems.

- Leaving excess material in a container (often referred to as a "pot") can lead to an exothermic effect that cures at a rapid rate and can potentially smoke and in extreme cases catch fire. To avoid this phenomenon, it is advised to only mix the required amount of material that you will immediately use. Unless an induction time is specified for the material it is not generally necessary to leave the material in the container for prolonged periods unless noted on the TDS and should in most cases only be left in the container during transportation to the site of application.