REQUIREMENTS FOR AUXILIARY MATERIALS FOR THE PRODUCTION OF ORGANIC GLUE

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Abstract: *This article discusses auxiliary materials for the production of organic glue, the requirements for materials and the norms for the preparation of auxiliary substances.*

Keywords: *glue, gelatin, lime, raw materials, air, dry, liquid, temperature, impurity.*

Various auxiliary materials are used in the production processes of the manufacture of glue and gelatin, the quality of which often plays no less important role than the quality of the source material-raw materials. Meanwhile, in the practice of factories, insufficient attention is often paid to this issue, which naturally entails a deterioration in the quality of the product obtained and a decrease in its quantitative yield. Knowledge of all the properties of the materials used and the correct establishment of the technical conditions that a particular material must meet are a prerequisite for successful and rational management of production processes. The following is basic information about the origin, properties and conditions of the most commonly used adhesives and auxiliary materials in the production.

Water is undoubtedly the most important auxiliary material in the production of glue. It is consumed in huge quantities, measured in hundreds of tons for each ton of finished product. The quality of water and the nature of its supply are issues of paramount importance, underestimation of which can lead to poor quality products produced by the enterprise.

In relation to the requirements for the quality of water for gluing, conventional water sources are not always satisfactory. In the absence of a source of good quality water supply, the production of high-grade glue is almost impossible. Therefore, the issue of water supply of the glue factory is crucial in the design and selection of the construction site.

During the processes of washing adhesive raw materials, it is necessary to have water with a general low content of mineral salts in order to achieve maximum swelling of the material. This circumstance is much more important than just "soft" or lime-poor water. Usually, in practice, the following requirements are imposed on water quality: water should be moderately soft, containing no more than 0.14—0.20 g of calcium and magnesium salts per 1 liter; it should be free from iron and hydrogen sulfide impurities and should have a small total content of mineral salts. In particular, the presence of sodium carbonate and ammonia is unacceptable. The presence of sodium chloride in any quantities is undesirable, since it has the property of softening and diluting the glue.

Water purification by coagulation has the advantage of reducing bacterial flora. During the final washing of adhesive raw materials (mezdra), the use of water containing microorganisms in significant quantities should be carefully avoided, since neutral raw materials are an excellent medium for the rapid reproduction of bacteria. Finally washed glue giving the material with the shortest storage can significantly suffer due to the development of bacteria. Therefore, it is recommended to sterilize water wherever possible. For this purpose, any method commonly used in the sterilization of water for drinking purposes is suitable. Ozone and chlorine cause the "rigidity" of raw materials, therefore, when using these reagents for the purpose of water neutralization, they should be used only in the required minimum quantities. The slightest excess of them should be removed from the water before its use, which is achieved by aeration or special chemical treatment.

The use of distilled water is recommended for the cooking process. The mineral salts contained in ordinary water during evaporation of the adhesive raw materials and subsequent evaporation of the resulting broths are concentrated and remain in the finished product to the probable damage to it. If, for example, 5% glue broth is dried after normal operations, then in each kilogram of dry product the salt content will be 19 times greater than they were in each kilogram of water.

Further, water plays a significant role as a refrigerating agent in various processes. In this case, the main requirement for water is a sufficiently low temperature. In addition, the water should still be soft enough, which is important for the correct and reliable operation of condensers and other cooling devices. If the cooling water at the outlet of the refrigeration unit is not used for production processes, then the two above conditions limit the requirements for cooling water. Otherwise, the water must meet all the requirements set out above for water used directly for production purposes. Thus, the water temperature in the production of glue is an additional limiting condition for the suitability of this water supply source.

The quality of the air used to dry the glue plays a very significant role. Minor shortcomings in air quality are aggravated due to the huge amounts of it usually consumed in the production of glue: obtaining 1 kg of dry glue usually requires 1-3 tons of air. The requirements for air quality are very simple: it should be as dry, clean as possible and sufficiently free from dust and bacteria.

Dust removal from the air can be carried out in various ways, of which the simplest is air filtration. For this purpose, various materials are used, such as muslin, gauze, felt, etc. However, the most effective are viscous filters based on the property of viscous liquids to retain dust particles and all kinds of solid and droplet-liquid air pollution.

CaO does not occur in nature in a free form, as it has strong basic properties. It occurs exclusively in the form of a combination of mainly carbon dioxide, sulfuric acid and phosphoric acid salts; only its carbon dioxide compounds (limestones, marble, chalk, etc.), which are relatively easily decomposed by the action of heat during firing, serve for lime extraction:

$CaCO3 \rightarrow CaO = CO2$

The anhydrous lime obtained in this case, which looks like porous white pieces, is vigorously combined with water and extinguished, developing a significant amount of heat. During quenching, lime greatly increases in volume and crumbles into a very fine powder - oxide hydrate, called slaked lime:

CaO + H20 = Ca (OH)2

Pure lime during quenching increases in volume very much, up to 3.5 times against the original volume; such lime is called fatty; various impurities weaken the increase in volume and make lime skinny. When water is added to lime in an amount greater than required by the reaction for quenching, slaked lime is obtained no longer in powder, but in the form of a plastic mass, the so-called lime dough.

After being left in the air, the lime dough begins to harden from the surface - partly due to the mechanical drying process, partly due to a chemical compound with air carbon dioxide (in the presence of water - atmospheric humidity), and carbonic lime is formed and chemically bound water is released:

$Ca(OH)2 + CO2 \rightarrow CaCO_3 + H20$

From all of the above, it can be concluded that very hard water can, of course, be improved by artificially softening it, and suspended substances can be eliminated by sand or other filters. However, it is necessary, if possible, to avoid such softening, in which a significant amount of alkali metal salts remains in the water.

The presence of dust and accompanying bacteria in the air causes contamination of the drying room and the dried material and the possibility of further contamination of the product. In addition, large amounts of dust settle on heating devices and begin to emit gases at 70-80 degrees can be harmful to the dried material.

Good lime should contain no more than 2% CaCO3 and should be white. The presence of various impurities gives lime different shades. MgO should be no more than 0.75%, Fe2O3 +AL2O3 - up to 0.5%. The residue insoluble in HCl is up to 2%, the content of underburning, burnout, ash, slag and unburned fuel should be no more than 10%. Small things should be no more than 10% by weight. The CaO content should be at least 80%.

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