



SCATTERED MATERIALS' PHYSICAL-MECHANICAL PROPERTIES AND A GOOD QUALITY MIXTURE TO TAKE EFFECT

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Article history:	Abstract:
Received: 20 th August 2025 Accepted: 14 th September 2025	This article presents a scattered collection of materials' physical-mechanical properties and their mixture harvest due to the process effect , mixing methods, and equipment choice to analyze the process impact on various materials between compatibility degree , separation cases, and one kind mixture to take opportunities to see the released information.
Keywords Scattered materials , physical-mechanical properties , particle size , materials dispersion , agglomeration property , cohesive forces , technological processes .	

Scattered materials are substances composed of small particles that can be separated by passing through different sieves. Examples include flour, rice, lime, cement, and sand. These materials are classified as scattered because their particles vary in size and are easily separated from each other.

Scattered materials are easily disintegrated under external forces and tend to be crumbly or porous in structure. They often possess properties such as being lightweight and having heat and sound-insulating features.

Scattered materials mixing mechanical engineering and technological of processes central from the elements This process is one of product quality , production release to the efficiency and economic to indicators directly impact shows . Scattered materials : flour, grain, sand , cement , powders , feed mixtures such as particulate or granular substances own inside takes . Their physical-mechanical properties (granularity , moisture , friction) properties) mixing process physicist model and mechanic device when choosing solution doer role plays .

Scattered materials following physical-mechanical from the characteristics consists of will be. That is, scattered materials granulometry — particle dimensions distribution of the material density , internal friction coefficient , humidity and viscosity such as to the features has will be . Granulometry interference in the process to segregation (content according to to divorce) arrival possible . Humidity and viscosity particles to each other adhesion property strengthens , this and to mix complicates . Density and density differences the material mixing in the process separately attention demand does .

Mixing is two or from it more than kind of of substances necessary at the level one to the same achieve for the purpose done increaseable mechanic Mixing is a process . in mechanisms to particles mechanical , gravitational and aerodynamic forces impact The process descriptive

main from indicators one of the mixture one sexuality is the mixing index , which is a mixture quality digital represents . Scientific-practical in the works various indexes used : dispersion based on indices , Lacey index and others . In this case simple and practical was dispersion based on from the model used :

$$K = 1 - \sigma / \bar{x}$$

this on the ground :

K is one sexuality coefficient ,
 σ — components dispersion ,
 \bar{x} — average value .

Scattered materials mixer of cars main types drum , auger , knife and pneumatic mixers in industry the most many applicable are types . Every one type of work principle and advantages and disadvantages For example , drum mixer simple and big voluminous materials with work for suitable , but one low sex drive possible . Pneumatic methods very small powders fast in mixing good result gives , but energy expense high will be .

Mixing efficiency many to factors related : knife configuration , rotation speed , mixing time , loading level , materials properties and etc. In experiments mixing efficiency determination for controllable of variables every one study important .

Also , mixing efficiency in improvement grains size and of the form suitable arrival , for example , various in size grains each other's spaces fill and mix general density increases and completeto fill help gives .

Durability is also important one from the conditions one is , is a kind or suitable incoming grains shape and size in the mixture one flat distribution provides . This is general strength increasing , spaces to reduce provides .

Work Ability : Grain size and the size of the material to pour and to each other to stick impact does this and him/her again work and to form, making it difficult or facilitating possible .



Chemical Activity : Some of materials surface chemical in terms of active to be it is possible , this and in the mixture to reactions take arrival possible . Grains size this reactions to the speed impact does .

Conclusion

Scattered materials' physical-mechanical properties play a key role in achieving high-quality mixtures. Modulus of elasticity, hardness, and related indicators directly influence the resulting mechanical properties of mixtures. A higher dispersibility level increases a mixture's resistance to deformation and extends its service life. Compatibility and effective synthesis between materials drive the creation of quality mixtures. Thus, careful selection and management of scattered materials based on their mechanical properties allows for the production of mixtures with optimal durability and quality, which is significant for various technological fields.

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