Continuous Processing Of Solid Propellants In Co Rotating Twin Screw Extruders

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Continuous Processing Of Solid Propellants

we focus on mixing because it is the most important process for achieving continuous solid rocket manufacture. Solid propellant slurry is produced by mixing oxidizer powder, metallic fuel powder, prepolymer and additives. For ammonium perchlorate (AP)-based propellant, which is the most widely used solid propellant, aluminum powder is used as a fuel.

The Continuous Mixing Process of Composite Solid ...

continuously process composite propellants using the twin screw extruder. It was part of an international cooperative research and development agreement to develop the processing technology...

Continuous Processing Demonstrated for Propellant ...

Usually, propellant is mixed in batches during multi-batch processing. In this work, we demonstrated that continuous mixing with a peristaltic pump containing an artificial muscle actuator could replace batch mixing, resulting in a safe, efficient manufacturing process.

The Continuous Mixing Process of Composite Solid ...

For the future continuous mixing is being considered. Like any transformation industry the solid propellants industry has considered very early the use of continuous processes that would be – compared to the batch processes – more economically efficient and safer, since a smaller quantity of propellant is worked on at a given time.

Solid Propellants - an overview | ScienceDirect Topics

The processing techniques for manufacturing composite solid propellants are described. The general operations of oxidizer preparation, binder and fuel preparation, propellant mixing, and chamber insulation and lining are illustrated by typical flow sheets and descriptions of the equipment used.

Composite Solid Propellant Processing Techniques ...

The manufacture of solid propellant involves complex physical and chemical processes. In the past, propellant has been produced by several different processes, including the compaction or pressing of powder charges, extrusion of propellant through dies under pressure using heavy presses, and mixing with a solvent which is later evaporated.

Propellant Processing And Manufacture - Chamber Pressure
Our invention comprises a continuous process in which a solid propellant is mixed by introducing the resinous binder and any propellant additives a-t a point which is within the moving stream of...

US3296043A - Continuous mixing process for solid resin ...
Method of Operation:Solid propellant is produced by one of two processes, either batch mixing or continuous mixing. Most missile programs use the batch process to make solid rocket motor propellant. After receipt and acceptance testing of the individual ingredients, ammonium perchlorate

ITEM 5 Propellant Production
Ordinarily, in processing solid propellants the fuel and oxidizer components are separately prepared for mixing, the oxidizer being a powder and the fuel a fluid of varying consistency. They are then blended together under carefully controlled conditions and poured into the prepared rocket case as a viscous semisolid.

PROPELLANTS - NASA
applied to propellants. A novel continuous processing technology that has shown a great deal of promise for solid rocket propellants is known as Twin Screw Extrusion (TSE) [2]. TSE processing can be applied not only to functionally grading solid rocket propellants, but to FGMs in general. For solid rocket

Development of a Novel Continuous Processing Technology ...
A solid-propellant rocket or solid rocket is a rocket with a rocket engine that uses solid propellants (fuel/oxidizer). The earliest rockets were solid-fuel rockets powered by gunpowder ; they were used in warfare by the Chinese , Indians , Mongols and Persians , as early as the 13th century.

Solid-propellant rocket - Wikipedia
The propellants consist of a thermite and a gas-generating substance, in which nano-Al/CuO and nitrocellulose are the best substances for solid propellant. Thermite-based propellants can be synthesized or prepared by ultrasonic mixing, electrospray mixing, and the sol–gel process,...

Propellant - an overview | ScienceDirect Topics
Usually, propellant is mixed in batches during multi-batch processing. In this work, we demonstrated that continuous mixing with a peristaltic pump containing an artificial muscle actuator could...

The Continuous Mixing Process of Composite Solid ...
General Dynamics Ordnance and Tactical Systems manufactures a wide variety of solid propellants that are qualified for commercial automotive and military applications. Manufacturing ranges from low-medium volumes (50 lb. single batches) to sustained 3,000 lb./week using methods that result in high performance repeatability.

Solid Propellants for commercial and military applications

The continuous process based on a twin screw extruder combines the capabilities of intensive mixing and high pressure extrusion. It is used for processing a variety of energetic materials, such as...

(PDF) Application of Twin Screw Extrusion for Continuous ...
continuous tableting have been removed in recent years. GEA MODUL tablet presses are an essential component of the company’s ConsiGma® continuous processing line for solid dosage forms. Special features such as the air compensator and enhanced dual process control make them ideal components of a continuous line allowing the tablet

Continuous Processing - GEA engineering for a better world
The continuous process based on a twin screw extruder combines the capabilities of intensive mixing and high pressure extrusion. It is used for processing a variety of energetic materials, such as gun and rocket propellants, plastic bonded explosives, pyrotechnics, thermo-baric explosives,

Application of Twin Screw Extrusion for Continuous ...
Description of a continuous, remote-controlled and largely automated processing method for double-base solid propellants for the propulsion of rockets. The base materials are mixed as an aqueous batch and processed into a wet mix paste with concurrent homogenization.

Technology of the Screw-Extrusion Process for the ...
Continuous processing of energetic materials using a twin screw extruder is gaining importance as it is a safe and cost-effective alternative to conventional batch processing. The continuous process based on a twin screw extruder combines the capabilities of intensive mixing and high pressure extrusion.

Central European Journal of Energetic Materials - Home ICM
Continuous processing also provides manufacturers an ability to limit production only to the amount of material required, preventing wasted material from batch overruns.