

## 4071465021 : MAJOR Chemical Engineering

KEY WORD: POLYURETHANE FOAM / MIXING / BATCH

RUJIRA JITRWUNG: EFFECT OF PARAMETERS ON HIGH DENSITY FLEXIBLE  
POLYURETHANE FOAM MIXING IN BATCH TANK. THESIS ADVISOR: ASSOC.PROF URA  
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This research study covered the impacts of parameters effecting the mixing in a batch tank of high-density flexible polyurethane foam. The main purpose was to find ways to prepare the laboratory work with properties approximating to those derived from the slabstock foam process. The parameters effecting the laboratory work properties include type of agitator, speed, mixing time and the temperature of reagents before reaction process. The study reveals the following. The key factor that affects the product properties is type of agitator, and the double helical ribbon screw type can yield the greatest efficiency of production. Second come speed and mixing time. A greater speed and lengthier mixing time lead to big pinholes in non-uniform cells causing a high ratio of air-volume per polyurethane foam volume. When applying an insufficient speed and shorter mixing time, imperfect homogeneous mixing occurs. This, in turn, affects the physical and mechanical properties of the product, causing it to be far too different from the reference sheet produced by the slabstock foam process. A suitable mixing speed ranges between 800-1000 rpm, and the best speed is 900 rpm. The suitable minimum mixing time that yields the best result is approximately five seconds. The temperature before reaction process of reagents is also important. When the temperature is lower than that appropriate, the product sheet splits. On the other hand, a higher temperature than that appropriate, shrinkage occurs. The suitable temperature before reaction process of reagents is at 20 degrees Celsius. However, when the amount of catalyst used is adjusted, the temperature required can be as high as 26 degrees Celsius.

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