



Process Improvements in Elimination of Miscut Generation in Granulation Process

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Abstract:Granulation refers to the process in which large objects are cut or shredded and re-melted into granules or pellets. Granules typically have a size range between 0.2 to 4 mm depending on their subsequent use. Granulation is a process that aids downstream processes to ensure high quality and safe product but the process is not without its potential sources of rejected material or waste. The particle size distribution is the most important physical property of a granulated material. Some issues that occur during a granulation process are under granulation, over granulation and wide particle size distributions. This problem can occur as a result of too much or little liquid and binder addition, incorrect pressure application during granulation. Under granulated particles have not adhered to a sufficient level to maintain agglomeration and will result in smaller particles than desired with sub-optimal attributes. This can have a negative impact on the flowability of the granule and any subsequent compression process. Over granulation leads to particles which are larger than desired. This can impact how the material blends with subsequent excipients and can lead to problems such as picking and lamination during compression. Due to process instability, miscut generation in the granulation process increases between 8-10 incidents in a month. Due to miscut generation, the chip line is getting choked and centrifugal pump gets tripped which leads to high production loss and high scrap generation. The location of problem has been identified that the lump generation of polymers between spinneret and rotary cutter. To overcome the above, quality tools are considered from quality management system in which Pareto chart tool is to find the main part of the problem and Cause & Effect diagram is to find the granulation related issues. With the help of these tools, the process equipment design is modified, strand guide roller material change, blower drive change and exact multi groove roller was added for strands separation in the cutter and after changing the dimensions few parts are taken to achieve zero miscut generation.

Keywords: Miscut, Tripping, Root causes, Rollers, Granulation.