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Optimal Performance of Plastic Extrusion Process Using Fuzzy Goal Programming

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Abstract : This study optimized the performance of plastic extrusion process of drip irrigation pipes using fuzzy goal programming. Two main responses were of main interest; roll thickness and hardness. Four main process factors were studied. The L₁₈ array was then used for experimental design. The individual-moving range control charts were used to assess the stability of the process, while the process capability index was used to assess process performance. Confirmation experiments were conducted at the obtained combination of optimal factor setting by fuzzy goal programming. The results revealed that process capability was improved significantly from -1.129 to 0.8148 for roll thickness and from 0.0965 to 0.714 and hardness. Such improvement results in considerable savings in production and quality costs.

Keywords : fuzzy goal programming, extrusion process, process capability, irrigation plastic pipes
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