

**A DESIGN OF SPECIAL PURPOSE DOUBLE SAMPLING PLAN  
OF TYPE  $DSP(0, 1)$  USING FUZZY PARAMETER**

**P. Kavi Priya and A. R. Sudamani Ramaswamy**

Department of Mathematics,  
Avinashilingam Institute for Home Science  
and Higher Education for Women,  
Coimbatore - 641 043, Tamil Nadu, INDIA

E-mail : kaviarun88@gmail.com, arsudamanimaths12@gmail.com

**(Received: May 24, 2021 Accepted: Aug. 20, 2022 Published: Aug. 30, 2022)**

**Abstract:** In traditional sampling plan, the proportion defective is generally assumed to be crisp value. But, in real life parameters are vague and assumptions are too rigid. So traditional methods are inaccurate. In this paper Fuzzy set theory is applied to acceptance sampling. A procedure for designing Special Purpose Double Sampling Plan of Type  $DSP(0, 1)$  using trapezoidal fuzzy number is developed and it is based on fuzzy binomial distribution. The  $OC$  curve values are determined using fuzzy parameter while fixing the sample size. Fuzzy probability of acceptance values are calculated for different  $\widetilde{AQL}$  and  $\widetilde{LQL}$  values and are presented in Tables for the selection of  $DSP(0, 1)$  Plan. Optimum value of the sample size is obtained such that it satisfies both the condition of producer's risk and consumer's risk for given  $\widetilde{AQL}$  and  $\widetilde{LQL}$  values. The sample size is obtained such that it minimizes the sum of risks. Numerical examples are provided for the illustrations.

**Keywords and Phrases:** Statistical quality control, Acceptance Sampling, Operating characteristic ( $OC$ ) curve, Fuzzy number, Trapezoidal fuzzy number.

**2020 Mathematics Subject Classification:** 03E72, 06A86, 62C86, 62E86.

## **1. Introduction**

Acceptance sampling plans are practical tools for quality assurance applications involving quality contract on product orders and it is important aspects of