# SKIP-LOT SAMPLING PLAN OF TYPE SKSP-T WITH GROUP ACCEPTANCE SAMPLING PLAN AS REFERENCE PLAN UNDER BURR-TYPE XII DISTRIBUTION

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**Abstract**

*This paper clearly assigns skip-lot sampling plan of type SkSP-T with Group Acceptance sampling plan is designing and Burr type XII distribution is applied to determine the lifetime of the product. The new proposed plan parameters are determined by using the two-point method on the Operating Characteristics curve together with consistent producer and consumer risks are specified. Tables are simulated for various parametric values of SkSP-T, Group acceptance sampling plan and Burr type XII distribution. Skip-lot sampling plan of type SkSP-T is also compared with Group acceptance single sampling plan and skip-lot sampling plan of type SkSP-2 with group acceptance sampling plan using Burr type XII distribution. Further, the efficiency of the proposed plan is discussed. Numerical illustration and examples are given to justify the efficiency of the proposed plan.*

**Keywords:** Burr type XII distribution, Group Acceptance Sampling Plan, Skip-lot sampling plan of type SkSP-T.

## I. Introduction

Statistical Quality Control (SQC) use statistical mechanisms to supervise the quality of products and maintenance. Acceptance sampling plans are followed by Statistical Quality Control tools and it is used to provide the "good quality of finished products". Acceptance sampling plan is a decision-making tool. It is a technique that deals with accepting or not the lot to be found on sampling inspection that delivers the quality of products manufactured by industries. Today's scientific world the area of acceptance sampling and statistical quality control has been enhanced by various quality control engineers, manufacturing industries, statisticians, biologists, researchers and etc. The most important areas of Acceptance Sampling plan is classified into four broad categories.

Dodge [8] introduced skip-lot sampling plans. It is an expansion of CSP. In general, the skip-lot sampling plan is the function of continuous sampling plans. The initial skip-lot sampling plan

is a single determination or test for verifying the lots acceptance or rejection. It is called the skip-lot sampling plan of type SkSP-1. Skip-lot sampling plan is bulk materials or products produced in successive lots. The SkSP-1 sampling plan was proposed without considering the concept of reference sampling plan. The structure of lot-by-lot sampling inspection plans and the condition is made for inspecting only a fraction of submitted lots. It is called the skip lot sampling plans. Dodge and Perry [9] introduced Skip-lot Sampling Plan of type SkSP-2. It is an extension of skip-lot sampling plan of type SkSP-1 and based on the origin of continuous sampling plan of CSP-1. Soundararajan and Vijayaraghavan [18] introduced the new system of skip-lot sampling plan; it is designated as SkSP-3. Skip-lot sampling plan of type SkSP-V is introduced by Balamurali and Chi-Hyuck Jun [6]. It is based on the concept of continuous sampling plan of type CSP-V. Skip-lot sampling plans are efficient in acceptance sampling system and it is used to reduce inspections. In skip-lot sampling system, the quality of submitted lots is extremely good and it is acceptable. Skip-lot sampling plans are best when the defective-free production in the production process.

Tightened multilevel plans that include three levels designed by Fordice [10]. Kandasamy and Govindaraju [11] used Markov Chain techniques to find the characteristics function of CSP-T plan. Balamurali [4] proposed Modified Tightened Three level Continuous sampling plan. Balamurali and Chi-Hyuck Jun [5] proposed a modified CSP-T sampling procedure.

Pradeepa Veerakumari and Suganya [15] introduced tightened three levels Skip-lot sampling plan, which is designated as SkSP-T. Skip-lot sampling plan of type SKSP-T is based on the concept of continuous sampling plan of types CSP-T and CSP-M modified tightened three level continuous sampling plans and skip-lot sampling plan of type SkSP-2. Sampling levels are fixed by using CSP-M procedure; sampling fractions are taken from the CSP-T procedure and other concepts are taken by modified CSP-T and SkSP-2 procedures. In SkSP-T sampling plan, the sampling frequency (f) is minimized by every skipping inspection level. The Operating Characteristic functions and operating procedures are derived for SkSP-T plan. SkSP-T plan vary among normal and skipping inspection with three levels. Skip-lot sampling plan starts with normal inspection using various reference sampling plans. In skipping inspection entire lots in the structure of construction and the skipping inspections are continued. The number of consecutive conforming lots or batches reaches some pre-specified clearance number i continue to normal inspection. If i consecutive lots are cleared with normal inspection, using skipping inspection with fraction f appear; if another i consecutive conforming lots are passed under fractional inspection, the fraction (f) is bisected to f/2, and then to f/4 provided no non-conforming is found. Then the non-conforming is found in skipping inspection the system goes to normal inspection.

## II. Design of SkSP-T plan with Group acceptance sampling plan as Reference plan

This section skip-lot sampling plan of type SkSP-T plan using group acceptance sampling plan as a reference plan. Then the skip-lot sampling plan parameters are i- clearance number and f-sampling frequency or fraction of submitted lots inspected in the skipping inspection. The attribute Group acceptance sampling plan for the necessary parameters the number of groups (g), acceptance number (c) and pre-defined (r). The following quantities of the plan parameters are stated as t-time of the experiment,$t_q/t_{q_0}$, $\alpha$, $\beta$ producer and consumer risks respectively. Therefore the operating procedure for the new proposed plan as follows

Step1: Initiate SkSP-T procedure with normal inspection using the group acceptance sampling plan as a reference plan. Select a random sample of size n from the lot and distribute r items in g groups and pre-defined experiment time $t_0$.

Step2: When i successive lots are accepted on normal inspection, discontinue normal inspection and switch to skipping inspection.

Step3: On skipping inspection, inspect only a fraction f of the lots selected at random, level 1.

Step4: After i consecutive lots in succession is accepted at level 1, then switches to skipping inspection with a fraction of f/2, level 2.

Step5: After i consecutive lots in succession is accepted at level 2, the system then switches to skipping inspection with a fraction of f/4, level 3.

Step6: If a lot is rejected on any of the skipping level, the system then reverts back to normal inspection.

Assume that the lifetime of the submitted products follows any accelerating lifetime distribution using the Cumulative Distribution Function (CDF) of F. Then, the probability of the failure of an item before experiment time $t_0$ is given by,

$$p = F(t_0) \tag{1}$$

The Operating Characteristics Function of SkSP-T plan is given by

$$P_a(p) = \frac{P^i(f_2f_3(1-P^i)+f_1f_3P^i(1-P^i)+f_1f_2P^{2i})}{f_1f_2f_3(1-P^i)+P^i(f_2f_3(1-P^i)+f_1f_3P^i(1-P^i)+f_1f_2P^{2i})} \tag{2}$$

The new proposed sampling plan of skip-lot sampling plan of type SkSP-T plan parameters are determined by using the two point's method on the Operating Characteristics (OC) curve together with consistent producer and consumer risks are specified. The two-point approach is used in the new proposed plan to find the proposed plan parameters such that producer and consumer risks are satisfied simultaneously. Let $p_1$ - Producer's risk (1-$\alpha$) at AQL (Acceptable Quality Level) and $p_2$ – Consumer's risk ($\beta$) at LQL (Limiting Quality Level).

$$p_1 = \sum_{i=0}^{c} \binom{rg}{i} {p_1}^i (1-{p_1}^i)^{rg-i} \tag{3}$$

$$p_2 = \sum_{i=0}^{c} \binom{rg}{i} {p_2}^i (1-{p_2}^i)^{rg-i} \tag{4}$$

To specified by the producer's and consumer's risk used by Acceptable Quality Level and Limiting Quality level as follows

$$P_a(p_1) = \frac{P^i(f_2f_3(1-P^i)+f_1f_3P^i(1-P^i)+f_1f_2P^{2i})}{f_1f_2f_3(1-P^i)+P^i(f_2f_3(1-P^i)+f_1f_3P^i(1-P^i)+f_1f_2P^{2i})} \geq 1-\alpha \tag{5}$$

$$P_a(p_2) = \frac{P^i(f_2f_3(1-P^i)+f_1f_3P^i(1-P^i)+f_1f_2P^{2i})}{f_1f_2f_3(1-P^i)+P^i(f_2f_3(1-P^i)+f_1f_3P^i(1-P^i)+f_1f_2P^{2i})} \leq \beta \tag{6}$$

The Average Sample Number (ASN) of SkSP-T plan with Group acceptance sampling plan as reference plan is given by

$$P_a(p_2) = \frac{n(f_1f_2f_3)}{f_1f_2f_3(1-P^i)+P^i(f_2f_3(1-P^i)+f_1f_3P^i(1-P^i)+f_1f_2P^{2i})} \tag{7}$$

Equations 3 and 4 are substituting in equation 5 and 6 respectively. Using the new proposed plan parameters is simulating the specified values of Acceptable Quality Level and Limiting Quality level (AQL and LQL). Equations 5 and 6 are satisfied at the same time. Aslam *et.al* [1] used to find the minimum ASN values at Limiting Quality Level instead of Acceptable Quality Levels we will use the same simulation process.

The following constraints used to simulate the optimal plan parameter values,

Minimize ASN ($p_2$)

Subject to

$$P_a(p_1) = \frac{P^i(f_2f_3(1-P^i)+f_1f_3P^i(1-P^i)+f_1f_2P^{2i})}{f_1f_2f_3(1-P^i)+P^i(f_2f_3(1-P^i)+f_1f_3P^i(1-P^i)+f_1f_2P^{2i})} \geq 1-\alpha$$

$$P_a(p_2) = \frac{P^i(f_2f_3(1-P^i)+f_1f_3P^i(1-P^i)+f_1f_2P^{2i})}{f_1f_2f_3(1-P^i)+P^i(f_2f_3(1-P^i)+f_1f_3P^i(1-P^i)+f_1f_2P^{2i})} \leq \beta$$

The above constraints used to calculate the proposed plan parameter values. The values are tabulate in table 1 and 2. From table 1 number of tester r = 5 and table 2 number of tester r = 10.

## III. Burr-type XII Distribution

In present situations, products are manufactured and guaranteed with high reliability. In order to know the lifetime information of a particular product, a destructive experiment is made on it. Since the process is long and time-consuming, the lifetime is truncated for a pre-specified time. This experiment is terminated in two cases, when the number of failure item exceeds the expected number of failures or when the pre-specified time is attained. Let $t_q$ be true percentiles life and $t_{q_0}$ be specified percentiles life. Assume that the lifetime of the submitted product follows the Burr-

type XII distribution with known and unknown shape parameters.

Burr [7] proposed the new distribution, which is called Burr Distribution. It is mainly based on log-logistic distribution. Zimmer and Burr [19] have used Burr distribution to find out the values of degrees of skewness and kurtosis. Rodriguez [17] developed Burr type XII distribution to generate distribution function of skewness and kurtosis also derives the area of the plane. Lio *et al*. [12] developed acceptance sampling plan for percentiles of Birnbaum- Saunders model and proposed that the acceptance sampling plans based on mean may not satisfy the requirement of engineers on the specific percentile of strength or breaking stress. Lio *et. al.,* [13] developed percentiles of Burr type XII distribution of single sampling plan when the life test is truncated at a pre-specified time. Aslam et.al [1] developed the skip-lot sampling plan of type SkSP-2 with GASP as reference plan using Burr distribution. Aslam derived the percentiles of median life. Aslam is compared mean life percentile (with [12]) and median life percentiles. It concludes that median life percentile is better than mean life percentile.

Aslam *et.al.,* [2] implemented the Two-Stage improved group plans for Burr type XII Distributions. Aslam.et.al [3] developed the RGS (Repetitive Group Sampling) plan using Burr-type XII distribution. Ismail et. al., [14] develop two and three parameters are estimating in Burr type XII distribution using expected maximization (EM) algorithm. Rao et al., [17] using Burr type XII distribution to estimate the multi-component stress strength reliability and estimate its parameters.

The Cumulative distribution function is given by

$$F(t) = 1 - [1 + (t/\eta)^b]^{-k} \quad t \geq 0, \eta \geq 0, b \geq 0, k > 0 \tag{8}$$

Here, b and k are the shape parameters and η is the scale parameter. When k=1, the Burr-type XII distribution converts to log-logistic distribution. The 100qth percentile of Butt-type XII distribution is given as

$$t_q = \eta\left[\left(\frac{1}{1-q}\right)^{\frac{1}{k}} - 1\right]^{1/b} \tag{9}$$

The median life of the Burr-type XII distribution is given by

$$m = \eta\left[\frac{1-(0.5)^{1/k}}{(0.5)^{1/k}}\right]^{1/b} \tag{10}$$

When the shape parameters k and b are fixed, the median is proportional to the scale parameter η. The p based on the 100qth percentile of the Burr-type XII distribution is

$$p = 1 - \left[1 + \left[\frac{\gamma\delta_q}{t_q/t_{q_0}}\right]^b\right]^{-k} \tag{11}$$

Where

$$\gamma = \left[\left(\frac{1}{1-q}\right)^{1/k} - 1\right]^{1/b} \tag{12}$$

Where p is based on the median life, it is given by

$$p = 1 - \left[\frac{1}{1+(\delta_q\gamma/(t_q/t_{q_0}))^b}\right]^k \tag{13}$$

Where

$$\gamma = \left[\frac{1-(0.5)^{1/k}}{(0.5)^{1/k}}\right]^{1/b} \tag{14}$$

## IV. Determination of Sample Size

Step 1: Find the value of $p_2$ from equation 3 for shape parameter k=2 and q=0.5 by changing another shape parameter b=0.5 to 1.

Step 2: Set the evaluated Probability of Acceptance value Pa ($p_2$), and $t_q/t$ = 2, 4, 6, 8, 10, 12.

Step 3: Find the ASN value at LQL level and other parameter values fixed.

## V. Numerical Illustration

Form table 1 and 2, Acceptable Quality Level ($p_1$) and Limiting Quality level ($p_2$) values are fixed by deriving the ASN at AQL ($p_1$) level and ASN at LQL ($p_2$) level. From table 2 number of tester's r increases, the group g decreases. From table 1 and 2, r, g, i, $f_1$, $f_2$, and $f_3$ values are fixed by changing the AQL and LQL values. It concludes that some small changes are made in Skip lot sampling plan of type SkSP-T with Group Acceptance Sampling Plan ASN at AQL values are very small compared to ASN at LQL.

From tables 3, 4, 5 and 6 shape parameters k and b values are fixed to find the percentiles ratios. The number of tester's r increases 5 to 10 then the group g decreases. The shape parameter b increase 0.5 to 1 also the number of group g is increasing. Consider the tables, table 3, 4, 5 and 6 simulating the values from Average Sample Number at Limiting Quality Level (ASN at $p_2$) and Probability of Acceptance at Acceptable Quality Level (Pa (p) at $p_1$) using 50th percentile ratio. Table 5 and 6 noticed that shape parameter b increases 0.5 to 1 maximum of all the LQL values are same and the probability of Acceptance values are almost equaled. For b=2 and k=1 for $q_{0.5}$ or $50^{th}$ percentile the Burr type XII distribution is converted into the log-logistic distribution.

The life distribution is burr type XII distribution is assumed and the experimenter is interested and focused on showing that the true unknown 50th ($q_{0.5}$) percentile life $t_{0.5}$ is at least 4000hrs. Consider the shape parameter k=2 and b=0.5 and the producer and consumer risks are fixed by $\alpha$ = 0.05 and $\beta$ = 0.05. The experimenter is stopped at desire percentile lifetime t=4000hrs. Hence the parameter of Skip lot sampling plan of type SkSP-T with Group Acceptance Sampling Plan as reference plan using Burr type XII distribution indexed through ASN at AQL and LQL levels used various parameters. From table 5, then the parameter value c=1, $f_1$=0.25, $f_2$=0.125 and $f_3$=0.0625. At the time the quality engineer can apply SkSP-T with Group Acceptance Sampling Plan using Burr type XII distribution as follows: high probability acceptance (Pa ($p_1$)) is 0.9876 and the minimum ASN at LQL level is 4.38 and the product lifetime is 4000hrs. Hence the lot is accepted or rejected for no failure and one failure found in 4000hrs. It concludes that only one failure occurred in 167 days and the probability of acceptance 0.9876 ≈ 0.99 or 99%. In this example is compared to Aslam *et. al* [1] skip-lot sampling plan of type SkSP-2 with GASP with Burr Type XII distribution and Aslam *et.al* [3] Repetitive acceptance singe sampling plan with Burr type XII distribution it concludes that Skip-lot sampling plan of type SkSP-T is more efficient. Skip-lot sampling plan of type SkSP-T with Burr type XII distribution has more probability of acceptance and minimum ASN at AQL and LQL levels compared with SkSP-2 with Burr type XII distribution.

From table 7, Skip-lot sampling plan of type SkSP-T with Group Acceptance Sampling Plan is compared with an existing Group acceptance sampling plan. And also calculate the corresponding Probability of Acceptance value. Let us consider the various group of Acceptable Quality and Limiting Quality levels are used and by fixed the number of tester r value (5 and 10), then calculate the group size for an existing plan and proposed plan. It concludes that the new proposed plan provides the very less number of group size and the already existing plan has more number of group size. For this table AQL=0.01 and LQL=0.02 and the number of tester r = 10, then the number of testers for existing plan to test the product under inspection is 130 and the proposed plan to test the product under inspection is 8. And this table is also compared with Aslam *et. al* [1] skip-lot sampling plan of type SkSP-2 with GASP with Burr Type XII distribution. It concludes that the new proposed plan has more efficient than GASP and SkSP-2 with Burr distribution.

**Table 1:** *Skip-lot sampling plan of type SkSP-T with Group Acceptance Sampling Plan as a reference plan based on truncated life tests for r = 5*

| AQL ($p_1$) | LQL ($p_2$) | Optimal parameters | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | g | i | c | $f_1$ | $f_2$ | $f_3$ | ASN at ($p_1$) | ASN at ($p_2$) |
| 0.001 | 0.002 | 552 | 2 | 4 | 0.1 | 0.05 | 0.025 | 135 | 1898 |
| | 0.003 | 150 | 2 | 1 | 0.15 | 0.075 | 0.0375 | 62 | 841 |
| | 0.004 | 98 | 2 | 1 | 0.2 | 0.1 | 0.05 | 36 | 458 |
| | 0.005 | 37 | 2 | 1 | 0.25 | 0.125 | 0.0625 | 12 | 36 |
| | 0.006 | 11 | 2 | 0 | 0.3 | 0.15 | 0.075 | 5 | 16 |
| 0.003 | 0.005 | 220 | 2 | 4 | 0.1 | 0.05 | 0.025 | 83 | 744 |
| | 0.0065 | 64 | 2 | 1 | 0.15 | 0.075 | 0.0375 | 38 | 274 |
| | 0.007 | 16 | 2 | 0 | 0.2 | 0.1 | 0.05 | 11 | 34 |
| | 0.0075 | 14 | 2 | 0 | 0.25 | 0.125 | 0.0625 | 10 | 32.8 |
| | 0.008 | 8 | 2 | 0 | 0.3 | 0.15 | 0.075 | 5 | 11.6 |
| 0.005 | 0.007 | 43 | 2 | 1 | 0.1 | 0.05 | 0.025 | 23 | 49.8 |
| | 0.008 | 11 | 2 | 0 | 0.15 | 0.075 | 0.0375 | 7 | 12.6 |
| | 0.009 | 7 | 2 | 0 | 0.2 | 0.1 | 0.05 | 4 | 7.66 |
| | 0.01 | 6 | 2 | 0 | 0.25 | 0.125 | 0.0625 | 4 | 6.54 |
| | 0.011 | 4 | 2 | 0 | 0.3 | 0.15 | 0.075 | 3 | 5.43 |
| 0.01 | 0.02 | 10 | 2 | 0 | 0.1 | 0.05 | 0.025 | 9 | 34.7 |
| | 0.03 | 5 | 2 | 0 | 0.15 | 0.075 | 0.0375 | 2 | 12.2 |
| | 0.04 | 4 | 2 | 0 | 0.2 | 0.1 | 0.05 | 2 | 10 |
| | 0.05 | 3 | 2 | 0 | 0.25 | 0.125 | 0.0625 | 1 | 9 |
| | 0.06 | 2 | 2 | 0 | 0.3 | 0.15 | 0.075 | 1 | 7.8 |

**Table 2:** *Skip-lot sampling plan of type SkSP-T with Group Acceptance Sampling Plan as a reference plan based on truncated life tests for r = 10*

| AQL ($p_1$) | LQL ($p_2$) | Optimal parameters | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | g | i | c | $f_1$ | $f_2$ | $f_3$ | ASN at ($p_1$) | ASN at ($p_2$) |
| 0.001 | 0.002 | 275 | 2 | 4 | 0.1 | 0.05 | 0.025 | 134 | 1866 |
| | 0.003 | 75 | 2 | 1 | 0.15 | 0.075 | 0.0375 | 62.7 | 835 |
| | 0.004 | 48 | 2 | 1 | 0.2 | 0.1 | 0.05 | 35.7 | 432 |
| | 0.005 | 18 | 2 | 1 | 0.25 | 0.125 | 0.0625 | 11.9 | 31.9 |
| | 0.006 | 6 | 2 | 0 | 0.3 | 0.15 | 0.075 | 5.14 | 15 |
| 0.003 | 0.005 | 110 | 2 | 4 | 0.1 | 0.05 | 0.025 | 83.4 | 740 |
| | 0.0065 | 31 | 2 | 1 | 0.15 | 0.075 | 0.0375 | 35.4 | 236 |
| | 0.007 | 8 | 2 | 0 | 0.2 | 0.1 | 0.05 | 10.4 | 30 |
| | 0.0075 | 7 | 2 | 0 | 0.25 | 0.125 | 0.0625 | 9.89 | 28.5 |
| | 0.008 | 4 | 2 | 0 | 0.3 | 0.15 | 0.075 | 4.86 | 10.4 |
| 0.005 | 0.007 | 21 | 2 | 1 | 0.1 | 0.05 | 0.025 | 21.2 | 45.9 |
| | 0.008 | 6 | 2 | 0 | 0.15 | 0.075 | 0.0375 | 6.51 | 11.6 |
| | 0.009 | 4 | 2 | 0 | 0.2 | 0.1 | 0.05 | 4.12 | 7.2 |
| | 0.01 | 3 | 2 | 0 | 0.25 | 0.125 | 0.0625 | 3.31 | 5.74 |
| | 0.011 | 3 | 2 | 0 | 0.3 | 0.15 | 0.075 | 2.97 | 5.15 |
| 0.01 | 0.02 | 5 | 2 | 0 | 0.1 | 0.05 | 0.025 | 8.95 | 35.1 |
| | 0.03 | 2 | 2 | 0 | 0.15 | 0.075 | 0.0375 | 3 | 11.8 |
| | 0.04 | 2 | 2 | 0 | 0.2 | 0.1 | 0.05 | 2 | 10.2 |
| | 0.05 | 1 | 2 | 0 | 0.25 | 0.125 | 0.0625 | 2 | 7.61 |
| | 0.06 | 1 | 2 | 0 | 0.3 | 0.15 | 0.075 | 1 | 7.09 |

**Table 3:** *Parameters for Skip-lot sampling plan of type SkSP-T with Group Acceptance Sampling Plan as a reference plan for the total failure under the Burr type XII distribution*

| | | r = 5, δq =0.5 | | | | | | | | r = 5, δq =1 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $\beta$ | $t_q/t_{q0}$ | g | c | i | $f_1$ | $f_2$ | $f_3$ | ASN at $p_2$ | Pa(p) | g | c | i | $f_1$ | $f_2$ | $f_3$ | ASN at $p_2$ | Pa(p) |
| 0.25 | 2 | 8 | 9 | 2 | 0.10 | 0.050 | 0.0250 | 91.17 | 0.9500 | 6 | 9 | 2 | 0.10 | 0.050 | 0.0250 | 99.19 | 0.9558 |
| | 4 | 7 | 6 | 2 | 0.15 | 0.075 | 0.0375 | 70.14 | 0.9504 | 5 | 6 | 2 | 0.15 | 0.075 | 0.0375 | 62.29 | 0.9498 |
| | 6 | 5 | 3 | 2 | 0.20 | 0.10 | 0.05 | 69.45 | 0.9498 | 4 | 3 | 2 | 0.20 | 0.10 | 0.05 | 83.86 | 0.9501 |
| | 8 | 4 | 2 | 2 | 0.25 | 0.125 | 0.0625 | 58.87 | 0.9503 | 3 | 2 | 2 | 0.25 | 0.125 | 0.0625 | 74.46 | 0.9504 |
| | 10 | 4 | 2 | 2 | 0.30 | 0.15 | 0.075 | 58.79 | 0.9502 | 3 | 2 | 2 | 0.30 | 0.15 | 0.075 | 55.86 | 0.9499 |
| | 12 | 3 | 1 | 2 | 0.35 | 0.175 | 0.0875 | 47.18 | 0.9499 | 2 | 1 | 2 | 0.35 | 0.175 | 0.0875 | 53.73 | 0.9494 |
| 0.20 | 2 | 7 | 7 | 2 | 0.10 | 0.050 | 0.0250 | 111.3 | 0.9998 | 5 | 7 | 2 | 0.30 | 0.15 | 0.075 | 111.3 | 0.9996 |
| | 4 | 5 | 3 | 2 | 0.15 | 0.075 | 0.0375 | 89.44 | 0.9836 | 3 | 2 | 2 | 0.20 | 0.10 | 0.05 | 89.44 | 0.9841 |
| | 6 | 3 | 1 | 2 | 0.15 | 0.075 | 0.0375 | 58.41 | 0.9616 | 2 | 1 | 2 | 0.10 | 0.050 | 0.0250 | 58.41 | 0.9618 |
| | 8 | 3 | 0 | 2 | 0.20 | 0.10 | 0.05 | 60.64 | 0.950 | 1 | 0 | 2 | 0.30 | 0.15 | 0.075 | 60.64 | 0.9589 |
| | 10 | 3 | 0 | 2 | 0.15 | 0.075 | 0.0375 | 58.37 | 0.9755 | 3 | 1 | 2 | 0.15 | 0.075 | 0.0375 | 58.37 | 0.9759 |
| | 12 | 3 | 0 | 2 | 0.30 | 0.15 | 0.075 | 47.33 | 0.9862 | 1 | 0 | 2 | 0.30 | 0.15 | 0.075 | 47.44 | 0.9861 |
| 0.10 | 2 | 6 | 6 | 2 | 0.10 | 0.050 | 0.0250 | 128.4 | 0.9880 | 4 | 5 | 2 | 0.15 | 0.075 | 0.0375 | 128.4 | 0.9881 |
| | 4 | 4 | 2 | 2 | 0.20 | 0.10 | 0.05 | 90.89 | 0.9832 | 2 | 1 | 2 | 0.30 | 0.15 | 0.075 | 90.89 | 0.9826 |
| | 6 | 3 | 1 | 2 | 0.10 | 0.05 | 0.0250 | 58.16 | 0.9613 | 1 | 0 | 2 | 0.20 | 0.10 | 0.05 | 58.16 | 0.9606 |
| | 8 | 2 | 0 | 2 | 0.20 | 0.10 | 0.05 | 60.64 | 0.9596 | 1 | 0 | 2 | 0.35 | 0.175 | 0.0875 | 60.64 | 0.9550 |
| | 10 | 2 | 0 | 2 | 0.40 | 0.20 | 0.10 | 58.37 | 0.9749 | 1 | 0 | 2 | 0.45 | 0.225 | 0.1125 | 58.37 | 0.9810 |
| | 12 | 2 | 0 | 2 | 0.45 | 0.225 | 0.1125 | 47.33 | 0.9859 | 1 | 0 | 2 | 0.30 | 0.15 | 0.075 | 47.33 | 0.9918 |
| 0.05 | 2 | 5 | 4 | 2 | 0.15 | 0.075 | 0.0375 | 120.4 | 0.9877 | 3 | 4 | 2 | 0.10 | 0.050 | 0.0250 | 120.4 | 0.9968 |
| | 4 | 3 | 2 | 2 | 0.20 | 0.10 | 0.05 | 90.89 | 0.9830 | 2 | 1 | 2 | 0.15 | 0.075 | 0.0375 | 90.89 | 0.9927 |
| | 6 | 2 | 0 | 2 | 0.25 | 0.125 | 0.0625 | 58.41 | 0.9608 | 2 | 1 | 2 | 0.10 | 0.050 | 0.0250 | 58.41 | 0.9977 |
| | 8 | 2 | 0 | 2 | 0.35 | 0.175 | 0.0875 | 60.64 | 0.9592 | 1 | 0 | 2 | 0.20 | 0.10 | 0.05 | 60.64 | 0.9669 |
| | 10 | 2 | 0 | 2 | 0.40 | 0.20 | 0.10 | 58.37 | 0.9747 | 2 | 0 | 2 | 0.15 | 0.075 | 0.0375 | 58.37 | 0.9847 |
| | 12 | 2 | 0 | 2 | 0.45 | 0.225 | 0.1125 | 47.33 | 0.9856 | 2 | 0 | 2 | 0.25 | 0.125 | 0.0625 | 47.33 | 0.9865 |

**Table 4:** *Parameters for Skip-lot sampling plan of type SkSP-T with Group Acceptance Sampling Plan as a reference plan for the total failure under the Burr type XII distribution*

| | | r = 10, δq =0.5 | | | | | | | | r = 10, δq =1 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $\beta$ | $t_q/t_{q0}$ | g | c | i | $f_1$ | $f_2$ | $f_3$ | ASN at $p_2$ | Pa(p) | g | c | i | $f_1$ | $f_2$ | $f_3$ | ASN at $p_2$ | Pa(p) |
| 0.25 | 2 | 4 | 9 | 2 | 0.10 | 0.050 | 0.0250 | 91.17 | 0.9504 | 3 | 9 | 2 | 0.15 | 0.075 | 0.0375 | 99.19 | 0.9551 |
| | 4 | 4 | 6 | 2 | 0.15 | 0.075 | 0.0375 | 70.14 | 0.9504 | 3 | 6 | 2 | 0.10 | 0.050 | 0.0250 | 70.14 | 0.9474 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6 | 3 | 3 | 2 | 0.20 | 0.10 | 0.05 | 69.45 | 0.9498 | 2 | 3 | 2 | 0.20 | 0.10 | 0.05 | 69.45 | 0.9583 |
| | 8 | 2 | 2 | 2 | 0.25 | 0.125 | 0.0625 | 58.87 | 0.9502 | 2 | 2 | 2 | 0.25 | 0.125 | 0.0625 | 69.45 | 0.9533 |
| | 10 | 2 | 2 | 2 | 0.30 | 0.15 | 0.075 | 58.79 | 0.9501 | 2 | 2 | 2 | 0.20 | 0.10 | 0.05 | 58.79 | 0.9513 |
| | 12 | 2 | 1 | 2 | 0.35 | 0.175 | 0.0875 | 47.18 | 0.9497 | 2 | 1 | 2 | 0.35 | 0.175 | 0.0875 | 47.18 | 0.9552 |
| 0.20 | 2 | 3 | 7 | 2 | 0.10 | 0.050 | 0.0250 | 111.3 | 0.9998 | 2 | 7 | 2 | 0.30 | 0.15 | 0.075 | 111.3 | 0.9996 |
| | 4 | 2 | 3 | 2 | 0.15 | 0.075 | 0.0375 | 89.44 | 0.9836 | 1 | 2 | 2 | 0.20 | 0.10 | 0.05 | 89.44 | 0.9841 |
| | 6 | 2 | 1 | 2 | 0.15 | 0.075 | 0.0375 | 58.41 | 0.9616 | 1 | 1 | 2 | 0.15 | 0.075 | 0.0375 | 58.41 | 0.9618 |
| | 8 | 1 | 0 | 2 | 0.10 | 0.050 | 0.0250 | 60.64 | 0.9627 | 1 | 1 | 2 | 0.50 | 0.25 | 0.125 | 60.64 | 0.9619 |
| | 10 | 1 | 0 | 2 | 0.20 | 0.10 | 0.05 | 58.37 | 0.9754 | 1 | 1 | 2 | 0.10 | 0.050 | 0.0250 | 58.37 | 0.9759 |
| | 12 | 1 | 0 | 2 | 0.30 | 0.15 | 0.075 | 47.33 | 0.9862 | 1 | 1 | 2 | 0.35 | 0.175 | 0.0875 | 47.44 | 0.9989 |
| 0.10 | 2 | 3 | 6 | 2 | 0.10 | 0.050 | 0.0250 | 128.4 | 0.9886 | 2 | 5 | 2 | 0.15 | 0.075 | 0.0375 | 128.4 | 0.9881 |
| | 4 | 2 | 2 | 2 | 0.20 | 0.10 | 0.05 | 90.89 | 0.9832 | 1 | 1 | 2 | 0.30 | 0.15 | 0.075 | 90.89 | 0.9825 |
| | 6 | 2 | 1 | 2 | 0.10 | 0.05 | 0.0250 | 58.16 | 0.9613 | 1 | 1 | 2 | 0.25 | 0.125 | 0.0625 | 58.16 | 0.9923 |
| | 8 | 1 | 0 | 2 | 0.10 | 0.050 | 0.0250 | 60.64 | 0.9631 | 1 | 1 | 2 | 0.10 | 0.050 | 0.0250 | 60.64 | 0.9974 |
| | 10 | 1 | 0 | 2 | 0.15 | 0.075 | 0.0375 | 58.37 | 0.9860 | 1 | 1 | 2 | 0.50 | 0.25 | 0.125 | 58.37 | 0.9983 |
| | 12 | 1 | 0 | 2 | 0.20 | 0.10 | 0.05 | 47.33 | 0.9919 | 1 | 0 | 2 | 0.10 | 0.050 | 0.0250 | 47.38 | 0.9977 |
| 0.05 | 2 | 2 | 4 | 2 | 0.15 | 0.075 | 0.0375 | 120.4 | 0.9877 | 2 | 4 | 2 | 0.10 | 0.050 | 0.0250 | 120.4 | 0.9967 |
| | 4 | 1 | 1 | 2 | 0.25 | 0.125 | 0.0625 | 90.89 | 0.9830 | 1 | 1 | 2 | 0.15 | 0.075 | 0.0375 | 90.89 | 0.9926 |
| | 6 | 1 | 1 | 2 | 0.20 | 0.10 | 0.05 | 58.41 | 0.9652 | 1 | 1 | 2 | 0.25 | 0.125 | 0.0625 | 58.41 | 0.9963 |
| | 8 | 1 | 0 | 2 | 0.10 | 0.050 | 0.0250 | 60.64 | 0.9828 | 1 | 1 | 2 | 0.45 | 0.225 | 0.1125 | 60.64 | 0.9669 |
| | 10 | 1 | 0 | 2 | 0.15 | 0.075 | 0.0375 | 58.37 | 0.9747 | 1 | 0 | 2 | 0.10 | 0.050 | 0.0250 | 58.37 | 0.9846 |
| | 12 | 1 | 0 | 2 | 0.20 | 0.10 | 0.05 | 47.33 | 0.9856 | 1 | 0 | 2 | 0.30 | 0.15 | 0.075 | 47.33 | 0.9864 |

**Table 5:** *Parameters for Skip-lot sampling plan of type SkSP-T with Group Acceptance Sampling Plan as a reference plan for the total failure under the Burr type XII distribution*

| | | r = 5, δq =0.5 | | | | | | | | r = 5, δq =1 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $\beta$ | $t_q/t_{q0}$ | g | c | I | $f_1$ | $f_2$ | $f_3$ | ASN at $p_2$ | Pa(p) | g | c | i | $f_1$ | $f_2$ | $f_3$ | ASN at $p_2$ | Pa(p) |
| 0.25 | 2 | 8 | 6 | 2 | 0.10 | 0.050 | 0.0250 | 13.2662 | 0.9952 | 5 | 7 | 2 | 0.10 | 0.050 | 0.0250 | 13.2662 | 0.9942 |
| | 4 | 6 | 3 | 2 | 0.15 | 0.075 | 0.0375 | 4.38 | 0.9882 | 6 | 6 | 2 | 0.15 | 0.075 | 0.0375 | 4.38 | 0.9876 |
| | 6 | 5 | 1 | 2 | 0.20 | 0.10 | 0.05 | 4.38 | 0.9873 | 3 | 2 | 2 | 0.20 | 0.10 | 0.05 | 4.38 | 0.9866 |
| | 8 | 4 | 1 | 2 | 0.25 | 0.125 | 0.0625 | 4.38 | 0.9857 | 4 | 2 | 2 | 0.25 | 0.125 | 0.0625 | 4.38 | 0.9855 |
| | 10 | 4 | 1 | 2 | 0.30 | 0.15 | 0.075 | 4.38 | 0.9904 | 4 | 2 | 2 | 0.30 | 0.15 | 0.075 | 4.38 | 0.9894 |
| | 12 | 4 | 1 | 2 | 0.40 | 0.20 | 0.10 | 4.38 | 0.9897 | 3 | 1 | 2 | 0.35 | 0.175 | 0.0875 | 4.37 | 0.9893 |
| 0.20 | 2 | 7 | 5 | 2 | 0.10 | 0.050 | 0.0250 | 13.2662 | 0.9953 | 5 | 7 | 2 | 0.30 | 0.15 | 0.075 | 13.2662 | 0.9960 |
| | 4 | 4 | 2 | 2 | 0.15 | 0.075 | 0.0375 | 4.38 | 0.9882 | 3 | 2 | 2 | 0.25 | 0.125 | 0.0625 | 4.38 | 0.9881 |
| | 6 | 4 | 2 | 2 | 0.50 | 0.25 | 0.125 | 4.38 | 0.9872 | 3 | 1 | 2 | 0.15 | 0.075 | 0.0375 | 4.38 | 0.9870 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 8 | 2 | 0 | 2 | 0.20 | 0.10 | 0.05 | 4.38 | 0.9856 | 1 | 0 | 2 | 0.30 | 0.15 | 0.075 | 4.38 | 0.9854 |
| | 10 | 2 | 0 | 2 | 0.35 | 0.175 | 0.0875 | 4.38 | 0.9898 | 3 | 1 | 2 | 0.35 | 0.175 | 0.0875 | 4.38 | 0.9896 |
| | 12 | 2 | 0 | 2 | 0.30 | 0.15 | 0.075 | 4.38 | 0.9895 | 1 | 0 | 2 | 0.40 | 0.20 | 0.10 | 4.38 | 0.9896 |
| 0.10 | 2 | 6 | 4 | 2 | 0.10 | 0.050 | 0.0250 | 13.2662 | 0.9949 | 4 | 5 | 2 | 0.15 | 0.075 | 0.0375 | 13.2662 | 0.9949 |
| | 4 | 4 | 2 | 2 | 0.20 | 0.10 | 0.05 | 4.37 | 0.9708 | 2 | 1 | 2 | 0.15 | 0.075 | 0.0375 | 4.37 | 0.9880 |
| | 6 | 4 | 1 | 2 | 0.10 | 0.05 | 0.0250 | 4.38 | 0.9866 | 1 | 0 | 2 | 0.20 | 0.10 | 0.05 | 4.38 | 0.9871 |
| | 8 | 2 | 0 | 2 | 0.25 | 0.125 | 0.0625 | 4.38 | 0.9856 | 1 | 0 | 2 | 0.30 | 0.15 | 0.075 | 4.38 | 0.9856 |
| | 10 | 2 | 0 | 2 | 0.40 | 0.20 | 0.10 | 4.38 | 0.9903 | 1 | 0 | 2 | 0.40 | 0.20 | 0.10 | 4.38 | 0.9895 |
| | 12 | 2 | 0 | 2 | 0.45 | 0.225 | 0.1125 | 4.8 | 0.9816 | 1 | 0 | 2 | 0.45 | 0.225 | 0.1125 | 4.8 | 0.9888 |
| 0.05 | 2 | 5 | 4 | 2 | 0.15 | 0.075 | 0.0375 | 13.2662 | 0.9945 | 3 | 4 | 2 | 0.10 | 0.050 | 0.0250 | 13.2662 | 0.9969 |
| | 4 | 3 | 1 | 2 | 0.25 | 0.125 | 0.0625 | 4.38 | 0.9876 | 2 | 1 | 2 | 0.10 | 0.050 | 0.0250 | 4.38 | 0.9848 |
| | 6 | 2 | 0 | 2 | 0.20 | 0.10 | 0.05 | 4.38 | 0.9869 | 2 | 1 | 2 | 0.20 | 0.10 | 0.05 | 4.38 | 0.9864 |
| | 8 | 2 | 0 | 2 | 0.15 | 0.075 | 0.0375 | 4.38 | 0.9856 | 1 | 0 | 2 | 0.20 | 0.10 | 0.05 | 4.38 | 0.9848 |
| | 10 | 2 | 0 | 2 | 0.35 | 0.175 | 0.0875 | 4.38 | 0.9898 | 2 | 0 | 2 | 0.25 | 0.125 | 0.0625 | 4.38 | 0.9899 |
| | 12 | 2 | 0 | 2 | 0.40 | 0.20 | 0.10 | 4.38 | 0.9896 | 2 | 0 | 2 | 0.35 | 0.175 | 0.0875 | 4.38 | 0.9896 |

**Table 6:** *Parameters for Skip-lot sampling plan of type SkSP-T with Group Acceptance Sampling Plan as a reference plan for the total failure under the Burr type XII distribution*

| | | r = 10, δq =0.5 | | | | | | | | r = 10, δq =1 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $\beta$ | $t_q/t_{q0}$ | g | c | i | $f_1$ | $f_2$ | $f_3$ | ASN at $p_2$ | Pa(p) | g | c | i | $f_1$ | $f_2$ | $f_3$ | ASN at $p_2$ | Pa(p) |
| 0.25 | 2 | 5 | 9 | 2 | 0.10 | 0.050 | 0.0250 | 13.2662 | 0.9948 | 3 | 9 | 2 | 0.10 | 0.050 | 0.0250 | 13.2662 | 0.9948 |
| | 4 | 5 | 6 | 2 | 0.15 | 0.075 | 0.0375 | 4.38 | 0.9874 | 3 | 6 | 2 | 0.15 | 0.075 | 0.0375 | 4.38 | 0.9878 |
| | 6 | 4 | 3 | 2 | 0.20 | 0.10 | 0.05 | 4.37 | 0.9867 | 2 | 3 | 2 | 0.20 | 0.10 | 0.05 | 4.38 | 0.9871 |
| | 8 | 3 | 2 | 2 | 0.25 | 0.125 | 0.0625 | 4.38 | 0.9855 | 2 | 2 | 2 | 0.25 | 0.125 | 0.0625 | 4.38 | 0.9855 |
| | 10 | 3 | 2 | 2 | 0.30 | 0.15 | 0.075 | 4.38 | 0.9899 | 2 | 2 | 2 | 0.30 | 0.15 | 0.075 | 4.38 | 0.9898 |
| | 12 | 2 | 1 | 2 | 0.35 | 0.175 | 0.0875 | 4.38 | 0.9895 | 2 | 1 | 2 | 0.35 | 0.175 | 0.0875 | 4.37 | 0.9893 |
| 0.20 | 2 | 4 | 7 | 2 | 0.10 | 0.050 | 0.0250 | 13.2662 | 0.9979 | 2 | 7 | 2 | 0.30 | 0.15 | 0.075 | 13.2662 | 0.9999 |
| | 4 | 3 | 3 | 2 | 0.15 | 0.075 | 0.0375 | 4.38 | 0.9878 | 1 | 2 | 2 | 0.25 | 0.125 | 0.0625 | 4.38 | 0.9867 |
| | 6 | 2 | 1 | 2 | 0.15 | 0.075 | 0.0375 | 4.38 | 0.9868 | 1 | 1 | 2 | 0.15 | 0.075 | 0.0375 | 4.38 | 0.9868 |
| | 8 | 1 | 0 | 2 | 0.10 | 0.050 | 0.0250 | 4.38 | 0.9849 | 1 | 1 | 2 | 0.30 | 0.15 | 0.075 | 4.38 | 0.9899 |
| | 10 | 1 | 0 | 2 | 0.35 | 0.175 | 0.0875 | 4.38 | 0.9898 | 1 | 1 | 2 | 0.35 | 0.175 | 0.0875 | 4.38 | 0.9895 |
| | 12 | 1 | 0 | 2 | 0.50 | 0.25 | 0.125 | 4.38 | 0.9892 | 2 | 1 | 2 | 0.40 | 0.20 | 0.10 | 4.38 | 0.9982 |
| 0.10 | 2 | 4 | 6 | 2 | 0.10 | 0.050 | 0.0250 | 13.2662 | 0.9947 | 2 | 5 | 2 | 0.15 | 0.075 | 0.0375 | 13.2662 | 0.9895 |
| | 4 | 2 | 2 | 2 | 0.20 | 0.10 | 0.05 | 4.37 | 0.9878 | 1 | 1 | 2 | 0.15 | 0.075 | 0.0375 | 4.37 | 0.9903 |
| | 6 | 2 | 1 | 2 | 0.30 | 0.15 | 0.075 | 4.38 | 0.9866 | 1 | 1 | 2 | 0.20 | 0.10 | 0.05 | 4.38 | 0.9919 |
| | 8 | 1 | 0 | 2 | 0.25 | 0.125 | 0.0625 | 4.38 | 0.9856 | 1 | 1 | 2 | 0.30 | 0.15 | 0.075 | 4.38 | 0.9938 |
| | 10 | 1 | 0 | 2 | 0.35 | 0.175 | 0.0875 | 4.38 | 0.9894 | 1 | 1 | 2 | 0.40 | 0.20 | 0.10 | 3.97 | 0.9983 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 12 | 1 | 0 | 2 | 0.45 | 0.225 | 0.1125 | 4.8 | 0.9896 | 1 | 0 | 2 | 0.45 | 0.225 | 0.1125 | 4.8 | 0.9934 |
| 0.05 | 2 | 3 | 4 | 2 | 0.15 | 0.075 | 0.0375 | 13.2662 | 0.9944 | 2 | 4 | 2 | 0.10 | 0.050 | 0.0250 | 13.2662 | 0.9968 |
| | 4 | 1 | 1 | 2 | 0.30 | 0.15 | 0.075 | 4.38 | 0.9875 | 1 | 1 | 2 | 0.10 | 0.050 | 0.0250 | 4.38 | 0.9847 |
| | 6 | 1 | 1 | 2 | 0.40 | 0.20 | 0.10 | 4.38 | 0.9876 | 1 | 1 | 2 | 0.20 | 0.10 | 0.05 | 4.38 | 0.9955 |
| | 8 | 1 | 0 | 2 | 0.25 | 0.125 | 0.0625 | 4.38 | 0.9856 | 1 | 1 | 2 | 0.20 | 0.10 | 0.05 | 4.38 | 0.9914 |
| | 10 | 1 | 0 | 2 | 0.35 | 0.175 | 0.0875 | 4.38 | 0.9897 | 1 | 0 | 2 | 0.25 | 0.125 | 0.0625 | 4.38 | 0.9899 |
| | 12 | 1 | 0 | 2 | 0.40 | 0.20 | 0.10 | 4.38 | 0.9895 | 1 | 0 | 2 | 0.35 | 0.175 | 0.0875 | 4.38 | 0.9896 |

**Table 7:** *Comparison of GASP with SkSP-T with GASP as reference plan using Burr type XII distribution*

| | | | r = 5 | | r = 10 | | |
|---|---|---|---|---|---|---|---|
| $p_1$ | $p_2$ | Group Acceptance Sampling plan | Proposed Plan (SkSP-T with Burr type XII) | Probability of Acceptance at Pa($p_1$) | Group Acceptance Sampling plan | Proposed Plan (SkSP-T with Burr type XII) | Probability of Acceptance at Pa($p_1$) |
| 0.001 | 0.002 | 200 | 13 | 0.9959 | 130 | 8 | 0.9973 |
| | 0.005 | 162 | 7 | 0.9978 | 45 | 5 | 0.9964 |
| | 0.01 | 53 | 5 | 0.9973 | 25 | 3 | 0.9981 |
| | 0.15 | 38 | 4 | 0.9973 | 14 | 2 | 0.9976 |
| | 0.02 | 25 | 4 | 0.9966 | 10 | 2 | 0.9979 |
| | 0.03 | 17 | 3 | 0.9974 | 8 | 2 | 0.9989 |
| 0.005 | 0.02 | 142 | 9 | 0.9955 | 113 | 7 | 0.9977 |
| | 0.03 | 62 | 6 | 0.9973 | 38 | 5 | 0.9956 |
| | 0.04 | 31 | 4 | 0.9977 | 21 | 3 | 0.9966 |
| | 0.05 | 18 | 3 | 0.9972 | 12 | 2 | 0.9973 |
| | 0.06 | 13 | 2 | 0.9961 | 8 | 2 | 0.9978 |
| | 0.07 | 7 | 2 | 0.9974 | 5 | 2 | 0.9982 |

## VI. CONCLUSION

The new proposed skip-lot sampling plan of type SkSP-T with Group Acceptance Sampling Plan will be useful when the lifetime of the product follows the Burr type XII distribution with known and unknown shape parameters. The proposed SkSP-T with GASP has been compared with SkSP-2 with GASP and Group Acceptance Sampling Plan. The comparison results have specified that the SkSP-T with Group Acceptance Sampling Plan is more efficient than the SkSP-2 and existing Group Acceptance Sampling Plan. From the illustration, it is noticed that the SkSP-T has more probability of acceptance compared with other existing plans. Producer and consumer risks are reduced while compared with SkSP-2 and RGASP under Burr type XII distribution. The article also provides a detailed procedure for designing and selecting the plan parameters. An attempt has been made in this paper in developing Skip lot sampling plans ensuring reduce the frequency of sampling inspection and total inspection cost and also reducing the defectives products. The necessary tables and examples are contributed and applied for the formulation of the new proposed sampling plan.

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