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RESEARCH ARTICLE

SELECTION OF THREE STAGE CHAIN SAMPLING PLAN OF TYPE (0, 1, 3) WITH REPETITIVE GROUP SAMPLING PLAN INDEXED THROUGH QUALITY REGIONS

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ABSTRACT

Acceptance sampling procedures are practical tools for quality assurance applications involving product control. In this article we have developed new method for designing sampling plans based on range of quality instead of pointwise description of quality by invoking a quality regions approach. The Quality Decision Region proposes wider potential applicability in industry ensuring a higher standard of quality attainment for a product. This paper provides a selection of chain sampling plan of type (0,1,3) with Repetitive Group Sampling plan indexed through quality regions. Tables are constructed by considering the various combinations of acceptable and limiting quality levels, and an example is given for illustration purpose.

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INTRODUCTION

Statistical Quality Control is the term used to describe the set of statistical tools used to describe the set of statistical tools used by quality engineers' professionals. One of the major areas of Statistical Quality Control is Acceptance sampling. Acceptance sampling is a methodology that deals with procedures, by which decision to accept or reject are based on the inspection of sample. Acceptance sampling is "the middle of the road" approach between no inspection and 100% inspection. There are two major classifications of acceptance plan: by attributes and variables. Therefore, there is a change of rejection a good lot (Producer's risk) and acceptance a bad lot(consumer's risk). Acceptance sampling by attributes each item is tested and classified as conforming and non- conforming. A sampling is taken and contains two many non –conforming items, then the batch is rejected, otherwise it is accepted. To ensure a good quality of the final product from the factory, inspection of the raw material and the product material should be done. The acceptance sampling plans are well known to reduce the above risks. In all the type of sampling plans namely single sampling plan, double sampling, multiple sampling plan and chain sampling plan, the basic assumption is the lot or fraction of defective goods is constant. Even though the process is stable, in practical situations, the goods produced from a process will slightly differ in their quality due to random fluctuations. Review of literature: The concept of Repetitive Group Sampling plan (RGS) plan was introduced by Sherman (1965) in which acceptance and rejection of the lot is based on the repeated sample results of the same lot. The detailed procedure and tables for the construction and selection of RGS plans have been given by Soundarajan and Ramaswamy (1984) and Singh et al. (1989).The purpose of present investigation is twofold. Firstly, following Stephens and Dodge (1976) proposed plan which uses different sample size in the normal and tightened phases of inspection. Cameron (1952) has developed an operating ratio based on Acceptable Quality Level (AQL) and Limiting Quality Level (LQL). A table is constructed for the selection of sampling plan under Poisson model and the ratio is a measure of discrimination. Soundararajan(1975) has indexed the single sampling plan through MAPD and K=pT/ p*, where MAPD is the proportion defective at the inflection point of OC curve defined and explained by Mayer (1967) and Mandelson(1962). Vedaldi (1986) has studied the SSP through Incentive and filter effects. This paper designs the parameters of the plan indexed with QDR and PQR. Suresh and Srivenkataramana (1996) have studied the selection of SSP using Producer and Consumer Quality Levels. Suresh and

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Saminathan (2007) have given a procedure to define multiple repetitive group sampling plans indexed with MAPD and MAAOQ. Suresh and Kaviyarasu (2008) have explained the desirability for developing Quick Switching System with Conditional RGS plan indexed through quality levels. Suresh and Divya (2009) have given the new procedure for Single Sampling Plan through Decision Region. Suresh and Sangeetha (2010) have studied the selection of Repetitive Deferred Sampling plan using Quality Regions.

Repetitive Group Sampling plan (RGS): Conditions for the Repetitive Group Sampling Plan

- The size of the lot is taken to be sufficiently large
- Under normal conditions, the lots are expected to be of eventually same quality
- The producer comes from a source in which the consumer has confidence Operating Procedure Draw a random sample of size n1 from the lot of normal inspection and determine the number of defectives (d) found therein
- Accept the lot id $d \leq c_1$
- Reject the lot if $d < c_2$
- If $c_1 < d \leq c_2$ repeat the steps (1),(2) and (3).it is also noted that $c_1 < c_2$.Thus, the RGS plan is determined by the parameters n,c_1 and c_2

The probability of acceptance in a particular group sample is

$$P_1(\text{p})=\sum_{k_1=0}^{c_1} \frac{e^{-np}(np)^{k1}}{k_1!}$$

The probability of rejection in a particular group sample is

$$P_1{}^1(\text{p})=\sum_{k_2=c_2}^{\infty} \frac{e^{-np}(np)^{k1}}{k_2!}$$

The probability of eventually accepting the lot is given as

$$P_1(\text{n},c_1c_2/p)=\frac{p_1}{p_1+p_1^1}$$

Then from (1) and (2)

$$P_a = \frac{\sum_{k_1=0}^{c_1} \frac{e^{-np}(np)^{k1}}{k_1!}}{1-\sum_{k_2=c_2}^{\infty} \frac{e^{-np}(np)^{k1}}{k_2!}}$$

OPERATING PROCEDURE FOR THREE STAGE CHAIN SAMPLING PLANS

Step 1: At the outset, select a random sample of n units from the lot and from each succeeding lot.
Step 2: Record the number of defectives d, in each sample and sum the number of defectives, D, in all samples from the first up to and including in the current sample.
Step 3: Accept the lot associated with each new sample during the cumulation as long as $D_i \leq c_1;\ 1 \leq i \leq k_1$.
Step 4: When k1 consecutive samples have all resulted in acceptance continue to sum the defectives in the k_1 samples plus additional samples up to not more than k_2 samples.
Step 5: Accept the lot associated with each new sample during cumulation as long as $D_i \leq c_2;\ k_1 \leq i \leq k_2$.
Step 6: When k_2 consecutive samples have all resulted in acceptance continue to sum the defectives in the k_2 samples plus additional samples up to not more than $k_3$samples.
Step 7: Accept the lot associated with each new sample during cumulation as long as $D_i \leq c_3;\ k_2 \leq i \leq k_3$.
Step 8: When the third stage of the restart period has been successfully completed (i.e.,$k_3$consecutive samples have been resulted in acceptance),start cumulation of defectives as moving total over k_3 samples by adding the current sample result while dropping from the sum, the sample result of the k_3th preceding sample. Continue this procedure as long as $D_i \leq c_3$and in each instance accept the lot.
Step 9: If for any sample at any stage of the above procedure, D_i is greater than the corresponding c, reject the lot.
Step 10: When a lot is rejected return to step-1 and fresh restart of the cumulation procedure.

The three-stage chain sampling plan has 7 parameters which are defined below:

n = sample size
k_1= The maximum number of samples over which the cumulation of the defectives take place in the first stage of procedure.
k_2 = The maximum number of samples over which the cumulation of the defectives take place in the second stage of procedure.
k_3= The maximum number of samples over which the cumulation of the defectives take place in the first of procedure.
c_1 = The allowable number of defectives in the cumulative results from $k_1$or fewer sample of n. Thus, c_1 is an acceptance number for cumulative results. It is the cumulative results criterion (CRC) that must be met by cumulative sampling results during the first stage of of the restart period in order to permit acceptance of a lot.

Table 1. Np value for given probability of acceptance by Three Stage Chain Repetitive Group Sampling Plan ChRGSP (0,1,3) i=1

k1	k2	k3	0.99	0.95	0.75	0.5	0.1	0.05	0.01
1	2	3	0.1012	0.2402	0.3201	1.0902	2.5302	3.1402	4.6502
1	2	5	0.2001	0.3201	0.4199	1.1201	2.5301	3.1399	4.6501
1	4	5	0.0611	0.1599	0.2601	0.9803	2.4798	3.1201	4.6401
2	3	4	0.0712	0.1723	0.2601	0.8801	2.3302	3.0012	4.6002
2	5	10	0.0814	0.1702	0.2498	0.8399	2.3199	3.0011	4.6001
2	9	10	0.0401	0.1201	0.2011	0.8202	2.3202	2.9989	4.5999
3	4	5	0.0602	0.1401	0.2212	0.7899	2.3001	2.9901	4.5601
4	5	6	0.0501	0.1299	0.2021	0.7402	2.2701	2.9791	4.5201
5	6	7	0.0401	0.1202	0.1878	0.7201	2.2674	2.9761	4.4802
6	7	8	0.0389	0.1102	0.1712	0.7002	2.2649	2.9699	4.4401
7	8	9	0.0378	0.1011	0.1586	0.6699	2.2623	2.9661	4.4010
8	9	10	0.0367	0.0985	0.1512	0.6902	2.2598	2.9615	4.3601
9	10	11	0.0356	0.0902	0.1503	0.6901	2.2573	2.9571	4.3198
9	10	20	0.0501	0.1100	0.1602	0.6901	2.3002	2.9901	4.5987
10	11	12	0.0345	0.0886	0.1398	0.6789	2.2548	2.9525	4.2802
11	12	13	0.0334	0.0872	0.1401	0.6719	2.2523	2.9481	4.2401
11	12	19	0.0400	0.1011	0.1498	0.6898	2.2998	2.9903	4.6001
11	17	20	0.0301	0.0801	0.1401	0.6902	2.2998	2.9902	4.6005
12	13	14	0.0323	0.0858	0.1302	0.6652	2.2498	2.9432	4.1999
13	14	15	0.0312	0.0785	0.1301	0.6581	2.2473	2.9387	4.1601
13	14	19	0.0301	0.0879	0.1401	0.6898	2.3001	2.9901	4.6002
13	14	22	0.0302	0.0901	0.1406	0.6886	2.3001	2.9908	4.6001
13	17	22	0.0312	0.0812	0.1302	0.6879	2.2998	2.9902	4.5998
13	20	22	0.0201	0.0795	0.1302	0.6877	2.2453	2.9899	4.5997
14	15	16	0.0301	0.0785	0.1301	0.6512	2.2448	2.9341	4.1202
14	15	19	0.0303	0.0798	0.1301	0.6899	2.3002	2.9899	4.6002
14	15	22	0.0304	0.0876	0.1402	0.6902	2.3001	2.9898	4.6001
14	17	22	0.0301	0.0801	0.1307	0.6901	2.3001	2.9897	4.6002
15	16	17	0.0298	0.0770	0.1302	0.6441	2.2423	2.9295	4.0801
15	18	19	0.0231	0.0801	0.1299	0.6901	2.3001	2.9902	4.6001
15	18	22	0.0302	0.0801	0.1298	0.6905	2.3023	2.9899	4.6002
15	20	22	0.0202	0.0803	0.1289	0.6895	2.3042	2.9896	4.5998
16	17	18	0.0289	0.0755	0.1202	0.6374	2.2398	2.9251	4.0401
16	18	20	0.0211	0.0801	0.1201	0.6902	2.3001	2.9899	4.6002
16	19	22	0.0235	0.08	0.1299	0.6901	2.3020	2.9871	4.6041
16	21	22	0.0245	0.07	0.1201	0.6902	2.3040	2.9842	4.0001
17	18	19	0.0282	0.074	0.1202	0.6302	2.2373	2.9204	3.9601
18	19	20	0.0275	0.0725	0.1205	0.623	2.2348	2.9158	3.9504
19	20	21	0.0268	0.071	0.1201	0.6164	2.2323	2.9112	3.9202
19	20	22	0.0261	0.0695	0.1199	0.6089	2.2298	2.9067	3.8801
19	21	22	0.0254	0.068	0.1198	0.6019	2.2273	2.9021	3.8402
20	21	22	0.0247	0.0665	0.1198	0.5951	2.2248	2.8975	3.8001

$c_2 =$ The allowable number of defectives in the cumulative results from k_1+ 1 to k_2 sample of n. Thus,c_2 is also an acceptance number for cumulative results and the CRC that must be met by cumulative sampling results during the second stage of the restart period in order to permit acceptance of a lot.
$c_3 =$ The allowable number of defectives in the cumulative results from k_2 + 1 to k_3 sample of n. Thus, c_3 is also an acceptance number for cumulative results and the CRC that must be met by cumulative sampling results during the third stage of the restart period in order to permit acceptance of a lot.

Designing of Quality Interval ChSP (0,1,3) with repetitive group sampling plan as follows

Selection of a Sampling Plan

Table 2 gives unique values of R for different values $k_1, k_2, c_1, and\ c_2$

Operating ratio $R = \frac{np_2 - np_1}{np_0 - np_1} = \frac{d_2}{d_0}$

Where $d_2 = np_2 - np_1\ and\ d_0 = np_0 - np_1$ is used to characterize the sampling plan.

For any given values of PQR (d_2) IQR (d_0), one can find the ratio R=$\frac{d_2}{d_0}$. Find the value in the table 2 under the column R, which is equal to or just less than specified ratio. Corresponding $k_1, k_2, k_{3,} c_1, and\ c_2$ values are noted. From this ratio, one can determine the parameters for the three-stage chain sampling plan with a repetitive group sampling plan as a reference plan.

Table 2. Values of operating ratio for constructing Three Stage Chain RGS Sampling Plan ChRGSP (0,1,3) i=1

k1	k2	k3	α=0.01 β=0.1	α=0.01 β=0.05	α=0.01 β=0.01	α=0.05 β=0.1	α=0.05 β=0.05	α=0.05 β=0.01
1	2	3	14.52734	19.35728	45.94605	9.810059	13.07164	31.02658
1	2	5	11.0743	14.52612	23.23656	7.477733	9.808509	15.69009
1	4	5	17.83968	29.02421	75.94272	11.99577	19.51648	51.06547
2	3	4	17.68627	26.69723	64.60955	11.53864	17.41745	42.15169
2	5	10	18.41513	27.02285	56.51229	12.01401	17.62968	36.86855
2	9	10	22.87369	38.29421	114.7107	14.91248	24.96587	74.78554
3	4	5	20.61528	32.5768	75.74917	13.51763	21.36091	49.66944
4	5	6	22.36566	34.8048	90.22156	14.74072	22.93909	59.46307
5	6	7	23.85623	37.26358	111.7257	15.84718	24.75339	74.21696
6	7	8	25.93516	40.28032	114.1414	17.34755	26.94276	76.34704
7	8	9	27.74905	43.52255	116.4286	18.70177	29.33248	78.46825
8	9	10	28.83664	44.26497	118.8038	19.58664	30.06599	80.69482
9	10	11	28.74118	47.91791	121.3427	19.67465	32.802	83.06461
9	10	20	28.70599	41.80636	91.79042	18.66479	27.18273	59.68263
10	11	12	30.6166	48.30926	124.0638	21.11946	33.32393	85.57971
11	12	13	30.26481	48.625	126.9491	21.04283	33.80849	88.26647
11	12	19	30.70828	45.4915	115.0025	19.96195	29.5718	74.7575
11	17	20	32.83726	57.42012	152.8405	21.34333	37.32152	99.34219
12	13	14	32.2573	48.94988	130.0279	22.60522	34.30303	91.12074
13	14	15	31.97617	52.98141	133.3365	22.58801	37.42613	94.1891
13	14	19	32.83512	52.34638	152.8306	21.34261	34.02481	99.33887
13	14	22	32.71764	51.04416	152.3212	21.27169	33.18686	99.03311
13	17	22	35.32873	56.62686	147.4295	22.96621	36.81152	95.83974
13	20	22	35.32796	57.89427	228.8408	22.9639	37.63247	148.7512
14	15	16	31.66949	52.48662	136.8837	22.55265	37.37707	97.47841
14	15	19	35.35895	57.64662	151.8218	22.98155	37.46742	98.67657
14	15	22	32.81098	52.51256	151.3191	21.32525	34.13014	98.34868
14	17	22	35.19663	57.43071	152.8306	22.87452	37.32459	99.32558
15	16	17	31.33717	52.98831	136.9161	22.500	38.04545	98.30537
15	18	19	35.41263	57.49406	199.1385	23.01925	37.37283	129.4459
15	18	22	35.44068	57.41638	152.3245	23.03467	37.31777	99.00331
15	20	22	35.68503	57.26843	227.7129	23.19317	37.22112	148.000
16	17	18	33.61148	53.51126	139.7958	24.33527	38.74305	101.2145
16	18	20	38.30308	57.41638	218.019	24.89509	37.31777	141.7014
16	19	22	35.44342	57.55125	195.9191	22.99538	37.33875	127.1106
16	21	22	33.30641	57.14429	163.2694	24.84763	42.63143	121.8041
17	18	19	32.94592	53.51486	140.4291	24.29617	39.46486	103.5603
18	19	20	32.7834	54.48828	143.6509	24.19751	40.21793	106.0291
19	20	21	32.64113	55.21408	146.2761	24.2398	41.00282	108.6269
19	20	22	32.36113	55.82878	148.6628	24.2427	41.82302	111.3678
19	21	22	32.05509	56.47353	151.189	24.22454	42.67794	114.2559
20	21	22	31.72037	57.14436	153.8502	24.18614	43.57143	117.3077

Example

Given p_1=0.05, k_1=2, k_2=3,k_3=4,c_1=1 and c_2=2. Compute the values of the IQR and PQR. Then Compute R. Select the associated values from table 2. The nearest values are IQR=0.2.1579, PQR=0.7077 and R=0.327996 with respective k_1=2, k_2=3, k_3=4, c_1=1 and c_2=2. One can obtain the values of np_1 from pa(p) table np_1=0.1723, which leads to n=np_1/p_1=9.708=10 using table 2. Thus, the selected parameters for chain sampling plan are n=10 k_1=1, k_2=2,k_3=5,c_1=1 and c_2=2 through quality interval. For specified PQR and IQR. Table 2 used to construct the plans when the PQR and IQR are specified. For any given values of the PQR and IQR, one can find the ratio R=d_2/d_0 which is a monotonic increasing function. Find the value in table 2 under the column of R, which is equal to or just less than the specified ratio. Then the corresponding values of k_1=1, k_2=2,k_3=5,c_1=1 and c_2=2 are noted. From this one can determine the parameters of chain RGS plan. Conversion of parameters: The given set of parameters can be converted into another familiar set, which will provide related information on the desired sampling plan. These parameters can be found using table 2.

Construction of tables Indifference quality range (IQR) denoted as $d_0 = np_0 - np_1$ is derived from probability of acceptance $P_a(p)$=

$$\frac{P_0 + P_1P_0^{K_2-1} + (k_3-k_2-1)P_1(P_1*2P_2)P_0^{k_3-2} + \binom{k_3-k_2-1}{2}P_1^3P_0^{k_3-3} + (P_2+P_3)P_0^{k_3-1} + P_1P_0^{k_1}\left(\frac{1-P_0^{k_2-k_1-1}}{1-P_0}\right) + (k_2-k_1)P_1(P_1+P_2)P_0^{k_2-1} + P_1(P_1+2P_2)P_0^{K_2}\left(\frac{1-(k_3-k_2-1)P_0^{k_3-k_2-2}}{1-P_0} + \frac{P_0(1-P_0^{k_3-k_2-2})}{(1-P_0)^2}\right) + P_1^3P_0^{k_2}\left(\sum_{j=0}^{k_3-k_2-4}\binom{j+2}{2}P_0^j + (P_2+P_3)P_0^{k_2}\left(\frac{1-P_0^{k_3-k_2-1}}{1-P_0}\right)\right)}{1 + P_1P_0^{k_1}\left(\frac{1-P_0^{k_2-k_1-1}}{1-P_0}\right) + (k_2-k_1)P_1(P_1+P_2)P_0^{k_2-1} + P_1(P_1+2P_2)P_0^{K_2}\left(\frac{1-(k_3-k_2-1)P_0^{k_3-k_2-2}}{1-P_0} + \frac{P_0(1-P_0^{k_3-k_2-2})}{(1-P_0)^2}\right) + P_1^3P_0^{k_2}\left(\sum_{j=0}^{k_3-k_2-4}\binom{j+2}{2}P_0^j + (P_2+P_3)P_0^{k_2}\left(\frac{1-P_0^{k_3-k_2-1}}{1-P_0}\right)\right)}$$

Table 3. Three Stage Chain with RGS plan through Quality Region i=1

1	k2	k3	np1	np0	np2	nd1	nd2	R
1	2	3	0.24023	1.0902	2.53024	2.29001	0.84997	0.371164
1	2	5	0.32012	1.1201	2.53017	2.21005	0.79998	0.361974
1	4	5	0.15987	0.9803	2.47987	2.3200	0.82043	0.353634
2	3	4	0.17231	0.8801	2.33023	2.15792	0.70779	0.327996
2	5	10	0.17023	0.8399	2.31995	2.14972	0.66967	0.311515
2	9	10	0.12012	0.8202	2.32023	2.20011	0.70008	0.318202
3	4	5	0.13998	0.7899	2.3001	2.16012	0.64992	0.300872
4	5	6	0.12987	0.7402	2.27012	2.14025	0.61033	0.285168
5	6	7	0.12023	0.7201	2.26743	2.1472	0.59987	0.279373
6	7	8	0.11023	0.7002	2.26499	2.15476	0.58997	0.273798
7	8	9	0.10112	0.6699	2.26233	2.16121	0.56878	0.263177
8	9	10	0.0985	0.6902	2.25983	2.16133	0.5917	0.273767
9	10	11	0.09015	0.6901	2.25733	2.16718	0.59995	0.276834
9	10	20	0.1100	0.6901	2.30021	2.19021	0.5801	0.26486
10	11	12	0.0886	0.6789	2.25483	2.16623	0.5903	0.272501
11	12	13	0.0872	0.6719	2.25233	2.16513	0.5847	0.270053
11	12	19	0.10112	0.6898	2.29987	2.19875	0.58868	0.267734
11	17	20	0.08012	0.6902	2.29981	2.21969	0.61008	0.274849
12	13	14	0.0858	0.6652	2.24983	2.16403	0.5794	0.267741
13	14	15	0.07852	0.6581	2.24733	2.16881	0.57958	0.267234
13	14	19	0.08788	0.6898	2.30019	2.21231	0.60192	0.272078
13	14	22	0.09012	0.6886	2.30011	2.20999	0.59848	0.270807
13	17	22	0.08123	0.6879	2.29989	2.21866	0.60667	0.27344
13	20	22	0.07945	0.6877	2.24531	2.16586	0.60825	0.280835
14	15	16	0.0785	0.6512	2.24483	2.16633	0.5727	0.264364
14	15	19	0.0798	0.6899	2.30024	2.22044	0.6101	0.274765
14	15	22	0.0876	0.6902	2.30018	2.21258	0.6026	0.272352
14	17	22	0.0801	0.6901	2.3001	2.22	0.6100	0.274775
15	16	17	0.077	0.6441	2.24233	2.16533	0.5671	0.2619
15	18	19	0.08001	0.6901	2.30012	2.22011	0.61009	0.274802
15	18	22	0.08012	0.6905	2.30232	2.2222	0.61038	0.274674
15	20	22	0.08032	0.6895	2.30422	2.2239	0.60918	0.273924
16	17	18	0.0755	0.6374	2.23983	2.16433	0.5619	0.259618
16	18	20	0.08012	0.6902	2.30012	2.22	0.61008	0.274811
16	19	22	0.08	0.6901	2.302	2.222	0.6101	0.274572
16	21	22	0.07	0.6902	2.304	2.234	0.6202	0.277619
17	18	19	0.074	0.6302	2.23733	2.16333	0.5562	0.257104
18	19	20	0.0725	0.623	2.23483	2.16233	0.5505	0.254586
19	20	21	0.071	0.6164	2.23233	2.16133	0.5454	0.252345
19	20	22	0.0695	0.6089	2.22983	2.16033	0.5394	0.249684
19	21	22	0.068	0.6019	2.22733	2.15933	0.5339	0.247253
20	21	22	0.0665	0.5951	2.22483	2.15833	0.5286	0.244912

Probabilistic quality range (PQR) denoted as $d_2 = np_2 - np_1$ is derived from probability of acceptance p_a ($p_1 < p < p_2$)

$$P_a(p) = \frac{p_a(1-p_c)^i - p_c p_a^i}{(1-p_c)^i}$$

where

$$p_a = \sum_{r=0}^{c_1} \frac{e^{-x}x^r}{r!}$$

and

$$p_c = \sum_{r=0}^{c_2} \frac{e^{-x}x^r}{r!} - \sum_{r=0}^{c_1} \frac{e^{-x}x^r}{r!}$$

Table 2 shows the value d_1=nQDR, d_2=nPQR for different values of provides various parametric values for ChSP(0,1,3) with RGS designed through quality interval.

Conclusion

Quality Interval Sampling (QIS) plan possesses wider potential applicability in industry ensuring higher standard of quality attainment for product or process. Thus Quality Interval Sampling (QIS) plan is a good measure for defining quality and designing any acceptance sampling plan which are readymade use to industrial shop-floor situations. The Quality Decision Region (QDR) idea is proposed in order to provide higher probability of acceptance compared with (AQL, LQL) indexed plan/scheme/system. Quality Decision Region (QDR) depends on the quality measure MAPD, which is a key measure assessing to what degree the inflection point empowers the OC curve to discriminate between good and bad lots. The present development would be valuable addition to the literature and a useful device for quality control practitioners. This paper mainly relates to the construction and selection of performance measures for Quality Interval Sampling (QIS) inspection indexed through Quality Regions. Conversions of parameters are also provided for comparison. Tables are provided which are tailor-made, handy and ready-made uses to the industrial shop floor situations.

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