

Supplementary material. Comparison of sampling plans to optimize sample sizes proposed in Regulation 44, corresponding to a simple normal sample with AQL = 10 and level of inspection II.

This Annex shows the sampling plans considered to optimize the sample sizes proposed in Regulation 44. The behavior of the alternative plans is shown in comparison with the sampling suggested by the regulation. Three curves are presented: Operating Characteristic (OC) curve, Average Outgoing Quality (AOQ) and Average Total Inspection (ATI).

The OC curve presents the discriminatory power of an acceptance sampling plan and graphs the probability of accepting a lot versus the defective fraction. The probability of accepting a lot with 0 defects is naturally 100%. Alternatively, if 100% of the units are defective, the probability of accepting the lot is 0%. Therefore, an OC curve always passes through points (0,1) and (100,0). For intermediate percentages of defective items, the probability of acceptance of the batch according to the sampling plan that is being applied must be calculated, which depends on the sample size and the calculation of the percentage of defectives in the batch. It is done following a Poisson distribution.

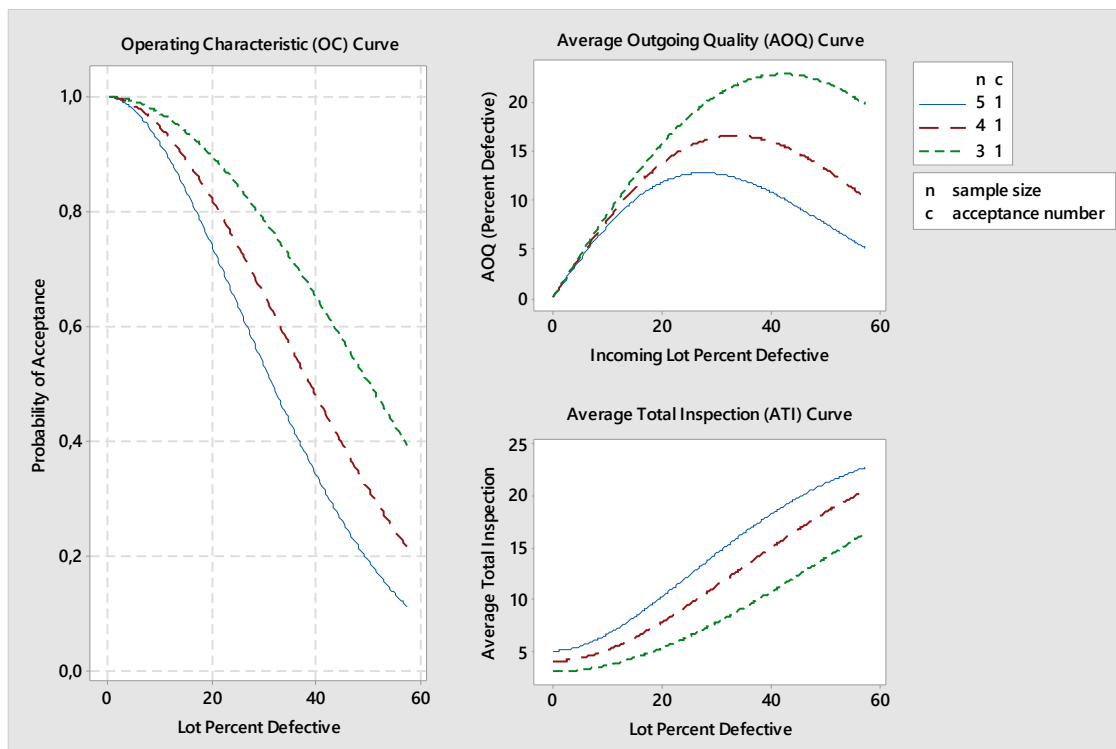
The AOQ curve graphs the relationship between the quality of the incoming and the outgoing material, assuming that the rejected lots will be inspected 100% and that an inspection will be made to rectify the defective elements. In a rectification inspection, the defective elements are removed, repaired or changed. To determine the probability of acceptance of the lot, the Poisson distribution is used, given the corresponding conditions are satisfied.

The ATI curve presents the relationship between the quality of the incoming material and the number of elements that must be inspected, assuming that the rejected lots will be inspected 100% and an inspection will be made to rectify the defective elements. In

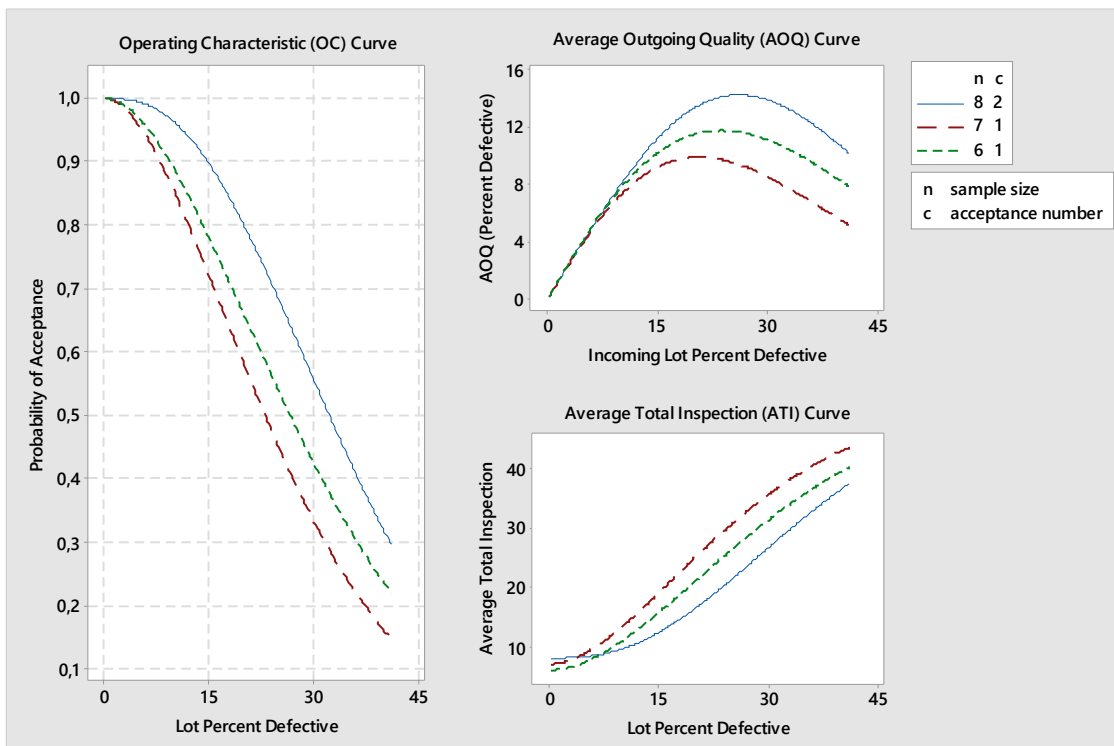
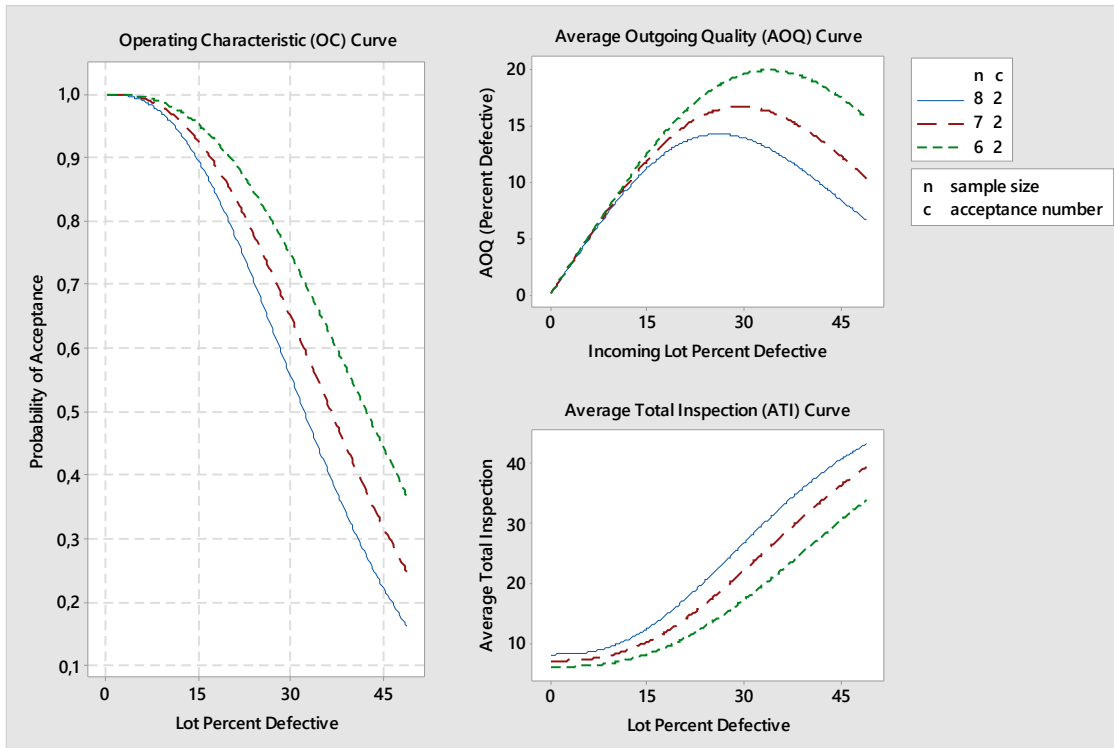
a rectification inspection, the defective elements are removed, repaired or changed. To build the curve a Poisson distribution is adopted.

When sampling plans are made, the interest is in evaluating which alternative plan behaves similar (greater overlap or closeness in the entire extension of the graph) to the original sampling plan. For the construction of the curves in this study statistical program Minitab v.18 was used.

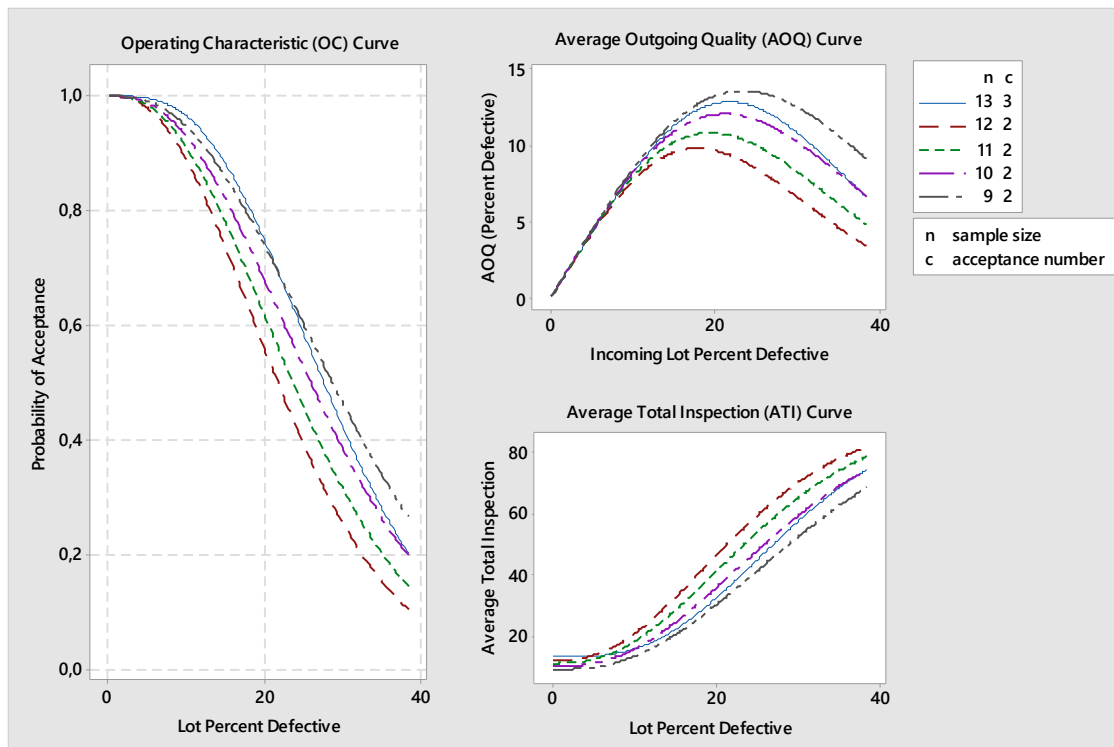
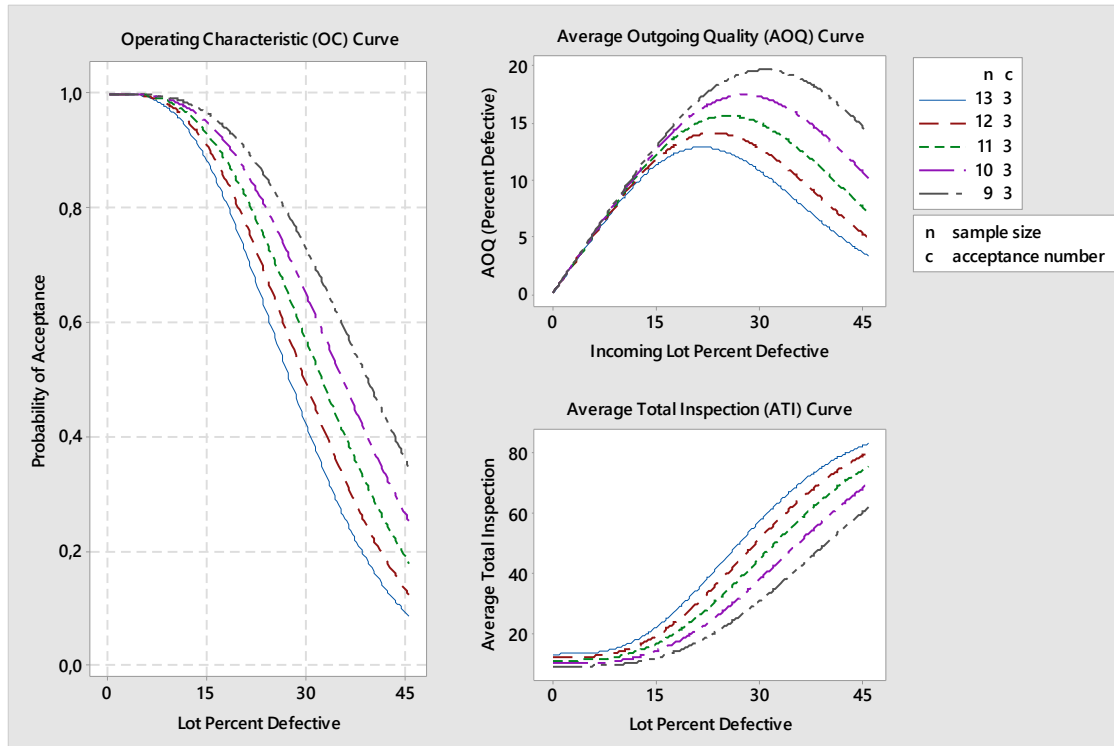
a) $N = 25$



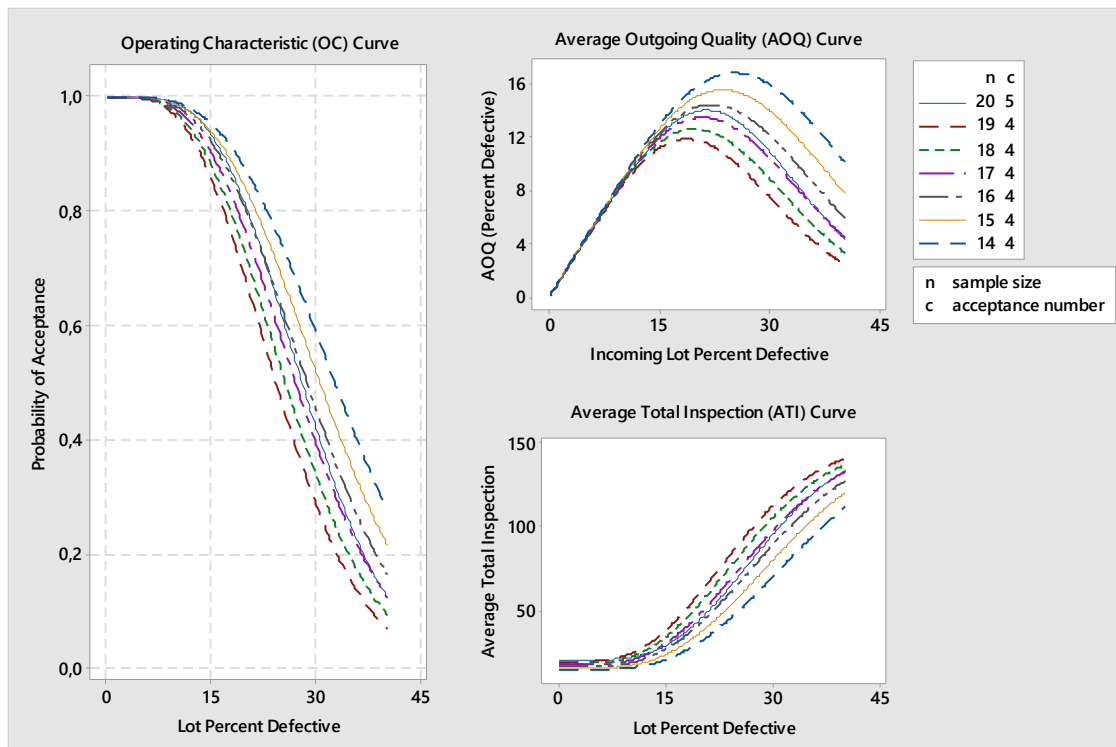
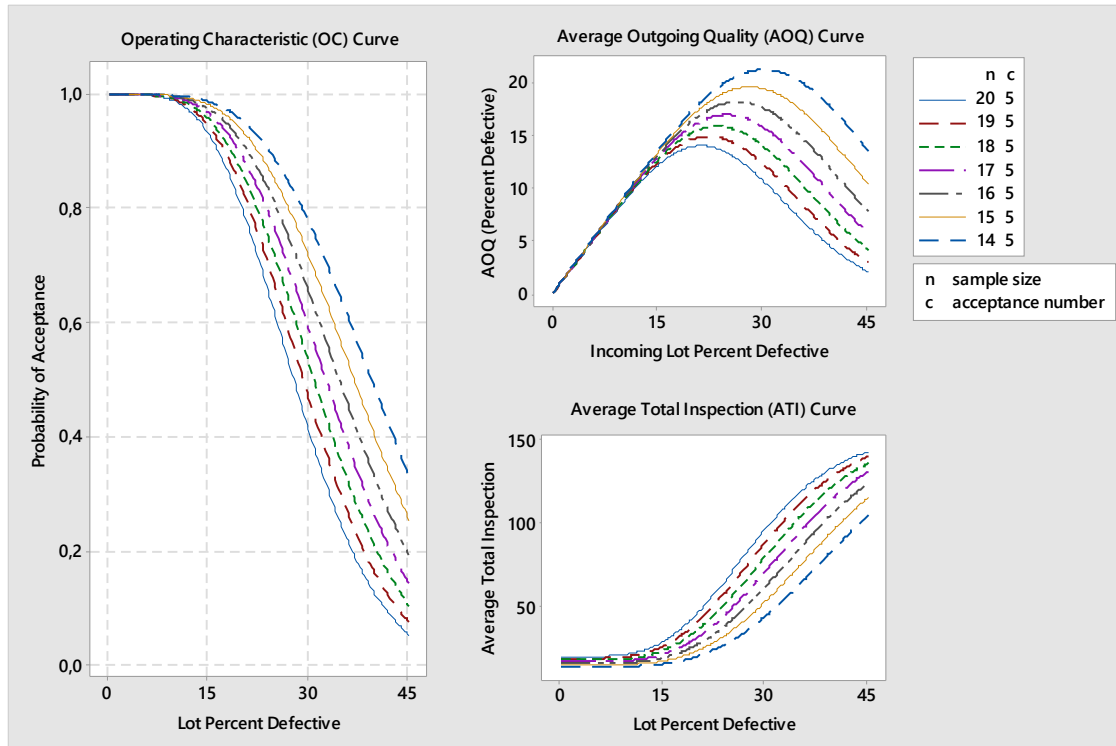
b) N=50

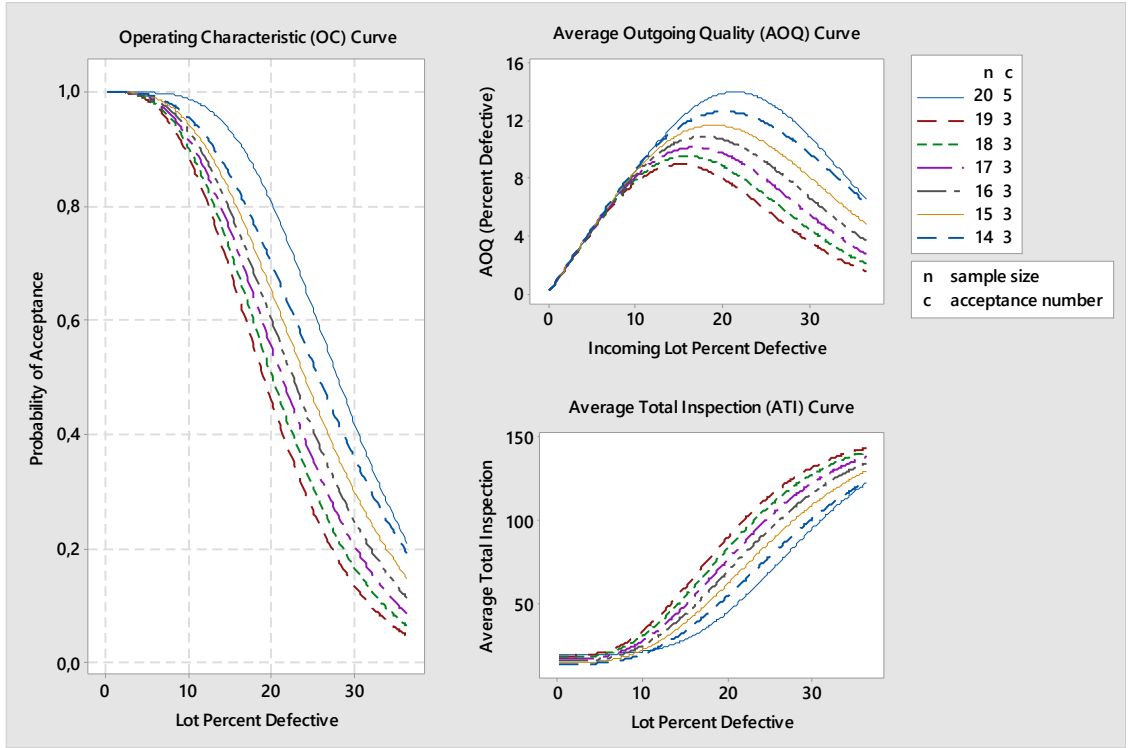


c) N=90

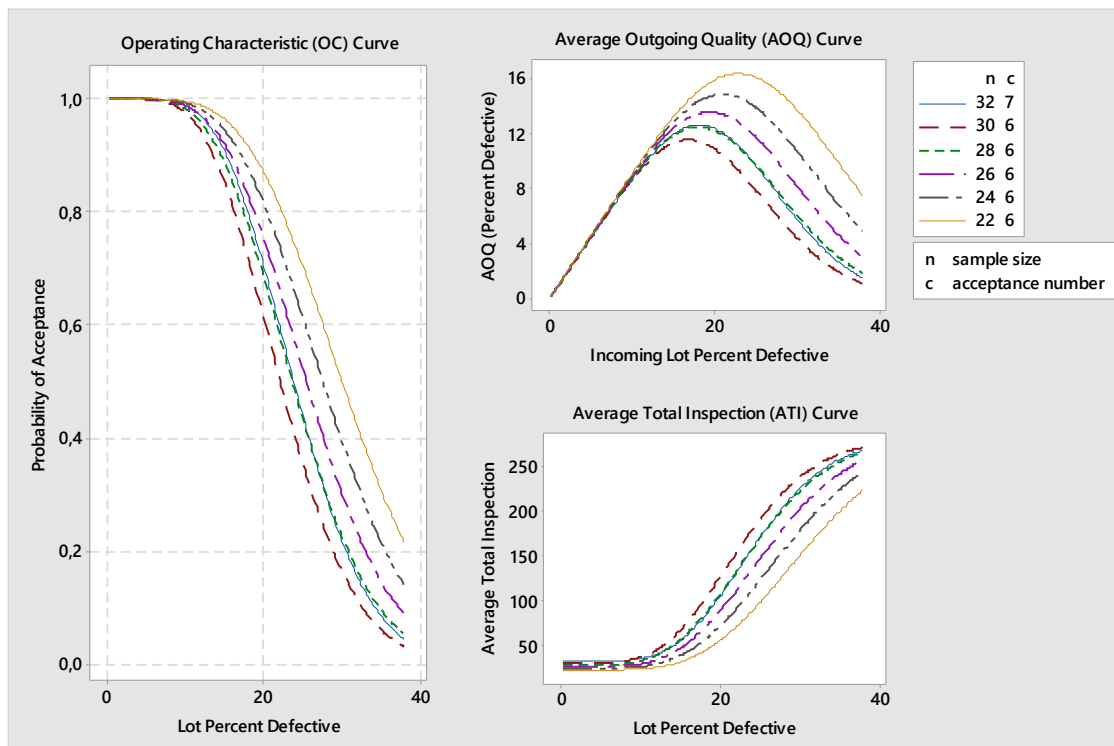
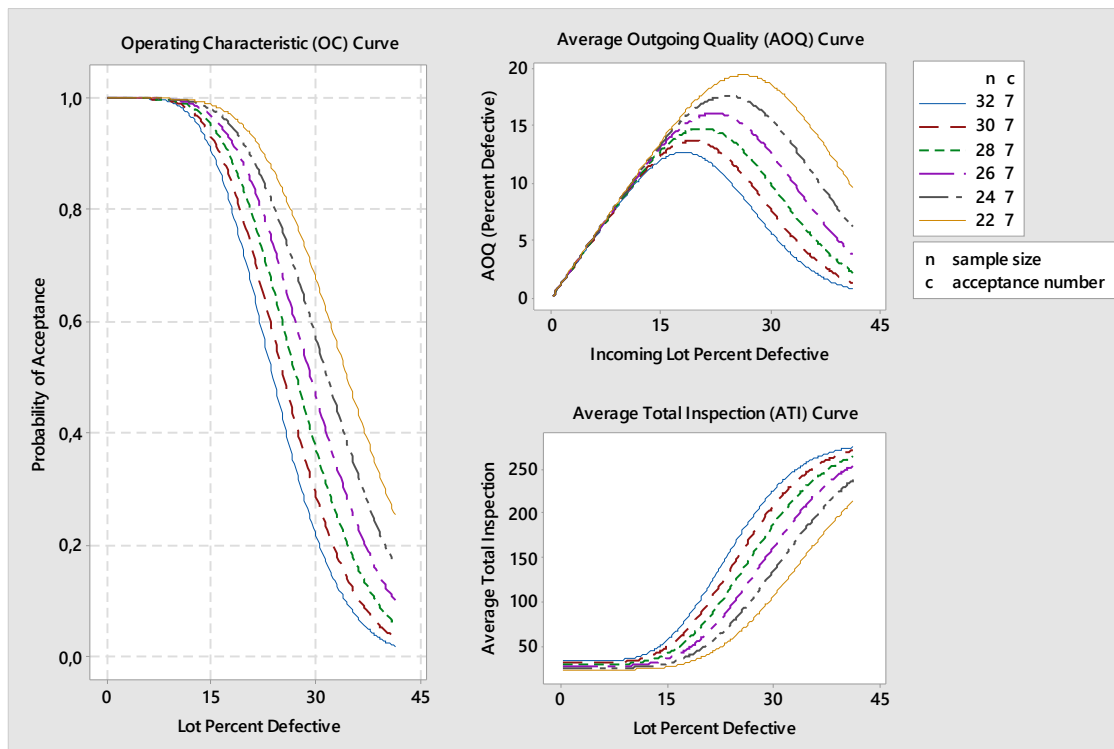


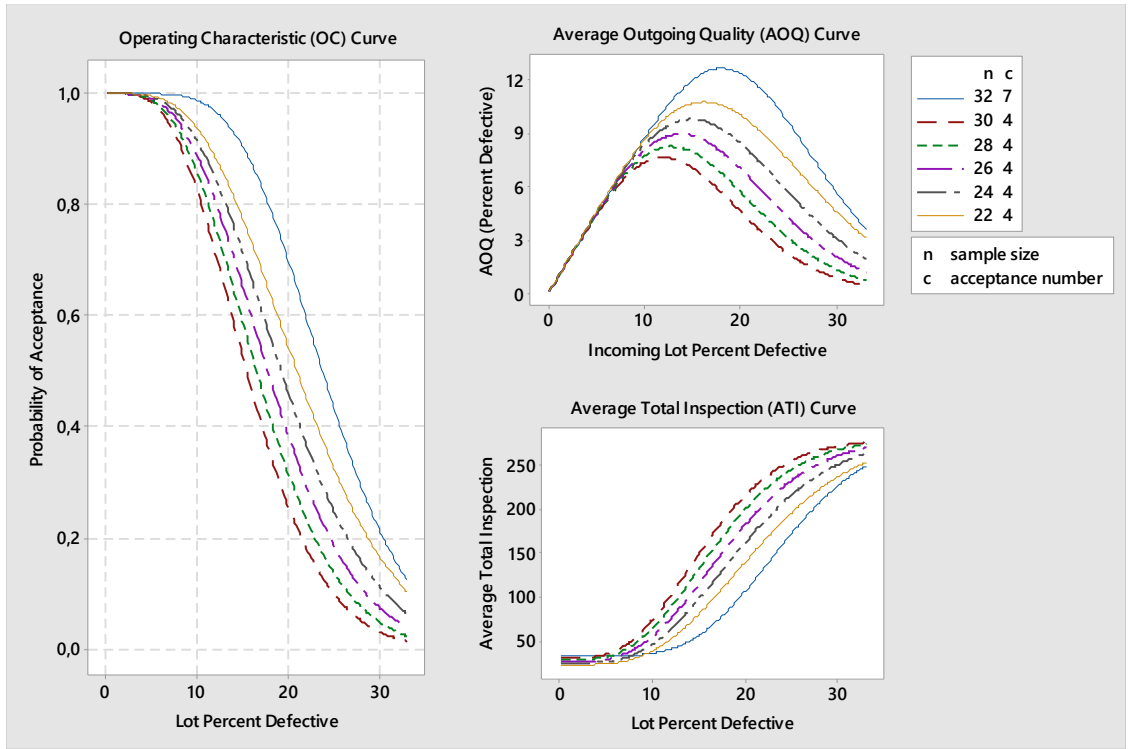
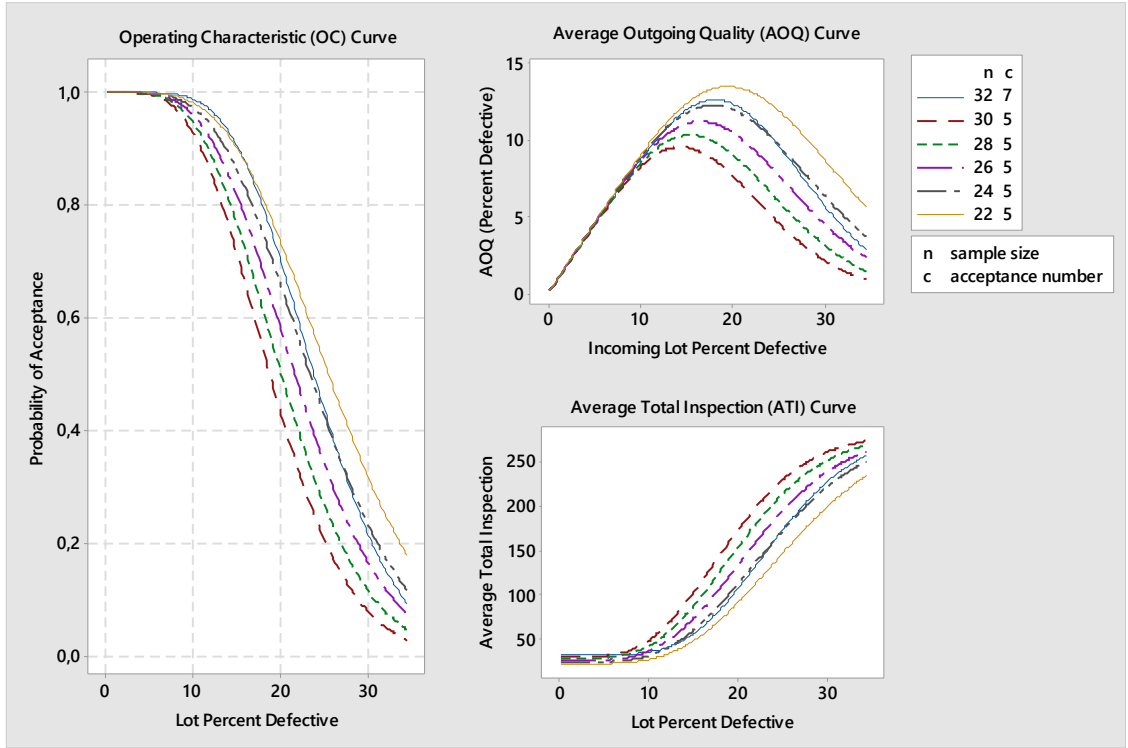
d) N=150



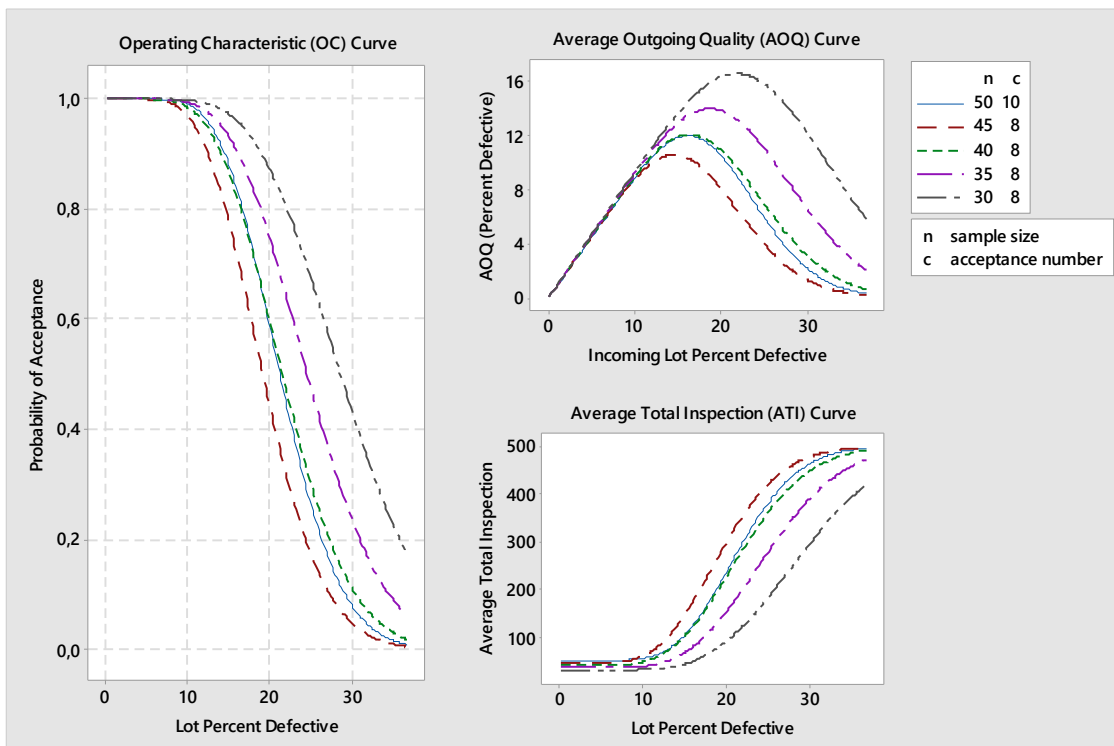
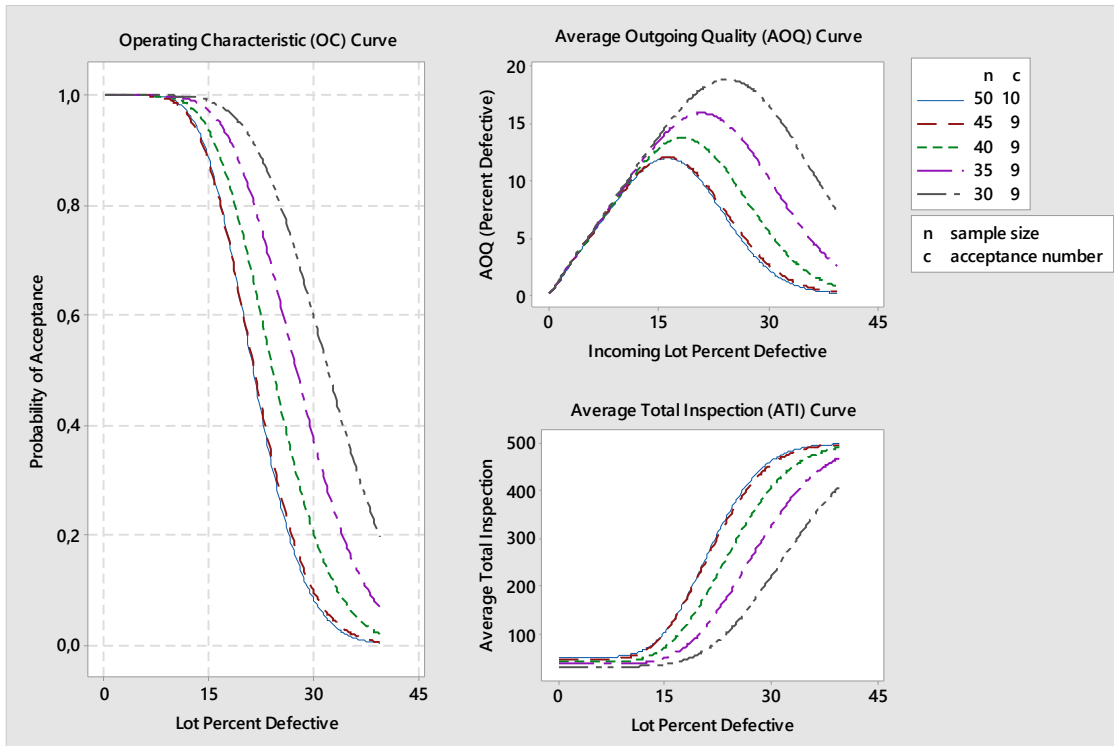


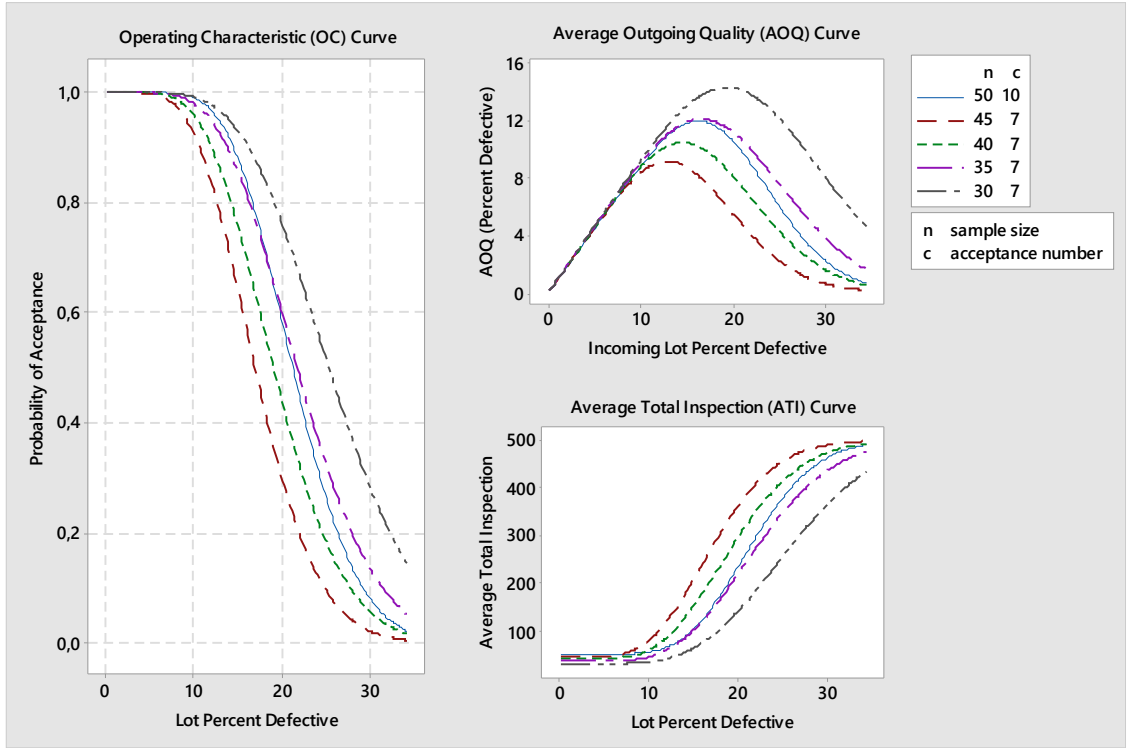
e) $N = 280$



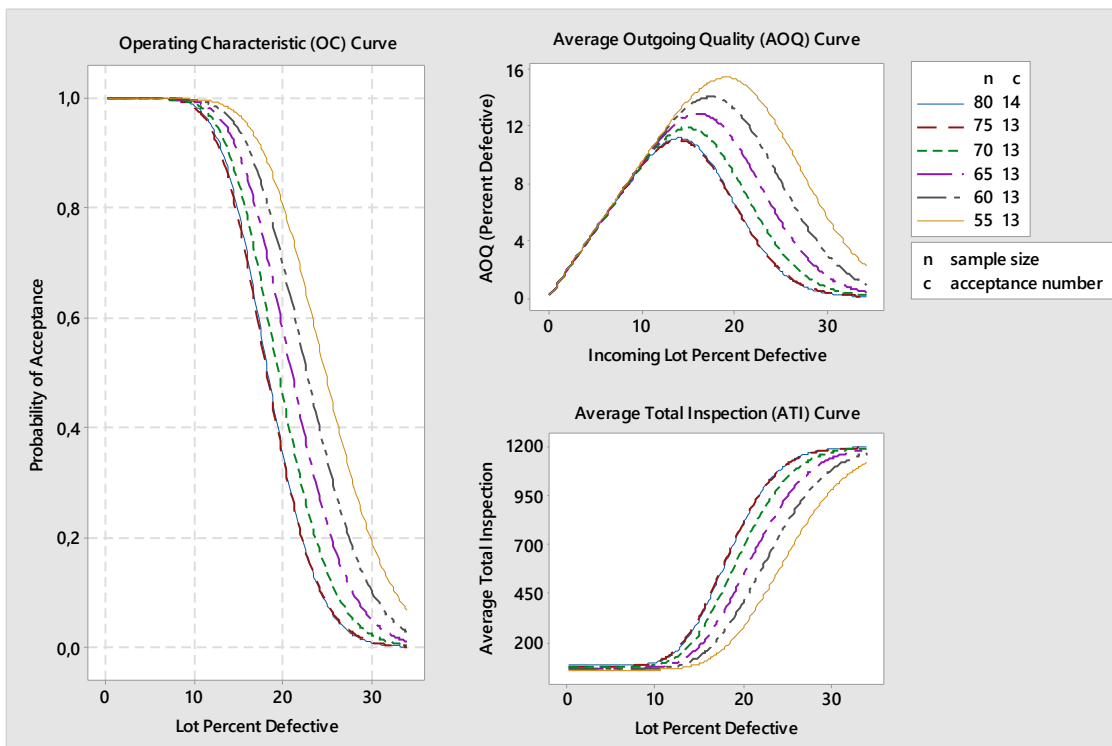
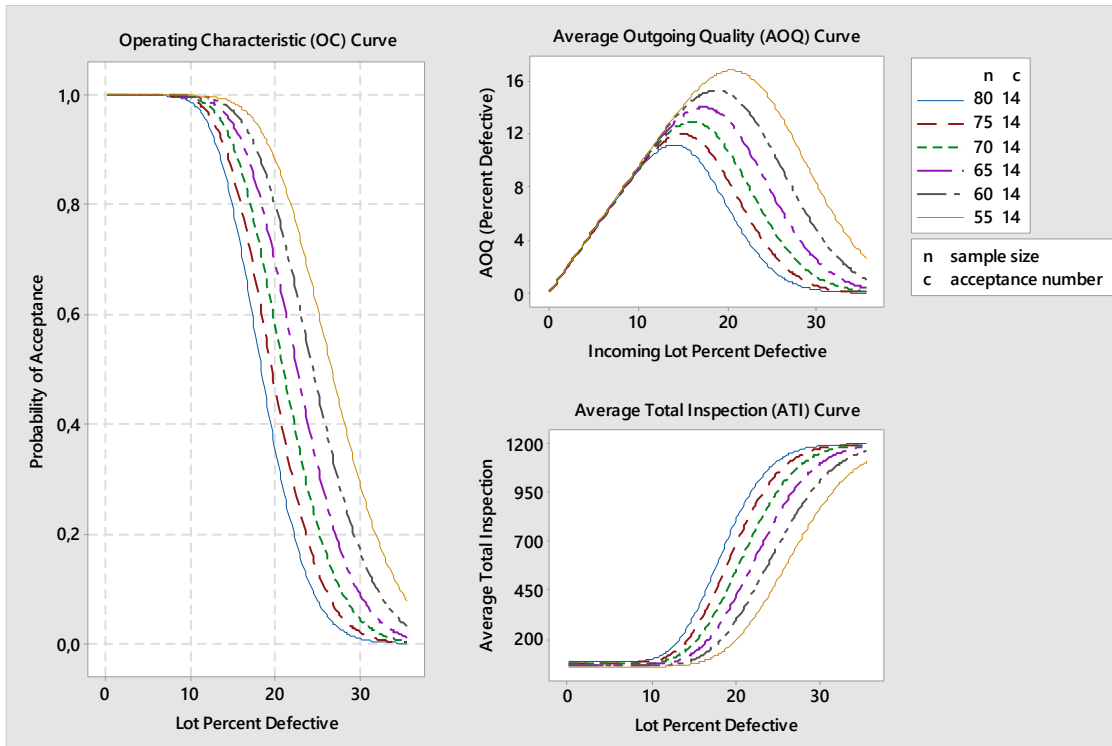


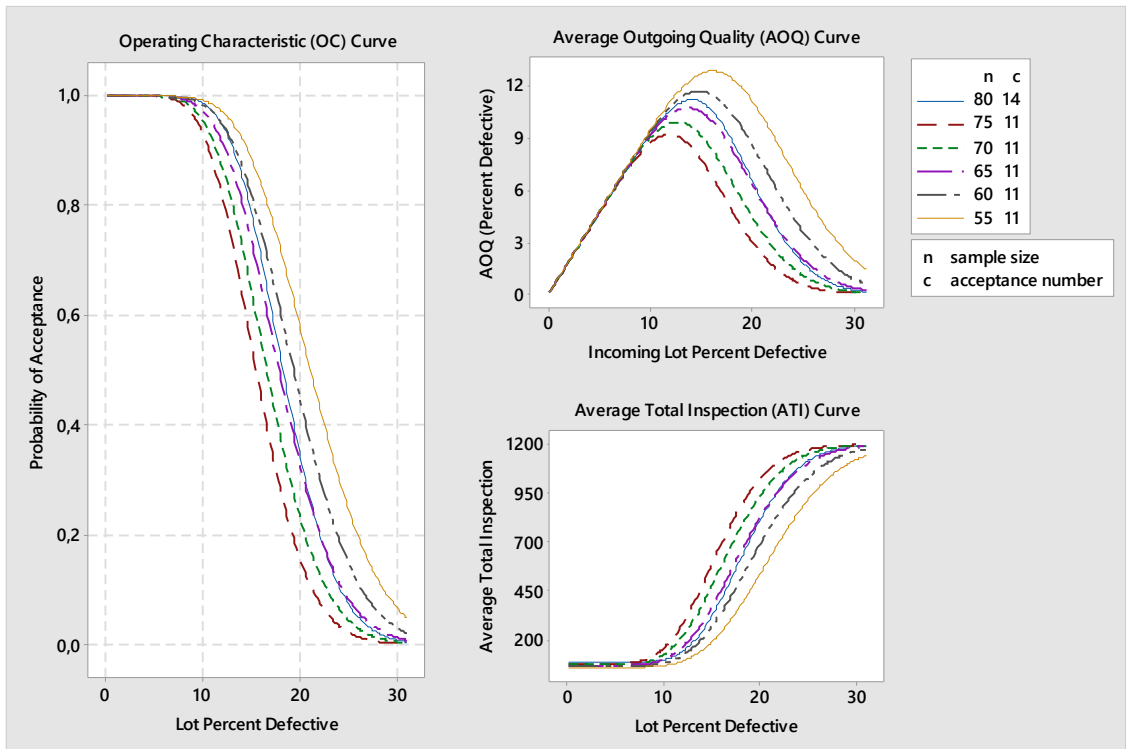
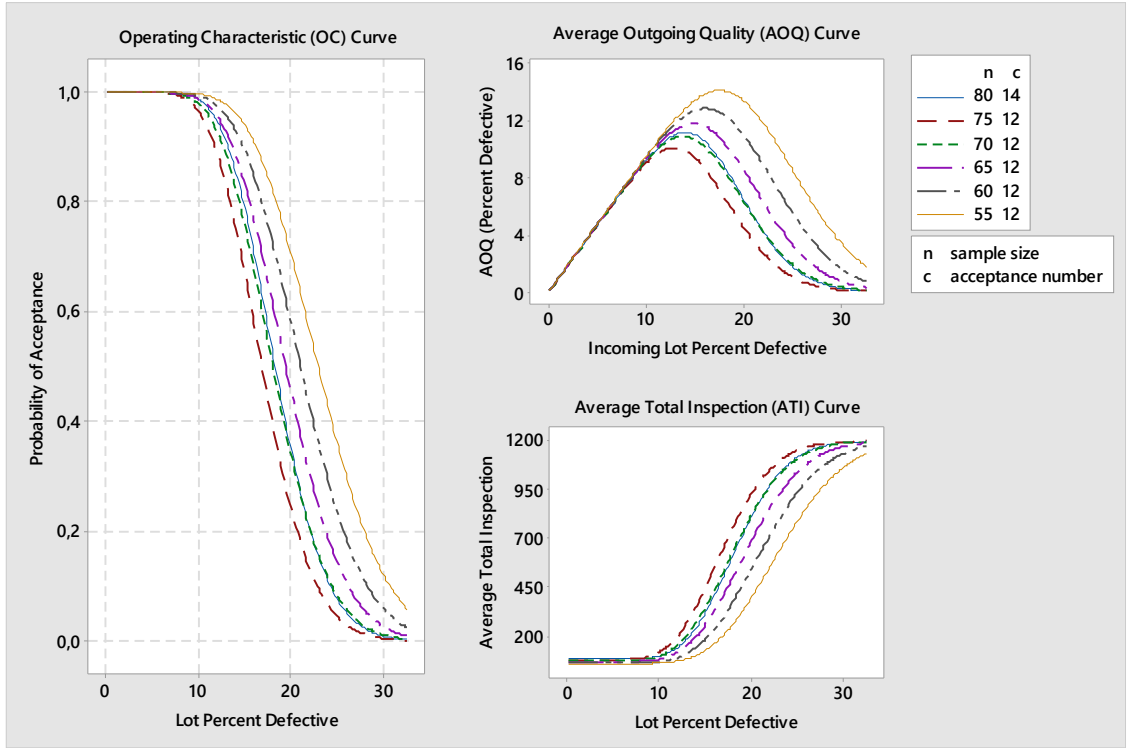
f) $N = 500$





g) $N = 1200$





h) $N = 1201$

