

C = 0

Acceptance Sampling Plans

Agenda

- ▶ Review of Basic Terms
- ▶ Minitab's Acceptance Sampling for Attributes
- ▶ ANSI/ASQ Z1.4
- ▶ C = 0 Concept and Justification
- ▶ C = 0 Using Minitab
- ▶ C = 0 Using Squeglia
- ▶ Comparisons and Conclusions



TERMS



Acceptance sampling by attributes – terms (1 of 3)

Defect vs. Defective

The first step is to determine if we are dealing with defects or defectives and what units we wish to use (e.g. percent defective or proportion defective).

AQL and α

The Acceptable Quality Level (AQL) is the defect/defective rate that we wish to accept a high proportion of the time ($1-\alpha$). Example: Given an AQL of 1.5% and an alpha of 0.05, we would expect to accept lots that had 1.5% defective units 95% of the time.

RQL and β

The Rejectable Quality Level (RQL) is the defect/defective rate that we wish to reject a high proportion of the time ($1-\beta$). Example: Given an RQL of 7.5% and a beta of 0.10, we would expect to reject lots that had 7.5% defective units 90% of the time. (Accept only 10% of the time).



Acceptance sampling by attributes – terms (2 of 3)

Consumer's Risk vs. Producer's Risk

Alpha is the producer's risk as it represents the likelihood that given a lot whose defect/defective rate is equal to the AQL, it will be improperly rejected. The higher the alpha, the more likely "Acceptable" lots will be rejected causing harm to the producer.

Beta is the consumers' risk as it represents the likelihood that given a lot whose defect/defective rate is equal to the RQL, it will be found acceptable. The higher the beta, the more likely "Rejectable" lots will be accepted causing harm to the consumer.

Sample size (n)

Sample to be pulled from the lot for inspection.

Acceptance number (c)

The maximum number of defects/defectives that can found and still allow the lot to be accepted. Example: Given $c = 3$, accept the lot if it has 3 or fewer defectives and reject the lot if it has 4 or more.



Acceptance sampling by attributes – terms (3 of 3)

Rectifying Inspection

All defective units found in the inspected sample are removed and replaced with compliant product **AND** if the lot is rejected, 100% inspection is performed and all defective units are replaced.

AOQ

Average Outgoing Quality is the expected outgoing quality of a lot (of a given incoming quality) after rectifying inspection has been performed.

AOQL

Average Outgoing Quality Limit is the worst case AOQ and is specified at the incoming quality that after rectifying inspection results in the maximum AOQ.

ATI

Average Total Inspection is the expected number of units inspected assuming rectifying inspection.



MINITAB ACCEPTANCE SAMPLING



Minitab

- ▶ Select plan for specific OC curve
- ▶ Specify AQL, RQL, alpha, and beta
- ▶ Optionally specify lot size (N)
- ▶ Output is sample size (n) and c (and if lot size N is provided also AOQL and ATI).
- ▶ Inspect a sample of size n, accept if # of defectives $\leq c$, reject lot if # of defective is $> c$.
- ▶ Example
Use Minitab to set up an inspection plan for an advertising firm to inspect giveaway flashlights (e.g. does the flashlight work or not).



Developing Acceptance Sampling Plans

We will generate two plans

- ▶ AQL (Acceptable Quality Level) of 1.5%
 - ▶ RQL (Rejectable Quality Level) of 7.5% and also at 11.5%
 - ▶ Leave alpha at default of 0.05
 - ▶ Leave beta at default of 0.10
 - ▶ Lot size = 2500
 - ▶ Measuring defectives (use “Percent defective” for units)
1. Choose **Stat** → **Quality Tools** → **Acceptance Sampling by Attributes**.
 2. Complete the dialog box as shown on next slide
 3. Click **OK**



Acceptance Sampling Plan

Shown for RQL = 7.5

Actual alpha vs. requested alpha

Note that while we asked for an alpha of 0.05, we got an alpha of 0.044. Due to the discrete nature of the plan (c must be an integer), the actual alphas and betas will be slightly different than the requested values.

Acceptance Sampling by Attributes

Create a Sampling Plan

Measurement type: Go / no go (defective)

Units for quality levels: Percent defective

Acceptable quality level (AQL): 1.5

Rejectable quality level (RQL or LTPD): 7.5

Producer's risk (Alpha): 0.05

Consumer's risk (Beta): 0.10

Lot size: 2500

Options...
Graphs...
OK
Cancel

Generated Plan(s)

Sample Size 88
Acceptance Number 3

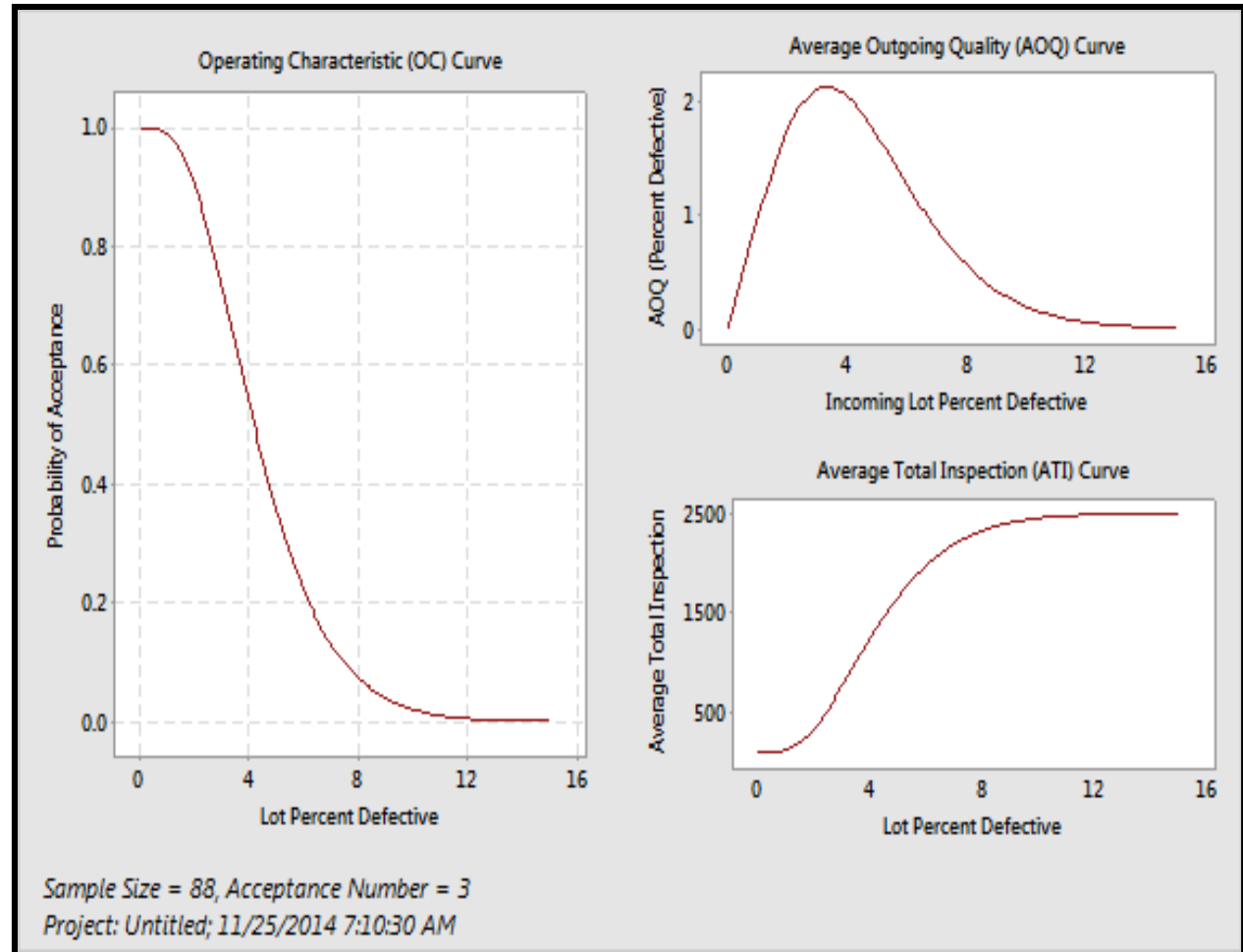
Accept lot if defective items in 88 sampled ≤ 3 ; Otherwise reject.

Percent Defective	Probability Accepting	Probability Rejecting	AOQ	ATI
1.5	0.956	0.044	1.384	193.7
7.5	0.096	0.904	0.696	2267.9

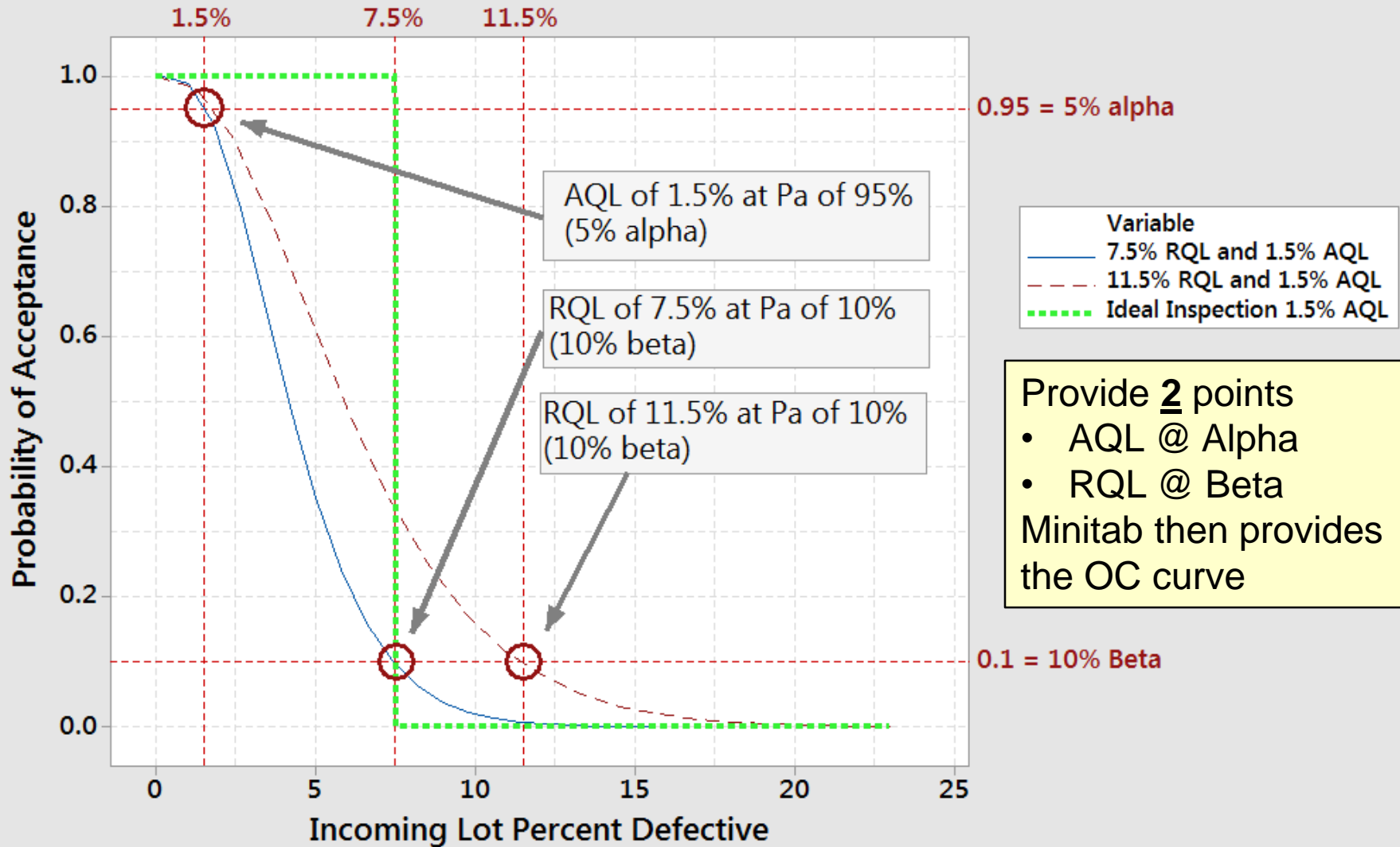


Based on 7.5% AQL

The OC curve describes the discriminatory power of an acceptance sampling plan. The OC curve plots the probabilities of accepting a lot (P_a) versus the fraction defective.



Comparison of Plans to Ideal



ANSI / ASQ Z1.4 (MIL-STD-105) ACCEPTANCE SAMPLING



ANSI / ASQ Z1.4

- ▶ Created pre-computer as MIL-STD-105
- ▶ Specify AQL, lot size (required)
- ▶ Specify level I, II, III, S1, S2, S3, or S4 (level II is almost always used and will be used throughout this document.)
- ▶ Output is n , c , alpha and beta
 - Default alpha is nominally close to 5%.
 - Beta at 10% P_a will vary (potentially greatly) depending on choice of AQL, lot size, and level. Example: Given a Level II, an AQL of 0.65 and lot sizes of 100 and 1000, the implied RQL at P_a of 10% is respectively 10.9% and 4.78%.
- ▶ Example: Use Z1.4 to set up an inspection plan for an advertising firm to inspect giveaway flashlights (e.g. does the flashlight work or not).



Developing Acceptance Sampling Plan

We will generate one plan

- ▶ AQL (Acceptable Quality Level) of 1.5%
 - ▶ Lot size = 2500
 - ▶ Measuring defectives (use “Percent defective” for units)

 - ▶ There is no ability to specify RQL - it is an output
 - ▶ There is no ability to specify alpha – we will compare at 95% P_a
 - ▶ There is no ability to specify beta – we will compare at 10% P_a
1. Using table I (Sample size code letters) lot size of 2,500, General Inspection Level II, the sample size code letter is K.
 2. Using table IIa (Single sampling plans for normal inspection – Master table) determine that for Letter K and AQL of 1.5%, the sample size is 125 and $C = 5$.
 3. Using Table X-K – Tables for sample size code letter : K, Given the 1.5% AQL at a P_a of 95%, the calculated AQL is 2.09% and at a P_a of 10%, the implied RQL is 7.42.



Table 1 from Mil-STD-105

TABLE I—Sample size code letters

(see 4.9.1 and 4.9.2)

Lot or batch size	Special inspection levels				General inspection levels		
	S-1	S-2	S-3	S-4	I	II	III
2 to 8	A	A	A	A	A	A	B
9 to 15	A	A	A	A	A	B	C
16 to 25	A	A	B	B	B	C	D
26 to 50	A	B	B	C	C	D	E
51 to 90	B	B	C	C	C	E	F
91 to 150	B	B	C	D	D	F	G
151 to 280	B	C	D	E	E	G	H
281 to 500	B	C	D	E	F	H	J
501 to 1200	C	C	E	F	G	J	K
1201 to 3200	C	D	E	G	H	K	L
3201 to 10000	C	D	F	G	J	L	M
10001 to 35000	C	D	F	H	K	M	N
35001 to 150000	D	E	G	J	L	N	
150001 to 500000	D	E	G	J	M	P	
500001 and over	D	E	G	K	N	Q	

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MIL-STD-105E

1201 to 3200

K

1201 To 3200

K

CODE LETTERS

Table 2a from Mil-STD-105

TABLE II-A—Single sampling plans for normal inspection (Master table)

(see 4.9.3 and 4.9.4)

SINGLE
NORMAL

14

Sample size code letter	Sample size	Acceptable Quality Levels (normal inspection)																							
		0.010	0.015	0.025	0.040	0.065	0.10	0.15	0.25	0.40	0.65	1.5	4.0	6.5	10	15	25	40	65	100	150	250	400	650	1000
		Ac Rr	Ac Rr	Ac Rr	Ac Rr	Ac Rr	Ac Rr	Ac Rr	Ac Rr	Ac Rr	Ac Rr	Ac Rr	Ac Rr	Ac Rr	Ac Rr	Ac Rr	Ac Rr	Ac Rr	Ac Rr	Ac Rr	Ac Rr	Ac Rr	Ac Rr	Ac Rr	Ac Rr
A	2																								
B	3																								
C	5																								
D	8																								
E	13																								
F	20																								
G	32																								
H	50																								
J	80																								
K	125																								
L	200																								
M	315																								
N	500																								
P	800																								
Q	1250																								
R	2000																								

MIL-STD-105E

- ⬇ = Use first sampling plan below arrow. If sample size equals, or exceeds, lot or batch size, do 100 percent inspection.
- ⬆ = Use first sampling plan above arrow.
- Ac = Acceptance number.
- Rr = Rejection number.

Table X-K from Mil-STD-105

95% P_a
Alpha

TABLE X-K-1 - TABULATED VALUES FOR OPERATING CHARACTERISTIC CURVES FOR SINGLE SAMPLING PLANS

P_a	Acceptable Quality Levels (normal inspection)											X	10
	0.10	0.40	0.65	1.0	1.5	2.5	3.76	4.94	6.15	7.40	8.78		
p (in percent defective or defects per hundred units)													
99.0	0.00604	0.119	0.349	0.659	1.43	2.32	3.76	4.94	6.15	7.40	8.78	10.1	
95.0	0.0410	0.204	0.654	1.09	2.09	3.18	4.35	5.62	6.92	8.24	9.95	11.9	
90.0	0.0843	0.425	0.882	1.40	2.52	3.72	4.35	5.62	6.92	8.24	10.9	13.0	
75.0	0.230	0.769	1.382	2.03	3.38	4.78	5.47	6.90	8.34	9.79	12.7	14.9	
50.0	0.555	1.34	2.14	2.94	4.54	6.14	7.04	8.57	10.1	11.7	14.9	17.3	
25.0	1.11	2.15	3.14	4.09	5.94	7.75	8.81	10.5	12.1	13.7	17.4	20.0	
10.0	1.84	3.11	4.26	5.34	7.42	9.42	10.5	12.1	13.7	15.3	19.8	22.5	
5.0	2.40	3.80	5.04	6.20	8.41	10.5	12.1	13.7	15.3	17.0	21.4	24.2	
1.0	3.68	5.31	6.72	8.04	10.5	12.8	15.3	16.1	18.3	20.4	24.5	27.5	
	0.15	0.65	1.0	1.5	2.5	X	4.0	X	6.5	X	10	X	

Calculated AQL at
alpha = 2.09

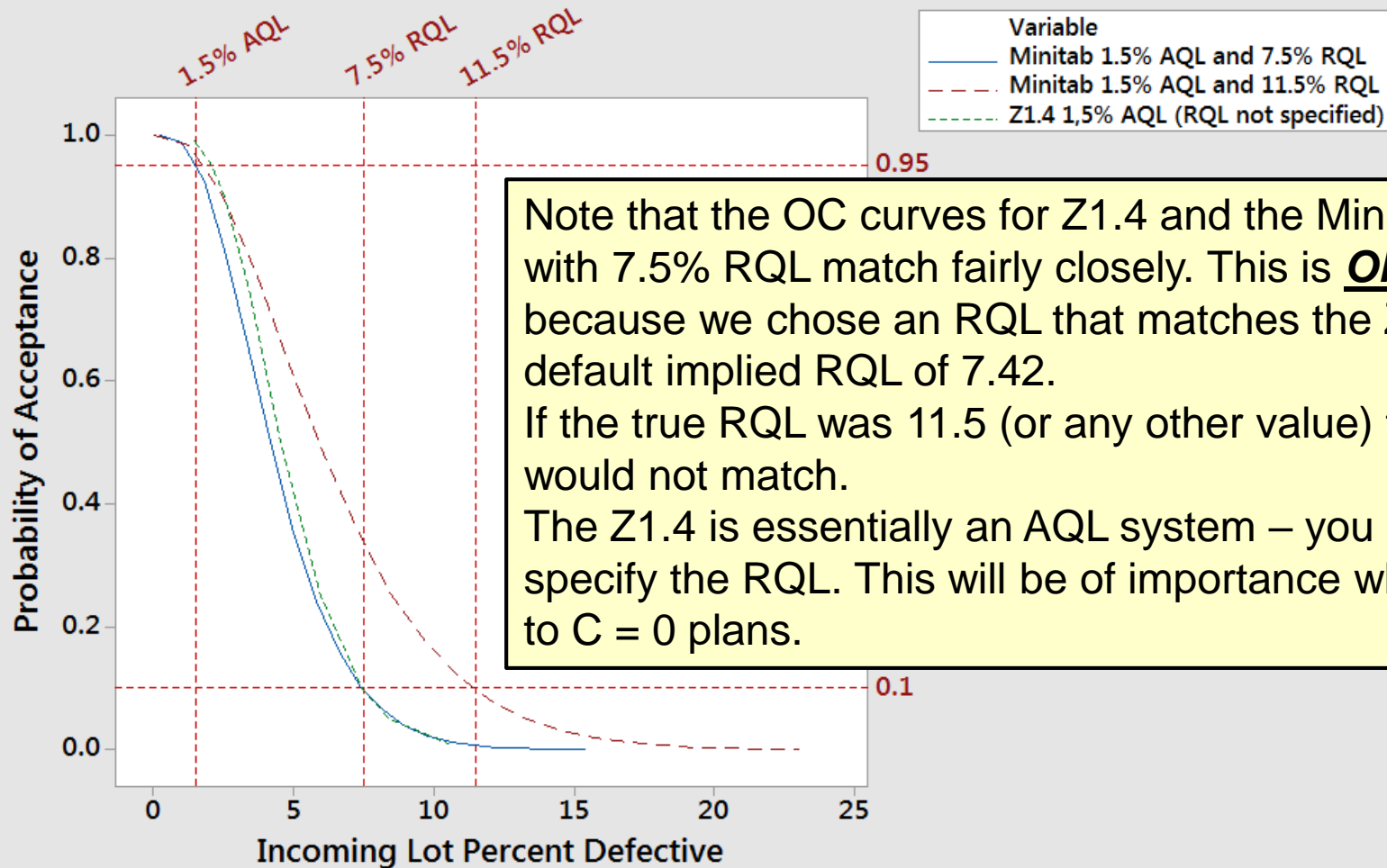
Calculated RQL at
beta = 7.42

10% P_a
Beta

Note: All values given in above table based on Poisson distribution or its approximation to the Binomial.

Compare Minitab to Z1.4

Comparison of Z1.5 to Minitab



Note that the OC curves for Z1.4 and the Minitab plan with 7.5% RQL match fairly closely. This is **ONLY** because we chose an RQL that matches the Z1.4 default implied RQL of 7.42. If the true RQL was 11.5 (or any other value) the curves would not match. The Z1.4 is essentially an AQL system – you do not specify the RQL. This will be of importance when we go to C = 0 plans.

C = 0 : CONCEPT AND JUSTIFICATION



Accept on None (C= 0) Plans

- ▶ The “Accept on None” commonly called $C = 0$ plans are lot sampling plans for attribute data designed such that if one defect is found in the inspected sample, the lot is rejected.
- ▶ These plans have both advantages and disadvantages over traditional lot inspection where you typically have an accept number “C” greater than zero (e.g. accept on 3, reject on 4).
- ▶ Where the ANSI (MIL-STD-105) is an AQL system (protects producer - If the quality is at the AQL let us make sure we can ship), $C = 0$ is an RQL system (protects consumer – if the quality is at the RQL let us make sure we reject).



Advantages of $C = 0$ (1 of 2)

- ▶ Because no lot is accepted if there is a defect in the sample, the perception of quality is preserved for both the consumer and the inspector. For many this is a prime driver of the use of $C=0$ plans.
- ▶ It is simpler to administrate.
- ▶ For lots with actual defect levels greater than 0 but less than the RQL, the $C=0$ approach will more likely reject the lot (protect the consumer).
- ▶ It requires only a designated RQL, no AQL is specified.
 - Note that the US Government is moving to eliminate the use of AQLs in all contracts “to support the movement away from an AQL-based inspection (detection) strategy to implementation of an effective prevention-based strategy including a comprehensive quality system, continuous improvement ..” (MIL-STD 1916, 1-APR 1996, p1)...



Advantages of $C = 0$ (2 of 2)

- ▶ If quality is near 100%, $C=0$ plans will result in fewer total parts being inspected.
- ▶ The Zero acceptance plans developed by Squeglia are designed “to provide overall equal or greater consumer protection with less inspection than the corresponding MIL-STD-105 sampling plans.” (Squeglia)
- ▶ If the MIL-STD-105 or the ANZI Z1.4 is invoked by contract, Squeglia’s plans can be used as they provide the same or better protection to the consumer (however they may impact the producer negatively – see next slide)



Disadvantages of $C = 0$

- ▶ **If there is an AQL** (and using typical value of $\alpha = 0.05$) a standard plan (either Minitab or Z1.4) would theoretically accept a lot with the AQL level of defectives 95% of the time whereas the $C=0$ plan would reject it with much higher frequency.
- ▶ **If quality is not near 100%**, The $C=0$ plans will result in more rejected lots.
- ▶ If the practice of rectifying Inspection is used, $C=0$ plans will result in greater total inspection quantities unless quality is near perfect.
- ▶ **It requires a carefully chosen RQL. The AQL will essentially float.**

In the special case where the MIL-STD-105 or Z1.4 has been invoked, an AQL has been provided, and a $C=0$ plan is desired/required, there is no need to “carefully select the RQL”, as it is a direct result of the AQL.



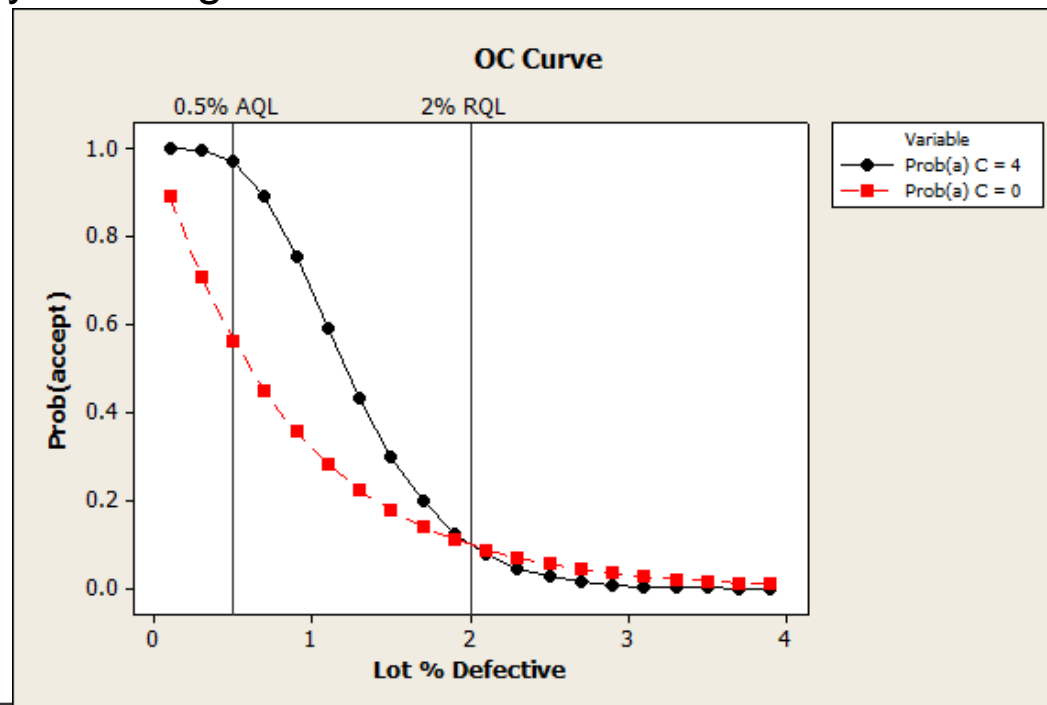
Comparison – AQL 0.5% and RQL 2%

	Standard Z1.4	C = 0
C number	4	0
Reject number	5	1
Sample size	379	111
Prob(accept) at AQL	97.4%	56.4%
Prob(Reject) at RQL	90.1%	90%
AOQL	0.551% at 0.95% incoming % defective	0.303% at 0.85% incoming % defective

- It can be seen that both plans provide the same protection to the consumer at the RQL of 2%. They will both reject such a lot 90% of the time.
- The difference is that the C = 4 plan will accept lots at the AQL (0.5%) 97.4% of the time while the C = 0 plan will only accept such a lot 56.4% of the time. This is because (as stated earlier) the C = 0 plans do not invoke an AQL.

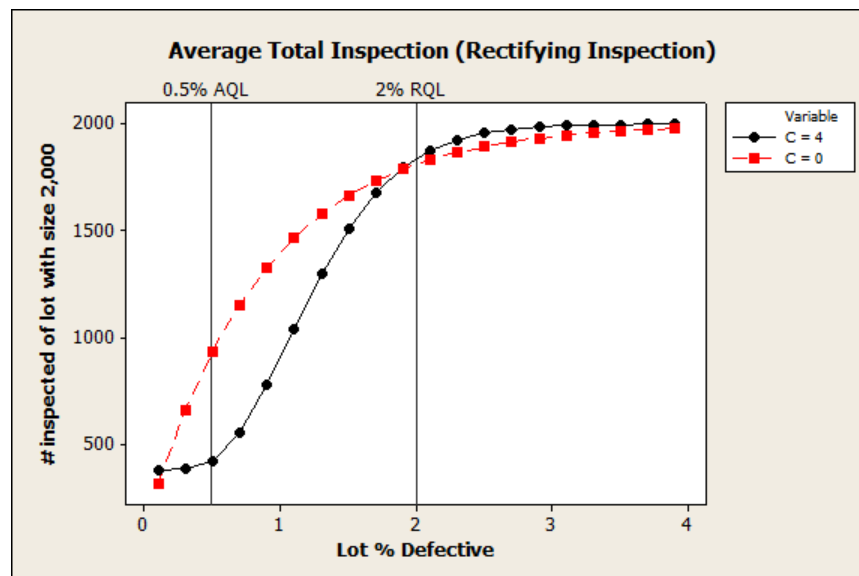
Comparison – OC Curve

- ▶ As can be seen below, the probability of accept is the same for both plans when the lot quality is 2% (RQL) but is vastly different at the AQL level of 0.5%.
- ▶ In fact the Prob(accept) for the C = 0 plan is lower (in many cases significantly) for all lot quality values less than the RQL and slightly greater for lot quality values greater then the RQL.



Comparison – Average Total Inspection

- ▶ Assumes rectifying inspection as required by both Mil-Std 1916 and 105E.
- ▶ It can be seen that once above near perfect quality levels and until the RQL is reached, the C = 0 plan requires more samples. Once past the RQL both plans are at essentially 100% inspection.
- Note: N. Squeglia in his book Zero Acceptance Number Sampling Plans (ASQ Quality Press, 4 edition, 1994) does not rigorously apply rectifying inspection. His C = 0 plans call for an inspector to “withhold a lot if a defect is found. ...the defective condition may not be cause for rejection and/or screening...” and further states that “The decision to reject, screen, or accept should be based on a review by competent authority” (page 7)



Summary

- ▶ $C = 0$ plans have advantages when the quality is assumed to be near perfect including requiring less inspection and enforcing the concept of no such thing as an AQL.
- ▶ If a $C = 0$ plan is used when a defect rate (less than the RQL) does exist, then the probability of rejecting a lot goes up (probably significantly). This has the effects of:
 - Further protecting the consumer.
 - Potentially increasing drastically the cost/time of inspection (this may be seen as a driver towards continuous improvement).
- ▶ There are cases where the $C = 0$ plan may not be the best choice. An example: If the quality of the process is not under your direct control (e.g., garments made in Asia) and you do expect some defects.
- ▶ Two key points:
 1. For a good $C = 0$ plan you must select an appropriate RQL (may be contractual).
 2. Unless quality is near perfect, you will be inspecting more items if you invoke rectifying inspection.



C = 0 USING MINITAB



Create a C=0 Plan in Minitab

Insert the AQL. Note, this is not critical and if you desire you can enter in a very small number like 0.1 and you will get same result.

Insert the associated RQL.

Insert 0.89 as Alpha. This will essentially make the AQL moot.

Insert 0.10 as the Beta.

Enter the Lot size.

Click on Options and select Hypergeometric.

Acceptance Sampling by Attributes

Create a Sampling Plan

Measurement type: Go / no go (defective)

Units for quality levels: Percent defective

Acceptable quality level (AQL): 1.5

Rejectable quality level (RQL or LTPD): 7.5

Producer's risk (Alpha): .89

Consumer's risk (Beta): 0.10

Lot size: 2500

Options...
Graphs...
OK
Cancel
Help



C = 0 Generated in Minitab

Measurement type: Go/no go
Lot quality in percent defective
Lot size: 2500
Use hypergeometric distribution to calculate probability of acceptance

Acceptable Quality Level (AQL)	1.5
Producer's Risk (α)	0.89
Rejectable Quality Level (RQL or LTPD)	7.5
Consumer's Risk (β)	0.1

Generated Plan(s)	
Sample Size	30
Acceptance Number	0

The Plan

Accept lot if defective items in 30 sampled ≤ 0 ; Otherwise reject.

Percent Defective	Probability Accepting	Probability Rejecting	AOQ	ATI
1.5	0.634	0.366	0.939	934.6
7.5	0.095	0.905	0.705	2265.2

Average outgoing quality limit (AOQL) = 1.185 at 3.200 percent defective.

Ignore these as they are associated with "Dummy" AQL



C = 0 USING Z1.4

**(BASED ON APPROACH PUBLISHED BY N. SQUEGLIA IN HIS BOOK
ZERO ACCEPTANCE NUMBER SAMPLING PLANS (ASQ QUALITY
PRESS, 4 EDITION, 1994))**



C = 0 Plans based on MIL-STD 105E

- ▶ Both Squeglia and the Defense Contract Management Agency have created plans that use the MIL-STD 105E (or ANSI Z1.4 which is essentially a copy of the now obsolete MIL-STD plan) to convert an AQL to an RQL and thence to a C = 0 Acceptance Sampling Plan.
- ▶ The DCMA worksheet may be found at http://guidebook.dcma.mil/226/tools_links_file/stat-sample.htm.
- ▶ Squeglia's book is readily purchased online.

Zero Acceptance Number Sampling Plans, Fifth Edition

by Nicholas Squeglia

ASQ Quality Press, 2008



Defense Contract Management Agency

ZERO-BASED ACCEPTANCE SAMPLING PLAN

"A Indicates that the Entire Lot Must be Inspected"

Acceptable Quality Level (AQL)

LOT SIZE	.010%	.015%	.025%	.040%	.065%	10%	.15%	.25%	.40%	.65%	1.0%	1.5%	2.5%	4.0%	6.5%	10.0%
1-8	A	A	A	A	A	A	A	A	A	A	A	A	5	3	2	2
9-15	A	A	A	A	A	A	A	A	A	A	13	8	5	3	2	2
16-25	A	A	A	A	A	A	A	A	A	20	13	8	5	3	3	2
26-50	A	A	A	A	A	A	A	A	32	20	13	8	5	5	5	2
51-90	A	A	A	A	A	A	80	50	32	20	13	8	7	6	5	4
91-150	A	A	A	A	A	125	80	50	32	20	13	12	11	7	6	5
151-280	A	A	A	A	200	125	80	50	32	20	20	19	13	10	7	6
281-500	A	A	A	315	200	125	80	50	48	47	29	21	16	11	9	7
501-1200	A	800	500	315	200	125	80	75	73	47	34	27	19	15	11	8
1201-3200	1250	800	500	315	200	125	120	116	73	53	42	35	23	18	13	9
3201-10,000	1250	800	500	315	200	192	189	116	86	68	50	38	29	22	15	9
10,001-35,000	1250	800	500	315	300	294	189	135	108	77	60	46	35	29	15	9
35,001-150,000	1250	800	500	490	476	294	218	170	123	96	74	56	40	29	15	9
150,001-500,000	1250	800	750	715	476	345	270	200	156	119	90	64	40	29	15	9
500,001 & Over	1250	1200	1112	715	556	435	303	244	189	143	102	64	40	29	15	9



Minitab C = 0 Plans based on MIL-STD 105E

This approach can be closely followed in Minitab as follows:

1. Using MIL-STD 105E (or equivalent ANSI) determine the “Sample size code letter” from table I based on the lot size to be evaluated.
2. Determine AQL from customer or local process knowledge.
3. Using table II-A verify that the plan for the desired AQL/Code Letter exists otherwise use the “sliders” to determine new code letter.
4. Go to tables X-A through X-R and select the table associated with the final Code Letter chosen.
5. In the column associated with the desired AQL, look up the “P (in percent defective)” for a P_a of 10.0. This is the associated RQL at 10% Beta.
6. Enter the data into Minitab as shown in previous section.

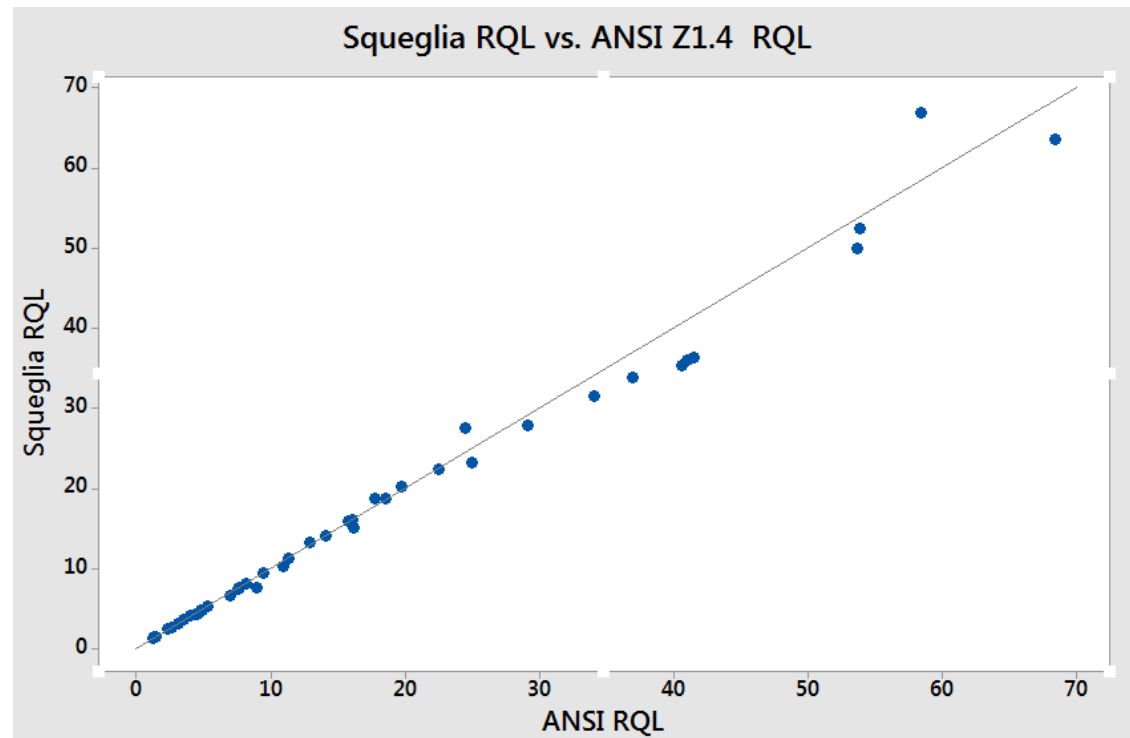


COMPARISONS AND CONCLUSIONS



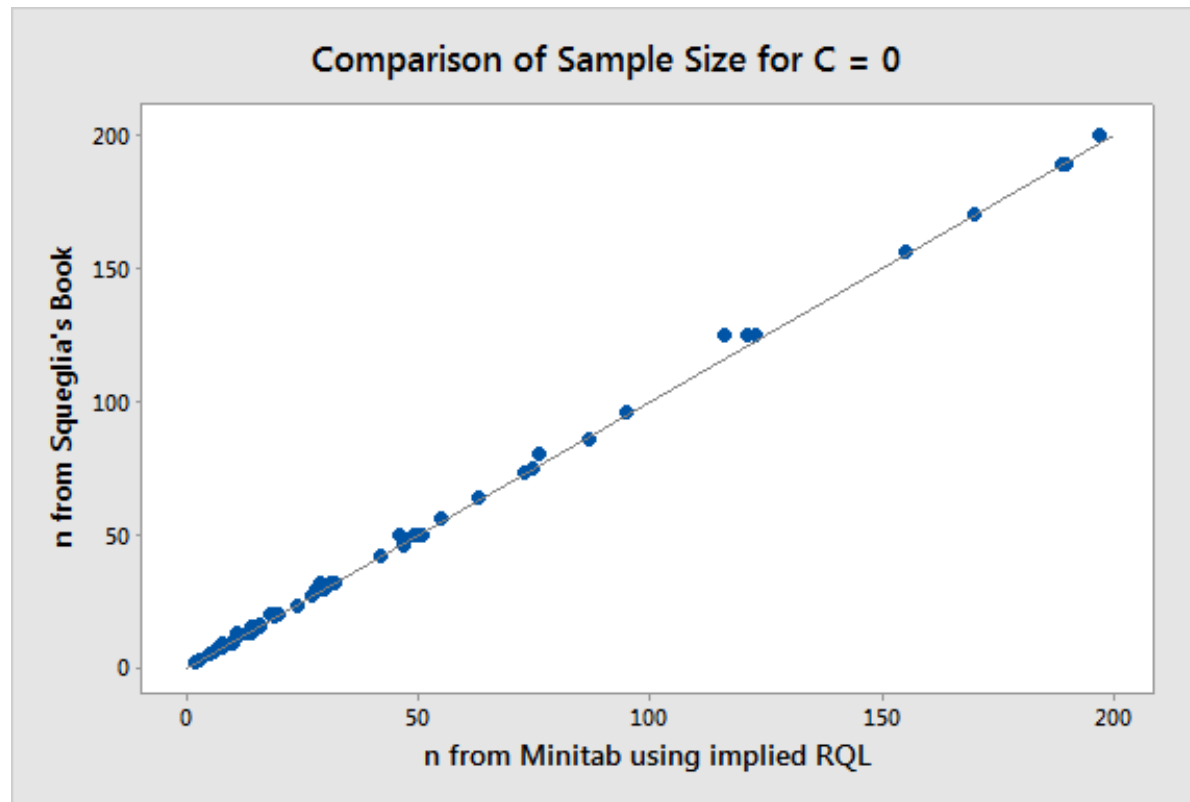
A Comparison of Results (1 of 2)

- ▶ The RQLs associated with a given AQL in Squeglia's book differ somewhat from those obtained directly from the MIL-STD
- ▶ Note: Squeglia does make some adjustments from the MIL-STD and uses the hypergeometric.



A Comparison of Results (2 of 2)

- ▶ The sample sizes (n) obtained from the Minitab approach track very closely those from Squeglia's book.



A Significant Feature of the MIL-STD

- ▶ The MIL-STD-105 is an AQL based system. The RQLs are not truly specified by the user/customer.
- ▶ For the same AQL, the RQL will vary for different lot sizes:
 - For a 6.5% AQL the RQL varies from 18.6 at a lot size of 501:1200 to 40.6 at a lot size of 26:50.
 - For a 0.65% AQL the RQL varies from 4.78 at a lot size of 501:1200 to 10.9 at a lot size of 91:150.
- ▶ The pattern is that the associated/implied RQL typically gets smaller as the lot size increases.



A Question and Some Answers

If you are using a C=0 plan and recognize that it is an RQL based plan why would you want the RQL to vary simply due to lot size?

- ▶ From a statistical view It is suggested that you specify the RQL directly based on process knowledge and consumer needs.
- ▶ If the MIL-STD-105 or ANSI Z1.4 are invoked by contract you need to use the associated RQLs in the appropriate tables.
- ▶ Squeglia states that this change (more rigorous RQL as lot sizes increase) is because "... it is generally considered more practical to obtain greater protection on larger lot sizes."

A comparison of the OC curves for the two cases follow.



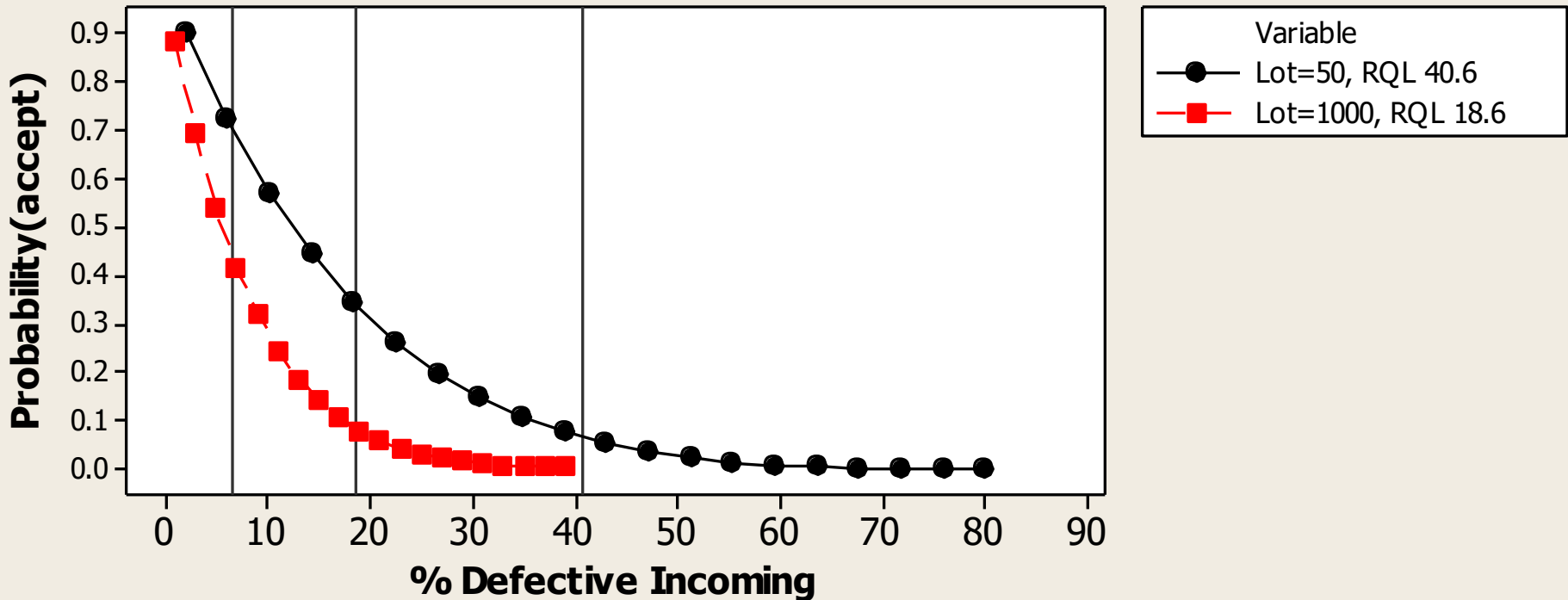
C = 0 plans for 6.5% Reference AQL

6.5 Ref AQL

18.6 RQL for Lot = 1000

40.6 RQL for Lot = 50

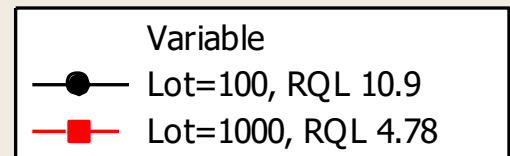
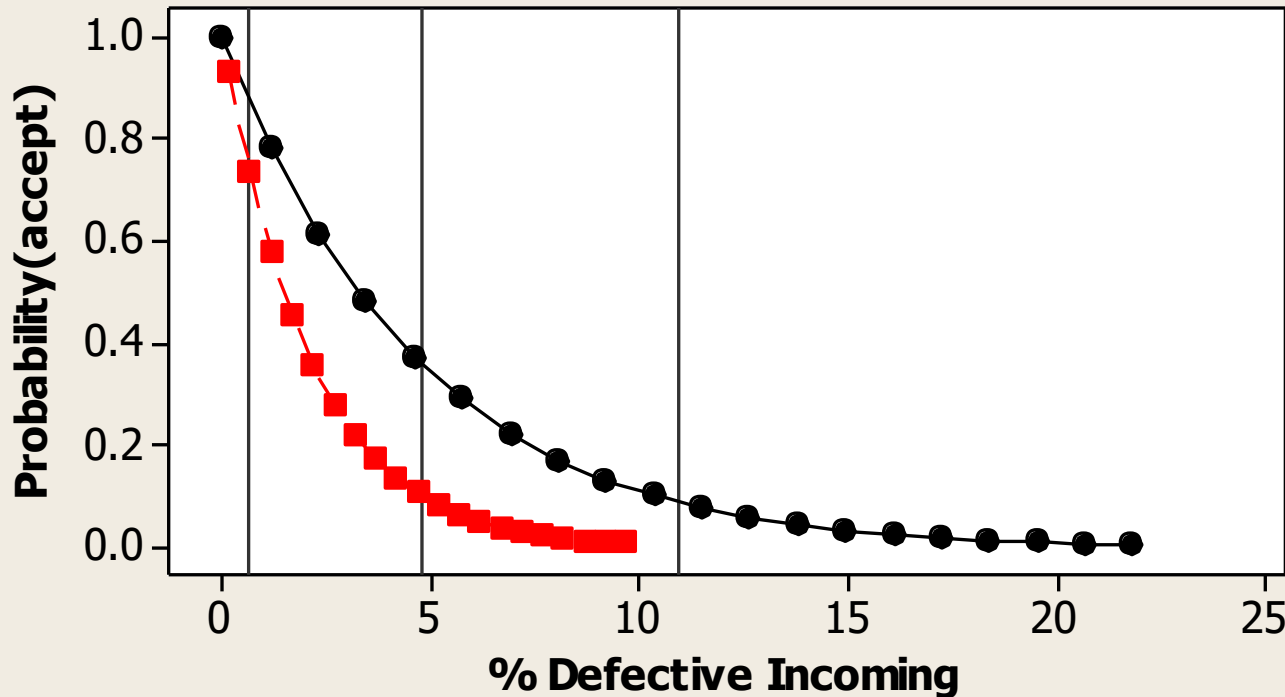
Both Curves are based on the same AQL of 6.5%.
The different RQLs are from MIL-STD 105E.



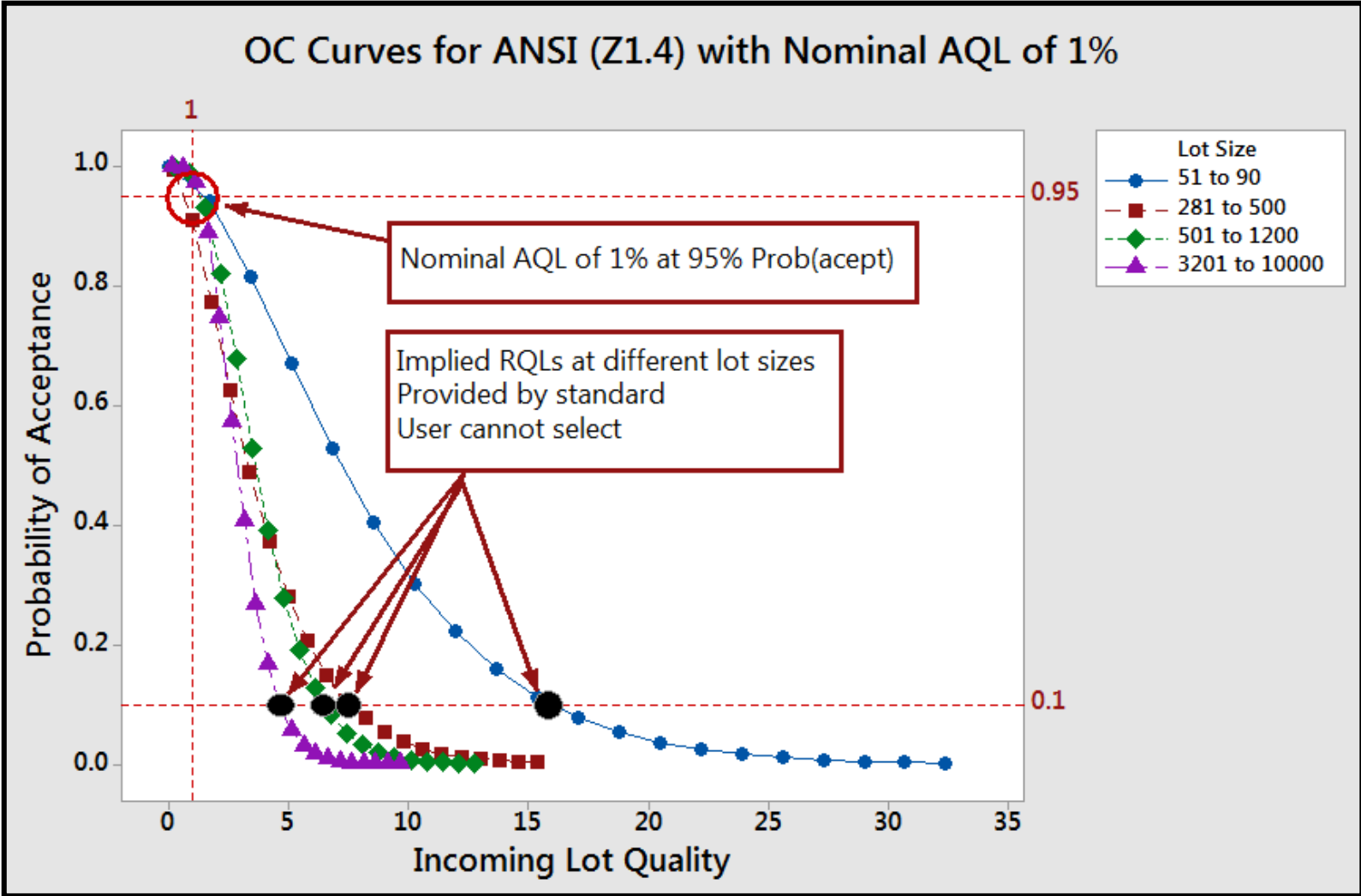
C = 0 plans for Reference 0.65% AQL

0.65 Ref AQL
4.78 RQL for Lot = 1000
10.9 RQL for Lot = 100

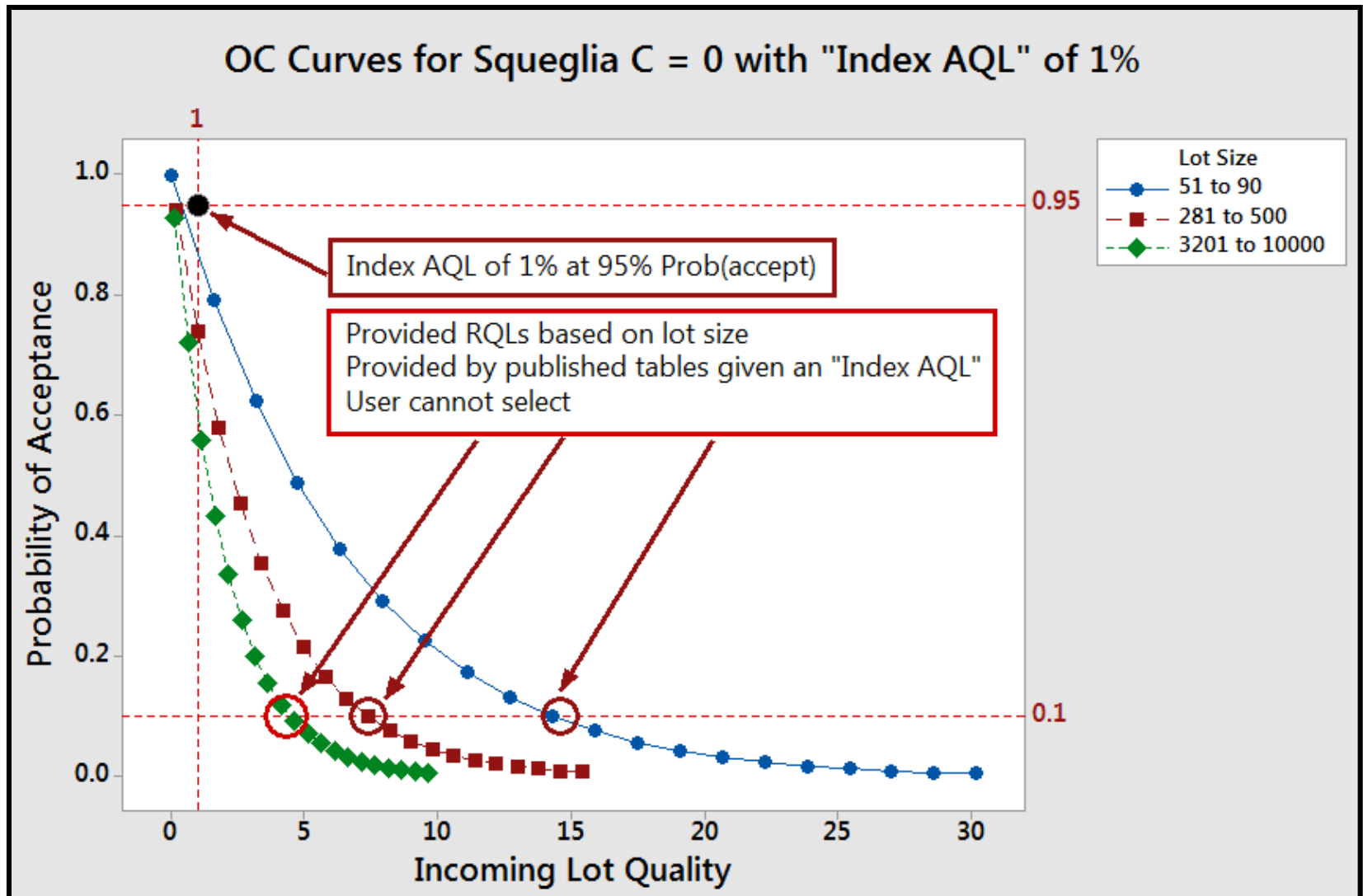
Both Curves are based on the same AQL of 0.65%.
The different RQLs are from MIL-STD 105E



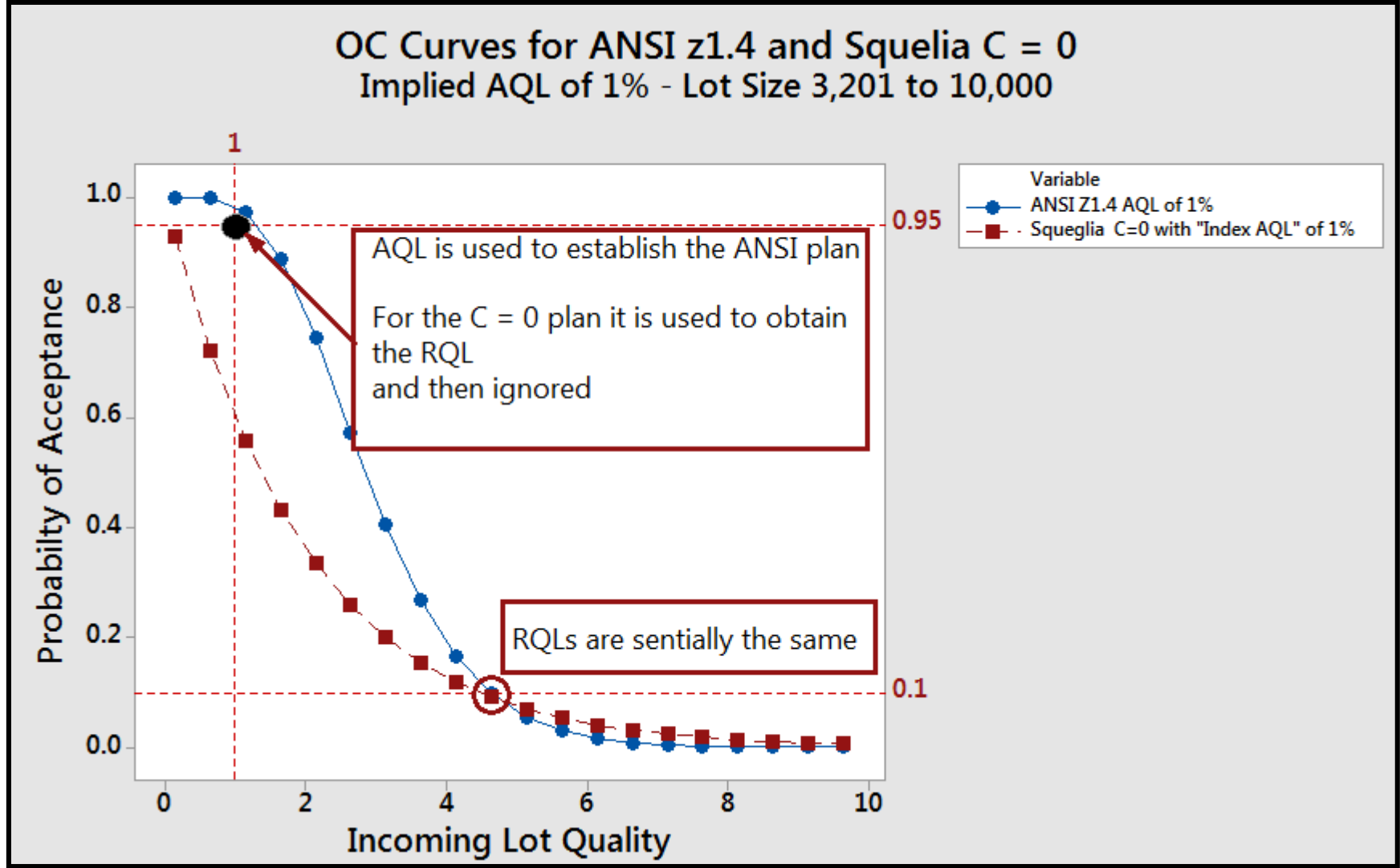
MIL-STD-105 and ANSI Z1.4 are AQL Based



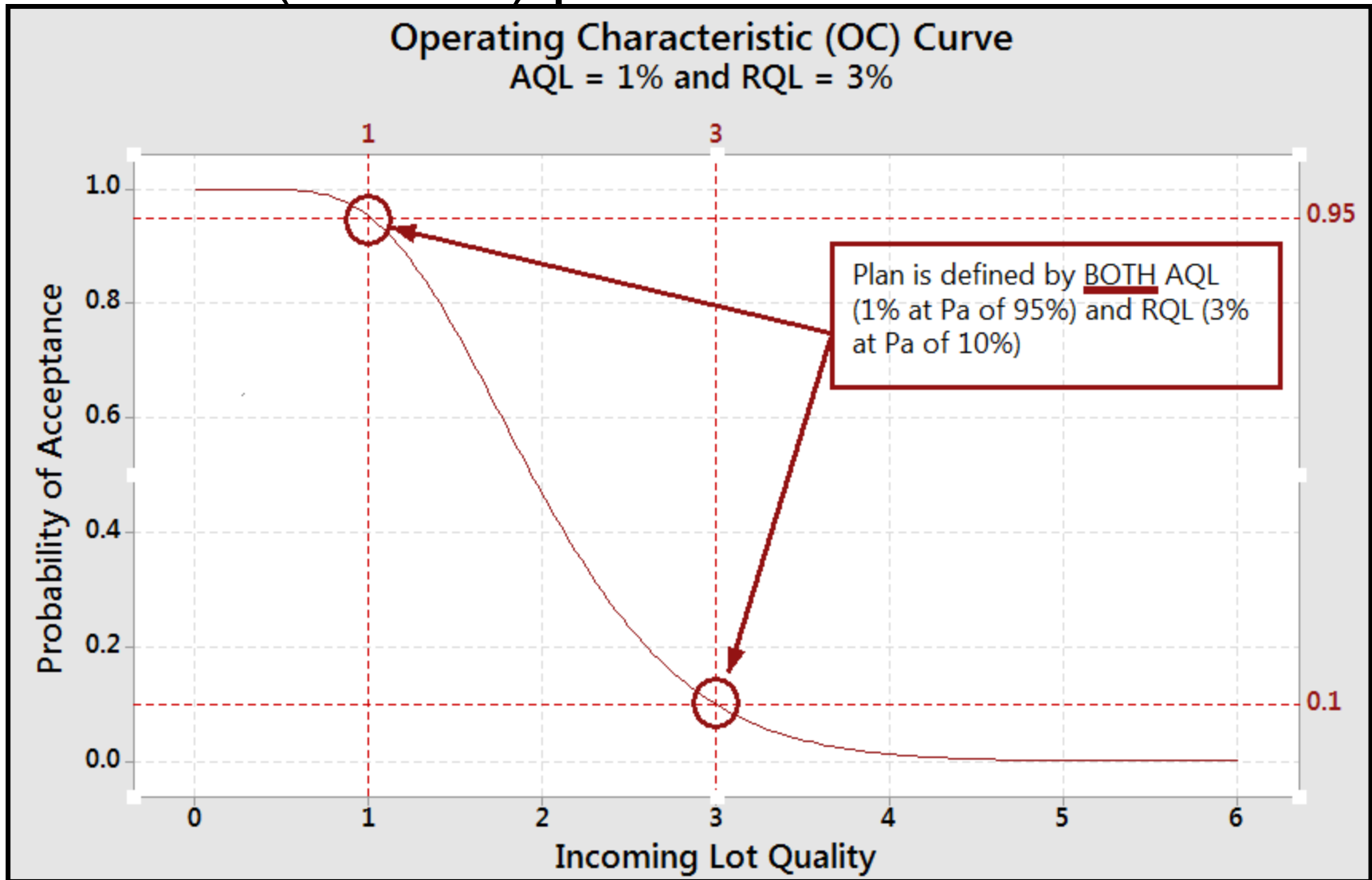
C = 0 Plans are RQL Based



Comparison of AQL vs. RQL Plans



Classical (Minitab) plans are AQL+RQL Based



Conclusion

Understand the benefits and drawbacks of C=0 plans **and** if you decide that your quality can support such a plan **and** you wish to reduce sample size **and** establish a philosophy that no defects are acceptable **and** with the understanding that if quality degrades even slightly that inspection levels may increase significantly then...

- ▶ If the MIL-STD-105 or ANSI Z1.4 is invoked: 1) use a plan like Squeglia's or the DCMA's to obtain n **or** 2) obtain the reference/implied RQL from the standards and enter into Minitab, let the AQL float by specifying alpha as 0.89 and obtain n.
- ▶ If the standards are not invoked, establish a logical RQL based on the needs of the customer and then calculate the plan in Minitab (let the AQL float by specifying alpha as 0.89) and obtain n.



END