LineTab

TECHNICAL STUDY · TQ120-001R.REV0

Dental Waterline Tablet Comparison Study

A comparison of BluTab, A-dec ICX, and the 49 mg NaDCC tablet supplied for LineTab.

REPORT NO.	TECHNICAL QUERY	REPORT DATE	SCOPE
TQ120-001R.Rev0	TQ120	12.02.2026	Physical · Chemical · Micro

The testing in this report was conducted by LineTab's manufacturer.

Report Title:	**Testing of BluTab and A-dec ICX - LineTab dental line maintenance competitor tablets**
Date:	**12.02.2026**
Technical Query No.:	**TQ120**
Report No.:	**TQ120-001R.Rev0**

1. INTRODUCTION

LineTab is a U.S. company registered to supply EPA-approved dental waterline maintenance tablets based on LineTab's NaDCC formulation, designed to provide continuous antimicrobial protection using a simple "shock once, dose every refill" protocol. Founded in 2025, the company focuses on delivering safer, easier, and more consistent dental waterline compliance and operates within the medical and diagnostic laboratory sector.

Its key competitors include BluTab, a low-level antimicrobial tablet that provides continuous waterline cleaning for up to 28 days and is added at each refill to maintain <10 CFU/mL. Another major competitor is A-dec ICX, an effervescent tablet formulated to maintain waterline effluent at ≤10 CFU/mL, prevent odour- and taste-causing bacteria, and remain active for up to two weeks.

This technical query involves comparing a 49 mg (3-03-012) tablet supplied by LineTab against its main competitors. The comparison will assess physical tablet parameters as well as efficacy performance, using carrier and suspension testing against *Staphylococcus aureus*, *Salmonella enterica*, and *Pseudomonas aeruginosa*.

2. AIM

To test each competitor tablet and compare to a 49mg (3-03-012) tablet control.

3. ACCEPTANCE CRITERIA

N/A

4. MATERIALS/EQUIPMENT

Material	Lot No.
TSB	MLS1348
D/E Broth	MLS1342
TSA	MLS1353
NaDCC Tablet	650C
A-dec ICX Tablets	N/A
BluTab Tablets	N/A

Equipment	Number
Pipette	EQ648, EQ496
Incubator	EQ513
Shaking Incubator	EQ512
Timer	EQ644
pH meter	EQ661
Thermometer	EQ651
Analytical Balance	EQ506
Biosafety Cabinet	EQ510
Fridge	EQ505
Water Bath	EQ521
Autoclave	EQ466
Sotax Multi-tester	EQ573

5. METHOD

5.1 Physical Testing

Each tablet was measured using the Sotax Multi-tester, measuring the diameter, thickness and hardness. Every tablet was weighed out in an analytical balance for their weight uniformity and average mass (mg).

5.2 Chemical Testing

Based on IFUs from related labels, each tablet was put into 700 mL at 20°C and was timed until it has disintegrated, followed by dissolution. Disintegration is the time at where effervescence ended, and the tablet no longer maintained structural integrity. Dissolution is the time point where all tablet contents were in solution. The pH of the tablet was taken from the 700 mL solution post dissolution.

5.3 Microbiological Testing

Suspension efficacy testing was performed in accordance with STMMB004 using contact times of 5 minutes and 60 minutes. Carrier efficacy testing was conducted as per STMMB005, also at 5- and 45-minute contact times. The reduction in the longer contact time for carrier testing from 60 minutes to 45 minutes is due to the fact that the disinfectant dried out on the carriers after 45 minutes had elapsed. Therefore, a 60-minute contact time was not feasible in the biosafety cabinet due to evaporation of the solution on the carrier.

Test solutions for the competitor tablets (BluTab and A-dec ICX) were prepared at a concentration of 1 tablet in 700 mL. The NaDCC control solution was prepared at 1 tablet in 750 mL, which aligns with the concentration recommended by the customer for routine dental waterline maintenance applications.

6. RESULTS

6.1 Physical Results

Table 1. Summary of physical test results

Parameter	Average Test Result		
	BluTab	A-dec ICX	NaDCC
Thickness (mm)	2.17	2.21	1.64
Diameter (mm)	7.96	5.55	4.73
Hardness (N)	16	40	21
Average Weight (mg)	143.42	81.35	49.23
Friability	0%	0%	0.4%
Disintegration (mins)	02:01	01:21	01:25
Dissolution (mins)	03:39	01:44	01:26
pH	3.503	6.404	6.601

6.2 Microbiological Results:

Figures 1 to 4 below display the data collected from suspension and carrier testing of the two competitor products and a 49mg NaDCC tablet from LineTab as a control.

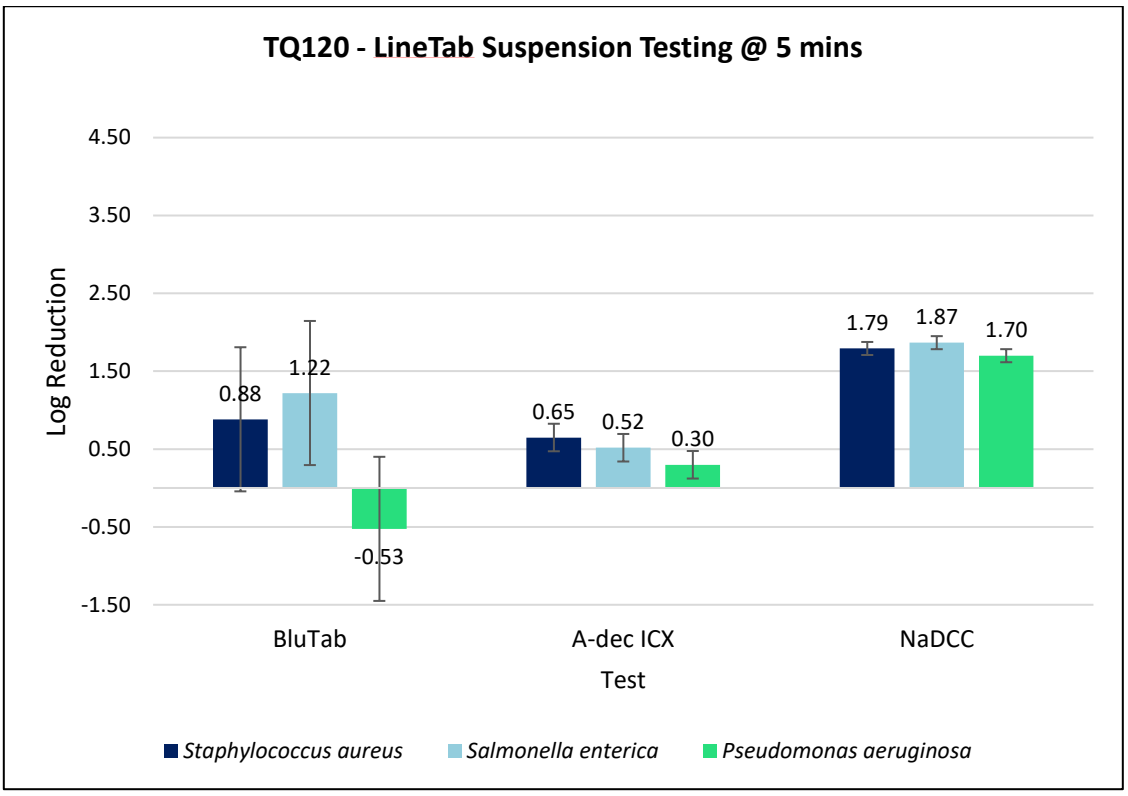

Figure 1: Suspension test data for each product at a 5-minute contact time

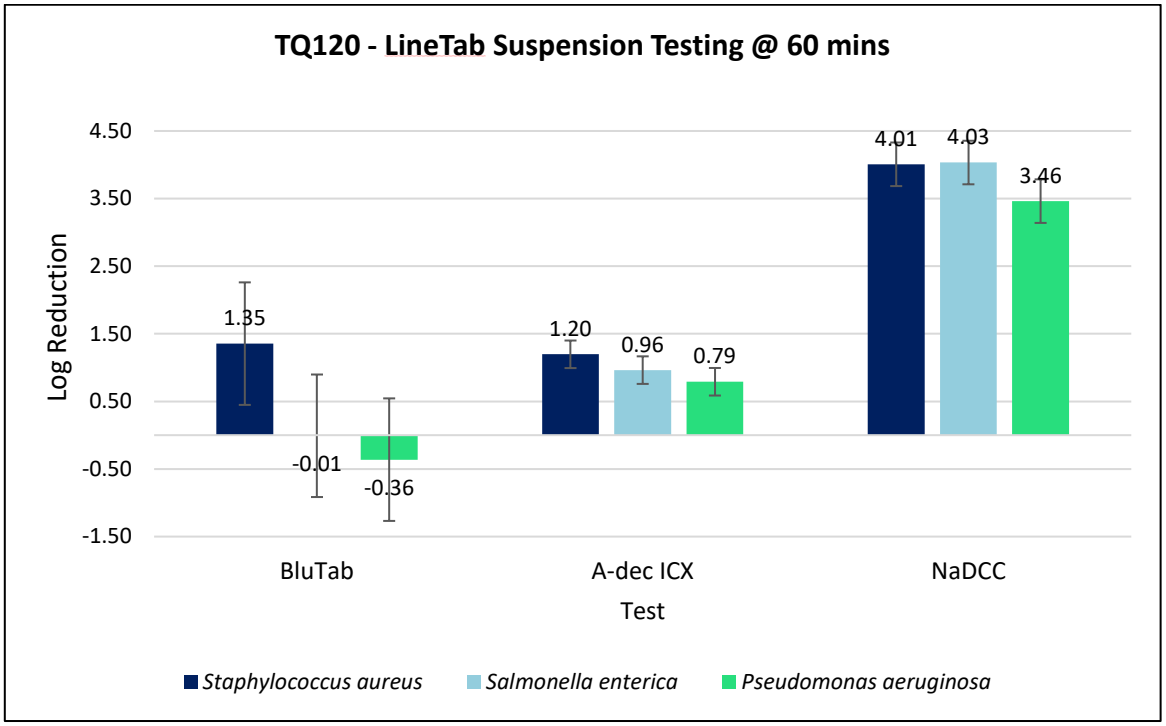

Figure 2: Suspension test data for each product at a 60-minute contact time

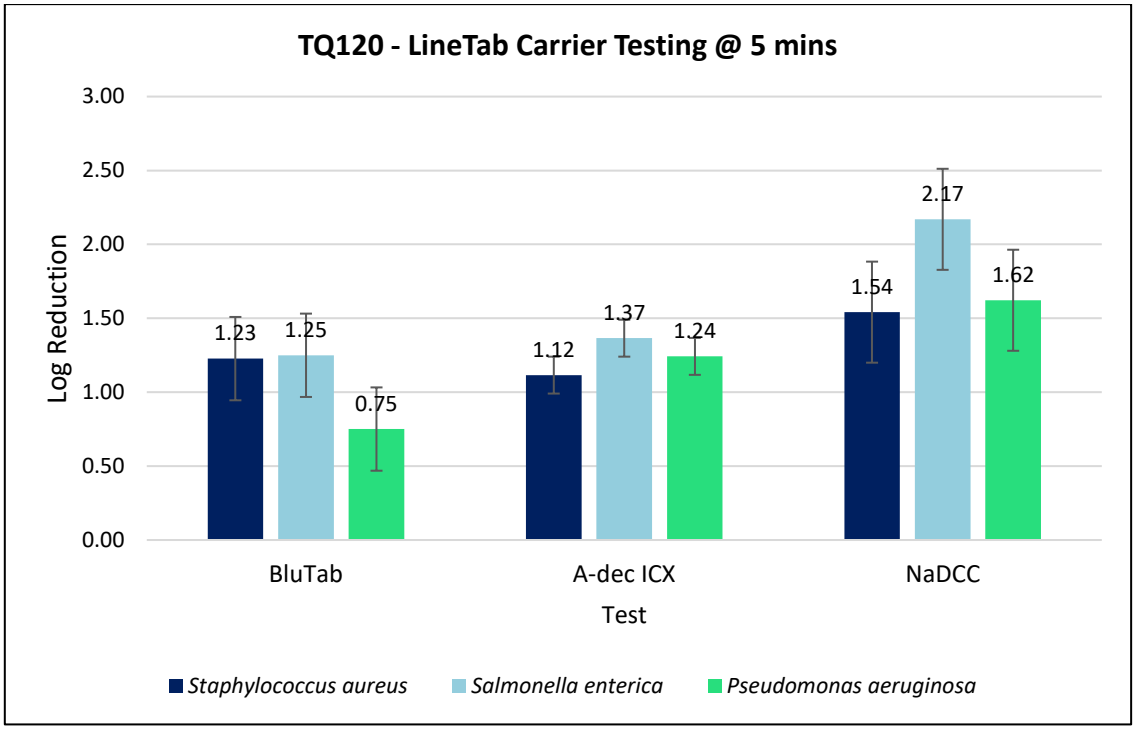

Figure 3. Carrier test data for each product at a 5-minute contact time

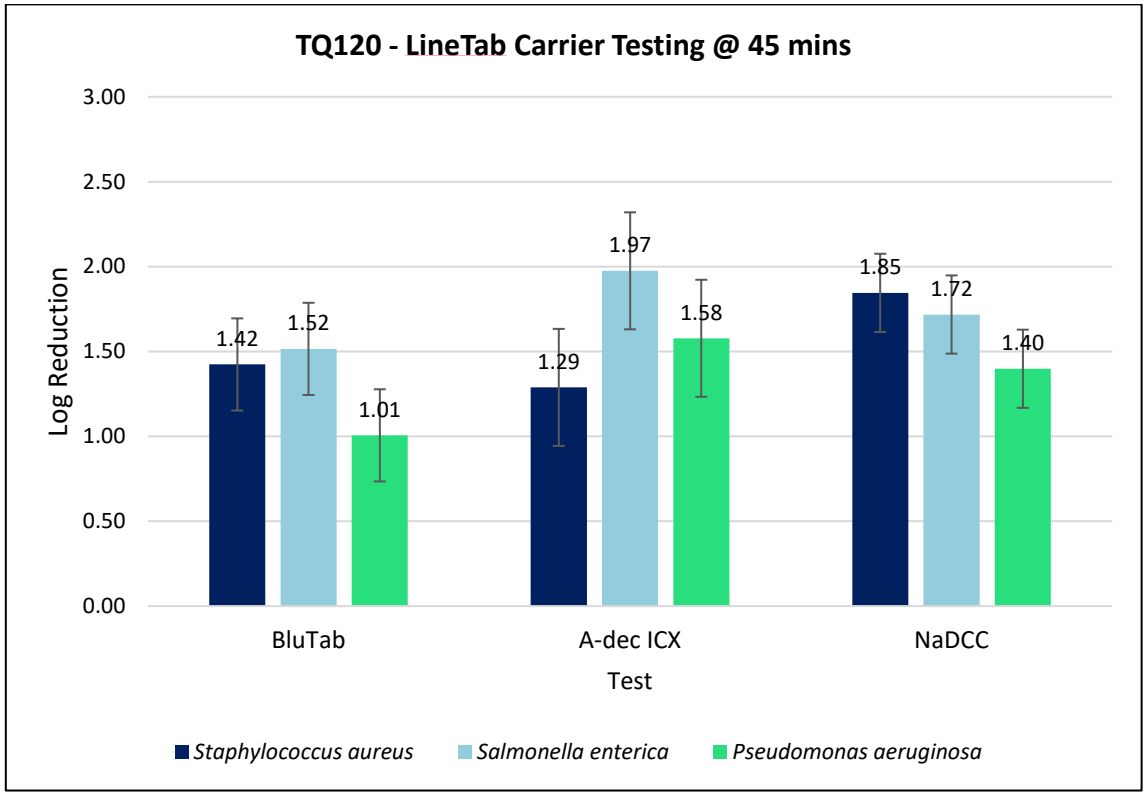

Figure 4. Carrier test data for each product at a 45-minute contact time

Figure 5. (A) A-dec ICX tablet; (B) BluTab tablet

7. DISCUSSION

7.1 Physical/Chemical Discussion:

The physical parameters of the competitor products (BluTab and A-dec ICX) were tested. BluTab exhibited an average thickness of 2.17 mm and diameter of 7.96 mm, while A-dec ICX

tablets were slightly thinner (2.21 mm) but significantly smaller in diameter (5.55 mm). NaDCC tablets were the smallest overall, with an average thickness of 1.64 mm and diameter of 4.73 mm. Similarly, the average mass of BluTab (143.42 mg) was substantially higher than A-dec ICX (81.35 mg), with NaDCC being the lightest at 49.23 mg. BluTab showed an average hardness of 16 N, whereas A-dec ICX was harder at 40 N. NaDCC had a moderate hardness of 21N. The A-dec ICX tablets appear more compressed, resulting in greater structural integrity but may also slow disintegration.

A-dec ICX demonstrated 0% friability, indicating good resistance to abrasion and low susceptibility to breakage during transportation or handling, while NaDCC exhibited only 0.4% friability. Friability testing on BluTab tablets was reduced to an average of 5 tablets rather than 10 tablets, due to some of the tablets being broken when opened. Though the friability result for BluTab was 0%, the average was based on fewer tablets, and it was clear that some had high fragility. This suggests that the tablets are more prone to damage under typical handling or transport.

Despite lower hardness, BluTab disintegrated in 2:01 min and completely dissolved in 3:39 min at 18.3°C. In contrast, A-dec ICX disintegrated more rapidly at 1:21 min and fully dissolved in 1:44 min even with a higher hardness. This may be due to a more soluble formula or a smaller tablet size leading to a larger surface area to mass ratio. BluTab's increased dissolution time is consistent with its larger mass. NaDCC disintegrated in 1:25 min and dissolved fully in 1:26 min, making it the overall fastest dissolving tablet.

There were significant differences between each competitor products in pH. BluTab produced an acidic solution at pH 3.503, whereas A-dec ICX yielded a basic solution at pH 6.404. NaDCC produced a similar basic pH to A-dec ICX at 6.601.

Tablet appearance:

A-dec ICX (Figure 5) is a white, circular, compressed tablet with a smooth, uniform surface. The colour is consistent across both the top face and the sidewall, with no visible granularity irregularities. The tablet maintains its original, unchanged appearance, suggesting it has remained stable since opening. BluTab is a dark, speckled tablet with a rough, uneven texture across its surface. This visual change indicates that the BluTab tablet has undergone a noticeable alteration in colour and surface appearance after being opened, contrasting distinctly with the stable appearance of the A-dec tablet.

7.2 Microbiological Discussion:

Suspension testing of each product was conducted at 5-minute and 60-minute contact times. After 5 minutes (Figure 1), the NaDCC tablet achieved the highest log reduction for all three strains; 1.79, 1.87 and 1.70 logs *for S. aureus, S. enterica* and *P. aeruginosa*, respectively. A-dec ICX achieved log reductions of 0.65, 0.52 and 0.30 logs, while BluTab 0.88, 1.22 and -0.53 logs for the same microorganisms. It is important to note BluTab was tested using older, weakened microbial strains, on a different week, which may have influenced the log-reduction data.

At 60 minutes (Figure 2), NaDCC remained the strongest across all strains; 4.01, 4.03 and 3.66 logs for *S. aureus, S. enterica*, and *P. aeruginosa*, respectively. A-dec ICX exhibited a slight increase but overall remained low with 1.20, 0.96 and 0.79 logs for the same microorganisms. BluTab exhibited a slight increase in logs for *S. aureus* (1.35) and *S. enterica* (1.20) but continued to perform poorly against *P. aeruginosa* (-0.36).

Carrier testing of each product was conducted at 5-minute and 45-minute contact times. After 5 minutes (Figure 3), the NaDCC tablet achieved the highest log reduction for all three strains; 1.54, 2.17, and 1.62 logs for *S. aureus*, *S. enterica*, and *P. aeruginosa*, respectively. BluTab achieved log reductions of 1.23, 1.25, and 0.75 logs, while A-dec ICX achieved 1.12, 1.37, and 1.24 logs for the same microorganisms. Overall, NaDCC displayed more consistent antimicrobial activity across all strains after 5 minutes, while competitor tablets showed reduced performance - most notably BluTab against *P. aeruginosa.*

At 45 minutes (Figure 4), NaDCC remained strongest on *S. aureus* (1.85 logs) and competitive on *S. enterica* (1.72 logs), whereas ICX showed the highest values for *S. enterica* (1.97 logs) and *P. aeruginosa* (1.58 logs). However, the integrity of the 60-minute results is limited by drying of the carriers before the full contact time elapsed. Carrier methods require the surface to remain visibly wet for the entire contact time. Once dry, the active is no longer in continuous contact, which can depress measured log reductions and introduce product specific bias (e.g. different evaporation or residue characteristics). Further investigation was carried out to determine the time a carrier can stay visibly wet while in the biosafety cabinet. This was found to be around 45 minutes.

8. CONCLUSION

BluTab had the largest and heaviest tablet, with the lowest hardness, which is reflected in it taking the longest time for disintegration and dissolution. In contrast, A-dec ICX exhibits the greatest hardness and a more compact size, with fast disintegration and dissolution times. NaDCC (LineTab), being the smallest and lightest tablet, showed moderate hardness but was the fastest to disintegrate and dissolve, consistent with its highly soluble active ingredient.

All products demonstrated strong mechanical robustness, with BluTab and A-dec ICX showing 0% friability and NaDCC remaining well within acceptable limits at 0.4%. BluTab produced an acidic solution, while A-dec ICX and NaDCC generated neutral to mildly basic solutions. These distinctions may influence compatibility with dental unit waterline materials and the intended mode of antimicrobial action.

Although the results suggest that while all three products are mechanically suitable for handling and storage, NaDCC and A-dec ICX offer faster dissolution performance and more neutral pH conditions, whereas BluTab delivers a slower-dissolving, acidic formulation.

Across both suspension and carrier testing, NaDCC consistently demonstrated the strongest and most reliable antimicrobial performance against *S. aureus*, *S. enterica*, and *P. aeruginosa* at both 5-minute, 45-minute and 60-minute contact times. A-dec ICX and BluTab showed comparatively weaker efficacy, with BluTab performing particularly poorly against *P. aeruginosa* in suspension tests. While some improvements were observed at longer contact times, neither competitor matched the consistent activity of NaDCC.

Interpretation of the 60-minute and 45-minute carrier data should clearly note variances due to the potential of drying of test surfaces before the full contact time was reached. Loss of visible wetness interrupts continuous exposure to the active ingredient, potentially suppressing log reductions. Despite this limitation, the overall trend across all experiments indicates that NaDCC provides the most dependable antimicrobial activity within the contact times relevant to real-world use.

9. FUTURE WORK

No future work required at this time.

10. APPROVAL OF REPORT

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