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## Breaking in Clarinet Reeds: Techniques and their Effectiveness

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## **ABSTRACT**

A comparison of different clarinet reed soaking methods and their effectiveness.

**Key words:** clarinet, single reeds, breaking in reeds, reed brands, humidity, single reed adjustment techniques, scraping, reed warping.

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## 1. Introduction

Reeds – problematic reeds – are a feature of every clarinettist’s life.

This is because reeds are made from a natural material, and therefore are incredibly variable. Every factor, from humidity, storage, the way a reed is prepared when taken out of its packaging, even altitude affects them.<sup>1</sup> Aside from the many brands and designs of clarinet reeds in existence – each developed to suit different performing styles – every single individual reed is also unique, and will behave differently from one person to the next, depending on their playing set up (their instrument, mouthpiece and ligature model, combined with their embouchure technique etc.).<sup>2</sup>

I remember when some time ago – in my ignorance – I used to open a box of reeds, try them all and immediately discard more than half, not knowing that one can adjust the unsuitable ones with the right equipment and knowledge. But what I now know about reed adjustment I have learned informally from all my different teachers, **each with their own, often contradictory advice**. And while there are general guidelines of how to take care of reeds, the number of variables and degree of customisation possible are overwhelming.

On top of this, when I moved from one country to another to further my musical education, I also realised that the different climates were rendering all my previous tricks useless. It was extremely frustrating to have reeds last days instead of weeks. How could I play comfortably, and achieve my full potential as a clarinettist, if I did not know how my reeds would greet me every day? While one should be prepared to perform in any sort of less than ideal situations, to be able to maximise the potential and longevity of reeds helps immensely. I decided to tackle this problem in a clear, methodical way.

Whereas there is a respectable amount of literature dedicated to the adjustment of reeds, not as much has been written about **breaking in methods**. “Breaking in” is the humidification process that reeds should go through when freshly opened from their packaging, while “reed adjustment” refers to the scraping and cutting techniques used to fix any flaws reeds might have. Every clarinettist, from David Weber in the 1920s to reed producers such as Vandoren agree that new reeds need to be “broken in” during the first days of being used until they start producing a consistent sound.<sup>3</sup> Hence, my questions:

1. Donald Jay Casadonte, “The Clarinet Reed: an introduction to its biology, chemistry, and physics” (Dissertation, Ohio State University, 1995), 5.

2. Paul Randall Stewart, “A Study and Comparison of Four Prominent Clarinet Making Methods” (Dissertation, University of Oklahoma, 2001), 1.

3. Jean-Marie Paul “David Weber: 75 Years of Clarinet,” *Vandoren Magazine* 1 (1999): 9.

## 1.1 Questions and Motivation

- Can I find a reed breaking in method that will work consistently for my mouthpiece and ligature set up and style of playing?

- Since we need to consider climate and weather when choosing a method of breaking in reeds, which would work best in my specific environment?

There are plenty of very technical articles and research conducted from a scientific viewpoint exploring these themes, for example analyzing reed material characteristics through measuring vibrations with specialized equipment etc. I have found most of these works complicated to read and understand, and with such a subjective art that is music, not very useful.<sup>4</sup> Therefore, I have made a conscious effort to be as clear and concise as possible in this text and make use of illustrations and other media to make the information as easy and visually attractive as possible.

To sum up, the purpose of this study is to methodically try out some of the different techniques I have come across, and hopefully get a better understanding about how the breaking in period affects the temperament of reeds. It is a highly personal research that will suit my own playing the most, but perhaps it will inspire other clarinetists to try experimenting more methodically and consciously as well.

4. Francisco Pérez Aranda and Jose Carlos Luján Artero, *El Ajuste de las cañas en el clarinete y el saxofón* (Madrid: Mundimúsica Ediciones, 1997), 10.

## 1.2 Method

In order to effectively study the differences of each breaking in technique, I tried to minimise the variables as much as possible. Therefore, all the experimenting is done with one specific brand and model of clarinet reed and in a stable environment. I used ten reeds for each technique.

- **Photographing the reed xylem:** I photographed the reed straight out of the package to be able to observe the xylem and determine what physical adjustments were needed.

- **Humidity Chart:** I always played in the same practice room to minimise the number of variables. Every day I measured the humidity level outdoors and indoors and map it in a chart to compare against reed experiment results.

- **Recording Analysis:** Every week I recorded myself playing an etude exploring a different articulation (staccato, legato, and a long musical study with contrasting moods) and noted the differences in quality and type of sound, the quality and ease of articulation, ease of breathing and phrasing. I graded each of these aspects to give the reed a "score" which I could then contrast between methods. **Note:** every recording was done in one take, regardless of mistakes.

- **Reed Survey:** I conducted a small survey at a well-known online clarinet forum, asking about clarinet reed preparation habits and tips, as well as the climate players live in. I then analysed the data gathered from the thirty-eight participants to discuss further.

## 2. The Clarinet Reed

### 2.1 Arundo Donax



Figure 1. *Arundo Donax* plantation, and Figure 2. *Arundo Donax* cane being dried in the fields.

Clarinet reeds are traditionally made from a species of reed grass called *Arundo Donax*, thought to be originally from the Mediterranean Basin and parts of East Asia but which has been successfully naturalized in various parts of the world. Its use in music can be traced back almost 5000 years.<sup>5</sup>

*Arundo Donax* is a rather special material because of its characteristics: it is strong and flexible, and when bent, it recovers its original shape quickly.<sup>6</sup> The Var region in Southern France is the most well-known source of high quality *Arundo Donax*, where the dry and stable climate, soil properties and strong western wind called the Mistral provide the ideal environment for reed cane plants to develop this necessary flexibility, according to the growers.<sup>7</sup> The cane is cut and harvested in winter, when the plant is dormant, and then dried carefully over a long period (Figure 2).<sup>8</sup>

5. Robert E. Perdue, "Arundo Donax: Source of Musical Reeds and Industrial Cellulose," *Economic Botany* 12 (1958), 368-404.

6. Marilyn S. Veselack, "Arundo Donax: The Source of Natural Woodwind Reed" (seminar presentation at the conference of the International Double Reed Society, Los Angeles, 1995).

7. David Kattenburg, "Sound of Music," October 2016, <https://www.greenplanetmonitor.net/arts-culture/music-reeds>.

8. "Production: The Reed of the Var," <http://www.donati-reeds.com>.

## 2.2 Reed Making and Anatomy

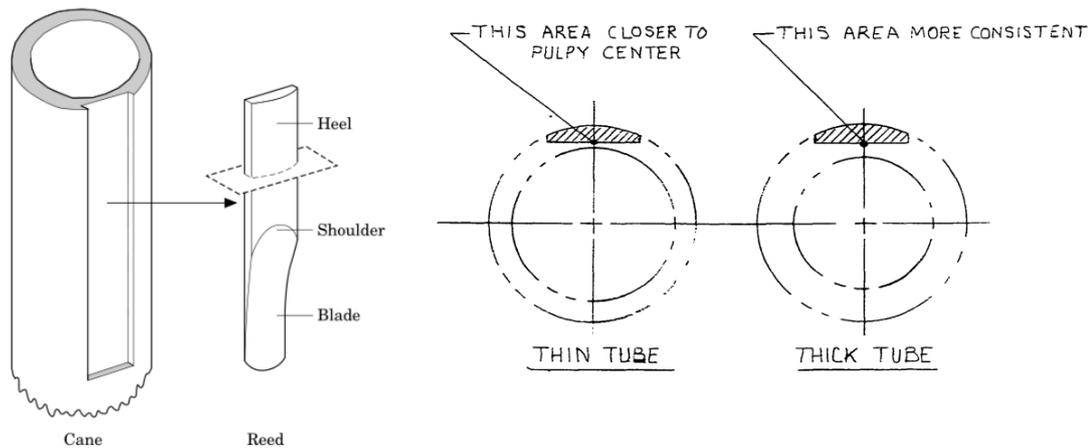


Figure 3. From cane into clarinet reed, and Figure 4. Ideal reed material in *Arundo Donax* cane.

Once a reed has completed the lengthy drying and selection process, it is cut into small tubes, and from there split and shaped into the clarinet reed as we know it (Figure 3). The area closest to the bark of the cane is much denser than the center, making it the ideal material for making quality reeds, as it is more consistent throughout (Figure 4).<sup>9</sup>

Reeds are then categorized by their thickness, and given a numbered grading, one being the softest and five the hardest.<sup>10</sup> The vamp and heart areas of the reed blade (Figure 5) keep it from opening against the force of the player's lower lip, and the strength and density of these is thought to determine the musical quality of a reed.<sup>11</sup> In very basic terms, this means that the thicker (stronger) the reed, the more difficult it is to produce a sound, as it will need more air pressure from the clarinetist to make it vibrate, but the more beautiful and stable the sound will be. If a reed is too hard however, and the resistance too high to overcome, it can cause the player to bite to be able to produce a sound.<sup>12</sup> Beginner clarinetists usually start playing with the softest reeds and level up as they gain experience, till they reach their ideal balance between ease of playing and control.

I will not cover the entire reed making and adjustment process as there are many excellent resources available freely for anyone to read further about it, such as *Selection, Adjustment, & Care Of Single Reeds* by Larry Guy or *Reed Making Method* by Douglas Monroe, which will be listed in the bibliography. As a clarinetist I recommend getting familiar with these methods as they are indispensable for understanding the temperament of reeds.

9. Randall Stewart, "Four Clarinet Making Methods," 24.

10. Victoria Williams, "Arundo Donax – The Science of Choosing a Clarinet Reed," <http://streetdirectory.com/etoday/arundo-donaxthe-science-of-choosing-a-clarinet-reed-ullawc.html>.

11. Eiichi Obataya and M. Norimoto, "Acoustic properties of a reed (*Arundo donax* L.) used for the vibrating plate of a clarinet," *The Journal of the Acoustical Society of America* (August 1999): 1108.

12. William A. Foss, "The Selection, Break-In and Care of Single Reeds," 2003, <http://sunscales.myzen.co.uk/Documents>.

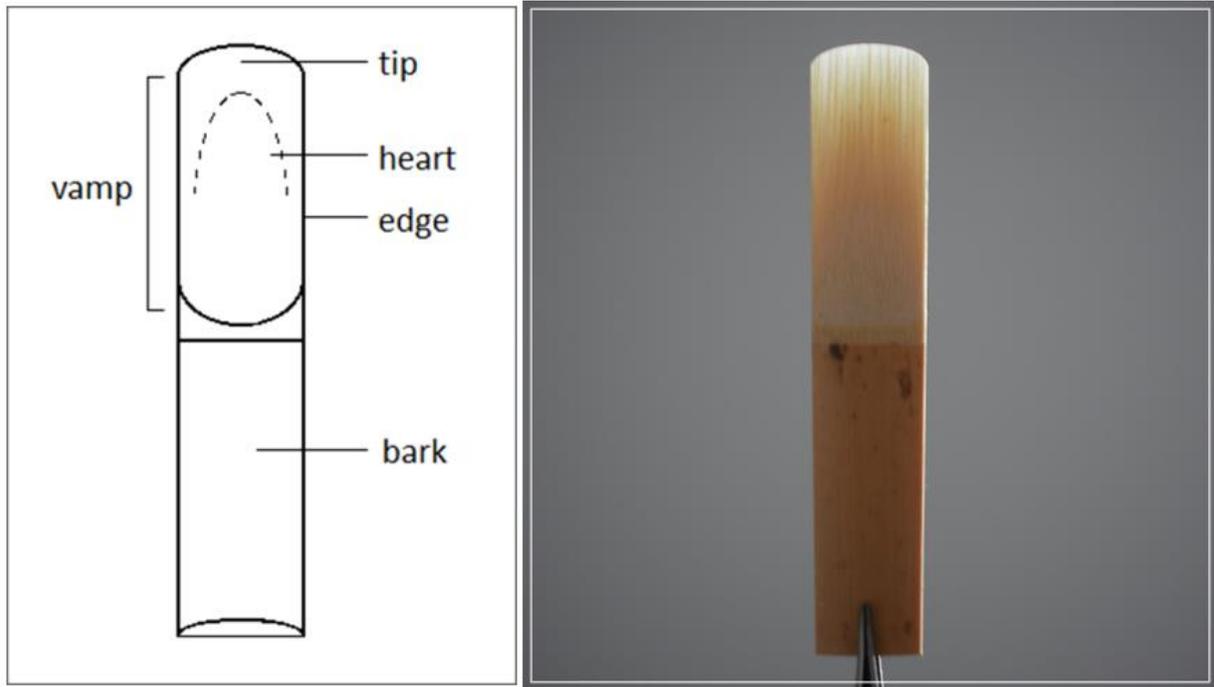


Figure 5. Reed anatomy, and Figure 6. A Vandoren V12 reed and its visible xylem.

### 2.2.1 Xylem

The xylem are part of the circulatory system in a plant, transporting water and dissolved minerals from the roots to the stems.<sup>13</sup> If you hold a clarinet reed to the light, these tiny vertical fibers are visible to the eye (Figure 6). Xylem do not stop being functional when the cane is dried and turned into reeds and are indeed essential to the musical quality of these, since clarinet reeds are only efficient when they are wet or have soaked up some moisture.<sup>14</sup>

Xylem can take in water partially thanks to hydrophilic, or water-absorbing molecules called hemicelluloses.<sup>15</sup> However, hemicelluloses are vulnerable to enzymes in our saliva that degrade them, and hence, when we play we cause a slow breaking down of the xylem structure that eventually wears the reed out.<sup>16</sup> Breaking in reeds is extremely important to reduce this effect, which we will discuss further in the next chapters (Breaking in Clarinet Reeds, p.14).

13. "The Organisation of the Plant Body," University of California, last modified 2013, retrieved from <http://www-plb.ucdavis.edu/courses/bis/1c/text/Chapter4nf.pdf>.

14. Peter Kolesik, Alan Mills and M. Sedgley, "Anatomical Characteristics Affecting the Musical Performance of Clarinet Reeds Made from *Arundo donax* L. (Gramineae)," *Annals of Botany* 81: 151-155 (1998): 154.

15. Casadonte, "The Clarinet Reed," 169.

16. Casadonte, "The Clarinet Reed," 169.

### 2.2.2 Reed Warping and Prevention

Reed warping is a serious issue and happens when a clarinet reed dries unevenly after being used, as xylem will all dry at different rates depending on their density.<sup>17</sup> As the moisture evaporates and the reed shrinks, the less dense areas (at the tip) dry faster than the thicker bark base.<sup>18</sup> This causes the vamp to develop a wavy shape that renders the reed unusable, as it cannot vibrate properly against the mouthpiece.



*Figure 7. A warped reed*

To prevent warping, reeds should always lie and be stored in a flat and smooth surface such as glass, or a mirror as a preventative measure. It is also important not to let the lower half of the reed, or bark, absorb any moisture when soaking the reeds to stabilize the more delicate vamp.<sup>19</sup> Fixing a warped reed is often impossible, since it requires physically altering the reed to restore its original shape. If the warping is confined to the tip, wetting it and pressing it down with the fingers to “iron” it flat again can be a quick fix. Serious warping issues however can only be partially corrected by sanding the back of the reed after playing, while taking care of not removing too much material away when doing so.<sup>20</sup> Even so the reed will not last very long or be as good, so it is best to prevent it from happening at all.

### 2.2.3 Reed Aging

Reed aging refers to opening the clarinet reeds from their package and storing them in a stable environment for several months before use, and is a method mostly mentioned by clarinetists who specialize in making their own reeds from scratch (as opposed to purchasing them). Reed aging is supposed to help making reeds softer and more consistent

17. “Clarinet Reed Help: Warping,” <https://reedhelp.wordpress.com/tutorials/warping>.

18. Ryan Fraser, “How to Fix Warped Reeds,” <http://www.ryanfraser.com/lessons/start/warpedreeds.html>.

19. Ed Palanker, “Breaking in New Reeds,” <http://test.woodwind.org/clarinet/BBoard/read.html?f=1&i=362459&t=362343>.

20. Fraser, “Warped Reeds.”

in quality.<sup>21</sup> Since it was mentioned informally across several sites, I decided to include it in my experimenting to see if I also experienced similar results.

### 2.3 What makes a musically good reed?

*“A good reed should be flexible, comfortable to play with, not break down in the middle of a performance, last two or three weeks of use at least.”*<sup>22</sup>

While the individual characteristics of the clarinet reeds favoured will vary from player to player, three general things we look for in our reeds are comfort, flexibility, and durability. However, since the definition of these aspects is rather vague, and a more music specific vocabulary is needed to be able to analyse our reeds further, I have used five characteristics described by Obataya and Norimoto to study each reed, that I personally interpret thus:<sup>23</sup>

- **Sonority** (Resonance): the resonance or ‘wideness’ of a reed. A reed must be able to project and fill a large performance space but still maintain focus and direction.
- **Richness** (Quality of Sound): the quality and beauty of the sound produced, as affected by the harmonics above. I like dark, velvety sounds on the clarinet, but there should be enough flexibility to be able to make angry, or bright sounds too if required.
- **Softness of tone** (Dynamic Range): the ability to play a soft, piano sound without fuzziness or the reed buzzing.
- **Ease of vibration** (Resistance): how easy it is to produce a sound through the reed. A balance is needed between too soft, which lacks control and will produce a poor sound, and a reed so hard it is a struggle to make vibrate.
- **Response** (Articulation): similar to “ease of vibration” but referring to the ability of articulating (staccato etc.) clearly, and without limiting your speed as a player.

Since it is hard to rate these characteristics numerically, I have chosen to use just three more general grades (A, B, and C) to describe each characteristic in every reed, as seen in Appendix A (Individual Reed Data, p.27).

- **A**: means good, comfortable, flexible, beautiful.
- **B**: means something is problematic but not impossible to work with.
- **C**: means bad, uncomfortable, difficult, ugly, flat.

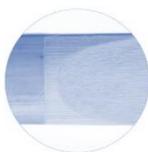
21. Palanker, “Breaking in New Reeds.”

22. Aranda, *El Ajuste de las cañas*, 12.

23. Obataya, “Acoustic properties of a reed,” 1106-1107.

### French Filed Cut

Reeds with a file cut or "double cut" have an extra strip of the bark removed in a straight line, just below the vamp area. This allows for extra flexibility and a fast response.



### American Un-filed Cut

A 'regular' or unfiled cut, sometimes referred to as "single cut," helps produce a powerful tone

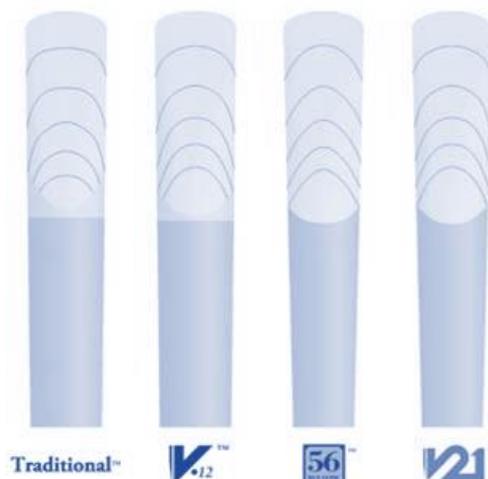
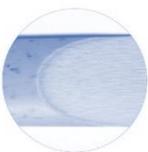


Figure 8. French vs American cut, and Figure 9. Vandoren Reed comparison guide.

## 2.4 A brief description of my playing set up

I grew up playing with Vandoren reeds on Buffet Crampon clarinets, a very standard combination in Europe. I have always been more comfortable with RC (conical) bore clarinets, so I played on a Buffet RC clarinet couple (Bb and A) for several years until I eventually replaced the Bb clarinet with a modified Buffet Divine model. The mouthpiece I grew up with was the Vandoren B40, but recently and thanks to my teacher Urban Claesson, I own a handmade asymmetrical, long-faced mouthpiece by James M. Pyne (Bc/Pk model).

Personally, I have always favoured reeds that aren't too soft. I like a reed that feels secure and sturdy, because I usually have problems with my breathing support when experiencing performance anxiety and having a good resistance that I can "sit" comfortably on top of gives me more control. I also dislike using thin or bright reeds, having developed towards a dark, round quality of sound over the years.

While I have experimented with other brands, I always find myself gravitating back towards Vandoren, specifically the V12 model. The Vandoren V12 is a reed that is cut from larger cane tubes usually used for alto saxophone reeds. They are filed (Figure 7) with a medium heel and longer blade, and produce a deeper, richer sound, since more of the reed surface is vibrating when playing (Figure 8).<sup>24</sup> As described by Wonka Kim, "the V12 reeds have a very strong core that enables great focus, direct response, and intensity in sound. When the reed is well balanced, it allows both full projection and subtle responses."<sup>25</sup> I have fluctuated between strengths, going from the moderately soft 3 to the personally impossible to handle 4, and currently I am most comfortable with the 3.5+ strength at present.

24. "Vandoren V12," <https://vandoren.fr/en/vandoren-reeds/v%E2%80%A212-bb-clarinet-reeds>.

25. Kim Wonka, "The Latest from Vandoren – A Look at Vandoren V21," 2014, <http://www.wonkak.com/blog/2014/12/18/the-latest-from-vandoren-my-first-look-at-v21>.

### 3. Breaking in Clarinet Reeds

As mentioned before (Xylem, p.10), the lifetime of a reed will depend on how long it takes for the internal xylem break down, and so the way we prepare reeds when using them will directly affect their lifespan and effectiveness when playing.<sup>26</sup>

Because reeds only work when they are humidified, the first thing a clarinetist must do when playing is to moisten their chosen reed in preparation. Reeds will go from a wet to dry state over and over during their lifetime, and it is extremely important to take care of how this humidification and drying occurs, especially to prevent warping (discussed further below).<sup>27</sup> The most common ways to moisten a reed is either with saliva or water, although more exotic liquids, such as oil and coffee have been experimented with as well.<sup>28</sup>

There are many methods detailed in different reed making manuals, such as Larry Guy's *Selection, Adjustment and Care of Single Reeds* or *El Ajuste de las cañas en el clarinete y el saxofón* ('The adjustment of clarinet and saxophone reeds') by Francisco Pérez and Jose Carlos Luján Artero which I grew up with, as well as multiple articles and videos online, and of course the knowledge gathered informally from my various teachers over the years. The general differences in these methods are:

- The period of breaking in.
- The duration of the soaking or wetting.
- Using either saliva or water, and most interestingly, the temperature of the water.
- Using reeds straight from the packaging versus aging.

26. Paul, "David Weber," 9.

27. Paul, "David Weber," 9.

28. "What would happen if you soaked reeds in coffee to make them taste better?," <https://forum.saxontheweb.net/archive/index.php/t-11883.html>.

Since I needed to reduce the number of variables, I selected the ones that would answer the questions I was most curious about: is saliva really that damaging to reeds and xylem? Will the water temperature make a significant difference? Would soaking the reeds (as opposed to briefly wetting) as double reed instrumentalists do be beneficial?

### 3.2 Breaking in Method Comparison Table

	Aging (Y/N)	Soaking Method	Water Temperature	
Control Group	N	Wet briefly with saliva.	n/a	Standard method.
Group A	N	Wet briefly with water.	Cold.	
Group B	Y (6 months)	Soak for 2-3min in water.	Cold.	Reed aging as recommended by reed makers.
Group C	N	Wet briefly with water.	Warm.	As taught to me by Urban C.
Group D	N	Soak for 2-3min with water.	Warm.	

- **Control Group:** The first ten reeds will be my “control” group, where I will do as I did while growing up in music school and use the reed with no special routine. I will be humidifying the reeds only using saliva and make no special adjustments, and it will serve as the comparison base with the following methods.
- In **Group A and B**, I will be wetting/soaking the reeds with cold water, which is supposed to stiffen and harden reeds. Group B is the only group in which I will be using reeds that were opened and left to age for six months prior to this experiment.
- In **Group C and D**, I will be wetting/soaking the reeds with warm water, as taught to me by my teacher Urban Claesson. Since he has extensive experience in playing in the climate, we currently live in I am expecting the best results from this method.

## 4. Reed Survey

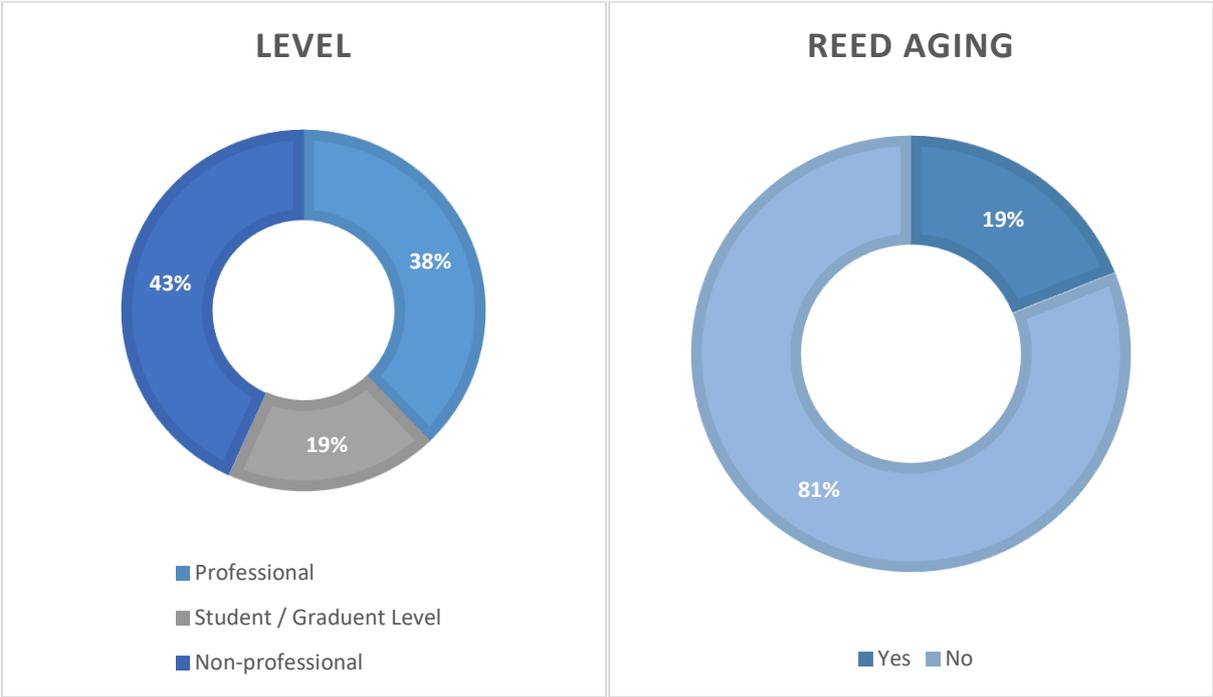
Clarinetists across the world will have different experiences and knowledge that differs to my own when it comes to preparing reeds. I decided to conduct a small survey asking about other people's routine and tips they might have to share. Ideally, I wanted participants to be as varied as possible and from across the world, instead of concentrated in a small area around me, so I decided to conduct the survey online via the Clarinet Bboard. This is a well-known forum where professional and student clarinetist post about different topics relating to the instrument. Thirty-eight clarinetists participated in this survey.

The results are presented in charts for easy understanding of the answer percentage, and I have also attempted to draw some conclusions where people in the same areas offered the same type of advice, for example.

### 4.1 Questionnaire

1. Do you play clarinet for a living?
2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?
3. What is your favorite reed brand?
4. Do you age your reeds?
5. How do you humidify your reeds?
6. How long do you usually break in reeds for?
7. Do you adjust your reeds after breaking them in?
8. Please describe your personal reed breaking in technique.

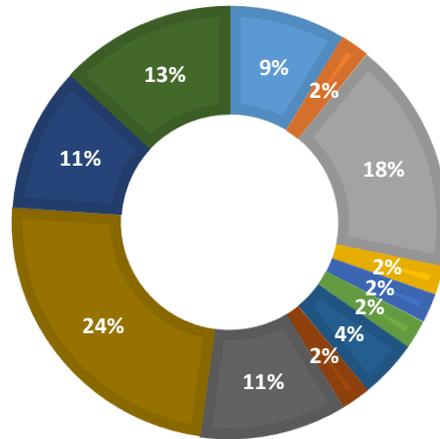
4.2 Survey Results and Analysis



Most participants were students and professional players. The more complicated breaking in and adjustment advice came, as is to be expected, from professional players, while students preferred to 'keep it simple'.

Reed aging is rare, which is expected as it is a technique mostly used by professionals who make their own reeds from scratch. Most people purchase reeds to use immediately.

## REED BRANDS



- Behn Aria
- D'Addario Reserve
- D'Addario Reserve Classic
- Marca
- Pilgerstofer
- Peter Leuthner
- Steuer
- Steuer Exclusive
- Vandoren Traditional
- Vandoren V12
- Vandoren V21
- Vandoren Rue Lepic 56

Vandoren V12 was the most popular reed followed closely by D'Addario Reserve Classic, both of which share very similar characteristics (they both feature a long vamp, a rounded square tip and thicker material) indicating that the current ideal sound is not as polarised as one might imagine. The next three most popular reed models were all from Vandoren (Lepic 56, V21 and Traditional, in that order).

World map of Köppen-Geiger climate classification

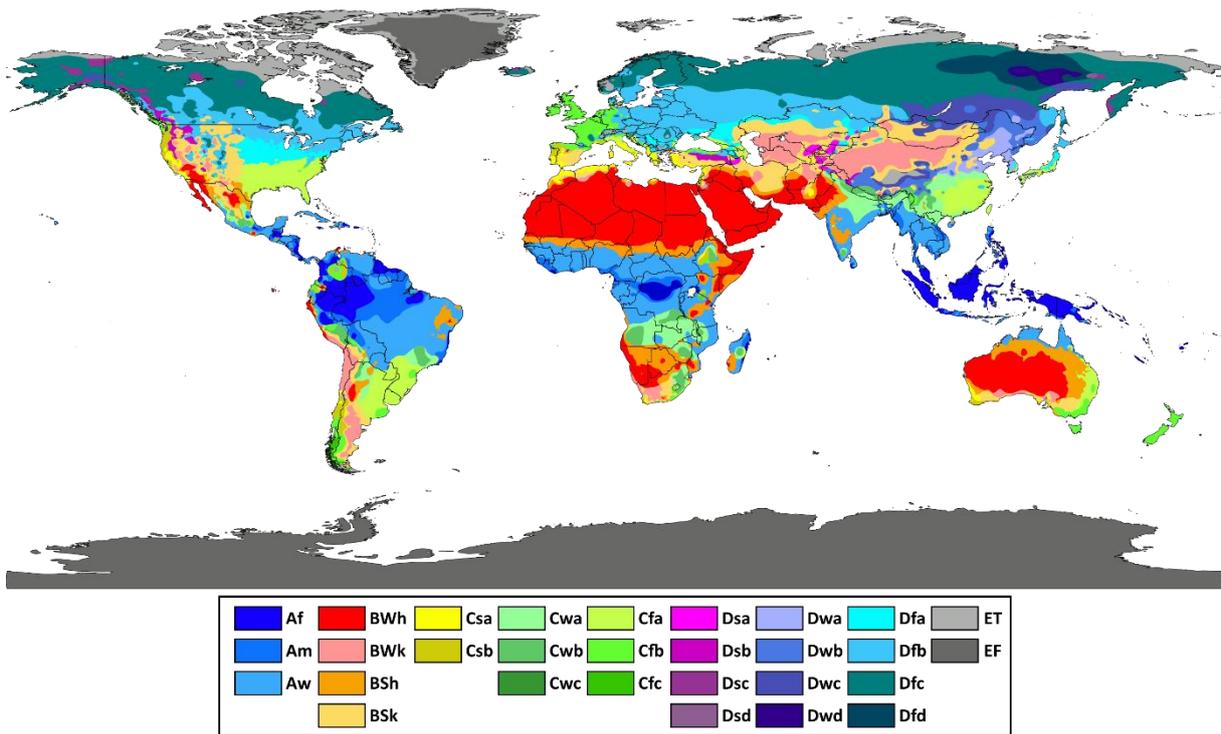
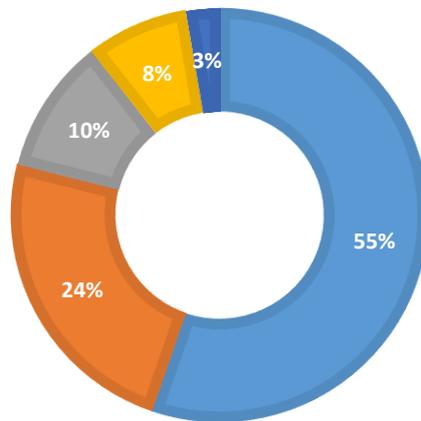


Figure 10. Köpper Climate Classification map.

Since the number of participants was not too high and most did not indicate their region, not much can be said about the climate data other than that it would be interesting to take this part of the survey further and research different methods across the globe, and see how clarinetists have adapted to suit the challenges of their particular countries. For example, players living in more extreme climates (dry, and in high altitude) recommended discarding the usual advice and simplifying the breaking in process, as well as taking a half step up in reed strength. Participants from each climate regions had the following answers in common:

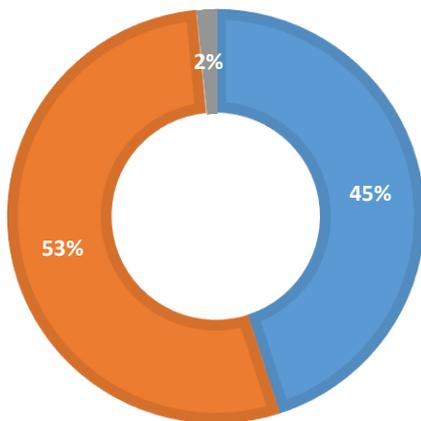
- **Am** (Tropical Monsoon): wet with saliva, short breaking in period, Vandoren.
- **Aw** (Tropical Wet and Dry): wet with saliva, short breaking in period, Behn Aria and Vandoren.
- **BWh** (Hot Desert): wet with saliva, long breaking in period, D’Addario.
- **Csa** (Hot Summer Mediterranean): wet with saliva, short breaking in period, D’Addario.
- **Cwc** (Cold Subtropical Highland): wet with saliva, short breaking in period, Vandoren.
- **Cfa** (Humid Subtropical): wet with saliva, long breaking in period, Vandoren.
- **Cfb** (Temperate Oceanic): wet with saliva, long breaking in period, D’Addario.
- **Dfa** (Hot Summer Humid Continental): wet with cold water, short breaking in period, D’Addario and Vandoren.
- **Dfb** (Warm Summer Humid Continental): wet with saliva/cold water, long breaking in period, D’Addario and Vandoren, and all mentioned sanding techniques.

### HUMIDIFYING YOUR REEDS



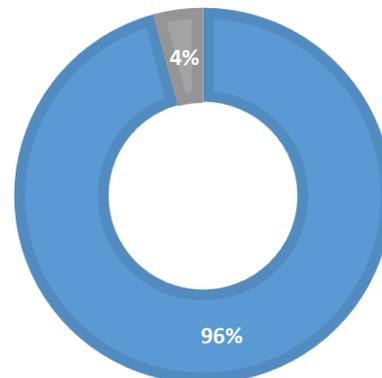
■ I just use saliva ■ Wet in cold water ■ Soak in cold water ■ Wet in warm water ■ Soak in warm water

### BREAKING IN PERIOD



■ Less than 5 days ■ 5-10 days ■ More than 10 days

### DO YOU ADJUST YOUR REEDS?



■ Yes ■ No

Most students, as well as clarinetists living in more extreme climates, use saliva and a simple, straight-forward breaking in method.

Most of the professional clarinetists describing adjustment techniques that involved sanding and flattening the reed (commonly used to prevent or fix reed warping) after playing used saliva to wet their reeds and a longer breaking in period than the participants using water to wet or soak their reeds. Most players do not use warm water, which interestingly is the method I will find the most effective of them all, as seen in the conclusion (Results, p.21).

## 5. Results and Conclusion

### 5.1 Results

I have included all the data, photographs and recordings from the twenty-one-day experiment in Appendix A (Reed Clarinet Data, p.26). Following the method described in the introduction of this thesis, I have reached some small and yet significant conclusions.

After the initial breaking in period of five to ten days, most reeds reached their peak at the seven to twelve-day mark and started breaking down by the twentieth.

I had the best results with **Group C** (wetting with warm water), as predicted, since it was part of a method described to me by an experienced professional player in the same environment as myself, but it was good to confirm this to be the case. Group C had the longest life average (I am still using them to practice after the theoretical life span of a reed) and the most consistency throughout the entire process. Despite struggling with their hardness in the beginning, they quickly became very comfortable to play with, and I felt I could play beautifully with them. When practicing, I knew I could rely on any of the C reeds even if I chose at random, and that is a very important objective to achieve.

**Group B** reached their playing “peak” around two to three days earlier than the rest of the groups, and as described by clarinet reed makers, they were indeed on the softer side when compared to the other groups. Unfortunately, this made them unusable for me as I rely on a sturdier reed to be in control of my sound. As one can hear in the recordings, I struggle to maintain a constant, secure air flow through the phrases. However, I can conclude that the few clarinetists that shared this method were correct about the results and that it may be worth aging a few reeds in case one needs reeds that can be readied quickly. Out of all groups they were the ones with the most beautiful and consistent sound quality. I think I could experiment with purchasing a higher strength reed and use this method to compensate on how soft they became, as I did prefer them sound-wise to Group C.

Surprisingly, the third-best group was the **Control reed group** (wetting with saliva only) which somewhat reflects the survey results while contradicting the common statement about saliva affecting xylem negatively. I am not sure why the theoretical and practical differ in this case, and it would be interesting to be able to research further to reach a definite answer, perhaps by photographing reeds that have been moistened with saliva on different days to compare the xylem degradation for example.

**Group A** (wetting with cold water) were generally very hard and difficult to do anything with, and I quickly came to dislike them and used them little outside of the experiment.

**Group D** (soaking with warm water) suffered serious issues with warping almost immediately and were difficult to rescue even by sanding down, and I can confidently conclude that (in my experience) soaking reeds for longer than a minute does not achieve good results, and that it often kills the reed before its potential is achieved. I ended up discarding most of the reeds from this group as impossible to play with.

I think the experiment has answered my questions at the beginning fully:

- Can I find a reed breaking in method that will work consistently for my mouthpiece and ligature set up and style of playing?
- Since we need to consider climate and weather when choosing a method of breaking in reeds, which would work best in my specific environment?

In the specific climate where I currently live (Dfb, or Warm Summer Humid Continental), a short breaking in method of around five days, wetting the reeds in room temperature or warm water is the best to reach the maximum potential of single reeds.

## 5.2 Conclusion

As we have seen throughout this work, reeds directly affect the quality of a clarinet as an instrument, influencing the ability of a player to perform. When I first moved to my current city, which has a very particular climate with rapidly changing humidity levels, I found that none of my reeds were lasting or functioning as usual. This immediately impacted my skills as a clarinettist and as an artist. Consistency gives one stability, and the confidence needed to play and make music. Without it, my self-assurance on stage was shaken to the core, as I could not communicate effectively to the audience. It was very important for me to find a solution to this problem and retake control.

By experimenting with the methods shown in this thesis I arrived at a very satisfying result. Despite the “one take” recordings, there is a stark difference between the ones made with a bad reed (Reed D5) and with a good reed (Reed C1): not only are the technical aspects suddenly possible (such as legato, big interval jumps etc.), **one can suddenly hear my voice coming through**. By finally finding a method that worked for my reeds, I was able to explore further, and go to greater artistic lengths in my daily playing, in rehearsals and orchestral projects. Eventually I found myself being able to play with more nuance, explore different colours in tone, small, subtler parts of the language of the instrument one must master to be able to do art with their music. I feel that this thesis **has helped me fix a very fundamental problem** and now I have the opportunity to work at a further level.

### 5.3 Further research

I had initially planned to experiment with different models of Vandoren reeds, even with different brands of reeds such as D’Addario for example, but it would have been difficult in the span of a master thesis to be able to really research across every model in the level of detail and depth it deserves. It would be interesting to do this in the future and compare results with the Vandoren V12 I used this time.

Also, if I were to conduct this thesis again, I would probably concentrate on analysing a single method at a time. It was difficult to balance a normal performer life, with rehearsals and practice targets and obligations with the amount of dedicated practice I needed to do just to be able to compare each reed in detail. I think using just one method at a time would have given me a better understanding of what was happening to the reeds and made it easier to have a more in-depth practice diary and more varied recordings. I would have also recorded each reed in the first, tenth and twenty first day to make following their upwards and downwards trajectory possible by listening and compare the reed “grades” against the humidity and temperature levels, to see if there was any link between.

How climate, humidity and altitude affect reeds should be explored further. I found the results of the survey fascinating, and it would have been amazing to be able to gather even more data, from professionals across the world. Also, since I made the climate question optional it was impossible to know the context in which most of the individual answers were given in. Conducting a survey with more time and sent to different sites and universities and established orchestras to gather more participants would show in a clearer way any correlation there may or may not be between different clarinet reed methods and techniques clarinettists might have adopted to tackle the problems of their regions. There is a lot of information thrown casually in online forums and personal blogs, and there should be some effort to gather this information and present it in a more formal way, to make it available to every clarinettist now and in the future.

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## 7. Illustrations

- **Cover:** "Donati Arundo Donax plantation" (Online Image). Retrieved 2019-02-12 from <http://www.donati-reeds.com/en>.

- **Figure 1.** "Arundo Donax" (Online Image). Retrieved 2019-02-18 from [https://commons.wikimedia.org/wiki/File:Arundo\\_donax\\_CBMen\\_1.jpg](https://commons.wikimedia.org/wiki/File:Arundo_donax_CBMen_1.jpg).

- **Figure 2.** "Arundo Donax drying" (Online Image). Retrieved 2019-02-26 from <http://www.donati-reeds.com/en>.

- **Figure 3.** Kolesik, Peter, Alan Mills and Margaret Sedgley, "Anatomical Characteristics Affecting the Musical Performance of Clarinet Reeds Made from Arundo donax L. (Gramineae)." *Annals of Botany* 81: 151-155, 1998.

- **Figure 4.** Randall Stewart, Paul. "A Study and Comparison of Four Prominent Clarinet Making Methods." Dissertation, University of Oklahoma, 2001.

- **Figure 5.** "Reed Anatomy" (Online Image). Retrieved 2019-02-14 from <https://clarinetandflute.com/blogs/news/vandoren-which-reed>.

- **Figure 6.** Fernandez-Bhogal, Naira. "Vandoren V12 and is visible xylem." 2019.

- **Figure 7.** "Reed Warping" (Online Image). Retrieved 2019-03-12 from <http://www.ryanfraser.com/lessons/start/warpedreeds.html>.

- **Figure 8.** "French vs American cut" (Online Image). Retrieved 2019-02-28 from <http://ricoreeds.blogspot.com/2009/03/filed-vs-unfiled.html>.

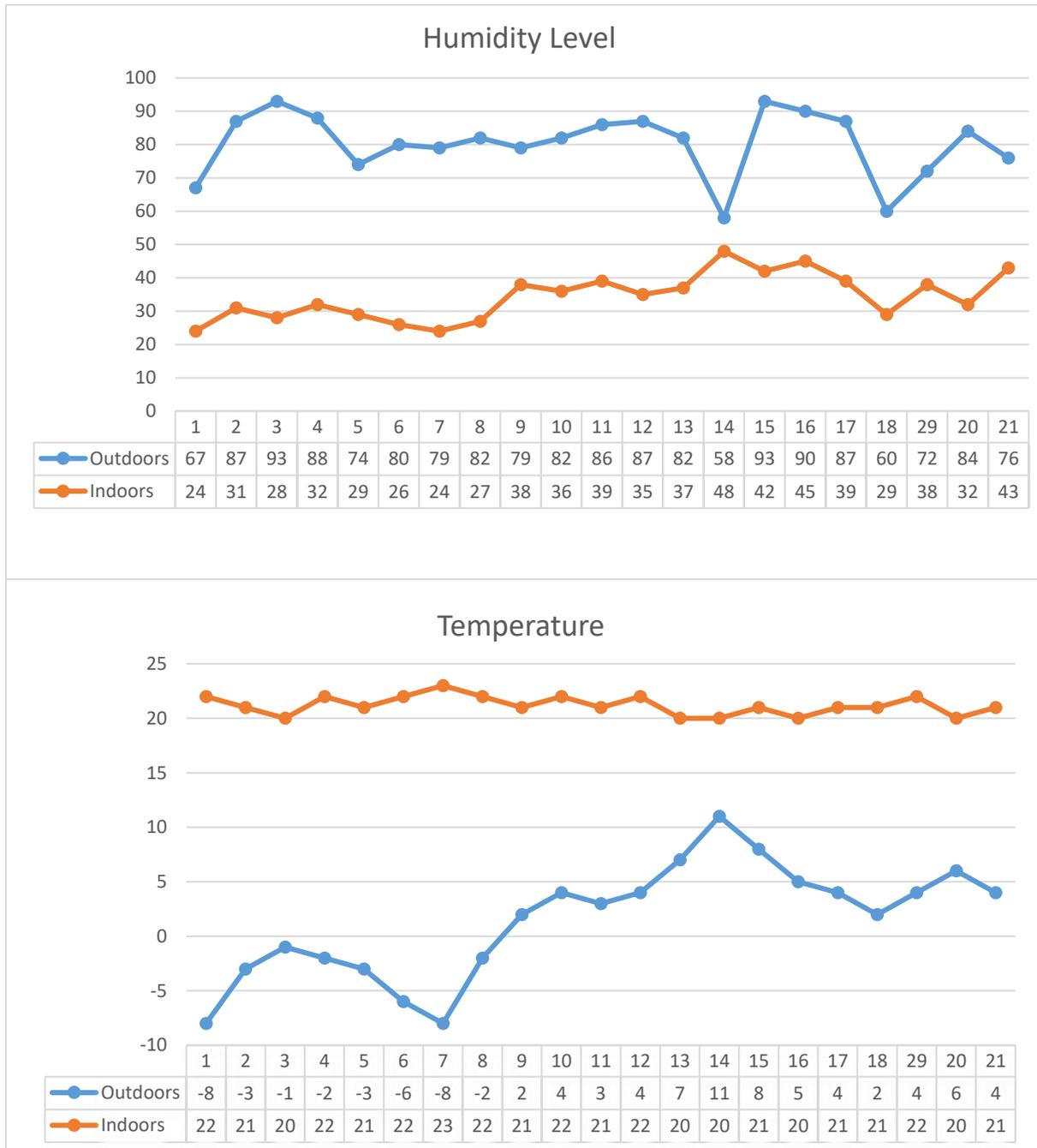
- **Figure 9.** "Vandoren Reed Guide" (Online Image). Retrieved 2019-03-04 from <http://news.paigesmusic.com/wp-content/uploads/2017/05/vandoren-clarinet-reed-guide.jpg>.

- **Figure 10.** "Köppen Climate Classification" (Online Image). Retrieved 2019-03-17 from [https://en.wikipedia.org/wiki/K%C3%B6ppen\\_climate\\_classification#/media/File:K%C3%B6ppen-Geiger\\_Climate\\_Classification\\_Map.png](https://en.wikipedia.org/wiki/K%C3%B6ppen_climate_classification#/media/File:K%C3%B6ppen-Geiger_Climate_Classification_Map.png).

## 8. Appendix A: Clarinet Reed Data

### 8.1 Humidity and Temperature Chart

Daily humidity level (outdoors and indoors) and temperature during the experiment.



## 8.2 Individual Reed Data

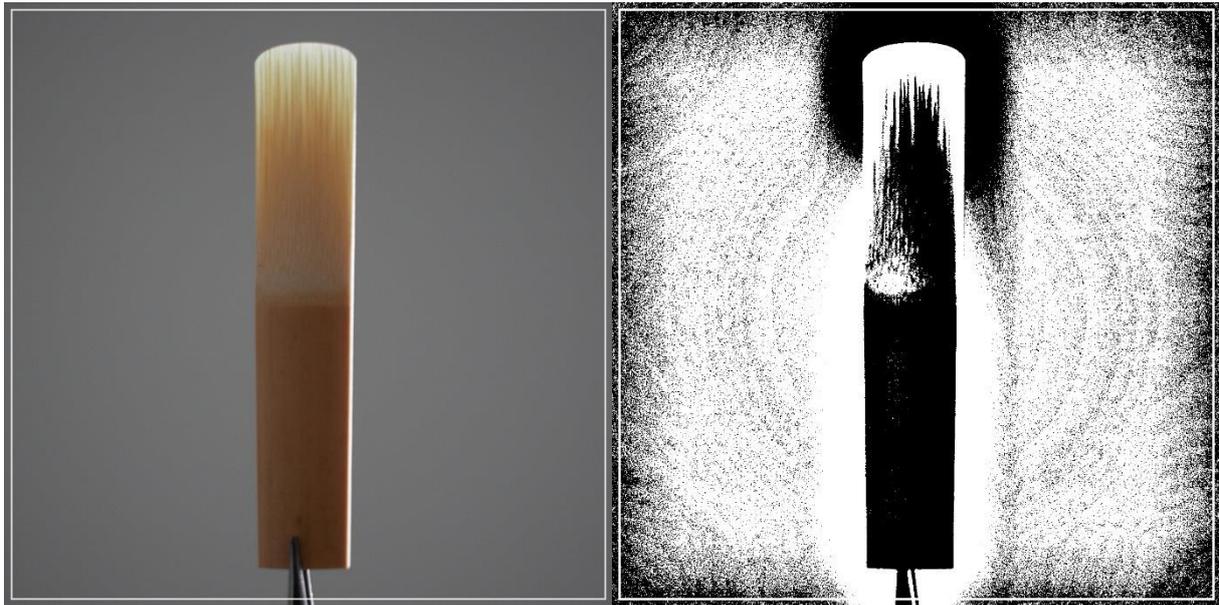
Each reed has a dedicated sheet.

The first photograph is the reed photographed straight out of the packaging and held against natural light to make the xylem and the heart visible. The second image is the same photograph, with a simple threshold filter applied to contrast the heart shape and how different every single reed is to one another.

Next is the table describing the five different reed characteristics (resonance, sound quality, dynamic range, resistance and articulation) and their respective scores on Day 1, 5 and 10 of the experiment. Then I have described each of those characteristics a bit further.

Lastly the recording for said reed is easily found by the matching file name.

## Control 1

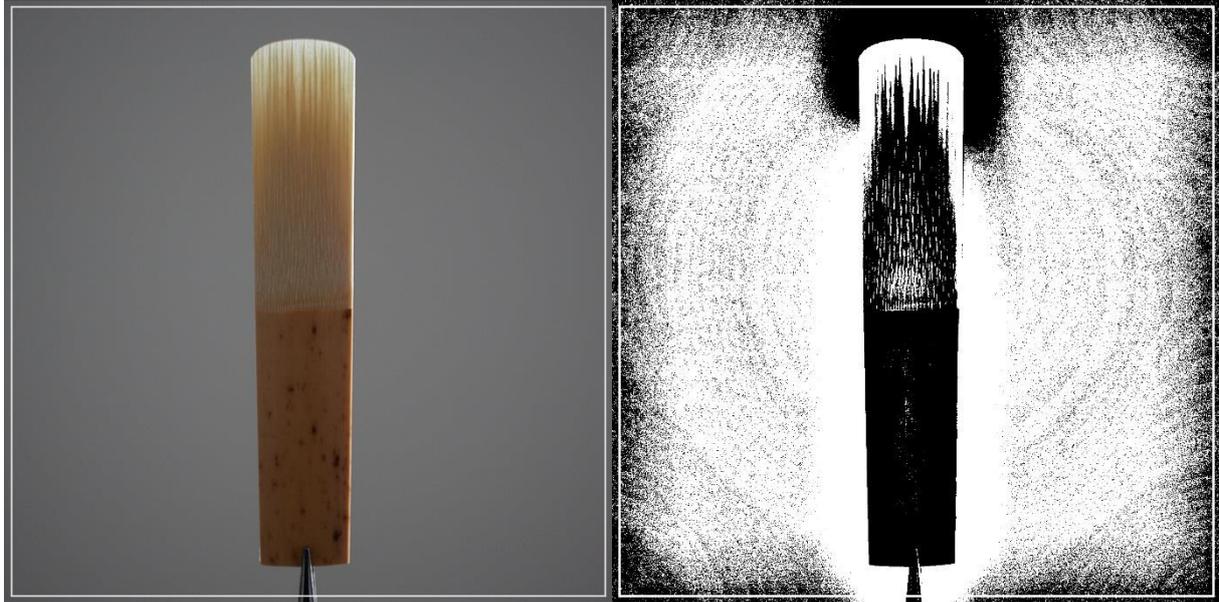


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	C	C	C	C
<b>Day 5</b>	A	B	B	A	B
<b>Day 10</b>	C	C	C	B	B

<b>Resonance</b>	Fuzzy, damp and a lack of resonance. Find it hard to be in tune because of the pressure needed to make a sound.
<b>Sound Quality</b>	A bit honky and harsh sounding.
<b>Dynamic Range</b>	Hard to make different and nuanced dynamics.
<b>Resistance</b>	Very hard to play and extremely taxing on my embouchure at first, but soon the reed was too easy to play with.
<b>Articulation</b>	Almost impossible to articulate clearly across the range.
<b>Low/Mid/High register:</b>	Lower register sounds a bit honky.
<b>Other:</b>	The quick breaking indicated this reed would not have a long lifespan.

🎵 Audio: 01 Reed Control 1

## Control 2



	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	C	C	C	B
<b>Day 5</b>	B	C	C	B	A
<b>Day 10</b>	C	C	C	C	B

<b>Resonance</b>	Sounds flat and not very resonant.
<b>Sound Quality</b>	First days started off with a damp, dull sound. By Day 5 the reed was easier to play but still had a thin, ugly sound.
<b>Dynamic Range</b>	Hard to make soft dynamics without sounding fuzzy.
<b>Resistance</b>	By Day 5 the reed was easier to play but much harder to control.
<b>Articulation</b>	Articulating was gradually easier.
<b>Low/Mid/High register:</b>	Middle to higher register is especially ugly.
<b>Other:</b>	The reed did not hold up well to playing more than a few minutes before collapsing.

🎵 Audio: 02 Reed Control 2

## Control 3

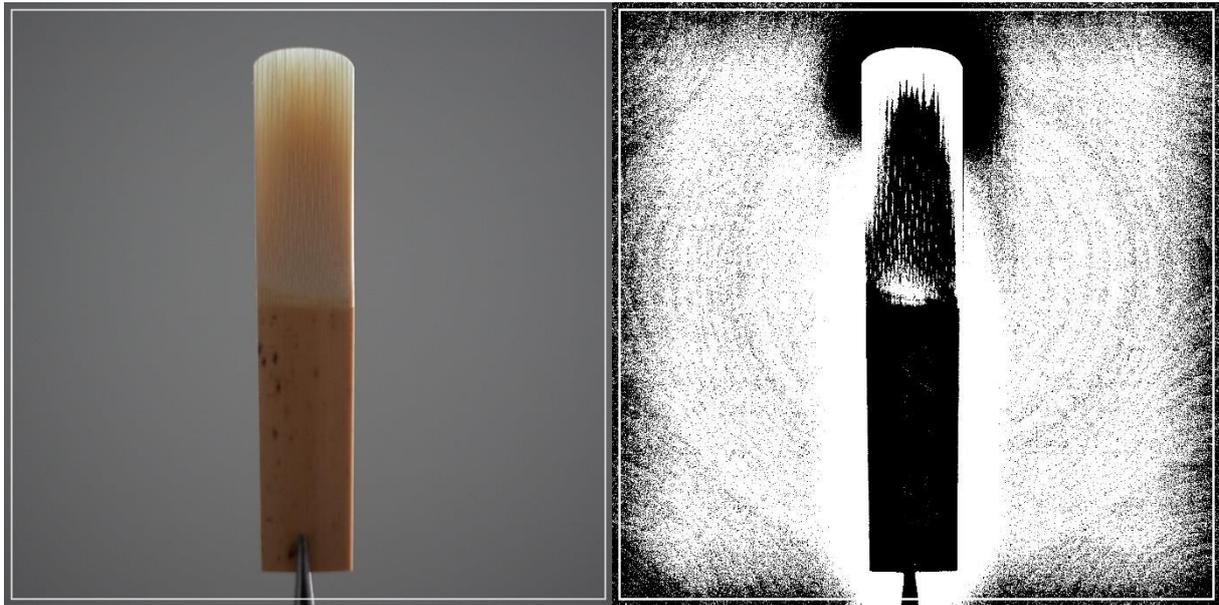


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	C	C	C	C
<b>Day 5</b>	B	C	C	B	C
<b>Day 10</b>	A	A	A	A	A

<b>Resonance</b>	At first, a fuzzy reed that developed into a nice, big sound.
<b>Sound Quality</b>	Bit too wide for my taste.
<b>Dynamic Range</b>	Good dynamic range although it does tend to widen when I try to play louder. Could be more flexible by opening a bit.
<b>Resistance</b>	Too hard at first, but as days went by the resistance was balanced perfectly.
<b>Articulation</b>	Fuzzy and difficult to articulate clearly especially in the middle register.
<b>Low/Mid/High register:</b>	The high register is thinner.
<b>Other:</b>	

🎵 Audio: Reed Control 3

## Control 4



	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	C	C	C	C
<b>Day 5</b>	C	B	C	B	C
<b>Day 10</b>	B	B	C	B	A

<b>Resonance</b>	A hard reed with a thin, fuzzy lower register. By Day 10 the sound was still a bit open but workable.
<b>Sound Quality</b>	First days started off with a damp, dull sound. By the fifth day the reed was easier to play but still had a thin sound.
<b>Dynamic Range</b>	Supported soft sound.
<b>Resistance</b>	Hard reed at first but softened a bit very soon.
<b>Articulation</b>	Articulations were clumsy at first, very fuzzy especially in the middle register. By Day 10 were easier and comfortable to make. Slurring is effortless across octaves.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	Does not hold up well to playing more than a few minutes before collapsing.

♪ Audio: Reed Control 4

## Control 5

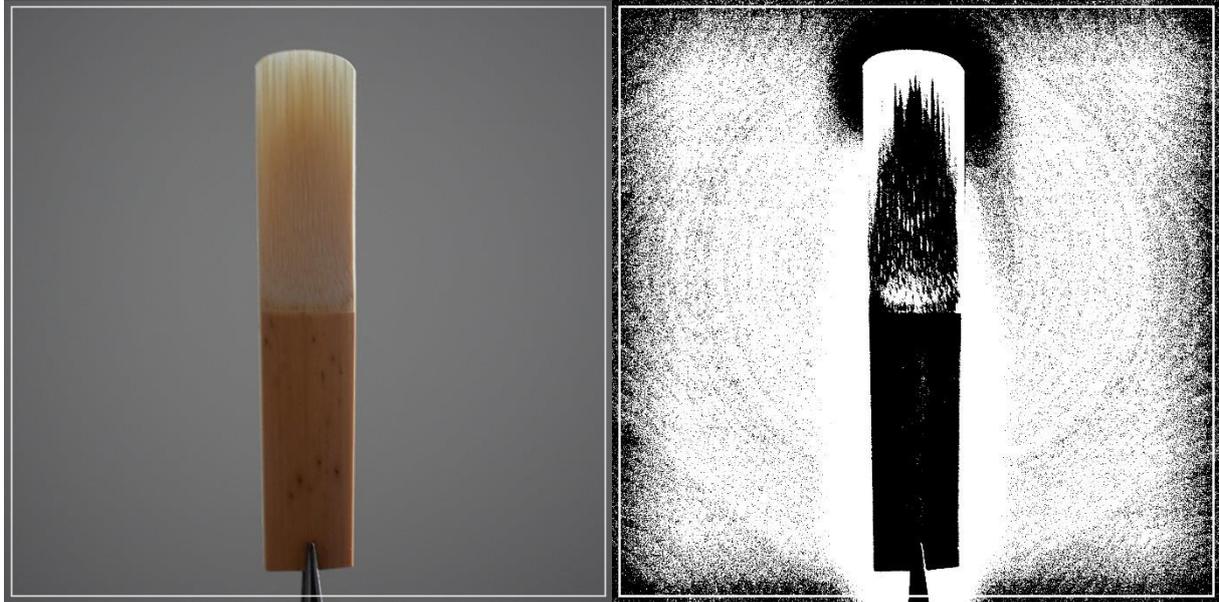


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	B	B	B	A	B
<b>Day 5</b>	C	C	C	C	B
<b>Day 10</b>	C	C	C	C	C

<b>Resonance</b>	At first very comfortable, and able to project far.
<b>Sound Quality</b>	The sound is nice and round but did not develop further.
<b>Dynamic Range</b>	
<b>Resistance</b>	At first felt very comfortable with the resistance and thus was able to express myself with ease but died soon.
<b>Articulation</b>	Very fuzzy and hard to make.
<b>Low/Mid/High register:</b>	Fuzzy middle register.
<b>Other:</b>	Already in the first days the reed collapsed within five to ten minutes of playing, and by Day 5 had quickly degraded.

🎵 Audio: Reed Control 5

## Control 6

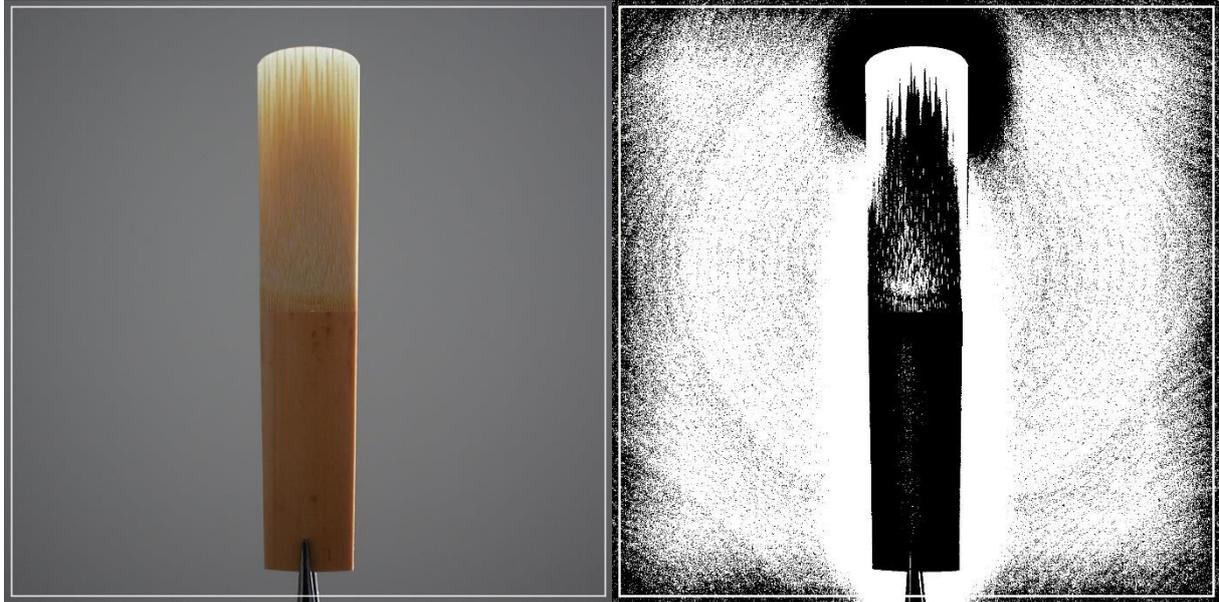


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	C	C	B	B
<b>Day 5</b>	C	C	B	B	B
<b>Day 10</b>	C	C	B	B	B

<b>Resonance</b>	Challenging to make a good, projected sound.
<b>Sound Quality</b>	Slightly fuzzy, thin and damp sound.
<b>Dynamic Range</b>	Not very flexible and hence hard to make distinct dynamics.
<b>Resistance</b>	A bit too resistant.
<b>Articulation</b>	While the articulations are somewhat clear, it is an uncomfortable reed to play with.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	Fails quickly, short reed life.

♪ Audio: 06 Reed Control 6

## Control 7

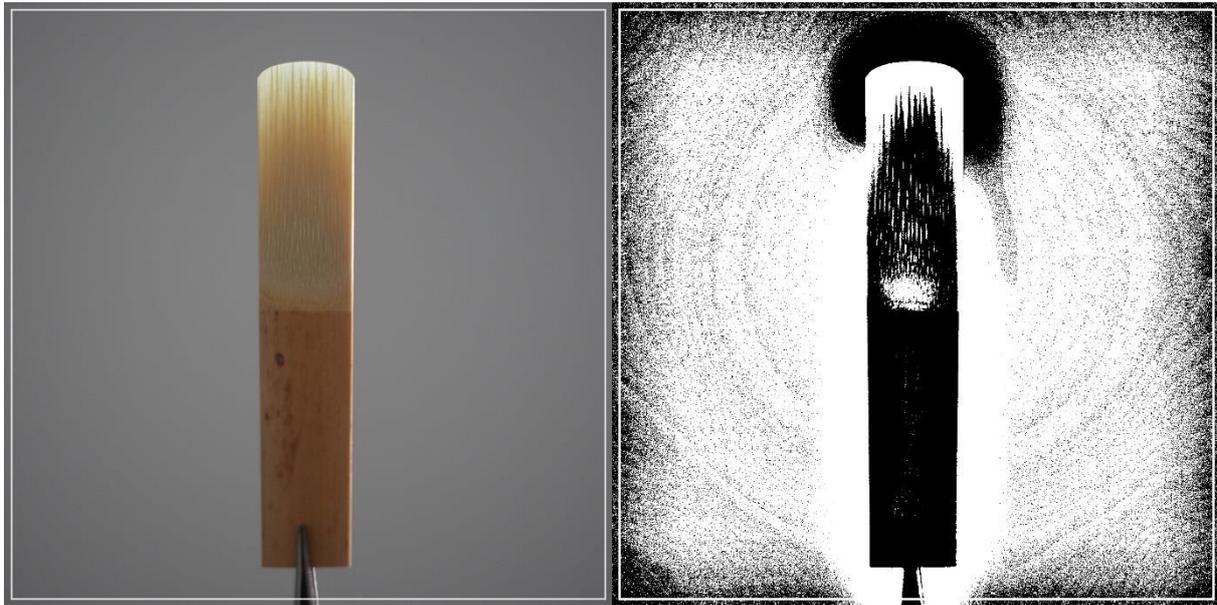


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	C	C	C	C
<b>Day 5</b>	B	C	B	B	B
<b>Day 10</b>	B	B	C	B	C

<b>Resonance</b>	Somewhat able to project.
<b>Sound Quality</b>	Nice sound in spite of challenges.
<b>Dynamic Range</b>	Not flexible.
<b>Resistance</b>	Slightly challenging but improved over time.
<b>Articulation</b>	Not flexible.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	Reed improved noticeably as the days went by.

🎵 Audio: 07 Reed Control 7

## Control 8

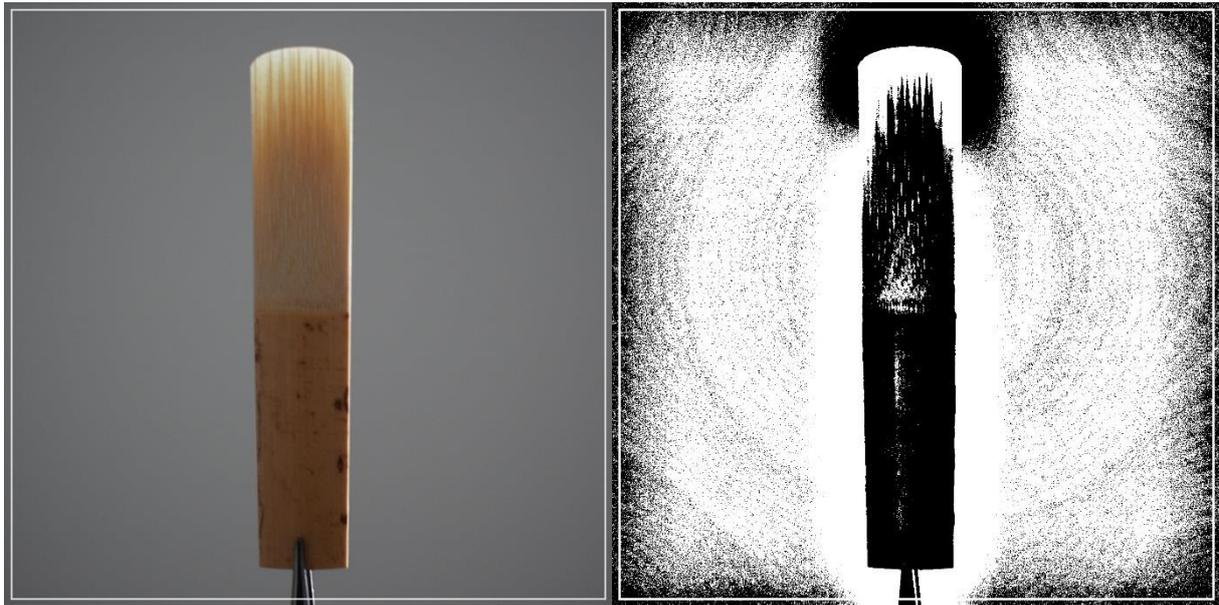


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	B	B	C	B	B
<b>Day 5</b>	A	A	B	A	B
<b>Day 10</b>	A	A	B	B	B

<b>Resonance</b>	Slightly hard reed, but which developed into a nice, comfortable one after a few days.
<b>Sound Quality</b>	Nice, round sound.
<b>Dynamic Range</b>	Not flexible. Very hard to make interesting distinctions and moods across the range of the instrument.
<b>Resistance</b>	A bit too resistant at first but loosed up after a while.
<b>Articulation</b>	Fuzzy and hard to achieve different expressions and moods across the range of the instrument.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	

🎵 Audio: 08 Reed Control 8

## Control 9

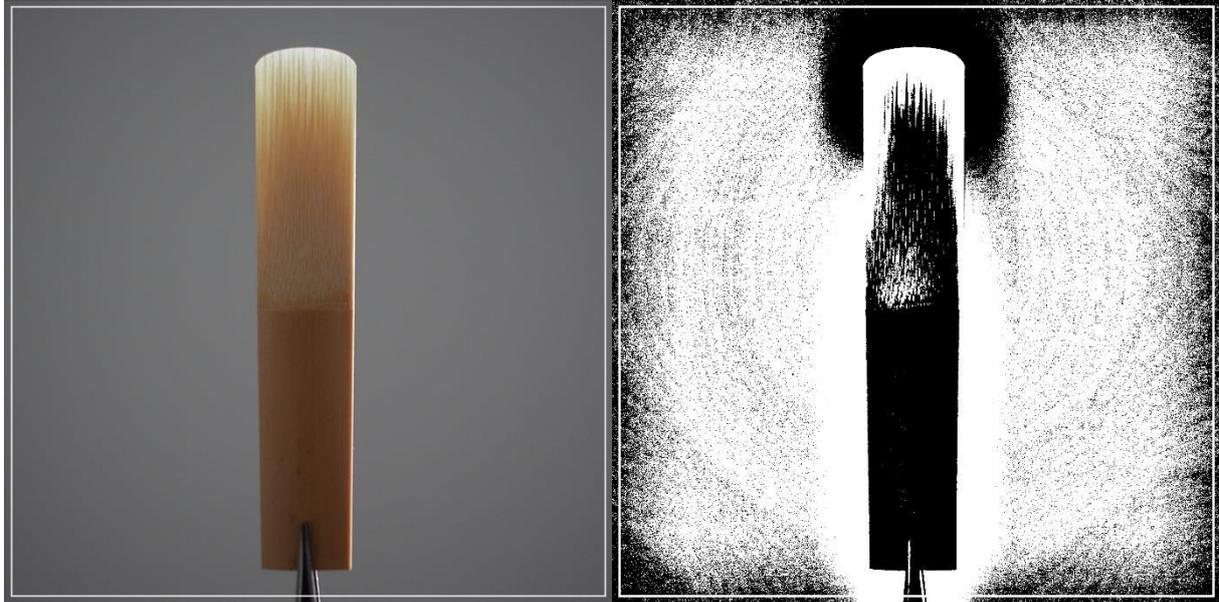


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	C	C	C	C
<b>Day 5</b>	B	B	B	C	C
<b>Day 10</b>	B	A	B	B	B

<b>Resonance</b>	Very hard and resistant at first but got more comfortable after some days.
<b>Sound Quality</b>	Mediocre, turned fuller.
<b>Dynamic Range</b>	Not flexible, hard to produce extreme contrasts.
<b>Resistance</b>	Hard and fluffy reed.
<b>Articulation</b>	Hard to articulate clearly across the ranges and with different nuance. Slurring smoothly is an effort.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	

🎵 Audio: 09 Reed Control 9

## Control 10

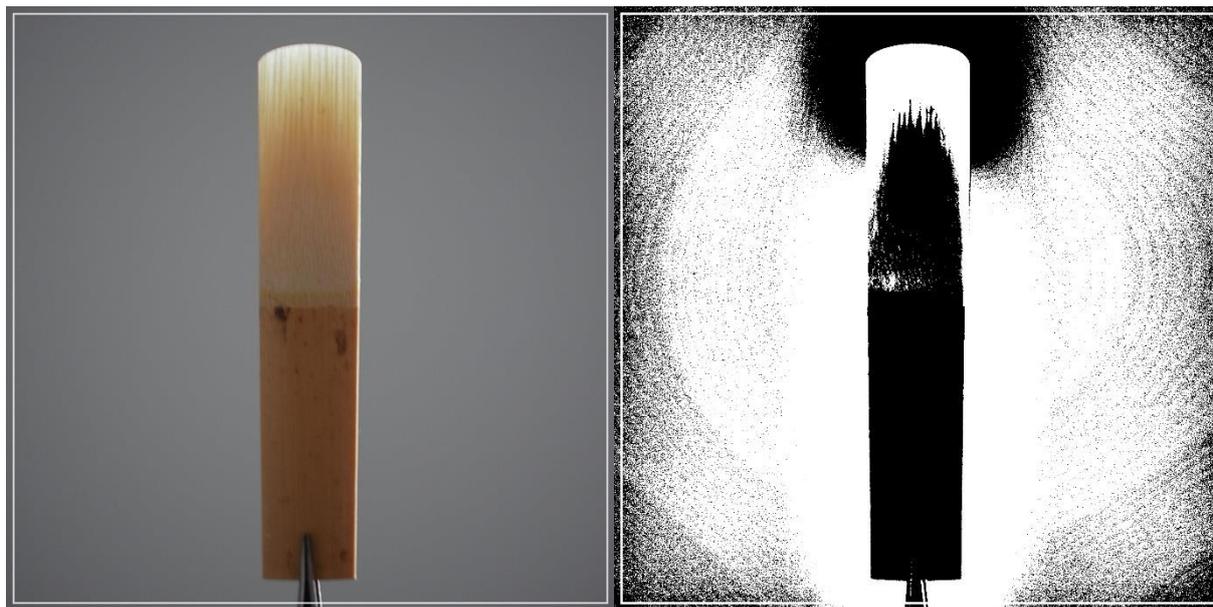


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	B	C	B	C
<b>Day 5</b>	C	C	B	C	B
<b>Day 10</b>	B	B	B	B	C

<b>Resonance</b>	Hard to produce a sound but loosened up over time.
<b>Sound Quality</b>	Mediocre sound.
<b>Dynamic Range</b>	Not flexible. Hard to make quiet attacks.
<b>Resistance</b>	Hard to produce a sound.
<b>Articulation</b>	Not flexible, very hard to make any sort of staccatos.
<b>Low/Mid/High register:</b>	Honky and hard to control the tuning of the lower register.
<b>Other:</b>	

🎵 Audio: 10 Reed Control 10

# A1

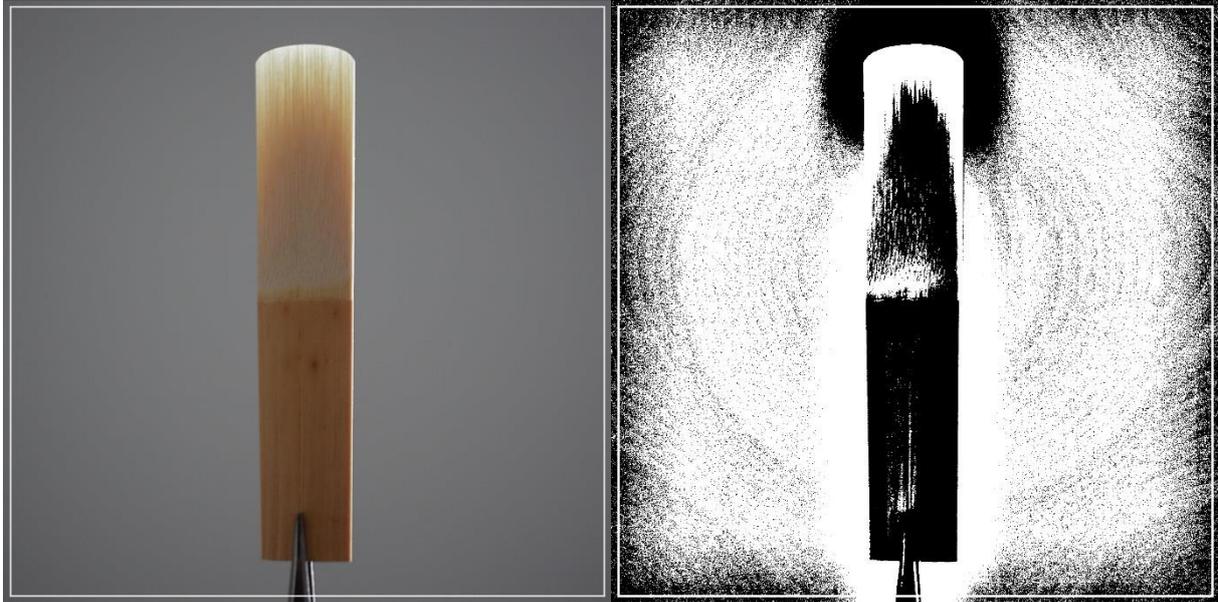


	Resonance	Sound	Dynamics	Resistance	Articulation
Day 1	C	C	C	C	C
Day 5	C	C	B	C	C
Day 10	C	C	C	C	C

<b>Resonance</b>	Moderately resistant.
<b>Sound Quality</b>	Strident, wide sound.
<b>Dynamic Range</b>	Too difficult to control across the octaves because of the lack of resistance.
<b>Resistance</b>	Too soft, almost no resistance.
<b>Articulation</b>	Somewhat easy because of the ease of blowing through but ugly and hard to control.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	

🎵 Audio: 11 Reed A1

A2

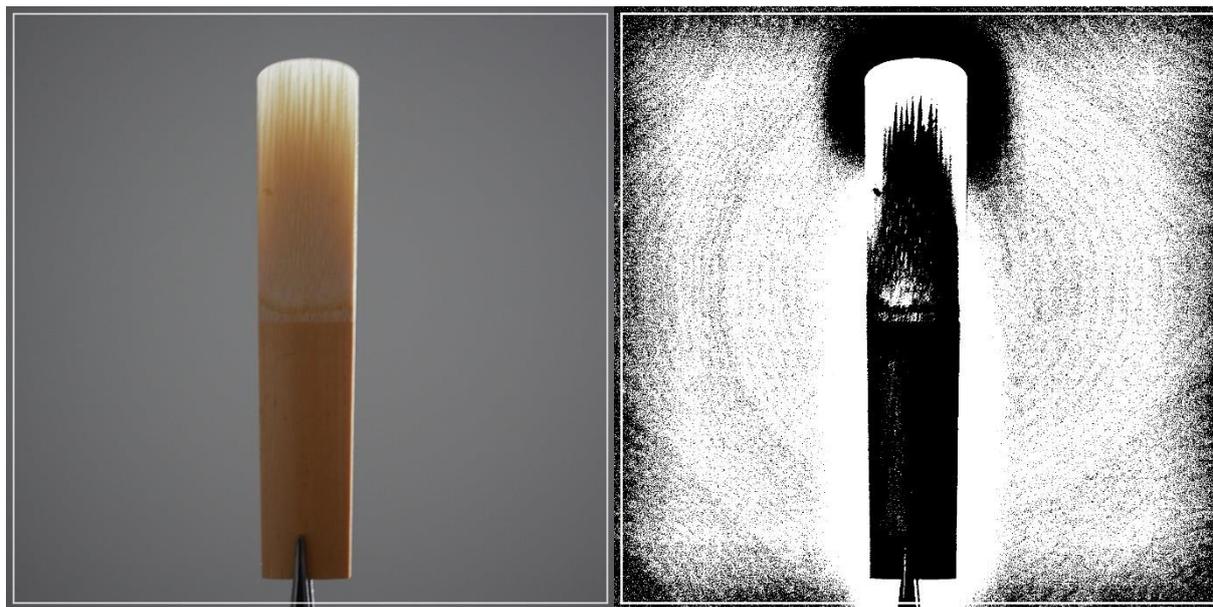


	Resonance	Sound	Dynamics	Resistance	Articulation
Day 1	C	C	C	C	C
Day 5	C	C	C	C	C
Day 10	C	C	C	C	C

<b>Resonance</b>	Too resistant.
<b>Sound Quality</b>	Too thin and wide.
<b>Dynamic Range</b>	Reed is too hard to control to be able to make a good, loud dynamics without overblowing.
<b>Resistance</b>	Too soft, no resistance.
<b>Articulation</b>	Not flexible.
<b>Low/Mid/High register:</b>	Middle register is surprisingly good.
<b>Other:</b>	

🎵 Audio: 12 Reed A2

# A3



	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	C	C	C	C
<b>Day 5</b>	C	C	B	C	C
<b>Day 10</b>	C	C	C	C	C

<b>Resonance</b>	Not very resonant.
<b>Sound Quality</b>	Honky, ugly sound.
<b>Dynamic Range</b>	Very limited and inflexible.
<b>Resistance</b>	Too resistant and difficult to express musical ideas.
<b>Articulation</b>	Hard to articulate which impedes speed and accuracy in fast passages.
<b>Low/Mid/High register:</b>	Thin high register.
<b>Other:</b>	

♪ Audio: 13 Reed A3

A4

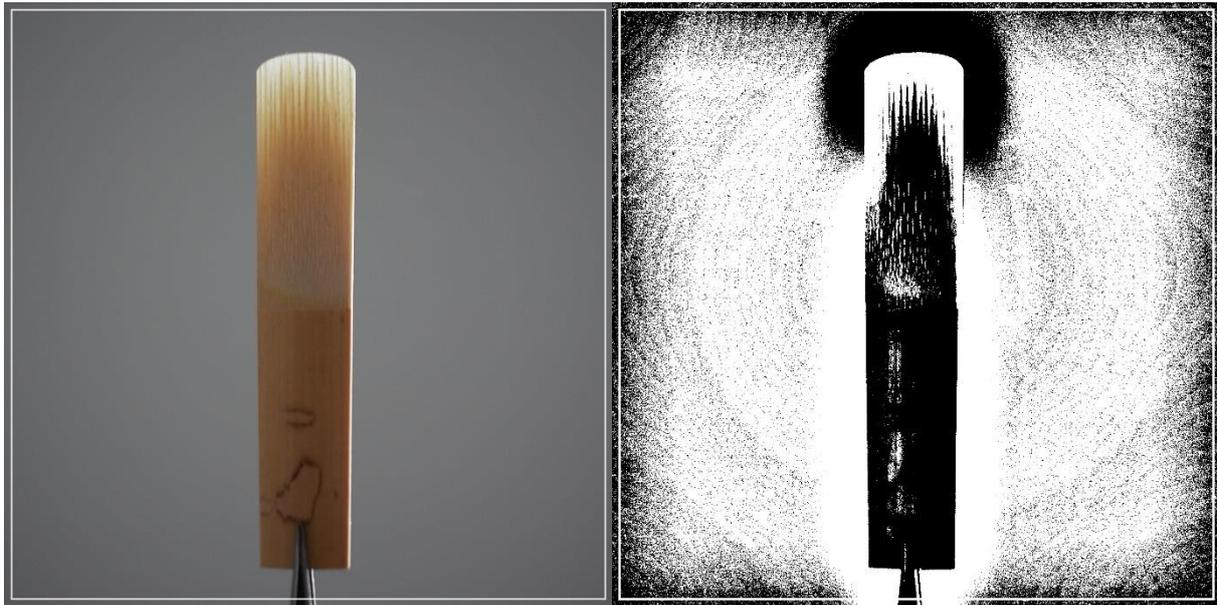


	Resonance	Sound	Dynamics	Resistance	Articulation
Day 1	C	B	C	C	C
Day 5	C	C	B	C	C
Day 10	C	C	B	C	C

<b>Resonance</b>	
<b>Sound Quality</b>	Ugly, honky, wide sound.
<b>Dynamic Range</b>	Very difficult to produce soft dynamics.
<b>Resistance</b>	Too resistant.
<b>Articulation</b>	Impossible to articulate properly.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	The reed is not comfortable and its so challenging to play that I make mistakes often.

♪ Audio: 14 Reed A4

A5

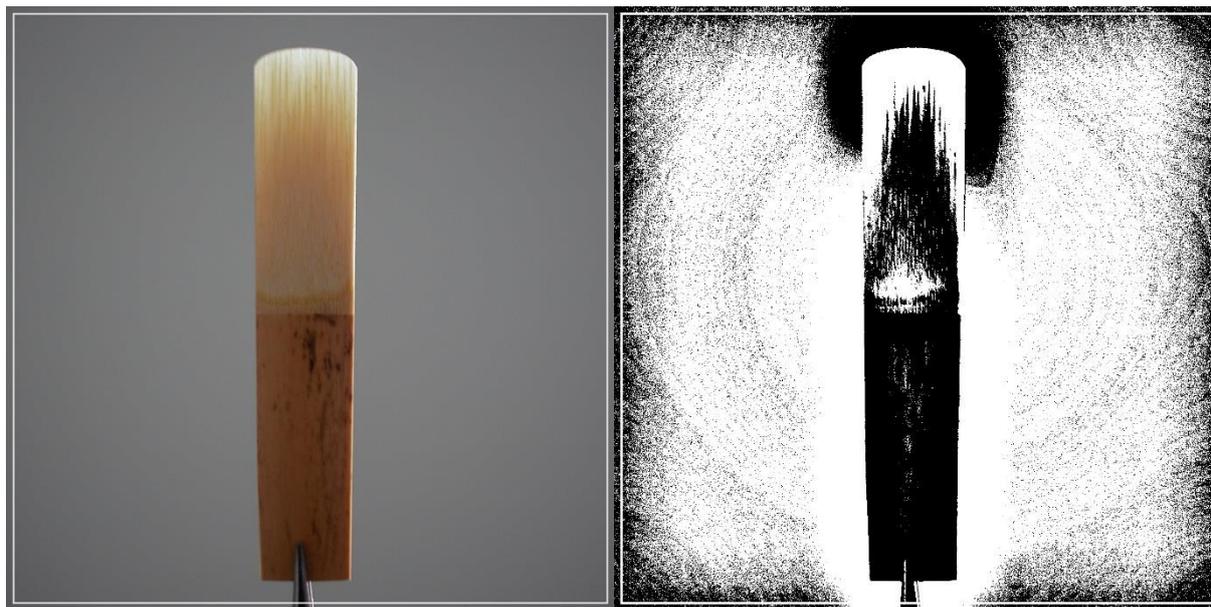


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	C	C	C	C
<b>Day 5</b>	C	B	C	C	C
<b>Day 10</b>	C	C	C	C	C

<b>Resonance</b>	
<b>Sound Quality</b>	
<b>Dynamic Range</b>	Small and inflexible. Everything sounds mezzoforte.
<b>Resistance</b>	Impossible to make music with.
<b>Articulation</b>	Difficult and slow.
<b>Low/Mid/High register:</b>	Wide and honky middle to low registers.
<b>Other:</b>	

♪ Audio: 15 Reed A5

A6

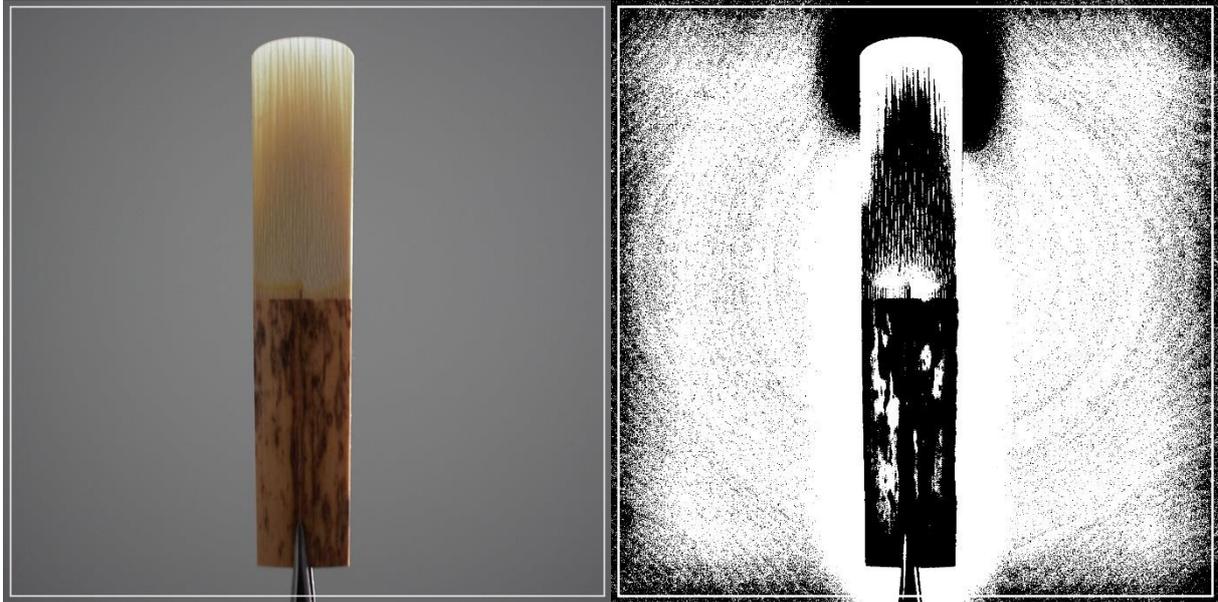


	Resonance	Sound	Dynamics	Resistance	Articulation
Day 1	B	C	C	B	C
Day 5	C	C	C	C	C
Day 10	C	C	C	C	C

<b>Resonance</b>	Not resonant.
<b>Sound Quality</b>	
<b>Dynamic Range</b>	
<b>Resistance</b>	Too hard to make music or anything with.
<b>Articulation</b>	Slow and difficult to be clear and agile.
<b>Low/Mid/High register:</b>	Thin middle register.
<b>Other:</b>	

♪ Audio: 16 Reed A6

A7

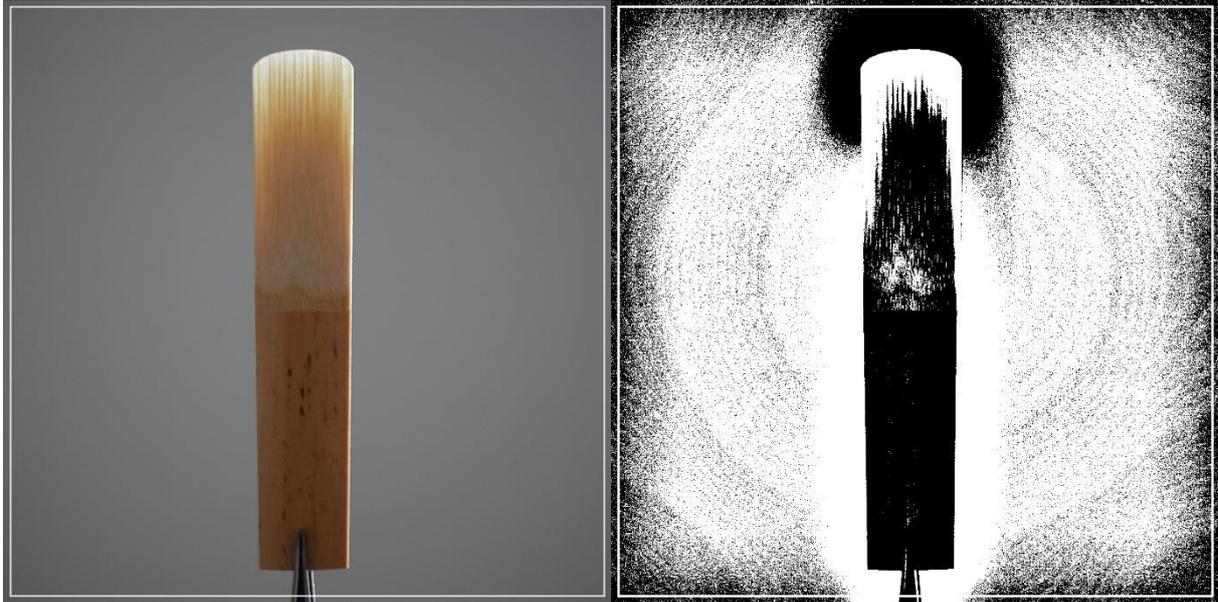


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	C	C	C	C
<b>Day 5</b>	C	C	B	C	C
<b>Day 10</b>	C	C	C	C	C

<b>Resonance</b>	Reed is so hard it is too difficult to make a sound.
<b>Sound Quality</b>	Reed is so hard it is too difficult to make a sound.
<b>Dynamic Range</b>	Reed is so hard it is too difficult to make a sound.
<b>Resistance</b>	Reed is so hard it is too difficult to make a sound.
<b>Articulation</b>	Reed is so hard it is too difficult to make a sound; standard staccatos are fine but not very agile.
<b>Low/Mid/High register:</b>	Honky and wide lower registers.
<b>Other:</b>	Too hard to play with.

♪ Audio: 17 Reed A7

A8



	Resonance	Sound	Dynamics	Resistance	Articulation
Day 1	C	C	C	C	C
Day 5	C	C	C	C	C
Day 10	C	C	C	C	C

<b>Resonance</b>	
<b>Sound Quality</b>	Soft, thin and wide sound.
<b>Dynamic Range</b>	Hard to make stable, strong dynamics across the range of the instrument, but especially in the high register.
<b>Resistance</b>	No resistance, uncomfortable support.
<b>Articulation</b>	Very hard to make clear articulations across the range.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	

♪ Audio: 18 Reed A8

A9

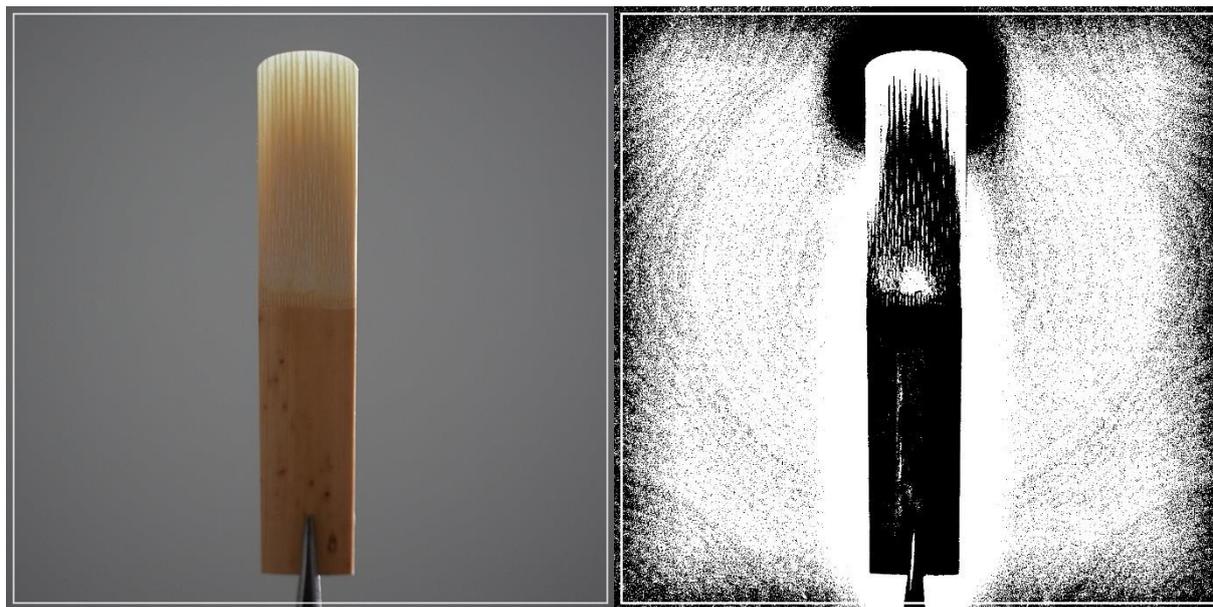


	Resonance	Sound	Dynamics	Resistance	Articulation
Day 1	C	C	B	C	C
Day 5	C	C	C	C	C
Day 10	C	C	C	C	C

<b>Resonance</b>	
<b>Sound Quality</b>	Muffled, fuzzy, open, wide sound.
<b>Dynamic Range</b>	Hard to make stable, strong dynamics across the range of the instrument, but especially in the high register.
<b>Resistance</b>	No resistance, uncomfortable support.
<b>Articulation</b>	Very hard to make clear articulations across the range.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	

♪ Audio: 19 Reed A9

## A10

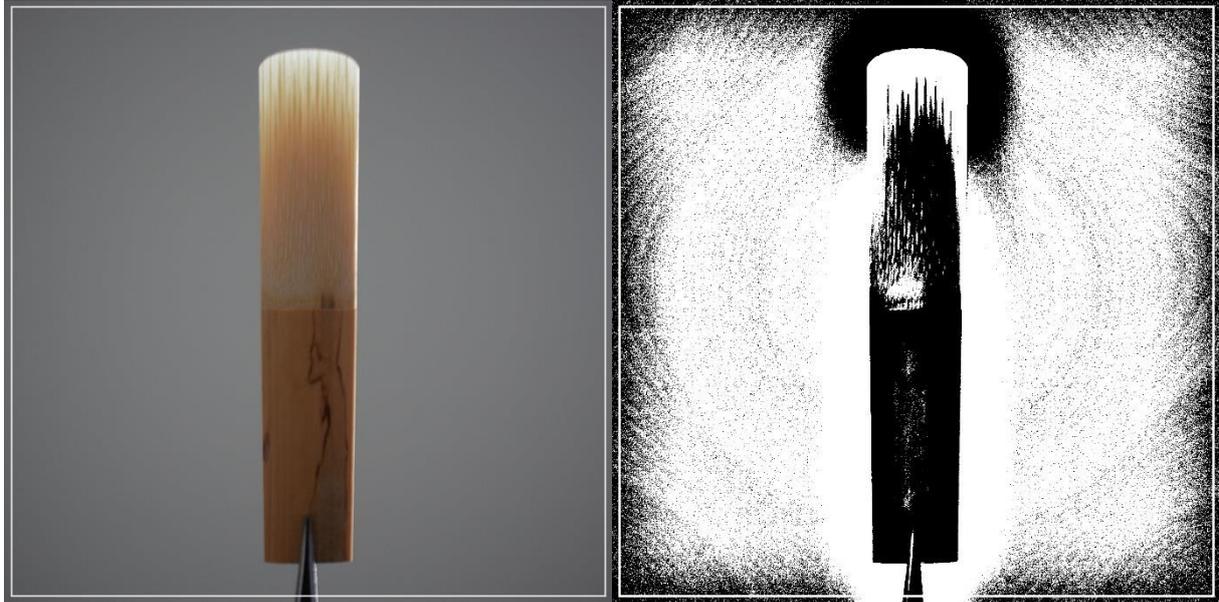


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	C	C	C	C
<b>Day 5</b>	C	C	C	C	C
<b>Day 10</b>	C	C	C	C	C

<b>Resonance</b>	
<b>Sound Quality</b>	Soft, thin and wide sound.
<b>Dynamic Range</b>	Hard to make stable, strong dynamics across the range of the instrument, but especially in the high register.
<b>Resistance</b>	No resistance, uncomfortable support.
<b>Articulation</b>	Very hard to make clear articulations across the range.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	

♪ Audio: 20 Reed A10

B1

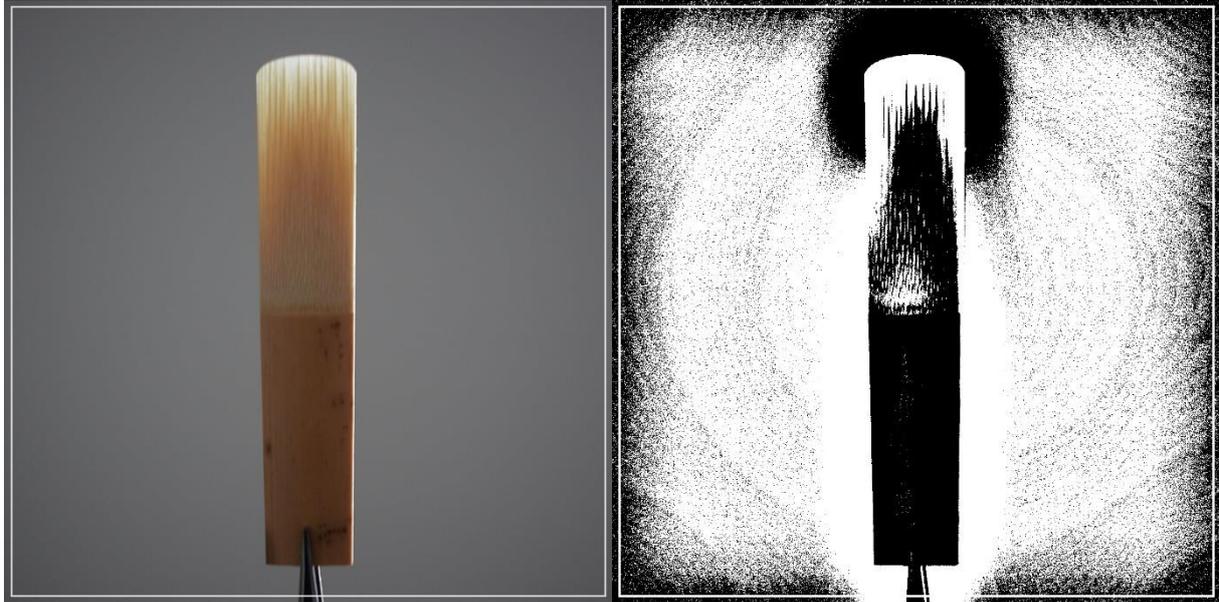


	Resonance	Sound	Dynamics	Resistance	Articulation
Day 1	C	C	B	C	B
Day 5	C	B	B	B	B
Day 10	C	C	C	C	C

<b>Resonance</b>	It is too soft to achieve a good sound and projection. I tend to inflate the notes.
<b>Sound Quality</b>	Thin sound.
<b>Dynamic Range</b>	Somewhat flexible, able to make different
<b>Resistance</b>	It is too soft to achieve a good sound and projection.
<b>Articulation</b>	Able to be slightly agile, and express different moods.
<b>Low/Mid/High register:</b>	Honky and wide in general.
<b>Other:</b>	

♪ Audio: 21 Reed B1

B2

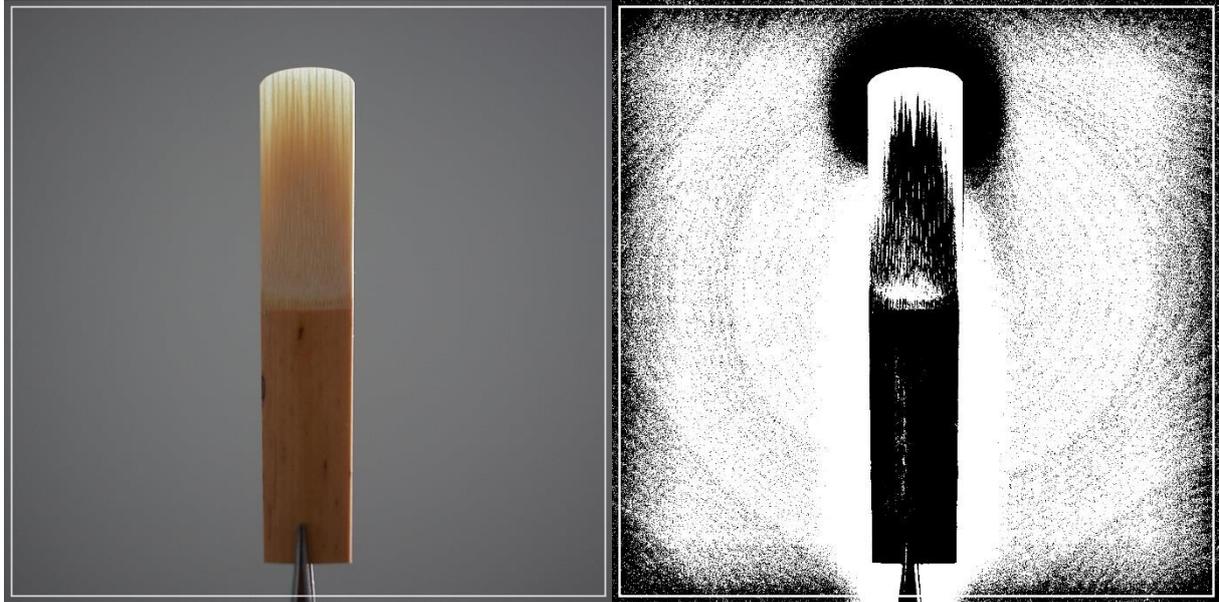


	Resonance	Sound	Dynamics	Resistance	Articulation
Day 1	C	C	B	C	B
Day 5	C	B	B	C	B
Day 10	C	C	C	C	B

<b>Resonance</b>	/
<b>Sound Quality</b>	Thin and ugly, due to the lack of resistance.
<b>Dynamic Range</b>	Easier to be flexible but the lack of resistance makes me lose sound and projection.
<b>Resistance</b>	Too little resistance.
<b>Articulation</b>	Easy to articulate clearly, and able to be more agile.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	Easier to be flexible but the lack of resistance makes me lose sound and projection.

🎵 Audio: 22 Reed B2

B3

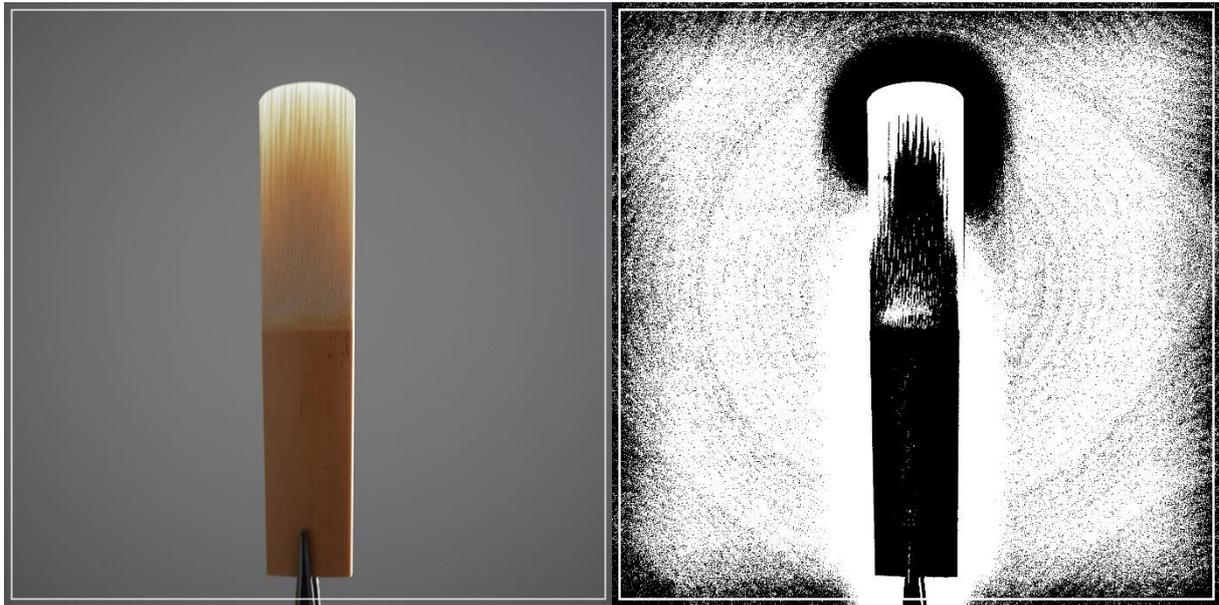


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	B	B	B	B	B
<b>Day 5</b>	B	B	B	B	B
<b>Day 10</b>	B	C	B	C	B

<b>Resonance</b>	Nice resonance.
<b>Sound Quality</b>	The first reed among the A group that I like the sound of.
<b>Dynamic Range</b>	Flexible and easy to differentiate moods.
<b>Resistance</b>	Too little resistance but not as bad as the rest of the A group.
<b>Articulation</b>	Easy to make different articulations across the range.
<b>Low/Mid/High register:</b>	Hard to tune middle register.
<b>Other:</b>	

♪ Audio: 23 Reed B3

B4

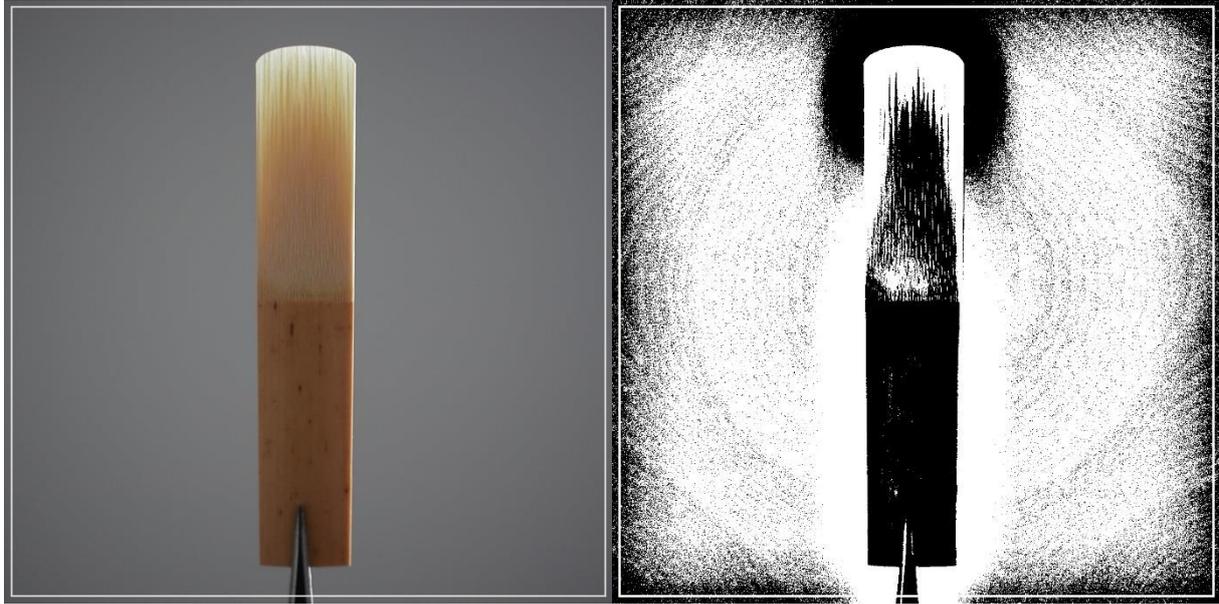


	Resonance	Sound	Dynamics	Resistance	Articulation
Day 1	B	C	B	B	B
Day 5	B	B	B	C	B
Day 10	C	B	C	C	B

<b>Resonance</b>	Able to project nicely, at least in comparison with the rest.
<b>Sound Quality</b>	Nice round sound.
<b>Dynamic Range</b>	A bit flexible.
<b>Resistance</b>	Resistance is okay, a bit too soft.
<b>Articulation</b>	Fuzzy and muddled but ok.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	

♪ Audio: 24 Reed B4

B5

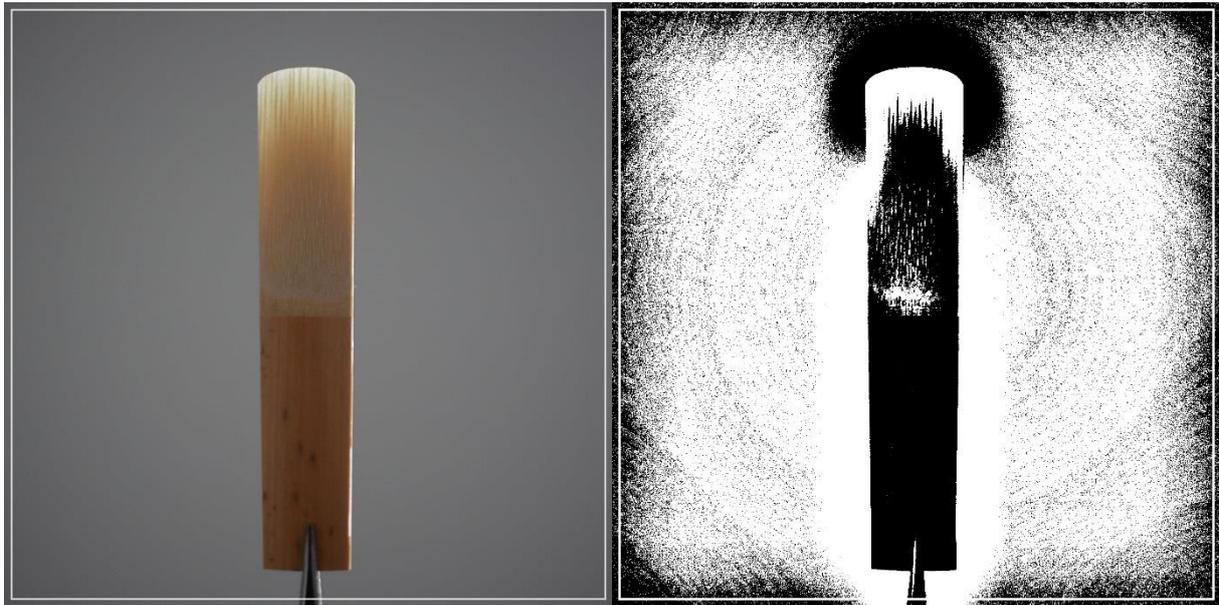


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	B	B	B	B
<b>Day 5</b>	B	B	B	B	B
<b>Day 10</b>	C	B	B	C	B

<b>Resonance</b>	
<b>Sound Quality</b>	Nice round sound.
<b>Dynamic Range</b>	Not as flexible as I would like but ok.
<b>Resistance</b>	A bit too soft also but manageable.
<b>Articulation</b>	Clearer and flexible articulations.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	

♪ Audio: 25 Reed B5

B6

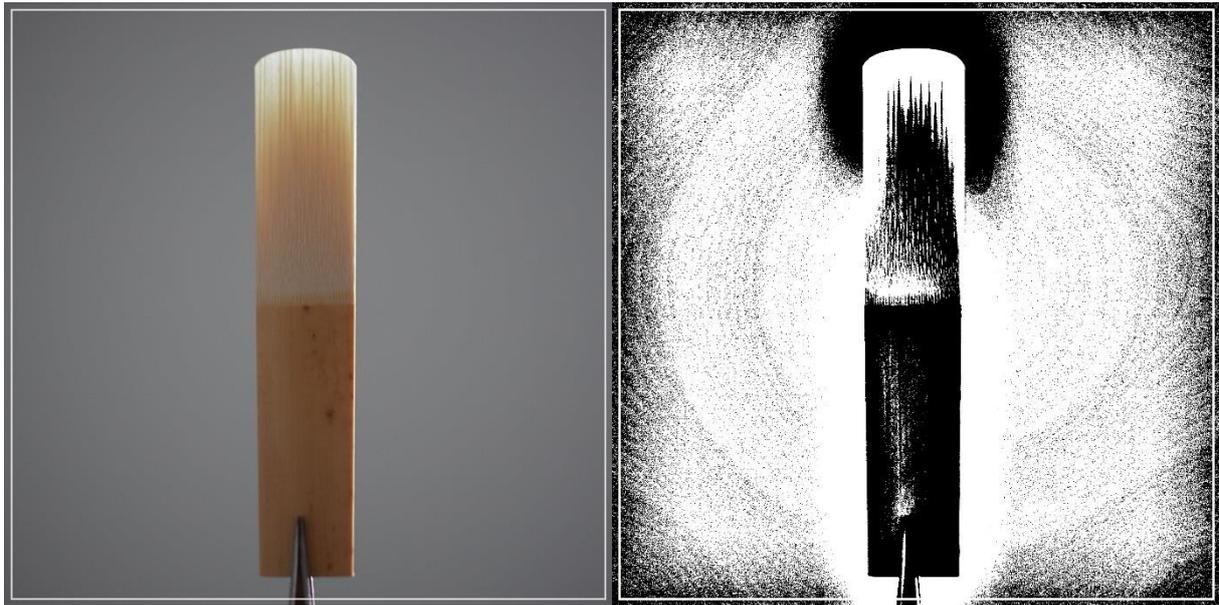


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	B	B	B	B	B
<b>Day 5</b>	B	A	A	C	B
<b>Day 10</b>	B	B	B	C	C

<b>Resonance</b>	
<b>Sound Quality</b>	Nice, round, warm sound.
<b>Dynamic Range</b>	Able to express different moods.
<b>Resistance</b>	A bit too soft for my taste, especially because it affects the tuning and makes me inflate long notes.
<b>Articulation</b>	Easy to articulate.
<b>Low/Mid/High register:</b>	Wobbly middle register, I should be careful to support to maintain the tuning.
<b>Other:</b>	

🎵 Audio: 26 Reed B6

B7

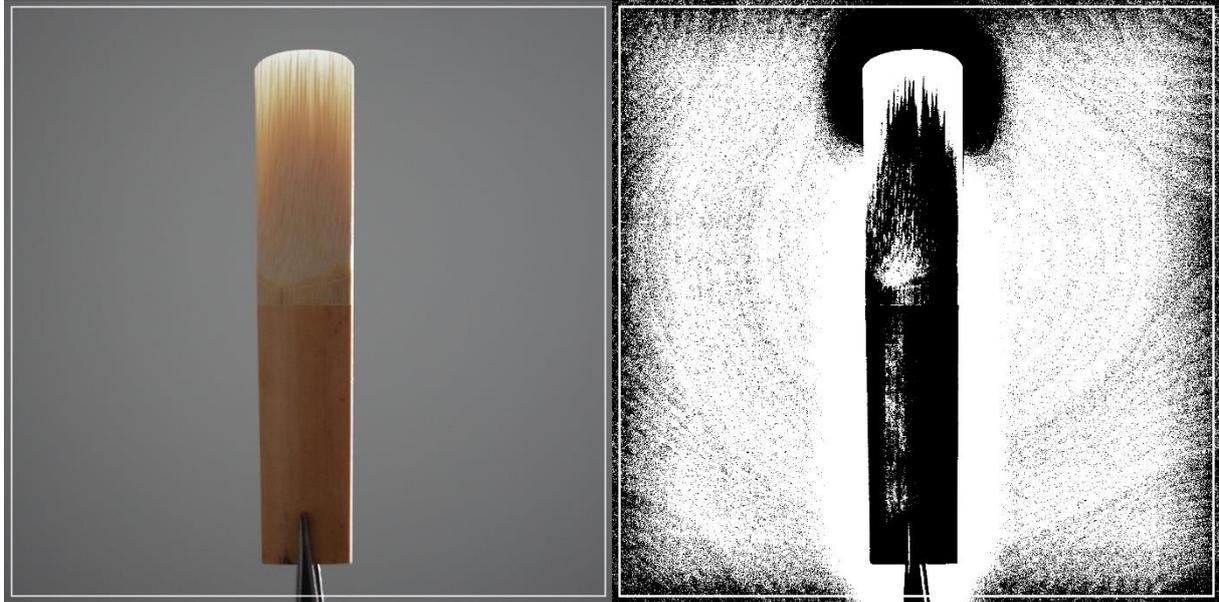


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	B	B	C	C
<b>Day 5</b>	B	B	B	C	B
<b>Day 10</b>	B	C	B	C	C

<b>Resonance</b>	
<b>Sound Quality</b>	Thin and ugly, due to the lack of resistance.
<b>Dynamic Range</b>	The reed has little resistance so its easier to make different dynamics.
<b>Resistance</b>	Little to moderate resistance.
<b>Articulation</b>	Clear but nothing special.
<b>Low/Mid/High register:</b>	Ugly middle to high register.
<b>Other:</b>	

🎵 Audio: 27 Reed B7

B8

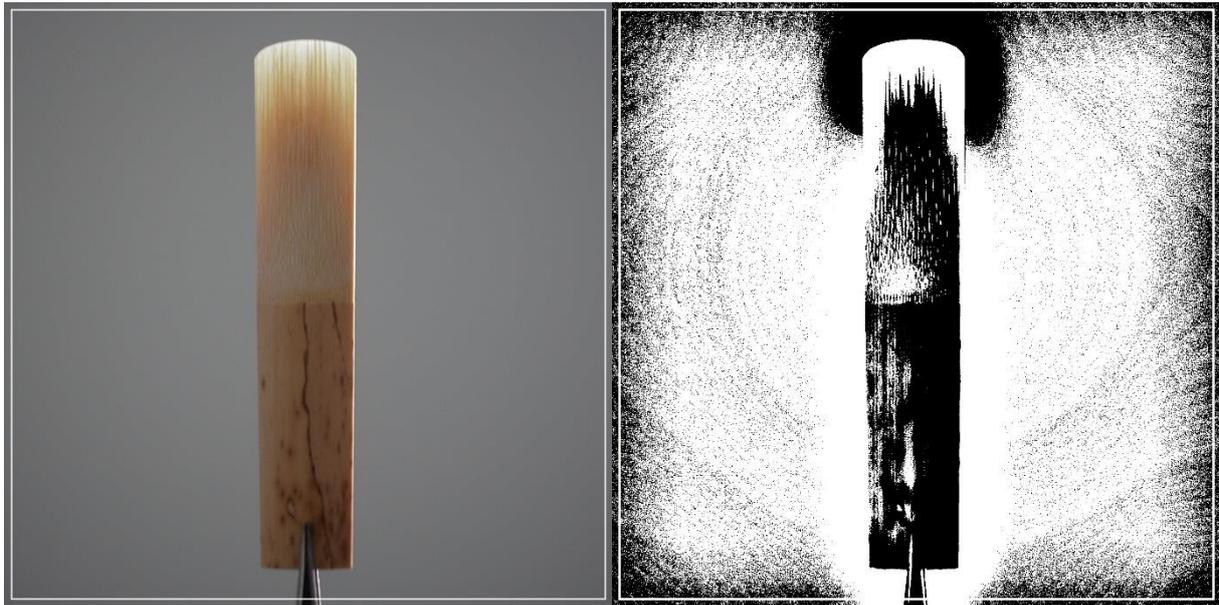


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	B	C	B	C	B
<b>Day 5</b>	C	C	C	C	B
<b>Day 10</b>	B	B	C	C	B

<b>Resonance</b>	Somewhat resonant.
<b>Sound Quality</b>	Nice sound, just too soft.
<b>Dynamic Range</b>	Easy to make different moods.
<b>Resistance</b>	Too soft for my taste, hard to maintain long phrases without sound stopping or inflating notes.
<b>Articulation</b>	Fuzzy and unclear.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	

🎵 Audio: 28 Reed B8

B9

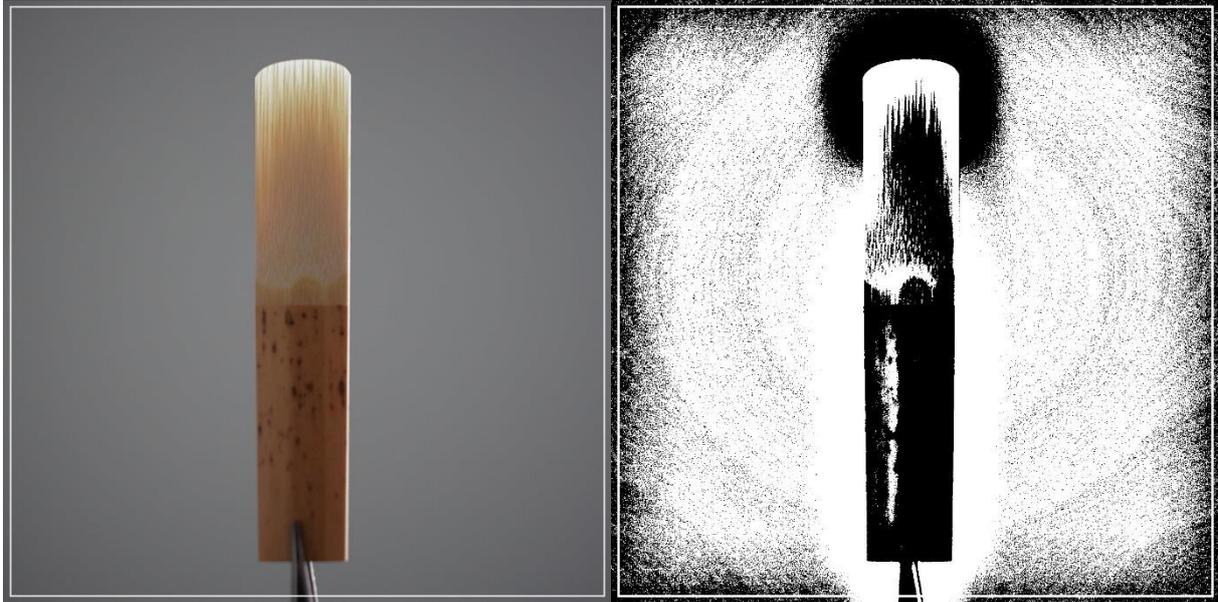


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	B	C	C	C	B
<b>Day 5</b>	C	B	B	B	B
<b>Day 10</b>	C	C	B	C	b

<b>Resonance</b>	
<b>Sound Quality</b>	Nice sound, just too soft.
<b>Dynamic Range</b>	Flexible to make different moods.
<b>Resistance</b>	Too soft for my taste.
<b>Articulation</b>	Flexible, fast articulation possible.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	

🎵 Audio: 29 Reed B9

## B10

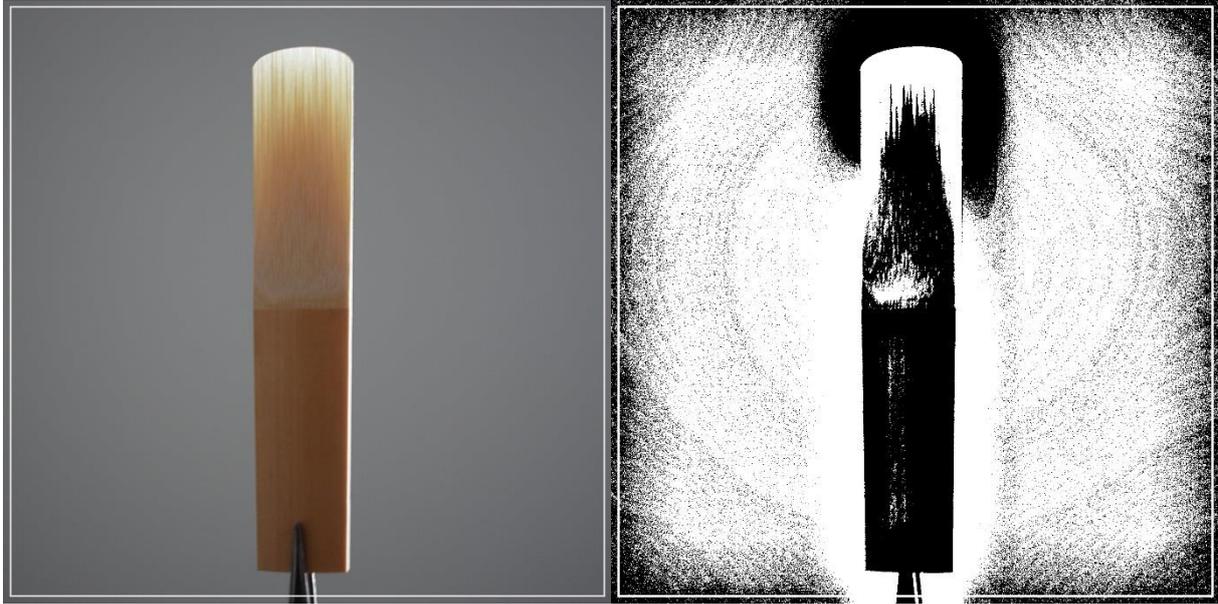


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	B	C	C	C	C
<b>Day 5</b>	B	B	B	C	B
<b>Day 10</b>	B	B	B	C	A

<b>Resonance</b>	No proper support.
<b>Sound Quality</b>	Nice, round sound, except in lower register which tends to blow out.
<b>Dynamic Range</b>	Able to do pianissimo but difficult to project and maintain proper support due to lack of resistance.
<b>Resistance</b>	Too soft and difficult to support. Tend to inflate the notes because of how little resistance there is.
<b>Articulation</b>	Agile and flexible.
<b>Low/Mid/High register:</b>	Wide and honky lower register.
<b>Other:</b>	

♪ Audio: 30 Reed B10

C1

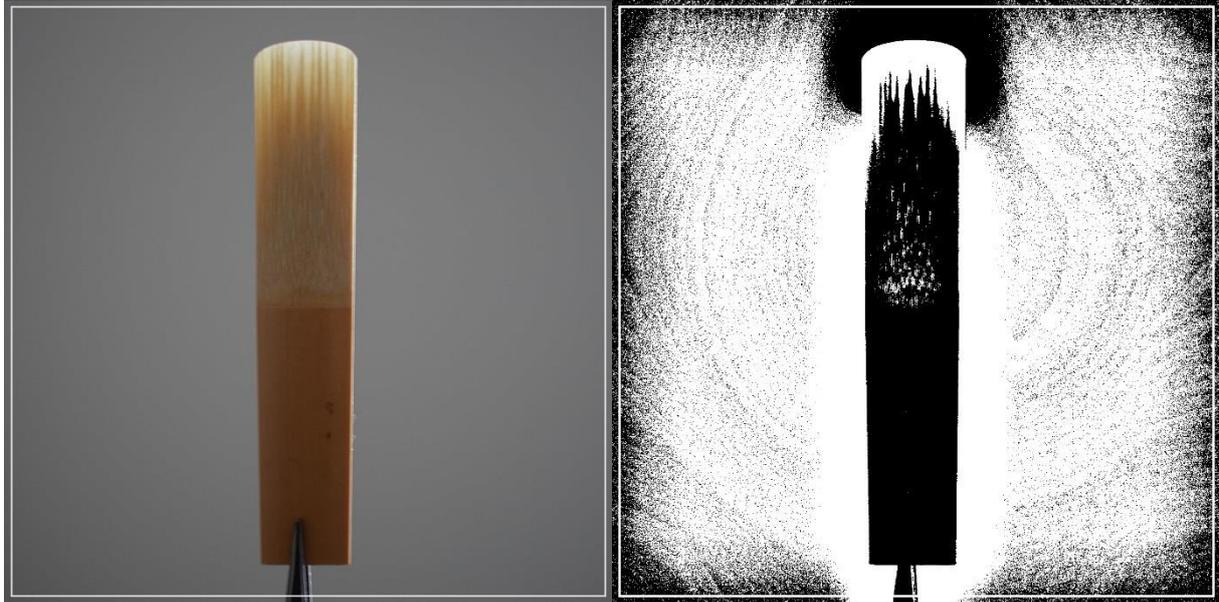


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	B	A	B	B	C
<b>Day 5</b>	A	A	B	B	C
<b>Day 10</b>	A	A	A	B	C

<b>Resonance</b>	Resonant and full, easy to project.
<b>Sound Quality</b>	Nice sound that developed into a lovely and warm tone.
<b>Dynamic Range</b>	
<b>Resistance</b>	Comfortable and easy to project against this resistance.
<b>Articulation</b>	Articulations were stiff and hard to be agile with staccato, but manageable somewhat.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	

🎵 Audio: 31 Reed C1

C2

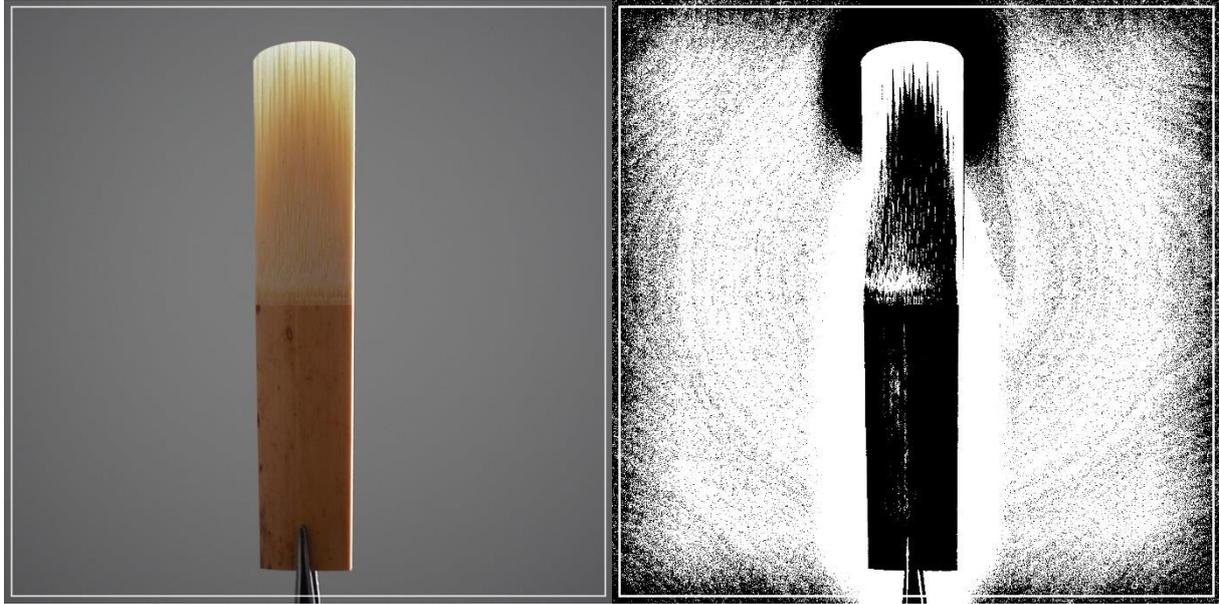


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	B	C	B	B
<b>Day 5</b>	C	C	A	B	B
<b>Day 10</b>	C	C	B	C	B

<b>Resonance</b>	
<b>Sound Quality</b>	Started with a decent sound that degraded into being too bright and wide for my taste due to low resistance.
<b>Dynamic Range</b>	
<b>Resistance</b>	It started being a bit too easy to play with and quickly lost this little resistance.
<b>Articulation</b>	
<b>Low/Mid/High register:</b>	
<b>Other:</b>	

🎵 Audio: 32 Reed C2

C3

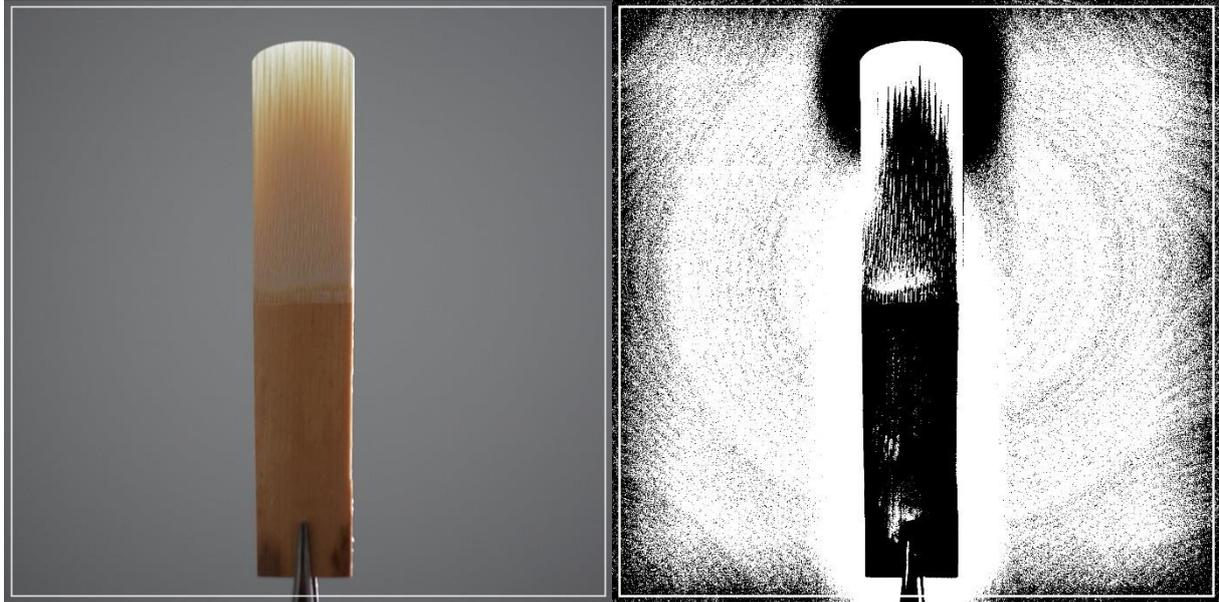


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	B	B	C	B	C
<b>Day 5</b>	A	B	A	B	B
<b>Day 10</b>	A	A	A	B	B

<b>Resonance</b>	Bit fuzzy at the beginning, which got better over time.
<b>Sound Quality</b>	Easy to make a round, controlled sound, that developed into a rich, lovely sound.
<b>Dynamic Range</b>	
<b>Resistance</b>	A good, comfortable resistance to play against that got eventually harder to play with.
<b>Articulation</b>	
<b>Low/Mid/High register:</b>	Amazing and easy to play in the altissimo range.
<b>Other:</b>	

♪ Audio: 33 Reed C3

C4

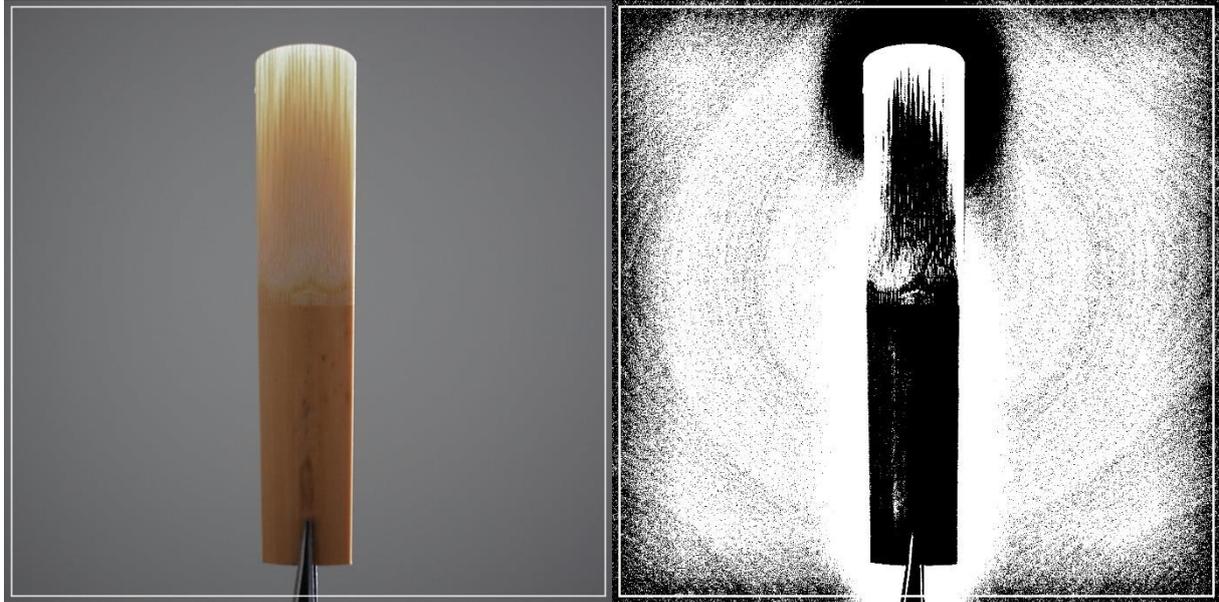


	Resonance	Sound	Dynamics	Resistance	Articulation
Day 1	C	B	B	C	C
Day 5	B	A	B	C	B
Day 10	B	A	A	C	B

<b>Resonance</b>	Hard to project since it is a bit too resistant.
<b>Sound Quality</b>	Nice, warm sound.
<b>Dynamic Range</b>	
<b>Resistance</b>	Closes up, hard to maintain a supported sound. Eventually softened slightly which permitted more flexibility.
<b>Articulation</b>	Since resistant is high it is hard to make clear articulations. Very fuzzy and slow.
<b>Low/Mid/High register:</b>	Thin high register.
<b>Other:</b>	

♪ Audio: 34 Reed C4

C5

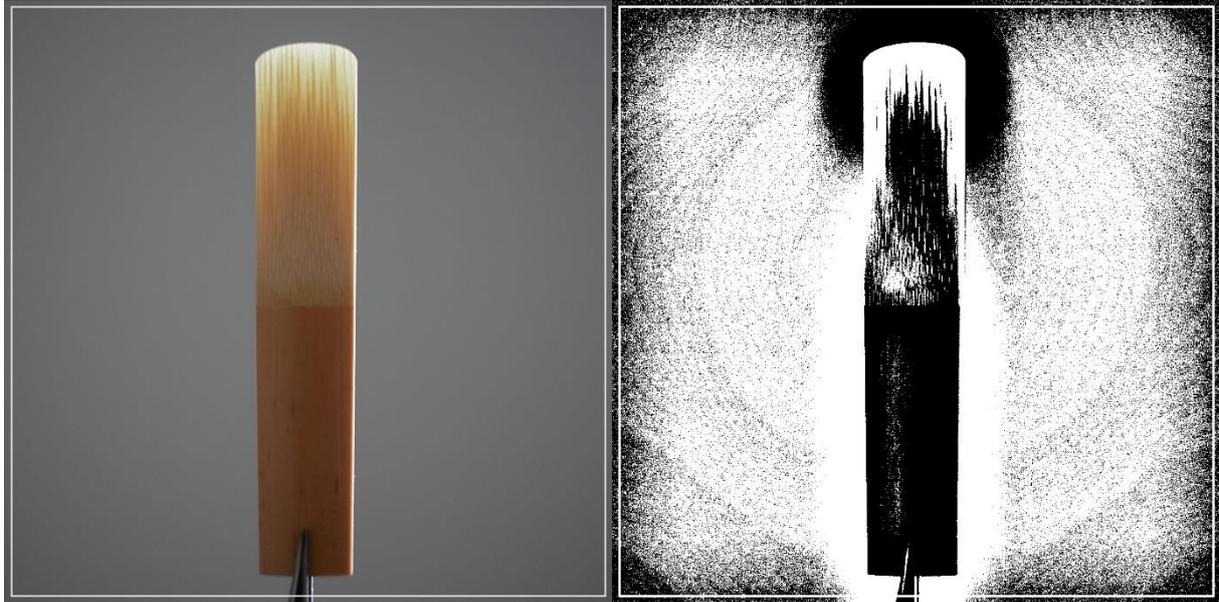


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	B	B	B	B	C
<b>Day 5</b>	A	B	A	B	C
<b>Day 10</b>	A	B	A	B	B

<b>Resonance</b>	Nice, supported sound and projection is possible.
<b>Sound Quality</b>	Lovely, warm sound.
<b>Dynamic Range</b>	Not very flexible at first but got better.
<b>Resistance</b>	The resistance is a bit too much but soon developed to the perfect resistance.
<b>Articulation</b>	Hard to articulate clearly.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	

🎵 Audio: 35 Reed C5

C6

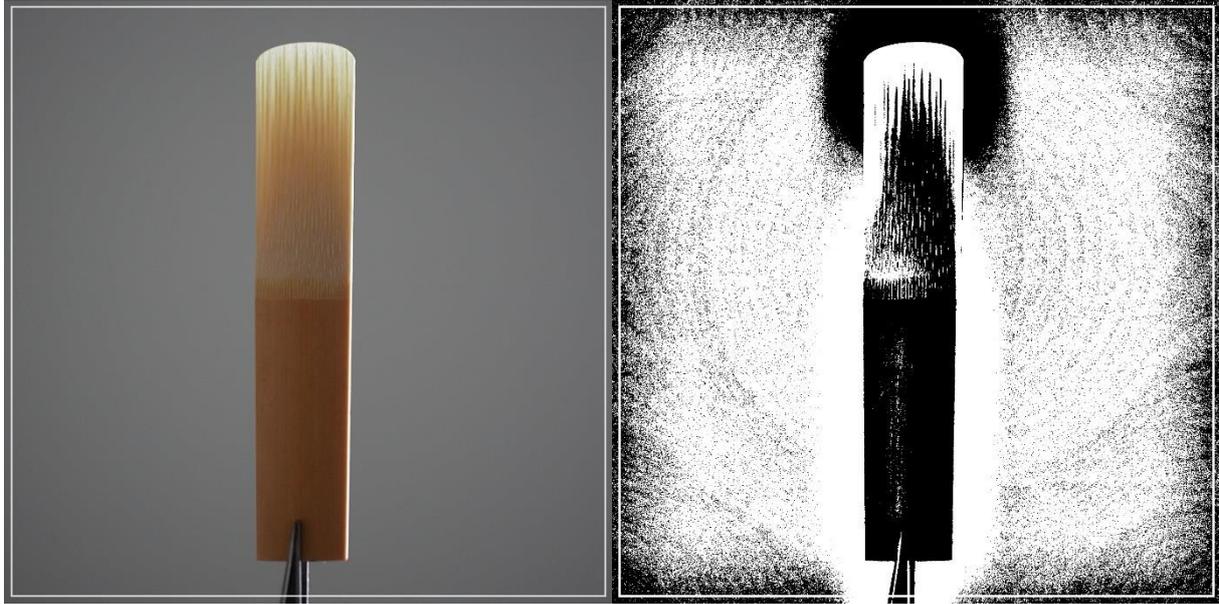


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	C	C	C	C
<b>Day 5</b>	C	C	B	B	C
<b>Day 10</b>	B	C	A	A	C

<b>Resonance</b>	
<b>Sound Quality</b>	Fuzzy, thin sound. Fuzzy and wide sound, especially in the high register.
<b>Dynamic Range</b>	Not very flexible and hard to make moods at first.
<b>Resistance</b>	Hard to maintain a supported sound.
<b>Articulation</b>	In spite of sight fuzziness, I am able to be more agile.
<b>Low/Mid/High register:</b>	Very wide higher register sound.
<b>Other:</b>	Developed into a good reed through the days.

♪ Audio: 36 Reed C6

C7

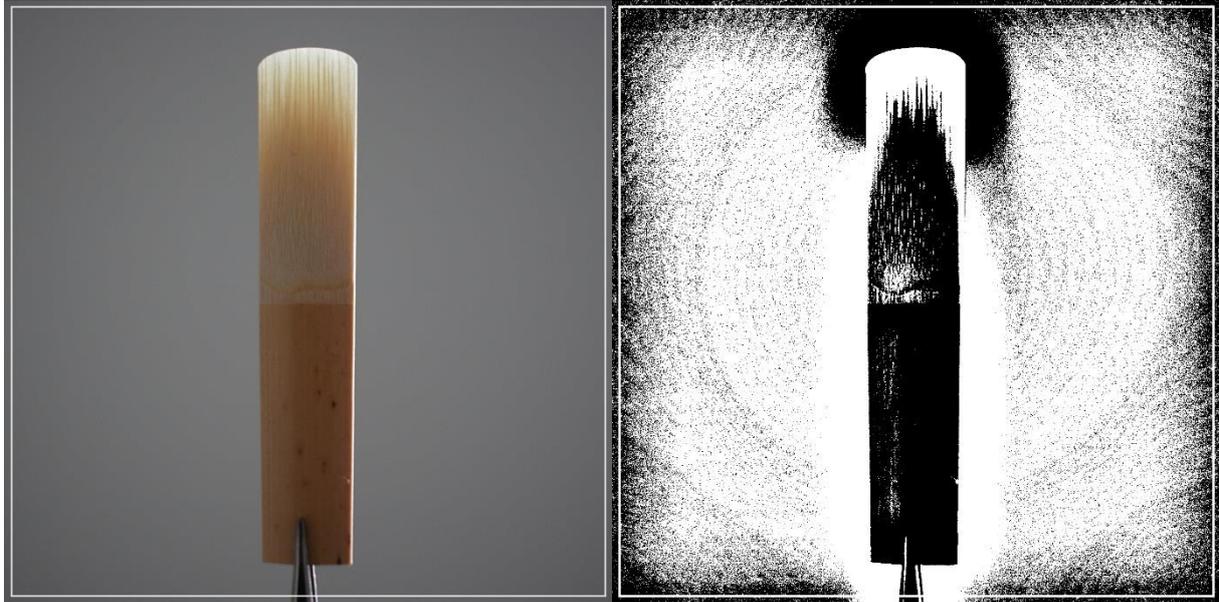


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	B	B	C	C
<b>Day 5</b>	B	B	B	B	C
<b>Day 10</b>	C	C	B	C	C

<b>Resonance</b>	Fuzzy, wide, honky, hard.
<b>Sound Quality</b>	Damp, muted sound.
<b>Dynamic Range</b>	
<b>Resistance</b>	Too resistant which makes the entire reed inflexible and hard to manage.
<b>Articulation</b>	Slow articulations and mostly unclear.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	Ended up being an okay reed.

♪ Audio: 37 Reed C7

C8

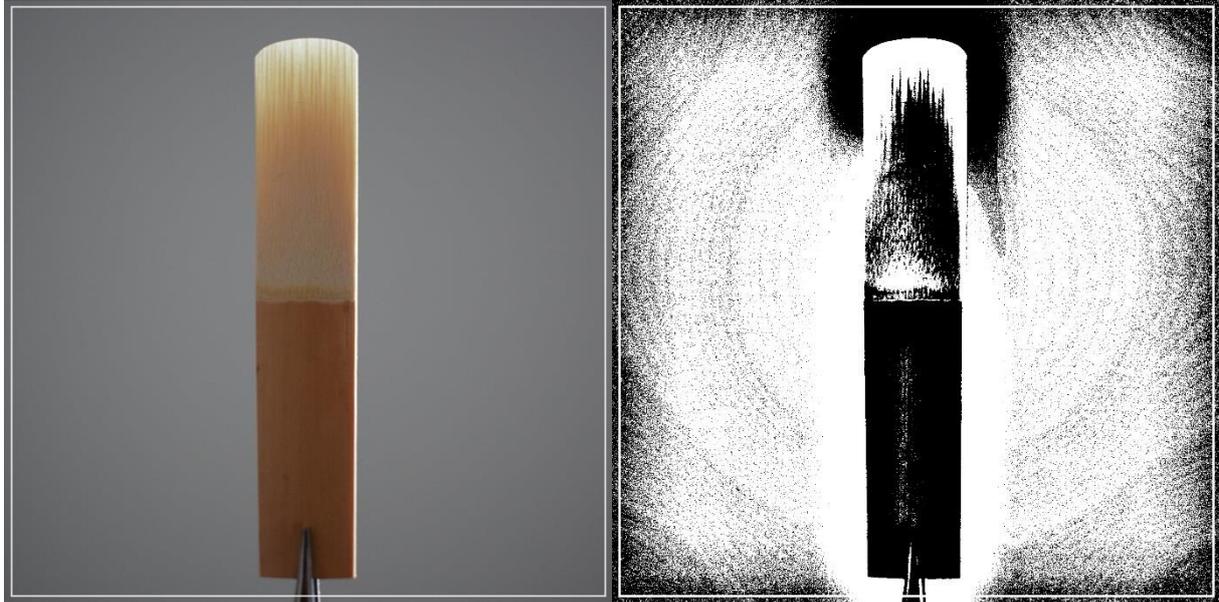


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	C	C	B	B
<b>Day 5</b>	B	C	B	B	B
<b>Day 10</b>	C	C	B	B	B

<b>Resonance</b>	Wide, closes after a while.
<b>Sound Quality</b>	Too wide and thin.
<b>Dynamic Range</b>	Difficult to create moods since reed closes up.
<b>Resistance</b>	Too resistant.
<b>Articulation</b>	Very inflexible.
<b>Low/Mid/High register:</b>	Very inflexible, especially in the high register.
<b>Other:</b>	

🎵 Audio: 38 Reed C8

C9

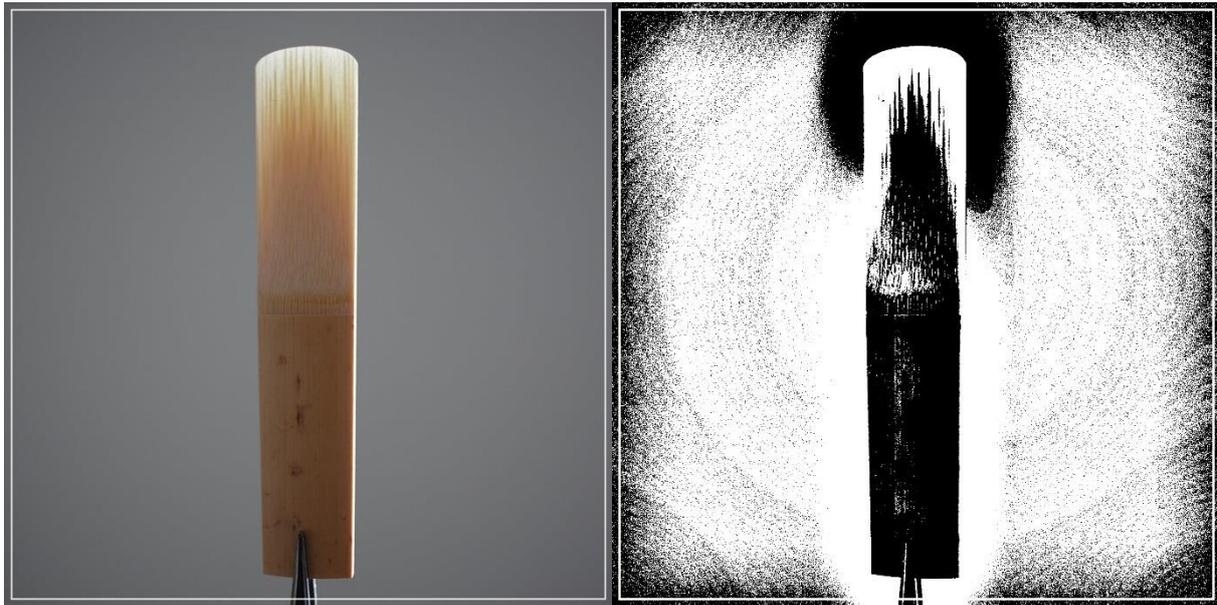


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	B	B	C	C	B
<b>Day 5</b>	A	B	B	B	B
<b>Day 10</b>	A	A	A	B	B

<b>Resonance</b>	Developed into a full resonant reed.
<b>Sound Quality</b>	Thin sound that ended rounding.
<b>Dynamic Range</b>	Developed into a flexible and very responsive reed that permitted big contrasting dynamics.
<b>Resistance</b>	Comfortable.
<b>Articulation</b>	Great reed but articulation is impeded which makes mistakes easily happen.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	

🎵 Audio: 39 Reed C9

## C10

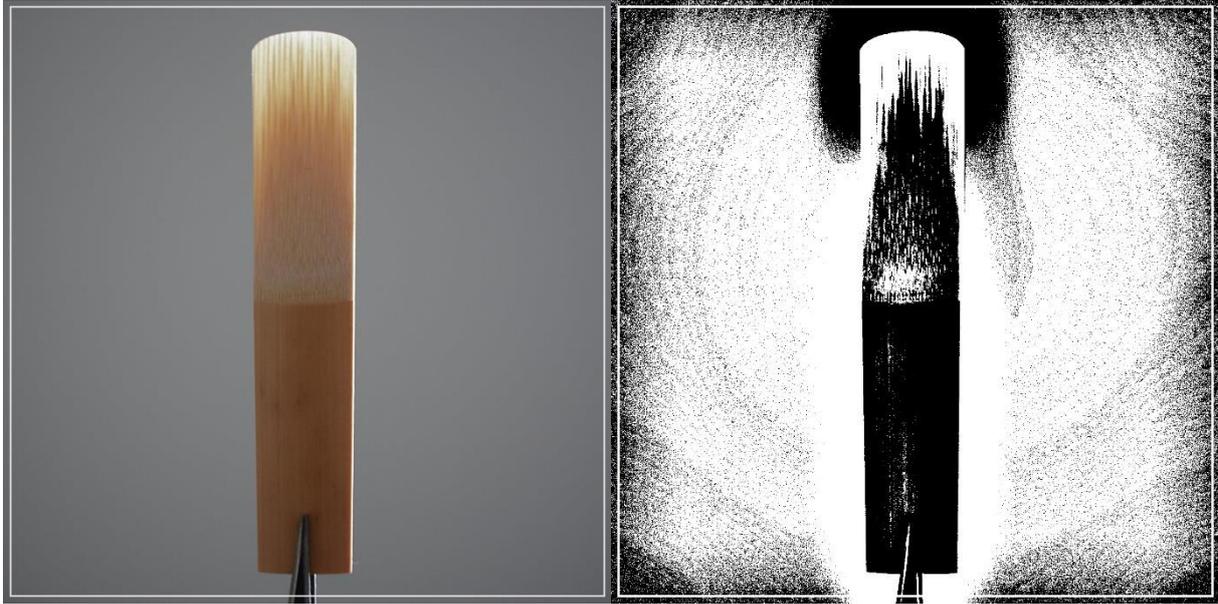


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	C	C	C	C
<b>Day 5</b>	B	B	B	C	C
<b>Day 10</b>	B	B	B	C	C

<b>Resonance</b>	Comfortable to project.
<b>Sound Quality</b>	Nice round sound.
<b>Dynamic Range</b>	Flexible and able to make contrasts.
<b>Resistance</b>	Fuzzy and hard.
<b>Articulation</b>	Very difficult to be agile and clear.
<b>Low/Mid/High register:</b>	Nice warm lower register.
<b>Other:</b>	Reed developed into a more flexible and open reed.

🎵 Audio: 40 Reed C10

# D1

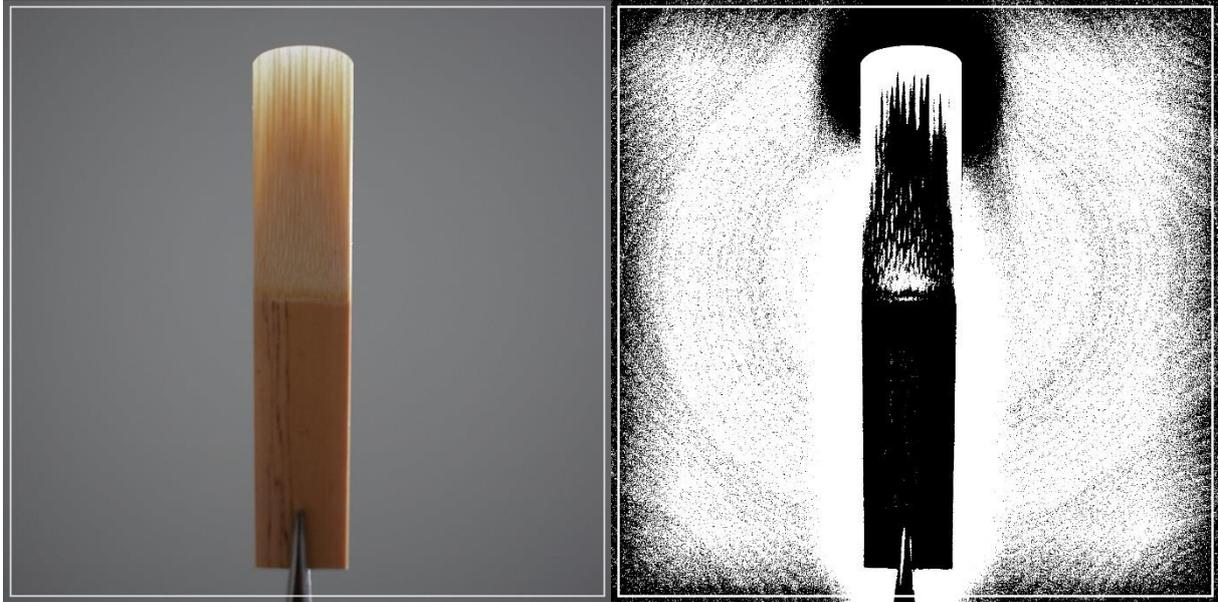


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	B	B	B	B	C
<b>Day 5</b>	C	B	C	C	C
<b>Day 10</b>	C	C	C	C	C

<b>Resonance</b>	Easy to project and support sound.
<b>Sound Quality</b>	Nice, warm sound with potential.
<b>Dynamic Range</b>	Ok
<b>Resistance</b>	A bit too resistant.
<b>Articulation</b>	Difficult to be agile and make clear articulations.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	Reed warped.

🎵 Audio: 41 Reed D1

## D2

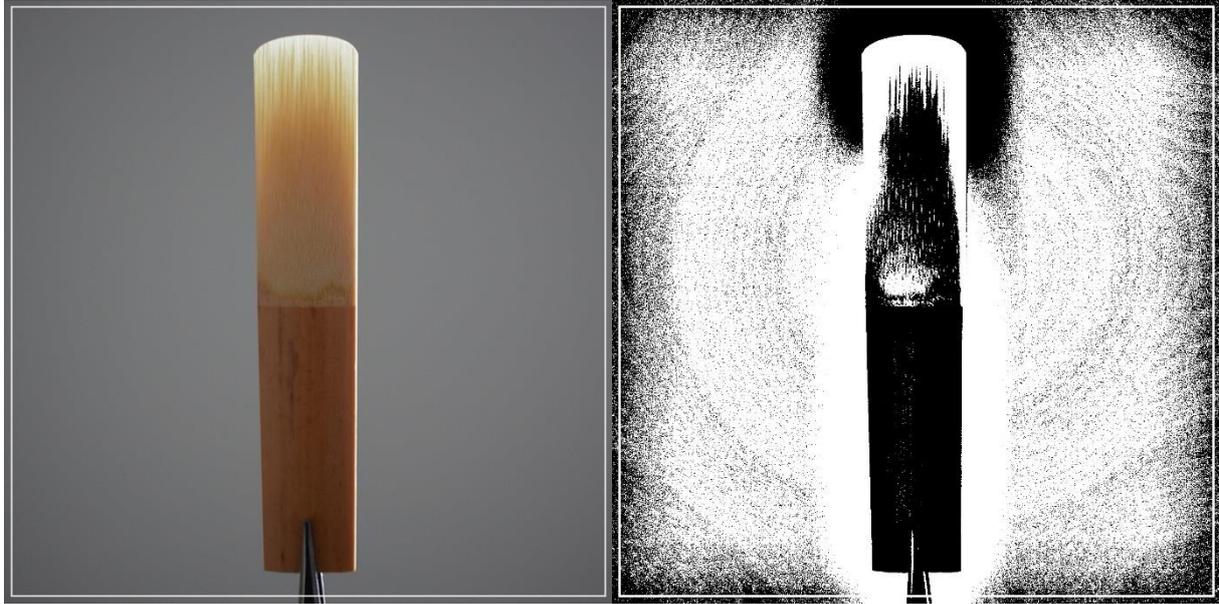


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	B	C	B	C	C
<b>Day 5</b>	C	C	C	C	C
<b>Day 10</b>	C	C	C	C	C

<b>Resonance</b>	Easy to project and carry the sound.
<b>Sound Quality</b>	Honky sound.
<b>Dynamic Range</b>	Hard to create contrasts.
<b>Resistance</b>	A bit too resistant and inflexible.
<b>Articulation</b>	Clumsy articulations because of resistance.
<b>Low/Mid/High register:</b>	Honky and wide lower register.
<b>Other:</b>	Reed collapsed by the fifth day.

♪ Audio: 42 Reed D2

D3

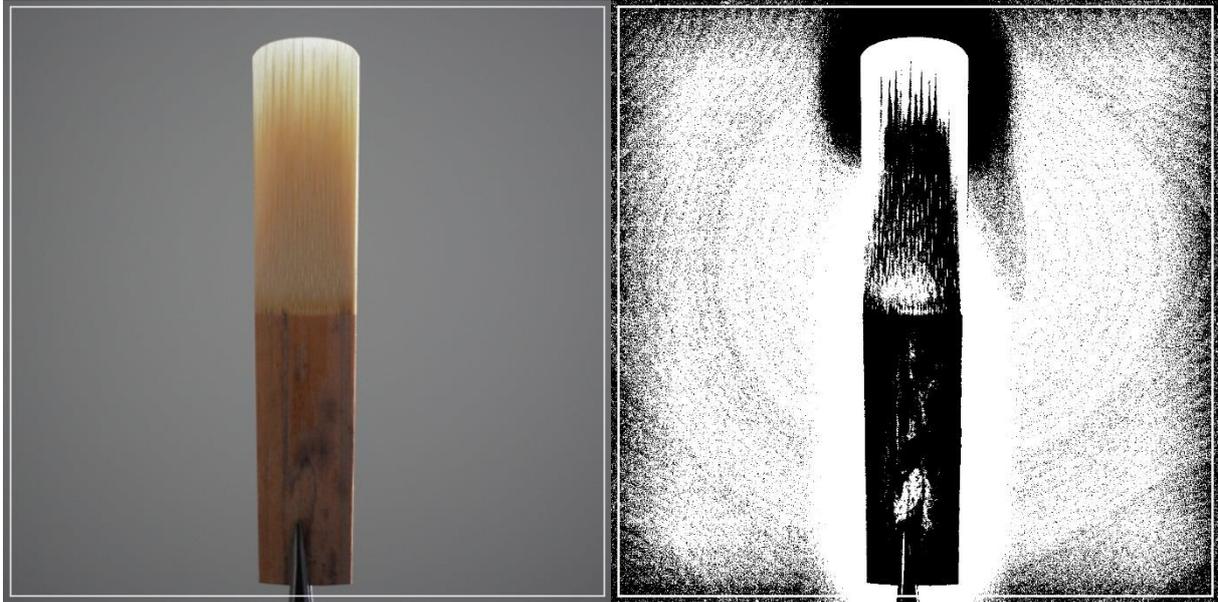


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	C	C	C	C
<b>Day 5</b>	C	C	C	C	C
<b>Day 10</b>	C	C	C	C	C

<b>Resonance</b>	Hard to make a sound let alone project.
<b>Sound Quality</b>	Honky and wide sound.
<b>Dynamic Range</b>	Inflexible.
<b>Resistance</b>	Too resistant.
<b>Articulation</b>	Impossible to make good articulations due to the hard resistance. Causes mistakes.
<b>Low/Mid/High register:</b>	Honky sound especially in the lower register.
<b>Other:</b>	Reed warped.

♪ Audio: 43 Reed D3

## D4

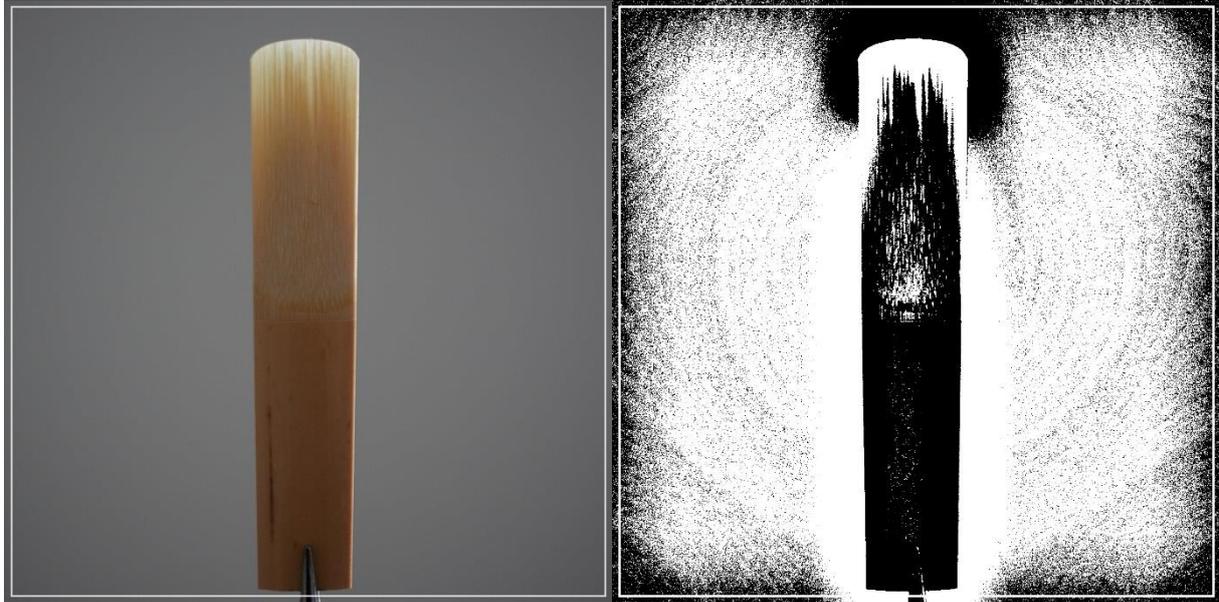


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	C	C	C	C
<b>Day 5</b>	C	C	C	C	C
<b>Day 10</b>	C	C	C	C	C

<b>Resonance</b>	Very difficult to produce a sound let alone project.
<b>Sound Quality</b>	Thin and wide.
<b>Dynamic Range</b>	Impossible to make proper contrasts.
<b>Resistance</b>	Too resistant.
<b>Articulation</b>	Impossible to make clear articulations.
<b>Low/Mid/High register:</b>	Honky and difficult to produce in tune, the high register almost does not sound.
<b>Other:</b>	Very hard and bad quality sound reed, threw it almost straight away.

🎵 Audio: 44 Reed D4

D5



	Resonance	Sound	Dynamics	Resistance	Articulation
Day 1	C	C	C	C	C
Day 5	C	C	C	C	C
Day 10	C	C	C	C	C

<b>Resonance</b>	
<b>Sound Quality</b>	Think and damp.
<b>Dynamic Range</b>	Inflexible to do hard resistance.
<b>Resistance</b>	Too hard and resistant, impossible to make a nice sound or any music.
<b>Articulation</b>	Almost impossible to make any sort of articulations.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	Discarded this reed on the third day as it was useless and getting worse.

🎵 Audio: 45 Reed D5

D6

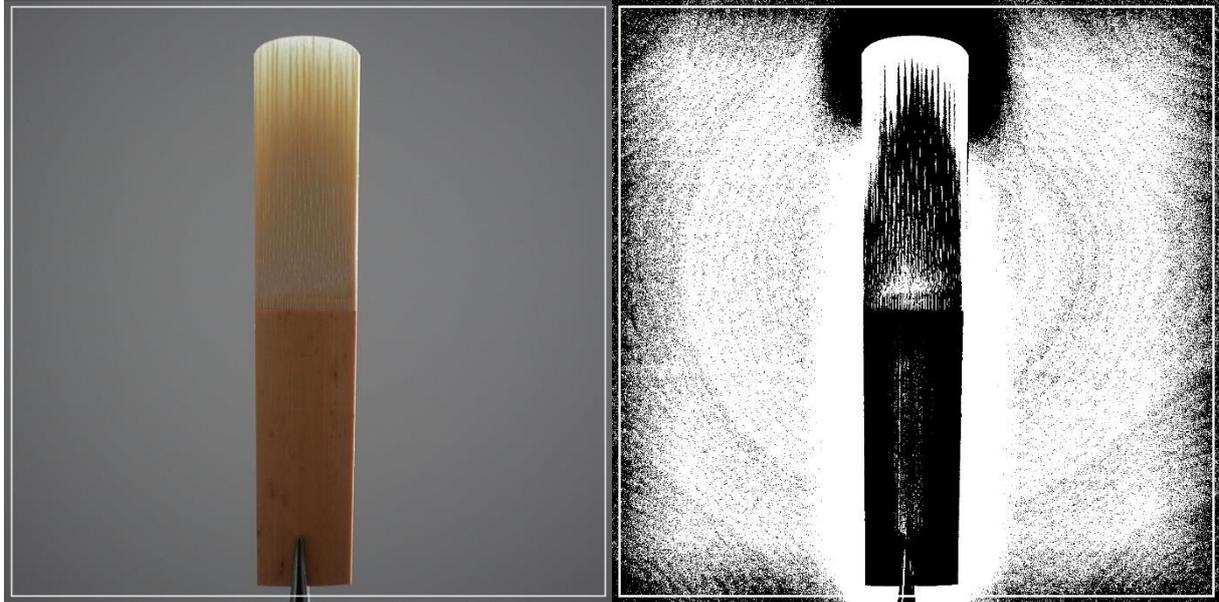


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	C	C	B	B
<b>Day 5</b>	C	C	C	C	C
<b>Day 10</b>	C	C	C	C	C

<b>Resonance</b>	
<b>Sound Quality</b>	Thin but better than the rest of the group.
<b>Dynamic Range</b>	Hard to make contrasting moods.
<b>Resistance</b>	Too resistant making high register squeaky and hard to play.
<b>Articulation</b>	Easier to articulate than the previous reeds.
<b>Low/Mid/High register:</b>	Squeaky high register.
<b>Other:</b>	Could have developed into a nice reed but warped.

🎵 Audio: 46 Reed D6

D7



	Resonance	Sound	Dynamics	Resistance	Articulation
Day 1	C	C	C	C	C
Day 5	C	C	C	C	C
Day 10	C	C	C	C	C

<b>Resonance</b>	Impossible to project with this resistance.
<b>Sound Quality</b>	Ugly, thin sound.
<b>Dynamic Range</b>	Very difficult to make contrasting dynamics.
<b>Resistance</b>	Too resistant and ugly.
<b>Articulation</b>	Fuzzy and unclear.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	Discarded this reed as it was not getting better and was impossible to play with.

♪ Audio: 47 Reed D7

D8

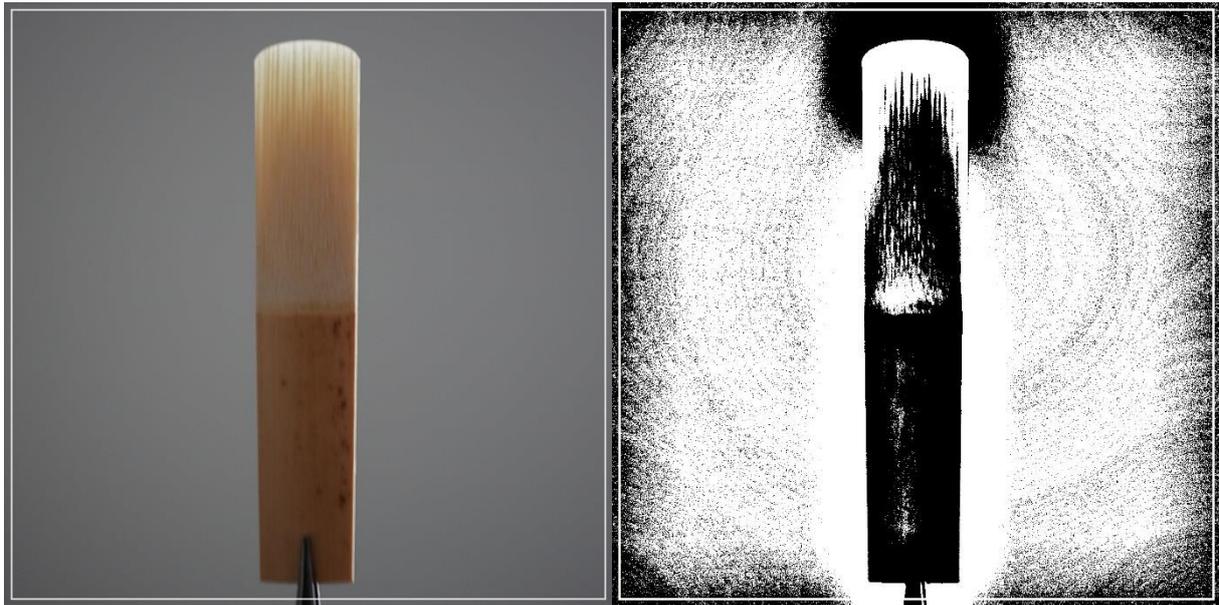


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	B	C	B	B
<b>Day 5</b>	C	C	C	C	C
<b>Day 10</b>	C	C	C	C	C

<b>Resonance</b>	Hard to project widely but ok.
<b>Sound Quality</b>	Better sound than the rest of the group.
<b>Dynamic Range</b>	Not very flexible, difficult to make music.
<b>Resistance</b>	Better than the rest of the group but difficult to play with and make music.
<b>Articulation</b>	Easy at first but impossible once reed warped.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	Reed warped.

🎵 Audio: 48 Reed D8

D9

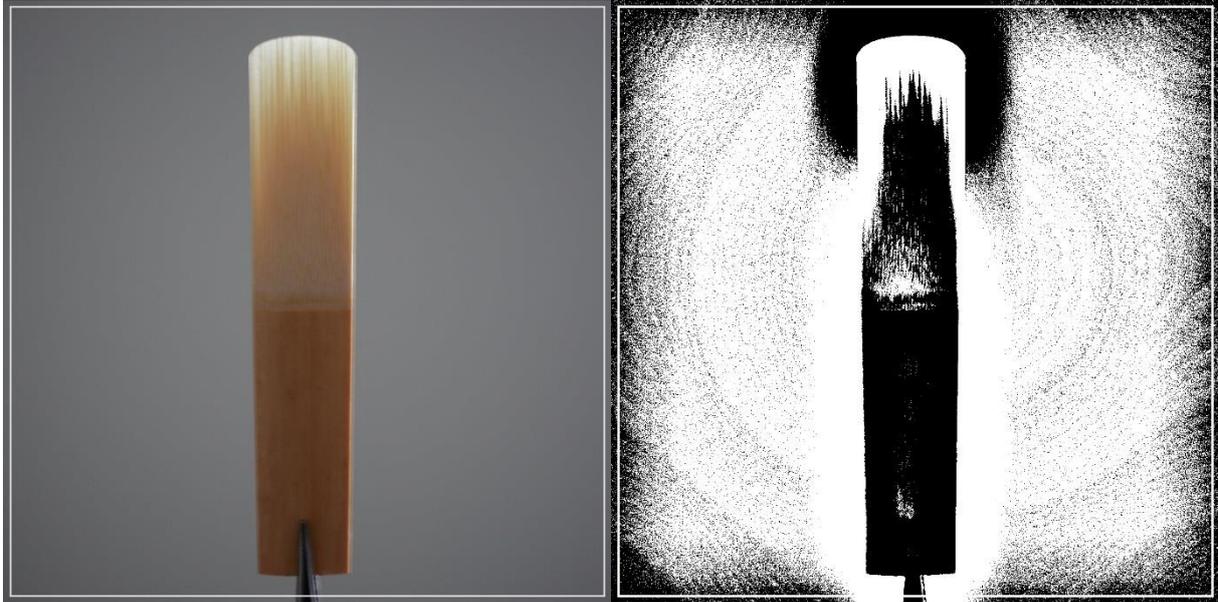


	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	C	C	C	C
<b>Day 5</b>	C	C	C	C	C
<b>Day 10</b>	C	C	C	C	C

<b>Resonance</b>	No real projection possible.
<b>Sound Quality</b>	Thin, ugly sound.
<b>Dynamic Range</b>	Non-existent.
<b>Resistance</b>	Too resistant and difficult to produce a sound.
<b>Articulation</b>	Impossible to make good and clear articulations.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	Discarded soon after first days for being too resistant.

♪ Audio: 49 Reed D9

## D10



	Resonance	Sound	Dynamics	Resistance	Articulation
<b>Day 1</b>	C	B	B	C	B
<b>Day 5</b>	B	B	B	B	B
<b>Day 10</b>	C	C	C	C	C

<b>Resonance</b>	Easier to project once reed develops (which ended up not happening as reed warped).
<b>Sound Quality</b>	Nice, warm sound potential.
<b>Dynamic Range</b>	Possible to make contrasting dynamics, although pianos are difficult to support.
<b>Resistance</b>	OK, much easier than the other reeds in the group, workable.
<b>Articulation</b>	Clearer articulation than any other reed in the group.
<b>Low/Mid/High register:</b>	
<b>Other:</b>	Reed ended up warping by day eight.

♪ Audio: 50 Reed D10

## 9. Appendix B: Survey Results

### **Respondent #1**

1. Do you play clarinet for a living?

**Student / Graduate level**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**n/a**

3. What is your favorite reed brand?

**Vandoren V12**

4. Do you age your reeds?

**No**

5. How do you humidify your reeds?

**I wet them with warm water**

6. How long do you usually break in reeds for?

**Less than 5 days**

7. Do you adjust your reeds after breaking them in?

**No, if a reed is bad, I just make do with what I have.**

8. Please describe your personal reed breaking in technique.

**n/a**

## **Respondent #2**

1. Do you play clarinet for a living?

**Professional clarinettist**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**n/a**

3. What is your favorite reed brand?

**Steuer**

4. Do you age your reeds?

**Yes, no less than 30 days**

5. How do you humidify your reeds?

**I just use saliva**

6. How long do you usually break in reeds for?

**More than 10 days**

7. Do you adjust your reeds after breaking them in?

**Yes, I have studied reed adjustment techniques and apply them accordingly.**

8. Please describe your personal reed breaking in technique.

**I wet my new reeds with saliva, and I play them no more than 5 minutes, usually for technic, for 7 or 10 days, then I modify them and take shape, the best I keep for the auditions have even 1 year of life. I change no more than 8 reeds a day during my practicing.**

### **Respondent #3**

1. Do you play clarinet for a living?

**Non-professional clarinettist**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**n/a**

3. What is your favorite reed brand?

**Vandoren Rue Lepic 56**

4. Do you age your reeds?

**No**

5. How do you humidify your reeds?

**I soak them in cold water.**

6. How long do you usually break in reeds for?

**Less than 5 days**

7. Do you adjust your reeds after breaking them in?

**Yes, I have studied reed adjustment techniques and apply them accordingly.**

8. Please describe your personal reed breaking in technique.

**n/a**

#### **Respondent #4**

1. Do you play clarinet for a living?

**Professional clarinettist**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**n/a**

3. What is your favorite reed brand?

**Vandoren V21**

4. Do you age your reeds?

**No**

5. How do you humidify your reeds?

**I soak them in cold water. 2-3 minutes, usually only for 4-day break-in period.**

6. How long do you usually break in reeds for?

**Less than 5 days**

7. Do you adjust your reeds after breaking them in?

**Yes, I have studied reed adjustment techniques and apply them accordingly.**

8. Please describe your personal reed breaking in technique.

**Three minutes of vamp submerged in water, then 5 minutes of play per day for four days.**

## **Respondent #5**

1. Do you play clarinet for a living?

**Professional clarinetist**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**n/a**

3. What is your favorite reed brand?

**D'Addario Reserve Classic**

4. Do you age your reeds?

**No**

5. How do you humidify your reeds?

**I wet them in cold water.**

6. How long do you usually break in reeds for?

**5-10 days**

7. Do you adjust your reeds after breaking them in?

**Yes, I have studied reed adjustment techniques and apply them accordingly.**

8. Please describe your personal reed breaking in technique.

**Play the reed minimally for 7 times/days, balancing and adjusting each day as needed. I use a Reed Geek to flatten the portion of the reed from the bottom of the mouthpiece window up to approximately where the facing begins. The reed will usually need this after it is being played for more extended periods of time. I also try to avoid getting the stock of the reed wet, just wetting the vamp.**

## **Respondent #6**

1. Do you play clarinet for a living?

**Student / Graduate Level**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**n/a**

3. What is your favorite reed brand?

**Vandoren V12**

4. Do you age your reeds?

**No**

5. How do you humidify your reeds?

**I just use saliva.**

6. How long do you usually break in reeds for?

**Less than 5 days.**

7. Do you adjust your reeds after breaking them in?

**Yes, I have studied reed adjustment techniques and apply them accordingly.**

8. Please describe your personal reed breaking in technique.

**When I take them from their box, I wet them and try them for a minute or so and then the next day a bit more and gradually they don't take in as much water anymore. Then they are done and hopefully good or at least playable. If not, I try to make them better by filing one side that are thicker or greasing them. This works sometimes. Often not though.**

## **Respondent #7**

1. Do you play clarinet for a living?

Professional clarinettist

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

n/a

3. What is your favorite reed brand?

D'Addario Reserve Classic and Vandoren Rue Lepic 56

4. Do you age your reeds?

Yes, one week.

5. How do you humidify your reeds?

I wet them in warm water. Only 15 seconds.

6. How long do you usually break in reeds for?

5-10 days

7. Do you adjust your reeds after breaking them in?

Yes, I have studied reed adjustment techniques and apply them accordingly.

8. Please describe your personal reed breaking in technique.

I do not do an extensive break in. After about 4 days of wetting and playing for only a few minutes, I use reed rush to polish the vamp until very smooth. Usually this allows me to get about 6-8 reeds out of a box that I can use. 3-4 that are very good. I continue to play them only a few minutes a day for 4 more days. Then they are good to go. You should always be in the process of breaking in new reeds as you are using your broken in reeds. I have never had been stuck for a good reed with this system. But that means that you are always into 2 boxes at a time, which can become expensive, but a box should last at least a month.

**Respondent #8**

1. Do you play clarinet for a living?

**Non-professional clarinetist**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**n/a**

3. What is your favorite reed brand?

**Behn Aria**

4. Do you age your reeds?

**No**

5. How do you humidify your reeds?

**I wet them in cold water.**

6. How long do you usually break in reeds for?

**Less than 5 days**

7. Do you adjust your reeds after breaking them in?

**Yes, I have studied reed adjustment techniques and apply them accordingly.**

8. Please describe your personal reed breaking in technique.

**n/a**

## Respondent #9

1. Do you play clarinet for a living?

Non-professional clarinetist

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

n/a

3. What is your favorite reed brand?

Marca

4. Do you age your reeds?

No

5. How do you humidify your reeds?

I just use saliva.

6. How long do you usually break in reeds for?

Less than 5 days

7. Do you adjust your reeds after breaking them in?

Yes, I have studied reed adjustment techniques and apply them accordingly.

8. Please describe your personal reed breaking in technique.

I studied music in college at an elevation 7000+ feet above sea level, and in an arid climate. I don't see any questions in your survey pertaining to average atmospheric humidity, or elevation. Both of which play heavily in the conditioning of reeds. Frankly, the methods everyone seems to use at sea level - well, those methods don't work here. I watched college student after college student end up with warped or moldy reeds coming to school in this dry elevation. Personally, after years of different instructors - I decided to forego the "break-in" process altogether and couldn't be happier with the results. An interesting side note: I find that I must use a half-strength firmer reed when I perform at sea level. Good luck with your research.

**Respondent #10**

1. Do you play clarinet for a living?

**Professional clarinettist**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**n/a**

3. What is your favorite reed brand?

**Vandoren V12**

4. Do you age your reeds?

**Yes, 2 years**

5. How do you humidify your reeds?

**I wet them in cold water.**

6. How long do you usually break in reeds for?

**5-10 days**

7. Do you adjust your reeds after breaking them in?

**No, if a reed is bad, I just make do with what I have.**

8. Please describe your personal reed breaking in technique.

**n/a**

**Respondent #11**

1. Do you play clarinet for a living?

**Non-professional clarinettist**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**n/a**

3. What is your favorite reed brand?

**Steuer Exclusive**

4. Do you age your reeds?

**No**

5. How do you humidify your reeds?

**I wet them in cold water.**

6. How long do you usually break in reeds for?

**Less than 5 days**

7. Do you adjust your reeds after breaking them in?

**Yes, I have studied reed adjustment techniques and apply them accordingly**

8. Please describe your personal reed breaking in technique.

**n/a**

**Respondent #12**

1. Do you play clarinet for a living?

**Non-professional clarinettist**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**n/a**

3. What is your favorite reed brand?

**Vandoren Traditional**

4. Do you age your reeds?

**No**

5. How do you humidify your reeds?

**I just use saliva.**

6. How long do you usually break in reeds for?

**5-10 days**

7. Do you adjust your reeds after breaking them in?

**Yes, I have studied reed adjustment techniques and apply them accordingly**

8. Please describe your personal reed breaking in technique.

**Play for 5 minutes, put it away. Repeat 2-3x a week for 1-2 weeks. Then lightly sand the back of the reed on a piece of flat glass. Plus, lightly scrape the face of the reed with a sharp reed knife for final adjustments.**

**Respondent #13**

1. Do you play clarinet for a living?

**Non-professional clarinetist**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**n/a**

3. What is your favorite reed brand?

**D'Addario Reserve Classic**

4. Do you age your reeds?

**No**

5. How do you humidify your reeds?

**I just use saliva.**

6. How long do you usually break in reeds for?

**5-10 days**

7. Do you adjust your reeds after breaking them in?

**Yes, I have studied reed adjustment techniques and apply them accordingly**

8. Please describe your personal reed breaking in technique.

**Wet with saliva for no more than 2 seconds. Test the reed on the mouthpiece, turning @ 30 deg. each side to determine balance. Use Tom Ridenour's ATG reed finishing system to balance. Play a short time each day for about 5 days, then use.**

## **Respondent #14**

1. Do you play clarinet for a living?

**Student / Graduate level**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**n/a**

3. What is your favorite reed brand?

**Vandoren Rue Lepic 56 and Vandoren V12**

4. Do you age your reeds?

**No**

5. How do you humidify your reeds?

**I just use saliva.**

6. How long do you usually break in reeds for?

**Less than 5 days**

7. Do you adjust your reeds after breaking them in?

**Yes, I have studied reed adjustment techniques and apply them accordingly**

8. Please describe your personal reed breaking in technique.

**I'm not a believer in an extended break-in process. Generally, I unwrap a new reed, play it for an hour and then put it aside. The next day I play it, and if necessary, adjust it. If it plays well, I add it to the 5-6 reeds I have in playable condition at any time. If it doesn't play well, I discard it and start again with another reed. There are better things to do with life than adjusting reeds.**

**Respondent #15**

1. Do you play clarinet for a living?

**Student / Graduate level.**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**n/a**

3. What is your favorite reed brand?

**Vandoren V12.**

4. Do you age your reeds?

**No.**

5. How do you humidify your reeds?

**I just use saliva.**

6. How long do you usually break in reeds for?

**Less than 5 days.**

7. Do you adjust your reeds after breaking them in?

**No, if a reed is bad, I just make do with what I have.**

8. Please describe your personal reed breaking in technique.

**n/a**

## **Respondent #16**

1. Do you play clarinet for a living?

**Nonprofessional clarinettist**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

n/a

3. What is your favorite reed brand?

**Vandoren Traditional and Vandoren V12.**

4. Do you age your reeds?

**Yes, 5 -25 years.**

5. How do you humidify your reeds?

**I soak them in cold water. 2-5 mins when new 30 secs when played in.**

6. How long do you usually break in reeds for?

**5-10 days.**

7. Do you adjust your reeds after breaking them in?

**Yes, I have studied reed adjustment techniques and apply them accordingly.**

8. Please describe your personal reed breaking in technique.

**Soak the reeds once or twice on days before first playing. Play for a few minutes in low and medium registers. Increase playing time over 5-10 days. Avoid adjusting (unless necessary to get them playing) for the first 3-4 days. Make gradual adjustments needed over next few days. By day 6 probably playing each reed for 10-15 minutes and introducing low altissimo and light staccato. By day 8-10 reed should be graded as practice of performance quality and ready for regular use.**

**Respondent #17**

1. Do you play clarinet for a living?

**Professional clarinettist.**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**n/a**

3. What is your favorite reed brand?

**Peter Leuthner.**

4. Do you age your reeds?

**No.**

5. How do you humidify your reeds?

**I wet them in cold water, about 15 seconds.**

6. How long do you usually break in reeds for?

**5-10 days.**

7. Do you adjust your reeds after breaking them in?

**No, if a reed is bad, I just make do with what I have.**

8. Please describe your personal reed breaking in technique.

**n/a**

## **Respondent #18**

1. Do you play clarinet for a living?

**Student / Graduate Level**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**Dfb**

3. What is your favorite reed brand?

**Vandoren Rue Lepic 56**

4. Do you age your reeds?

**No.**

5. How do you humidify your reeds?

**I just use saliva.**

6. How long do you usually break in reeds for?

**5-10 days.**

7. Do you adjust your reeds after breaking them in?

**Yes, I have studied reed adjustment techniques and apply them accordingly.**

8. Please describe your personal reed breaking in technique.

**I use a bastard file to flatten reeds when they are warped or need a better seal against the mouthpiece. I use a sanding stick to balance the tip and the "fulcrum point" against the mouthpiece's rails (about midway down the reed along the edges). I don't make much material off at all for each adjustment.**

**Respondent #19**

1. Do you play clarinet for a living?

**Student / Graduate Level**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**Aw**

3. What is your favorite reed brand?

**Behn Aria**

4. Do you age your reeds?

**No.**

5. How do you humidify your reeds?

**I just use saliva.**

6. How long do you usually break in reeds for?

**5-10 days.**

7. Do you adjust your reeds after breaking them in?

**Yes, I have studied reed adjustment techniques and apply them accordingly.**

8. Please describe your personal reed breaking in technique.

**n/a**

## **Respondent #20**

1. Do you play clarinet for a living?

**Non-professional clarinettist.**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**Cfa**

3. What is your favorite reed brand?

**Behn Aria**

4. Do you age your reeds?

**No.**

5. How do you humidify your reeds?

**I just use saliva.**

6. How long do you usually break in reeds for?

**5-10 days.**

7. Do you adjust your reeds after breaking them in?

**Yes, I have studied reed adjustment techniques and apply them accordingly.**

8. Please describe your personal reed breaking in technique.

**Wet the first time for 40 seconds in water. Rub vamp to close pores. Play for 1 minutes.**

**Store and allow to dry. Next 6 days, wet, play for 1 minute, store and dry.**

## **Respondent #21**

1. Do you play clarinet for a living?

**Professional clarinettist.**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**Dfa.**

3. What is your favorite reed brand?

**Vandoren Rue Lepic 56 and Vandoren V21.**

4. Do you age your reeds?

**No.**

5. How do you humidify your reeds?

**I soak them in cold water. 2 min.**

6. How long do you usually break in reeds for?

**Less than 5 days.**

7. Do you adjust your reeds after breaking them in?

**No, if a reed is bad, I just make do with what I have.**

8. Please describe your personal reed breaking in technique.

**n/a**

## **Respondent #22**

1. Do you play clarinet for a living?

**Professional clarinettist.**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**Csa.**

3. What is your favorite reed brand?

**D'Addario Reserve Classic.**

4. Do you age your reeds?

**No.**

5. How do you humidify your reeds?

**I just use saliva.**

6. How long do you usually break in reeds for?

**Less than 5 days.**

7. Do you adjust your reeds after breaking them in?

**No, if a reed is bad, I just make do with what I have.**

8. Please describe your personal reed breaking in technique.

**n/a**

### **Respondent #23**

1. Do you play clarinet for a living?

**Non-professional clarinettist.**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**Cfb.**

3. What is your favorite reed brand?

**Vandoren V12 and Vandoren V21.**

4. Do you age your reeds?

**No.**

5. How do you humidify your reeds?

**I just use saliva.**

6. How long do you usually break in reeds for?

**5-10 days.**

7. Do you adjust your reeds after breaking them in?

**Yes, I have studied reed adjustment techniques and apply them accordingly.**

8. Please describe your personal reed breaking in technique.

**First day: play thirty seconds. Evaluate stiffness. Second day: play one minute. Adjust for imbalance and stiffness.**

**Third to sixth (?) day: same as second day. Repeat until playable without too much effort.**

**Then skip the adjustments but limit the use to about one minute each time. After several times of short playing (see above), play five or ten minutes. Maybe adjust some details.**

**After two weeks play half an hour, then quickly up to one hour. Always switch good reeds after one hour, so all broken in reeds are cycled. I have three good reeds and one being broken in.**

**Respondent #24**

1. Do you play clarinet for a living?

**Non-professional clarinettist.**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**BWh.**

3. What is your favorite reed brand?

**Vandoren V12.**

4. Do you age your reeds?

**No.**

5. How do you humidify your reeds?

**I just use saliva.**

6. How long do you usually break in reeds for?

**5-10 days.**

7. Do you adjust your reeds after breaking them in?

**No.**

8. Please describe your personal reed breaking in technique.

**n/a**

**Respondent #25**

1. Do you play clarinet for a living?

**Student / Graduate Level.**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**Cfa.**

3. What is your favorite reed brand?

**Vandoren Traditional.**

4. Do you age your reeds?

**No.**

5. How do you humidify your reeds?

**I just use saliva.**

6. How long do you usually break in reeds for?

**5-10 days.**

7. Do you adjust your reeds after breaking them in?

**No.**

8. Please describe your personal reed breaking in technique.

**n/a**

## **Respondent #26**

1. Do you play clarinet for a living?

**Professional clarinettist.**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**Dfb.**

3. What is your favorite reed brand?

**D'Addario Reserve Classic and Behn**

4. Do you age your reeds?

**Yes. Nothing formal, but I tend to buy ahead, so they do sit for a time, possibly months.**

5. How do you humidify your reeds?

**I just use saliva. A few minutes, saliva or water**

6. How long do you usually break in reeds for?

**5-10 days.**

7. Do you adjust your reeds after breaking them in?

**Yes, I have studied reed adjustment techniques and apply them accordingly.**

8. Please describe your personal reed breaking in technique.

**Gentle wetting over a few days, gradually increase playing time, rub reeds to close pores, adjust with knife or rush for balance. Flatten on a file.**

## **Respondent #27**

1. Do you play clarinet for a living?

**Non-professional clarinetist.**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**Dfb.**

3. What is your favorite reed brand?

**Vandoren V21**

4. Do you age your reeds?

**No.**

5. How do you humidify your reeds?

**I wet them in cold water.**

6. How long do you usually break in reeds for?

**Less than 5 days.**

7. Do you adjust your reeds after breaking them in?

**Yes, I have studied reed adjustment techniques and apply them accordingly.**

8. Please describe your personal reed breaking in technique.

**Wet and rest 24h. Play a few times over a few days. Minor sanding on the tips and rails if necessary.**

**Respondent #28**

1. Do you play clarinet for a living?

**Professional clarinettist.**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**Am.**

3. What is your favorite reed brand?

**Steuer.**

4. Do you age your reeds?

**No.**

5. How do you humidify your reeds?

**I just use saliva.**

6. How long do you usually break in reeds for?

**Less than 5 days.**

7. Do you adjust your reeds after breaking them in?

**Yes, I have studied reed adjustment techniques and apply them accordingly.**

8. Please describe your personal reed breaking in technique.

**n/a.**

## **Respondent #29**

1. Do you play clarinet for a living?

**Non-professional clarinettist.**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**Aw.**

3. What is your favorite reed brand?

**Vandoren V12.**

4. Do you age your reeds?

**No.**

5. How do you humidify your reeds?

**I wet them in warm water.**

6. How long do you usually break in reeds for?

**5-10 days.**

7. Do you adjust your reeds after breaking them in?

**No, if a reed is bad, I just make do with what I have.**

8. Please describe your personal reed breaking in technique.

**It's fairly hit or miss. I've tried making adjustments in the past but was never confident in the results. I am constantly disappointed in how many reeds are either bad or take a \*long\* time to break in in a given package.**

**Respondent #30**

1. Do you play clarinet for a living?

**Non-professional clarinettist.**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**n/a.**

3. What is your favorite reed brand?

**Vandoren Rue Lepic 56 and Legere European cut.**

4. Do you age your reeds?

**No.**

5. How do you humidify your reeds?

**I wet them in cold water.**

6. How long do you usually break in reeds for?

**Less than 5 days.**

7. Do you adjust your reeds after breaking them in?

**Yes, I have studied reed adjustment techniques and apply them accordingly.**

8. Please describe your personal reed breaking in technique.

**n/a.**

### **Respondent #31**

1. Do you play clarinet for a living?

Professional clarinettist.

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

Dfa.

3. What is your favorite reed brand?

D'Addario Reserve Classic.

4. Do you age your reeds?

Yes, few days in humidity-stable environment before breaking in.

5. How do you humidify your reeds?

I just use saliva.

6. How long do you usually break in reeds for?

Less than 5 days.

7. Do you adjust your reeds after breaking them in?

Yes, I have studied reed adjustment techniques and apply them accordingly.

8. Please describe your personal reed breaking in technique.

Flatten backs on the back of a piece of sandpaper or sand flat depending on warp. First day play for a minute or two, flatten back after playing. Second day play for around 5 mins, again flattening before and after play. Third day play for 5-10 minutes, this day doing major balancing adjustments, always flattening reed back before and after play. Increase time played after this by about five minutes per day, and by the end of a week reed is stable enough to perform final tweaking for strength/balance and enter regular rotation.

### **Respondent #32**

1. Do you play clarinet for a living?

Professional clarinetist.

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

Dfb.

3. What is your favorite reed brand?

Pilgerstofer.

4. Do you age your reeds?

Yes, I work them for 10 days +, wetting them with saliva several times each day. Learned this process from Harold Wright.

5. How do you humidify your reeds?

I wet them in cold water. Prior to playing, about 5 minutes depending on season. Longer in winter than summer.

6. How long do you usually break in reeds for?

More than 10 days.

7. Do you adjust your reeds after breaking them in?

Yes, I have studied reed adjustment techniques and apply them accordingly.

8. Please describe your personal reed breaking in technique.

I open a box of 10 reeds, soak them in water, try each reed and put them in rank order good to bad. I then take off bark if it protrudes beyond the ligature and smooth the reed with rush also checking the back for flatness. Toss reeds that don't respond. I use saliva to wet reeds several times a day for the first few days rub them with my fingers on a piece of glass. I gradually adjust with the reed knife. I do not play on reeds very much especially for the first week. After 10 days I usually have 3 reeds out of the box of 10 that I feel comfortable playing in rehearsals and concerts.

### **Respondent #33**

1. Do you play clarinet for a living?

**Professional clarinettist.**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**BWh.**

3. What is your favorite reed brand?

**D'Addario Reserve Classic.**

4. Do you age your reeds?

**No.**

5. How do you humidify your reeds?

**I just use saliva.**

6. How long do you usually break in reeds for?

**5-10 days.**

7. Do you adjust your reeds after breaking them in?

**Yes, I have studied reed adjustment techniques and apply them accordingly.**

8. Please describe your personal reed breaking in technique.

**The first day I play a new reed, I play it for 30 seconds, the next day 1 minute, the day after, 2 minutes, and so on...**

**Respondent #34**

1. Do you play clarinet for a living?

**Student / Graduate level.**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**Cfb.**

3. What is your favorite reed brand?

**D'Addario Reserve Classic and Vandoren V12.**

4. Do you age your reeds?

**No.**

5. How do you humidify your reeds?

**I just use saliva.**

6. How long do you usually break in reeds for?

**5-10 days.**

7. Do you adjust your reeds after breaking them in?

**No, if a reed is bad, I just make do with what I have.**

8. Please describe your personal reed breaking in technique.

**n/a.**

### **Respondent #35**

1. Do you play clarinet for a living?

**Professional clarinettist.**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**Dfb.**

3. What is your favorite reed brand?

**D'Addario Reserve and Vandoren V12.**

4. Do you age your reeds?

**No.**

5. How do you humidify your reeds?

**I just use saliva.**

6. How long do you usually break in reeds for?

**5-10 days.**

7. Do you adjust your reeds after breaking them in?

**Yes, I have studied reed adjustment techniques and apply them accordingly.**

8. Please describe your personal reed breaking in technique.

**I only use sandpaper, regular printer paper, a reed geek (tool), and the Vandoren reed trimmer for V12s. I primarily ensure that the vamp of the reed isn't warping by either flattening on paper or using the square edge of the reed geek to precisely flatten. I use approximately 400 grit sandpaper to finish the reed; usually it takes 1-2 gentle swipes to fix a reed's problem and/or balance it. I trim my reeds frequently, especially as they age and get a little too flexible, though when I do trim, I take of very little material. I keep my reeds in a humidified Tupperware container. I used to use a knife, but I find that it doesn't fit my needs for clarinet reeds.**

**Respondent #36**

1. Do you play clarinet for a living?

**Non-professional clarinettist.**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**Aw.**

3. What is your favorite reed brand?

**Vandoren Traditional and Vandoren V21.**

4. Do you age your reeds?

**No.**

5. How do you humidify your reeds?

**I just use saliva.**

6. How long do you usually break in reeds for?

**5-10 days.**

7. Do you adjust your reeds after breaking them in?

**Yes, I have studied reed adjustment techniques and apply them accordingly.**

8. Please describe your personal reed breaking in technique.

**n/a.**

**Respondent #37**

1. Do you play clarinet for a living?

**Non-professional clarinettist.**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**Cwc.**

3. What is your favorite reed brand?

**Vandoren Traditional.**

4. Do you age your reeds?

**No.**

5. How do you humidify your reeds?

**I soak them in warm water. 5 days.**

6. How long do you usually break in reeds for?

**Less than 5 days.**

7. Do you adjust your reeds after breaking them in?

**n/a.**

8. Please describe your personal reed breaking in technique.

**n/a.**

**Respondent #38**

1. Do you play clarinet for a living?

**Student / Graduate level.**

2. According to the Köppen-Geiger Climate Classification map below, which climate would you say you currently live in?

**Dfb.**

3. What is your favorite reed brand?

**Vandoren V12.**

4. Do you age your reeds?

**No.**

5. How do you humidify your reeds?

**I wet them in warm water during four-five days.**

6. How long do you usually break in reeds for?

**5-10 days.**

7. Do you adjust your reeds after breaking them in?

**n/a.**

8. Please describe your personal reed breaking in technique.

**n/a.**