

HUMIDITY IN BRASS INSTRUMENTS AND THE PREVENTION OF CORROSION

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ABSTRACT

The moisture generated in historical wind instruments during musical performances poses a serious threat to their long-term preservation. The potential damage impact varies greatly depending on the material. While the effects of humidity fluctuations caused by playing had previously been analysed in woodwind instruments [1], similar research on brass instruments had not yet been conducted. This study aims to gauge the processes and consequences occurring inside regularly played historic brass instruments as well as to provide suggestions for suitable preventive measures in order to minimise possible damage. The study took place within the frame of the interdisciplinary research project "Brass instruments of the 19th and early 20th centuries between long-term conservation and use in historically informed performance practice" by the Swiss Nationalfonds. The project is a collaboration between the Bern University of Arts, the Swiss National Museum, the ETH Zurich and the Paul Scherrer Institute Villigen.

Approximately 100-years-old brass instruments, later used in historically informed performances of Stravinsky's *Le sacre du printemps* [2], were deeply investigated. Based on temperature and humidity measurements, the climatic conditions were assessed before, during and after playing of different historical brass instruments, ranging in scale length from the trumpet to the tuba. It could be established that the instruments' internal relative humidity reached very high levels after just a few minutes playing and that these values decreased only very slowly afterwards, despite emptying the tuning slides, which is common practice for musicians. Regularly played brass instruments have therefore a very high, permanent level of internal relative humidity which consequently increases the risk of metal corrosion.

Amongst other things, the concept of preventive conservation included tests on various greases and oils in order to access their suitability for conservation. But the main task aimed at devising a simple drying method easy to apply daily by musicians. Climatic measurements showed that the moisture levels inside the instruments can be reduced within short time using simple fans (figure 1). The efficiency of this preventive conservation protocol is tested by a long-term survey during which 16 brass instruments, divided into two groups, are played daily by musicians. The first group is played according to specific preventive conservation guidelines while the second one is played following common practice. All instruments are analysed by non-destructive methods at different times in order to evaluate the progression of their corrosion state [3]. Comparison between the conditions of the two groups, will allow an assessment of the efficiency.

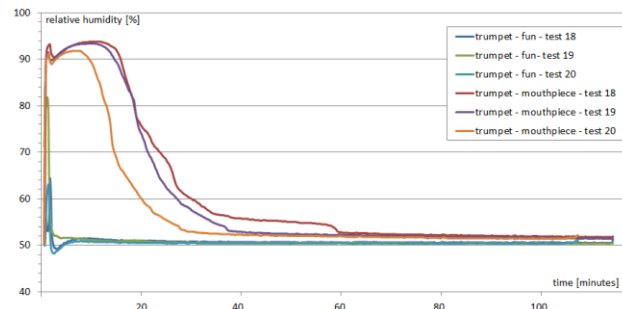


Figure 1: Decrease of relative humidity over time observed inside a trumpet at different places, using a fan as drying device.

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