

1 Measurement report airtightness

1.1 Active climate control

There are two ways to make acclimatized showcases, active and passive. The biggest advantage of active climate controlling is the flexibility of working compared with the gradation of the enclosure. It can be seen as the future standard for climate control, already running on full reliability.

With active humidity control in a showcase the system must be able to reach its setpoint value within 120 minutes after closing the showcase. With the system used by Bruns the quickest time to reach the setpoint value is 60 minutes in ideal circumstances. These values are based on the information provided by MiniClima.

Before deciding what is good or bad, there need to be considered some things. First, those active systems only need to operate at full speed immediately after opening and closing the showcase. The raise in the reaction time will go down after the climate in the showcase is settled. Therefore, the active system can acclimatize all the air inside the showcase, assuming that the conditions are optimal within 60 minutes. The upper limit of the system is two times this time, 120 minutes. This is based on the theory that, the first hour the active system makes all the air “clean air”. At the moment that the air is refreshed all over again by leakage, the system needs to keep running on full speed all the time. This corresponds to 1ac/hor 24 ac/d.

The airtightness of the showcase determines the refresh time of the showcase. In the ideal situation of 60 minutes refresh time specified by MiniClima the airtightness of the showcase is 0.1ac/d, by 35-95% Relative humidity in the building,

1.2 NAM – case

In the case of the National Army Museum, an exhibition that Bruns provided with showcases, there been done some AER-tests (Air Exchange Rate tests). Those tests are telling us how air tight the showcase is, but tells nothing about the climate control of the showcase. Therefore the specifications of the active systems used by Bruns need to be linked to the measured airtightness.

Name showcase	ac/d		refresh time [min]
ARM 5 SHO 2	0,45		60,9
ARM 5.1SHO2	0,54		61,1
SOC 1.7 SHO 1 + SOC 3.1 SHO1	2,06		64,9
SOC 1.9 SHO 1 + SOC 1,3 SHO 1	1,14		62,6
SOC 4.1SHO1*	0,07		60,0
SOL 2.4 SHO1+ SOL 2.1SHO2	0,27		60,4

*This showcase is not acclimatized

In this case, the highest increase of the reaction time is 8,1%. Considered that this increase only reach that high when the showcase was opened for a while and closed again.