

Anwendung der stationären Thermokammer und Erfolgskontrolle

[Application and success control of the stationary thermal chamber]

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Zusammenfassung

Die Nutzung der von der Firma Thermo Lignum®, Heidelberg, konzipierten Thermokammern zur Bekämpfung von holzerstörenden Insekten in musealen Objekten im Westfälischen Freilichtmuseum Detmold (WFM) und im Museumsdorf Bayerischer Wald in Tittling (MBW) wird dargestellt. In Reihenuntersuchungen im WFM wurde mittels Lebendproben mit Larven des Gewöhnlichen Nagekäfers und Hausbockkäfers die Effektivität dieser Behandlungen untersucht (Erfolgskontrolle). Die praktische Anwendung der Thermokammer, insbesondere hinsichtlich der Bestückung mit landwirtschaftlichen Holzobjekten, wird anhand der Verfahrensweise im MBW erläutert. Die Einbindung dieses Verfahrens in die Integrierte Schädlingsbekämpfung wird diskutiert.

Summary

Thermal measures are one method of controlling of wood-destroying organisms, in addition to application of fumigants and curative wood preservatives. One of the existing temperature treatment methods is the use of stationary or mobile thermal chambers, which are based on the principle of kiln-drying for lumber and are additionally equipped with a humidification system and extensive control technology. This humidity-regulated control measure permits a gentle warming of infested wooden material up to lethal temperatures for the insects. The computer-assisted ThermoLignum®-process has been used many times for the treatment of materials attacked by wood-destroying insects.

Two stationary ThermoLignum® chambers are employed in the open air museum „Museumsdorf Bayerischer Wald“ in Tittling/Passau (MBW) and in the main depot of the Westphalian Open Air Museum Detmold (WFM; „Fliegerhorst“). Since the begin-

ning of the millenium these chambers have been used for the treatment of furniture (cupboards, chests, tables, chairs, etc.), construction materials (floor boards, beams, large elements) and agricultural or technical wooden objects (carts, wagons, large pieces of equipment, tools, miniature objects).

The practical work with the thermal chamber in the MBW is presented and summarized. This presentation includes details of staff work, chamber running cycles, material turnover, archive work, maintenance and trouble shooting. In 5 years of operation in the MBW 173 runs with more than 15,000 objects have been carried out; whereas in 6 years in the WFM 280 runs were recorded. In the former museum the size of objects were on the scale of large handcarts to spindles, thus, resulting in numbers of treated objects between a few and up to one thousand items per chamber operation.

Mainly in the thermal chamber of the WFM, the Federal Research Centre for Forestry and Forest Products (BFH) conducted control studies, which were to simulate and document the success of this treatment on infested objects. For this purpose control blocks with living larvae of one of the main target insects – e.g., the common furniture beetle (*Anobium punctatum* (De Geer)) in both museums – were used. Additionally, samples with different larval stages of the old house borer (*Hylotrupes bajulus* (L.)) were applied for assessment of the efficiency of the treatment.

The results of these bioassays with varying holding time of the timber temperature revealed that holding times of one hour at the target temperature will ensure the eradication of larval stages of both *Anobium* and *Hylotrupes* at a temperature of 55°C in the centre of the largest timber diameter present and with a maximum difference of $\Delta T=10^{\circ}\text{C}$ between chamber and timber temperature. Further specific details of

selected chamber runs are presented, explained and discussed.

The successful application of the thermal chamber in museums is extensively analysed with respect to the strategic integration in the integrated pest management of wood-destroying insects, especially regard-

ing storage in infested buildings and/or those suspected of being infested. The necessity of establishing a storage facility, constant inspections and required cleanness particularly with regard to importing unattacked and/or treated – if previously attacked – objects is stressed.