Comparison of ISPM-15 and USDA Firewood Heat Treatment Standards

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This article compares the international ISPM-15 standard for wood packaging with the USDA's domestic firewood heat treatment requirements. It explains key differences in purpose, temperature, time, and certification procedures used to prevent the spread of invasive pests such as the emerald ash borer.

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The movement of untreated wood materials has long been a pathway for the spread of invasive pests around the world. To address this problem, international and domestic agencies have developed strict heat treatment standards to sterilize wood and prevent pest transmission. Two major standards guide these efforts: the International Standards for Phytosanitary Measures No. 15 (ISPM-15) for wood packaging materials, and the USDA Animal and Plant Health Inspection Service (APHIS) heat treatment requirements for firewood. While both aim to eliminate pests, they differ in their application, temperature and duration, and certification process.

Purpose and Application

ISPM-15 was established by the International Plant Protection Convention (IPPC) to regulate wood packaging materials used in international trade, such as pallets, crates, spools, and dunnage. The standard ensures that wooden materials crossing borders are free of live pests that could harm ecosystems and agriculture in importing countries.

The USDA's firewood heat treatment standard, by contrast, focuses on domestic firewood movement within the United States. It was developed to combat the spread of invasive species such as the emerald ash borer, a destructive beetle that has caused billions of dollars in damage to North American forests. Because firewood pieces are thicker and more irregular than shipping pallets, they require a higher temperature and longer treatment time to ensure complete sterilization.

Temperature and Time Requirements

The ISPM-15 standard requires that the wood's core temperature reach at least 56 degrees Celsius, equivalent to 133 degrees Fahrenheit, and be held for a minimum of 30 minutes. This level of heat is sufficient to kill most wood-boring insects and pathogens commonly associated with packaging materials.

In comparison, the USDA firewood standard requires a more intense treatment due to the higher heat tolerance of the emerald ash borer and the density of firewood. The firewood must reach a minimum core temperature of 60 degrees Celsius, or 140 degrees Fahrenheit, for a continuous duration of 60 minutes. Earlier versions of this standard required 71 degrees Celsius for 75 minutes, but this was revised after testing confirmed the lower threshold was sufficient.

Certification and Monitoring

Under ISPM-15, certification is managed by national plant protection organizations (NPPOs). Treated wood must be marked with the official IPPC heat treatment stamp before export. Facilities are inspected regularly, and their temperature sensors and data logging equipment must be calibrated and verified to maintain certification.

In the United States, the USDA APHIS program certifies firewood heat treatment facilities through compliance agreements. Operators are required to install temperature monitoring equipment, record core wood temperatures at frequent intervals, and keep complete digital or paper records for each treatment cycle. Unlike ISPM-15, there is no international stamp, but each facility must maintain proof of compliance for regulatory review.

Key Differences in Approach

The differences between ISPM-15 and USDA firewood heat treatment standards reflect their distinct goals. ISPM-15 addresses global trade, focusing on the uniform processing of small, manufactured wood materials. The USDA firewood standard, meanwhile, is designed to stop domestic pest spread through natural, irregularly sized firewood logs that retain more moisture and require greater heat penetration.

ISPM-15 operates on a global scale and is harmonized across member countries of the IPPC, while the USDA program functions at the national level with region-specific enforcement depending on pest threats.

Conclusion

Both ISPM-15 and the USDA's firewood heat treatment standards share the same ultimate goal—to protect forests and ecosystems from invasive species. However, their methods differ to accommodate the nature of the wood being treated and the pests being targeted. ISPM-15 ensures safe movement of wood packaging materials across international borders, while the USDA standard prevents domestic spread of pests such as the emerald ash borer through firewood. Together, they represent complementary efforts to safeguard the global and national environment from biological threats.

Source: United States Department of Agriculture, Forest Products Laboratory, General Technical Report FPL–GTR–200.

ISPM 15	Firewood Heat Treatment
TEMPERATURE 56 °C (133 °F)	TEMPERATURE 60 °C (140 °F)
TIME 30 minutes	PURPOSE 60 minutes

ISPM 15	Firewood Heat Treatment
TEMPERATURE 56 °C (133 °F)	TEMPERATURE 60 °C (140 °F)
TIME 30 minutes	PURPOSE 60 minutes
Wood packaging materials	Transported firewood