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REVIEW AND ANALYSIS

OF

POLESAVER™ TESTING

By

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INTRODUCTION

Polesaver® Rot-Guard™ is a dual layer composite total barrier system that is applied to new wooden utility poles before they are installed. When heated to approximately 310 °F, the inner layer of sealant melts and bonds to the surface of the pole while the outer thermoplastic shrinks to provide an additional layer of protection. This dual action forms an impermeable watertight barrier which prevents subsequent fungal attack.

Polesaver barriers have been in volume use for over 30 years with over 20 million composite sleeves in service in 35 countries.

SUMMARY

Extensive testing has demonstrated that the Polesaver total barrier effectively prevents direct fungal and insect attack and thus maintains the original pole strength over time. The complete seal provided by the barrier significantly limits moisture ingress resulting in low moisture levels within the sleeved zone compared with unsleeved poles. Controlling moisture in this critical groundline area controls rot in the pole.

The substantial body of test evidence shows that Polesaver sleeves significantly extend the life of wooden utility poles. In this context, the manufacturer’s claim that sleeves can add 20 years to a pole’s lifespan appears both reasonable and achievable.

For utility operators, this additional lifespan translates into meaningful economic benefits. There would be reduced pole replacement rates, lower maintenance costs, and the potential for extended pole inspection intervals. In addition, Polesaver sleeves can support grid hardening initiatives by enabling utilities to achieve enhanced pole durability without the need for oversized wood poles or more expensive alternates such as composite or steel poles.

ANALYSIS AND SUMMARY OF DATA

In discussing the data, it is important to recognize that barrier wraps (and indeed all products) must be applied correctly in order to perform as they are designed or performance will be impaired. It should also be noted that all tests herein were performed on Polesaver products and not extrapolated from other test data/reports.

Uganda Pole Test[1]

This program assessed 113 distribution poles sleeved with Polesaver Rot-Guards compared to 87 control poles with no sleeves that were placed in central Uganda. Central Uganda is bisected by the equator with temperatures of 60-80 °F and about 60 inches of rainfall annually. In short, the climate is hot and humid with significant rainfall which is indeed a harsh environment for wood in ground contact.

After 8 years exposure, no attack was found on 112 poles where Polesaver Rot-Guards were correctly applied. One pole with an incorrectly applied Rot-Guard (with less than 6 inches left above ground level) showed some degradation (1-20%) within 3 feet of the ground line.

In contrast, 4.6% of the 87 control poles without sleeves had fungal attack and 5.8% had termite damage in only 8 years.

This large-scale full exposure test in a harsh climate irrefutably showed that correctly applied Rot-Guards prevent early attack by both wood decaying organisms and termites and hence extend the service life of poles.

England Pole Test[2]

The Building Research Establishment Ltd. (BRE) a leading European wood test body, conducted testing using Rot-Guards at two sites in a manner similar to the AWPA E8 Post

Test using 10-inch diameter poles. After 10 years, none of the five Polesaver protected poles at the first site had any damage while 2 of the 3 unprotected control poles showed signs of decay. Similar results were found at the second site where the 3 Polesaver poles were still sound at the 10-year mark and the one control pole had some softening.

The images below show wood at the top of sleeve to be dry and free from algae whereas unprotected poles are visibly wet with surface algae present at the ground line. This shows the effectiveness of total barrier systems in controlling moisture in the sleeved zone.



Image of Polesaver protected pole



Image of control pole wetting/algae present

England Stake Test[3]

In 2000 The BRE began an ongoing test of wooden stakes protected with Polesaver Rot-Guards using procedures analogous to the AWPA E7 Stake Test. Prior to sleeve application, the stakes were dipped in 3% CCA to achieve low retentions of preservative. At the 2025 inspection (after 25 years in test) there were no failures among the sleeved stakes while the dipped but unwrapped stakes only lasted an average of 15 years. The untreated, unwrapped stakes lasted slightly over 5.5 years on average. Thus, there is a considerable increase in life associated with the barrier sleeve.

England Soil Bed Test[4]

This test used the equivalent of the AWPA E14 Soil Bed Test to evaluate Polesaver Rot-Guard performance by measuring the strength (MOR) of the test stakes. After 4 years of exposure to fungal attack, the Polesaver protected stakes had the same MOR as at the beginning of the test. In contrast, the unwrapped but preservative treated stakes had MOR losses of 20% or more. This again demonstrates the effectiveness of the Polesaver barrier sleeve in preventing decay and also preventing loss of pole strength over time.

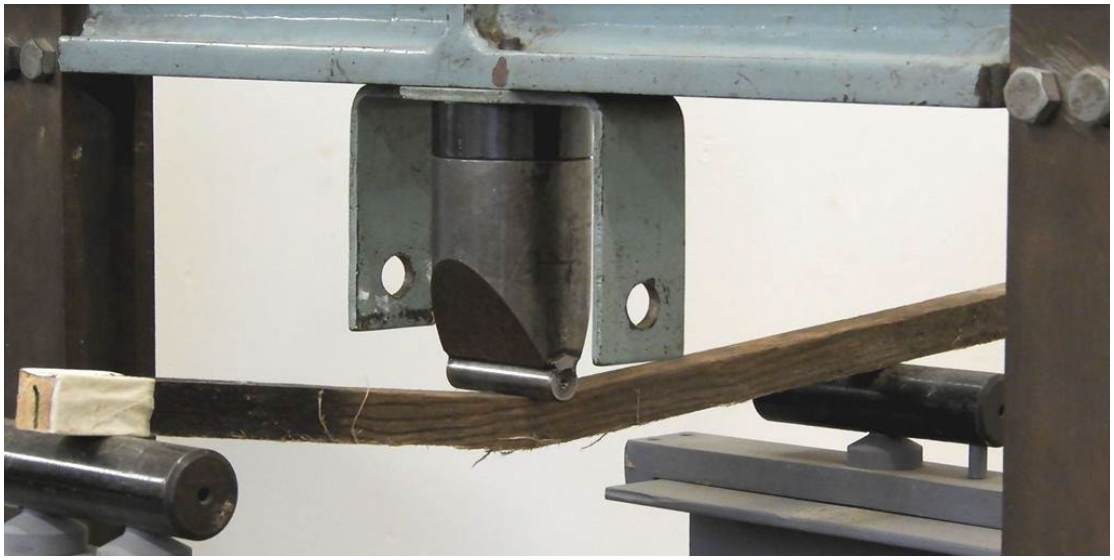


Image showing MOR (strength) testing of control stakes

England Soft Rot Test[5]

This test also is a soil bed test, but the moisture content of the soil is controlled to favor soft rot attack on the wood samples. After 1.2 years, the wrapped stakes had a mean weight loss of 2-7% and a moisture content at the top of the wrapped section of 21% which is below the 25% threshold required for decay to begin. This demonstrates the effectiveness of the system in controlling moisture content. By comparison, the unwrapped stakes had a weight loss of 6-41% and had a moisture content at the ground line of 170%. The extremely high moisture contents in the unwrapped stakes are troublesome as this provides an extremely attractive environment for decay organisms.

Partial and Total Barrier Comparative Moisture Uptake Test[6]

This test compared moisture uptake in poles protected with a range of partial barrier systems and the Polesaver total barrier system. The specimens were immersed ground line level in dyed water which was used to enable visual tracking of moisture movement. Partial barriers have only a single layer of protection and those on test included a simple wrap, a self-adhesive tape and a bag product. In contrast, the Polesaver total barrier has two layers of protection: the inner sealant and the outer barrier.

The findings confirm those seen in the above England Soft Rot Test[5] and the England Pole Test[2]. The Polesaver total barrier was effective in preventing the entry of moisture with no visible wetting of the wood behind the barrier. Conversely, there was visible wetting of the wood when the partial barrier systems were removed. In the case of the plain wrap and bag type barrier system water staining was visible at the top of the barrier after only a few days on test. The presence of moisture at this point is of concern since decay can easily spread on damp, unprotected wood.

CONCLUSIONS

Each of the six tests summarized above shows conclusively that correctly applied total barrier sleeves will significantly extend the service life of the underlying wood product whilst controlling moisture ingress and maintaining pole strength over time. Maintaining pole strength is a key requirement for utilities looking to improve grid hardening without having to use either oversize wooden poles or poles made from costly alternative materials.

The test evidence indicates that the manufacturers statement of sleeves adding 20 years to the life of a pole is reasonable and realistic.

REFERENCES

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5. Freedom Report (D. Sinclair), 2023, Project APPEAL Environmentally Acceptable Wood Pole Pre-treatment Alternatives to Creosote: Review of Potential Products and Initial Efficacy Tests, 36 pp.

6. Polesaver report covering moisture uptake for different barrier systems that clarifies the key difference between partial and total barrier systems. Richard George dated 04/11/2015

The above reports are available at www.Polesaver.com.