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APPLICATION BRIEF

Model 3216 Roof Reader™

Roof Moisture Gauge

Measures moisture content / moisture concentration within a roof structure

July 2001

Introduction

The 3216 Roof Reader, roof moisture gauge can quickly pinpoint problem areas on a roof structure and allow determination of the source of a leak. Areas of highest concentrations are shown by plotting the data derived from the gauge measurements. This type of survey can greatly reduce maintenance costs due to the ability to define areas needing repairs before total replacement becomes necessary. This method is nondestructive, quick and relatively inexpensive.

Troxler Technology

The Troxler Model 3216 Roof Reader gauge measures moisture concentration within a roof structure utilizing the theory of neutron thermalization. This gauge contains an Americium 241: Beryllium source. This source emits fast neutrons which are then thermalized (or slowed) by hydrogen present in the measurement area. The He³ detector in the gauge then counts the thermalized neutrons. Because other hydrogen bearing materials are present in roof structures, a measurement survey is performed to establish a relative base level, or a gauge reading that indicates a dry area. Areas showing a higher than normal moisture count can then be determined to contain moisture of varying levels.

If the actual moisture content value is desired, the gauge can easily be calibrated to the particular roof structure by removing core samples at various locations and performing laboratory moisture analysis. This is generally not necessary due to the fact that the relative readings taken by the gauge will effectively indicate elevated moisture levels in the roof structure.

Gauge Operation

The operation of the Model 3216 Roof Reader gauge is as simple as pressing a button. The results of a measurement can be viewed in 7.5 seconds or immediately in scanning mode. To begin a roof survey, a grid pattern should be laid out on the roof to determine where measurements will be performed and plotted on a scaled drawing of the roof. The grid size determines the total number of data points, data collection time, and resolution. There is no rule for determining the optimum size. On a 100' by 200" roof a grid size of 5' by 5' would result in 800 data points and 2.8 hours of measurement time using the 7.5 second mode; a grid size of 10' by 10' would result in 200 data

points and 0.7 hours of measurement time using the 7.5 second mode (with 5 seconds between tests). After performing measurements at each grid intersection point and recording the count on the roof drawing at the appropriate point, a frequency histogram can be created to determine which values represent dry areas and which represent wet areas. At this point the wet areas can be defined by drawing contour lines on the roof drawing, outlining the values determined to represent wet areas. Data analysis can be performed using spreadsheet software widely available today.

Main Features

The Model 3216 Roof Reader gauge allows the user to perform measurements on roof structures quickly and easily while keeping the gauge as simple to use as possible. The gauge offers a 7.5 second, 15 second and 60 second measurement mode as well as a scanning mode which gives instantaneous results. The gauge is lightweight, allowing it to be carried up ladders or otherwise transported to areas that need to be measured. This also allows the gauge to be used on vertical surfaces such as walls, sheathing materials, etc. without difficulty. In order to measure under structures such as air conditioning units, the handle of the gauge adjusts in height and tilts down and out of the way. Also, there are two start buttons on the gauge to begin a measurement. One is located on the gauge face and one on the handle to minimize the amount of bending done by the user.

Batteries and Power Consumption

The Roof Reader runs on rechargeable nickel - cadmium batteries. The gauge will run for approximately 130 hours before requiring a full recharge. This is approximately 2 weeks or more of typical use. The recharge period for a battery needing a full recharge is 16 hours or overnight. Adaptors included as standard accessories are a 110/220 V ac charger and a 12/14 V dc charger for a vehicle cigarette lighter outlet.

Summary

Troxler's Model 3216 Roof Reader roof moisture gauge allows mapping of hydrogen concentrations within a roofing structure, permitting repair or replacement of only saturated areas. As part of a preventative maintenance program, the Roof Reader quickly pinpoints problem areas, saving time and minimizing capital outlay. The Roof Reader is also an effective quality assurance tool on new roofing materials for warranty verification and for tracing leaks. The Model 3216 is a quick, versatile and nondestructive way to locate the source of a leak and repair the roof before complete removal and replacement of all roofing materials is necessary.

Model 3216 Roof Reader Specifications

(U.S. Customary Units)	7.5 sec.	15 sec.	60 sec.	
Precision at 12.5 pcf	0.62	0.44	0.22	+/- pcf
Depth of Measurement at 12.5 pcf	8.9 inches			
Useful Measurement Range	0 – 62.4 pcf			
 (SI Units)				
Precision at 200 kg/m ³	10.0	7.0	3.5	±kg/m ³
Depth of Measurement at 200 kg/m ³	225 mm			
Useful Measurement Range	0-1000 kg/m			