When you choose Galvalume coated steel for your roof, you're getting longevity built on decades of experience. Make the safe bet and trust a Galvalume roof.

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GALVALUME®
BUILD ONCE - ROOF ONCE

60 YEARS

Q What is the minimum desired lifetime for building materials to assure maximum energy and environmental credits, and to minimize building insurance rates?

A The Athena Sustainable Materials Institute has stated that 60 years represents the assumed buliding service life in life cycle analyses.

www.athenasmi.org

Q What service life can be expected for low-slope, unpainted GALVALUME roof panels?

A “End of life” service has not yet been seen because the oldest properly installed GALVALUME roof panels, dating to 1974, are still exhibiting excellent performance. Based on recent quantitative estimates, GALVALUME panel service life can potentially be as long as the assumed building service life of 60 years.

It may be the only roof required for that building.

Again, how long will low-slope unpainted GALVALUME roof panels last?

AND COUNTINING...

Panel service life estimates, based on inspections of actual roof installations by experienced engineers, have increased over time. The product has continued to perform successfully without end of life being observed.*

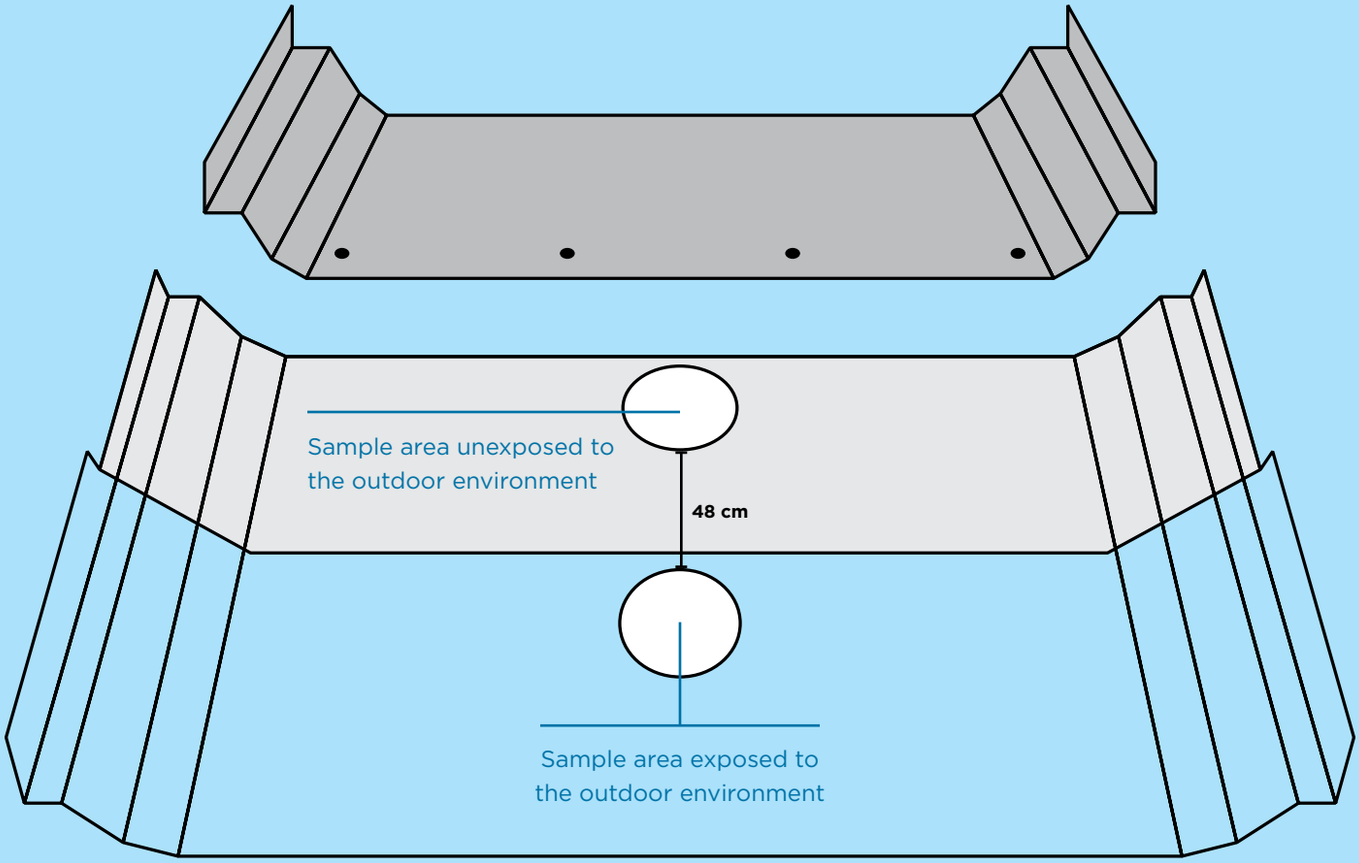
- In 1972 when the product was first introduced in the US market, the warranted service life for GALVALUME roof panels was 20 years.
- In 1987, inspection of roofs 8 to 11 years old prompted a roofing-industry expert to remark: "GALVALUME standing seam roofs that have adequate slope for free drainage, in normal environments, will all last 20 years. Many will provide 30 or more years..."
- In 1995, 20-year performance data on actual low-slope Standing Seam Roofs (SSR) confirmed that the GALVALUME roof panel outlived the 20-year warranted period.
- In 2000, low-slope SSR exhibited excellent service life after 25 years exposure.
- In 2004/2005, inspection results in Europe and USA projected the service life at more than 40 years. "Environmentally friendly regulation... expectations of life in excess of 50 years may well become the norm." *EuroZAC Technical Validation Paper 1, 2004.* "Based on field inspection results... indicates a total life of 40+ years, and confirms the experience of similar surveys in North America." *ZAC publication, 2005.*
- In 2010, a new method for Service Life Assessment of Low-Slope Roof Systems was peer-reviewed and published in the Journal of ASTM International.
- In 2012, inspection of 10 GALVALUME SSRs, using this quantitative methodology, predicted the service life of GALVALUME roof panels to be in excess of 60 years.**

*End of life has not been observed under normal atmospheric conditions where the roof has been installed using proper practices and suitable, long-life roof ancillaries.

**Haddock, R. and Dutton, R.J., "Service Life Assessment of a Low-Slope 55% Al-Zn Alloy-Coated Steel Standing Seam Roof System," Journal of ASTM International, Vol. 8 (8), September 2011.

NEW SAMPLING PROCEDURE

A more comprehensive and quantitative inspection in 2012 included removing a piece of the roof from an area that was exposed to the environment as well as from the adjacent overlapped area which was effectively protected from the environment. The roof panel was repaired by patching over the area from where the desired sample was obtained.

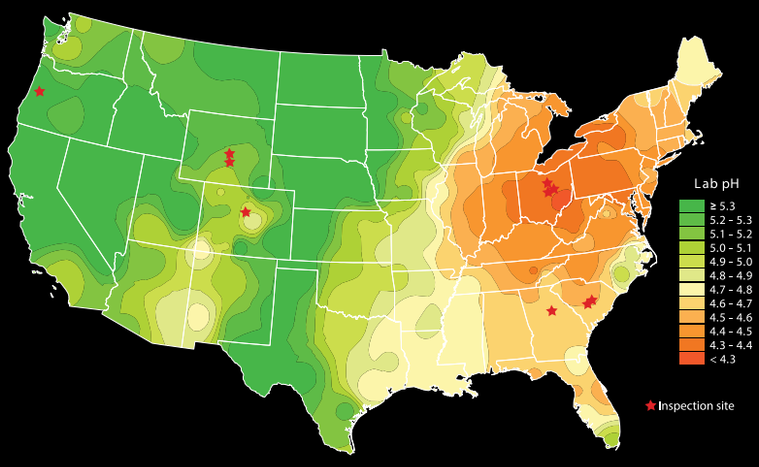


The sampling methodology used in the study included disassembly to allow for access to the overlapped and sealed area, which effectively represents the unexposed material. Exposed samples were removed from the same panel at an area immediately down slope from the above end lap and that was exposed to the environment. The end lap was reassembled and the hole in the roof was patched and sealed to make it water-tight.

Panel Disassembled

Sample Removed

Sample Repaired



Hydrogen ion concentration as pH from measurements made at the Central Analytical Laboratory, 1999*

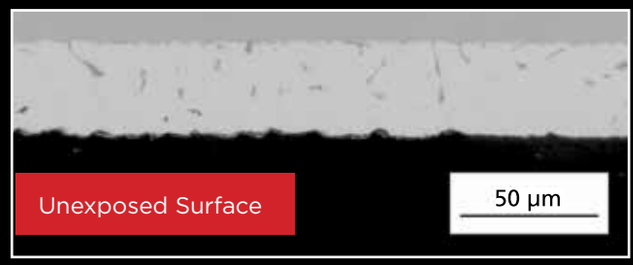
*National Atmospheric Deposition Program/National Trends Network, http://nadp.sws.uiuc.edu.

SAMPLED BUILDINGS

The locations of buildings inspected in 2012 are marked with the iso-pH map of the United States, which shows the average pH in that region. The average pH is a measure of the acidic rainfall in the region with lower values indicating more acidic rainfall. The 1999 average pH data of the precipitation was selected because it represents a mid-way point of precipitation pH improvement for most of the roof inspection sites between the late 1970's and today due to more stringent environmental controls.

Samples were analyzed for corrosion by an independent laboratory. The measured rate of corrosion was then used to calculate the projected panel service life for a typical Galvalume roof installed today in each building's environment.

Metallographic examination confirmed no deterioration of the GALVALUME coating on the unexposed side; the coating on the exposed side continues to protect the steel from corrosion.



SERVICE LIFE CALCULATION

Panel service life can be defined as:

The time required until the coating on the original top surface has disappeared and therefore no longer protects the steel from corrosion.

$$L_p = C_t/R$$

where

L_p = projected service life of roof panels, years
C_t = coating mass on top surface, g/m²
R = corrosion rate, g/m²/yr

SERVICE LIFE CALCULATION (WORST CASE)

Assume:

AZM165 coat (per ASTM A792)
Single-spot test limit is 150 g/m²
40% of coating is on top surface (60 g/m²) Central Ohio environment, pH = 4.36.

Then the time required until total mass loss of the original top surface coating has been achieved is:

Coating Mass (before exposure)	Mass Lost in 32 years	Corrosion rate
198 g/m²	27.3 g/m²	0.85 g/m²/yr
198 g/m²	32.7 g/m²	1.02 g/m²/yr

$$L_p = C_t/R$$
$$= (60\ g/m^2) / (1.02\ g/m^2/yr)$$
$$= 59\ years$$

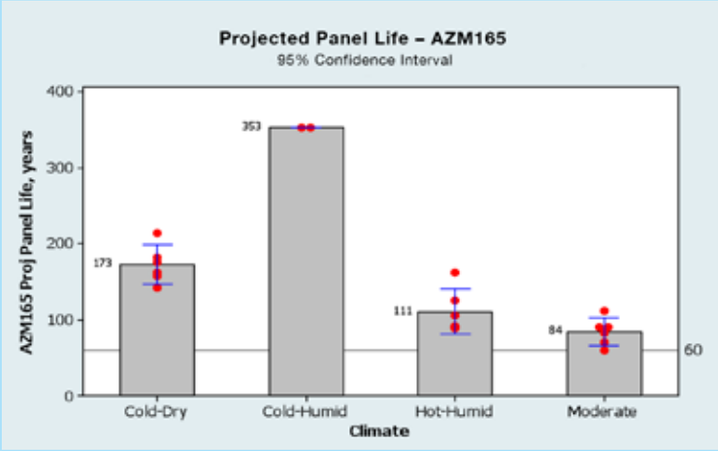
$$L_p = C_t/R$$
$$= (60\ g/m^2) / (0.85\ g/m^2/yr)$$
$$= 71\ years$$

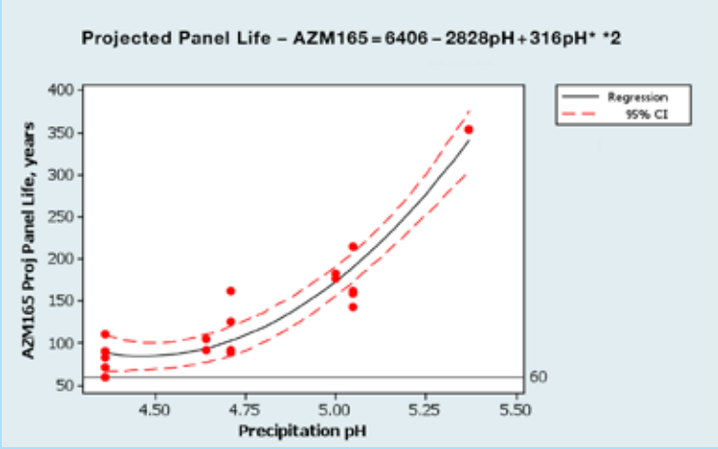
ANALYSIS

The results of this study, involving 20–to 35–year old SSRs in four environments, were remarkable. Confirming earlier predictions, the results provided compelling data to support the estimated 60-year service life of the GALVALUME panels.

This projected service life data for the North American climate zones represented in the study clearly demonstrate a service life in excess of the 60-year criterion commonly used for the useful life of a building in green ratings analysis for life cycle assessments. Depending on the climate zone, the projected service life of GALVALUME SSRs can be considerably longer than 60 years.

SERVICE LIFE CALCULATION

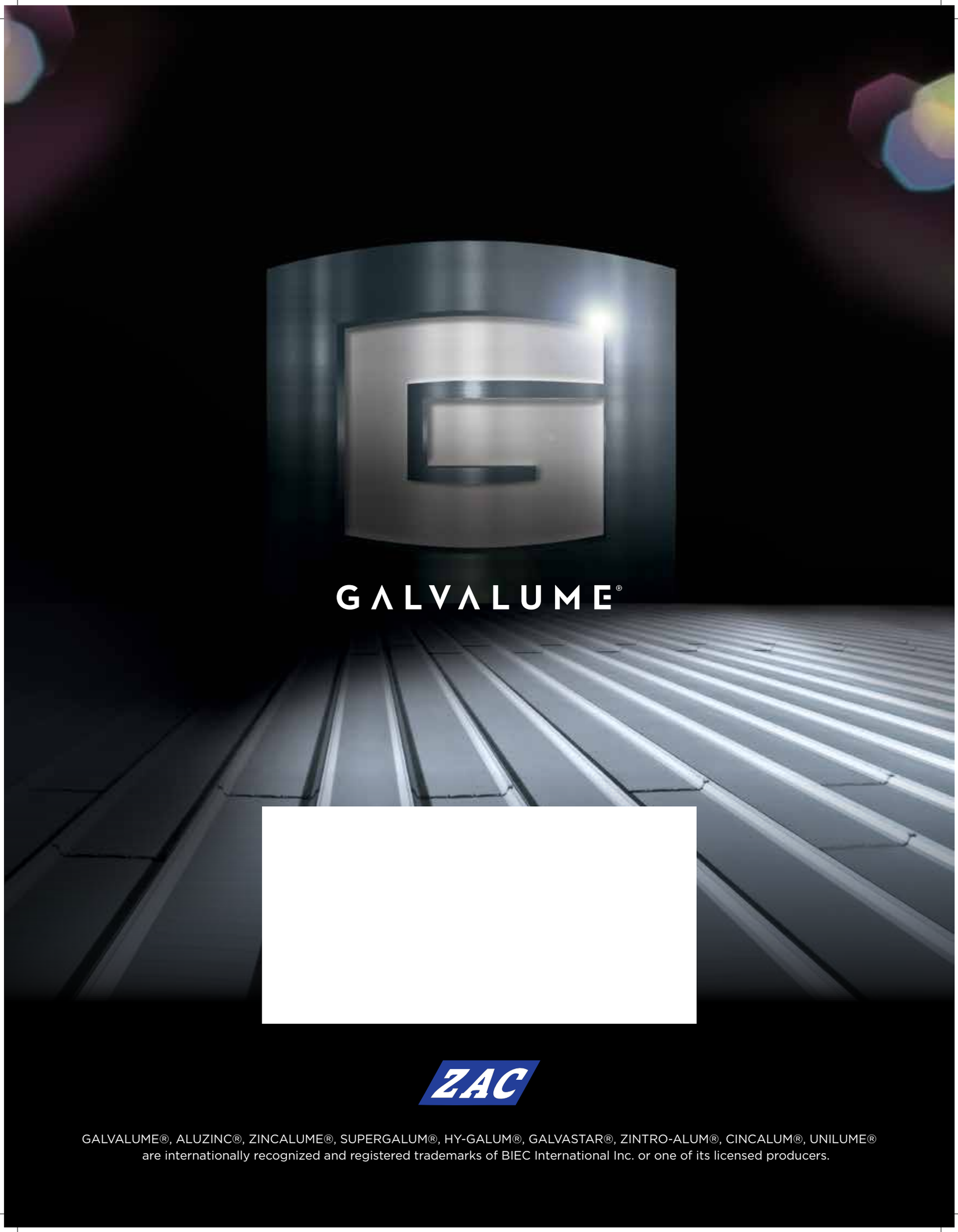




The variations in panel service life for different climate zones can be rationalized on the basis of the impact that precipitation pH had on the durability of the panels. With average values in excess of 60 years over a range of environments, it is entirely feasible that roof replacements would be unnecessary for the entire life of the building.

Additionally, enhanced environmental regulations have resulted in an increase in rainfall pH (reducing the acid-rain effect) over the last several decades.

Therefore, GALVALUME SSR system panels installed today can be expected to perform even better than those represented in this study. Indeed, a GALVALUME SSR system may be the only roof you'll ever need to install.



ZAC