WHITE PAPER | UV LIGHT RESISTANCE TESTING

TAMCO Silicone Seal Resistance to UV Light – 96 Months

TAMCO

Dane Carey, Director of Engineering | SEPTEMBER 2021

EXPERIENCE TRUE EXCELLENCE IN SERVICE, QUALITY,
AND MAINTENANCE-FREE PERFORMANCE.

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The Question

Many of our customers ask us whether the silicone seals used for TAMCO blade and jamb seals are resistant to constant exposure to UV light, and what effect this exposure has on leakage performance over the course of a TAMCO damper's service life – well over 20 to 30 years. This is an important question, because damper air leakage has a significant effect on the cost of operating a building, be it the day the damper is installed, or after twenty years of operation. Lower air leakage equals cost savings. High air leakage translates into increased operating costs.

Jamb seals (also commonly referred to as frame or side seals) are used to prevent air from leaking between the blades and damper side frames when the damper is in the fully closed position. Blade and jamb seals are the two principal elements that influence a control damper’s leakage rates.

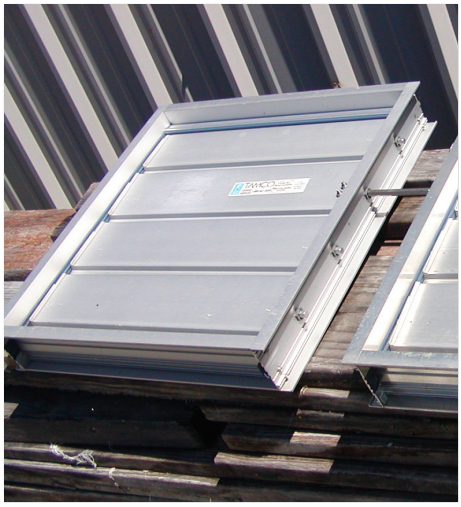
In order to determine how resistant TAMCO silicone seals are to UV light rays, TAMCO has been conducting ongoing UV light exposure testing since 2013.

The Facts

Test Objectives:

The test objective was to measure the effects of prolonged exposure to UV light on the physical appearance and durability of silicone seals, and on a damper's air leakage performance.

Test Methodology:



Damper has been in full sunlight for nearly eight years.

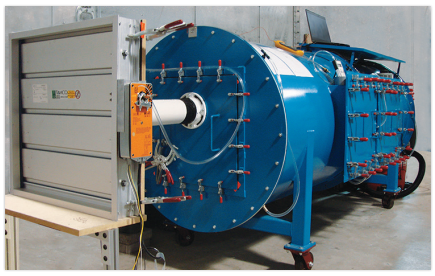
At the outset of the study, a leakage test was conducted in TAMCO's AMCA certified laboratory to establish base point leakage rates for the test damper. Leakage was tested with airflow in both directions at 1, 4, and 8 inches w.g. *(0.25, 1, and 2 kPa)*.

The damper was placed outside on October 13, 2013, in a location right next to a solar field, where it is exposed to full sunlight.

Since that date, two series of leakage tests have been conducted at six month intervals.

1. First, the damper was leakage tested prior to cleaning off any accumulated dust, dirt, or debris.
2. Then, the damper was cleaned using compressed air and wiped down with a damp cloth, and the leakage tests were repeated.

Changes in leakage rates at each interval were compared to base test results. The damper seals were also inspected for physical signs of deterioration, discoloration, or damage.



TAMCO Leakage Test Chamber

The following damper was tested:

The test damper measured:
24" x 24" *(610 mm x 610 mm)*

- *Series 1500 Damper – SW Option* opposed blade, normal production as per TAMCO specifications.

Test Results:

SERIES 1500 WITH SW OPTION – OPPOSED BLADE DAMPER Normal TAMCO Production Standard						
Maximum Leakage Rates CFM/ft² *(l/s/m²)*						
STATIC PRESSURE INCHES W.G. *(kPa)*	0 MONTHS	24 MONTHS	48 MONTHS	78 MONTHS	90 MONTHS	96 MONTHS
1.00 *(0.25)*	1.83 *(9.30)*	1.78 *(9.04)*	1.97 *(10.01)*	2.03 *(10.31)*	2.15 *(10.92)*	2.36 *(11.99)*
4.00 *(1.00)*	4.11 *(20.88)*	4.08 *(20.73)*	3.96 *(20.12)*	4.17 *(21.18)*	4.32 *(21.95)*	4.85 *(24.64)*
8.00 *(2.00)*	5.96 *(30.28)*	5.93 *(30.12)*	5.42 *(27.53)*	6.15 *(31.24)*	6.35 *(32.26)*	6.85 *(34.80)*

After eight years of exposure to UV light, under extreme conditions, the TAMCO Series 1500 damper's leakage rates stayed well below AMCA's maximum allowable leakage rate for Class 1A certification. Leakage rates increased minimally at 1" w.g. *(0.25 kPa)* and at 4" w.g. *(1.00 kPa)*, by 0.53 CFM/ft² *(2.69 l/s/m²)* and 0.74 CFM/ft² *(3.76 l/s/m²)* respectively. The maximum increase in leakage rate from 0 months to 96 months was seen at 8" w.g. *(2.00 kPa)*, at 0.89 CFM/ft² *(4.52 l/s/m²)*.

TAMCO Series 1500 with SW Option test damper - April, 2021

Although some dust, dirt, and insects had settled on the damper surfaces, the blue silicone blade and jamb seals showed no discernible change in color or appearance.

A length of blue silicone jamb seal was also laid out next to the damper for the duration of the test period. This section of silicone seal showed no evidence of damage caused by exposure to UV light.

Appearance of frame seal after 96 months

Silicone Jamb Seal
exposed to UV light for
96 months

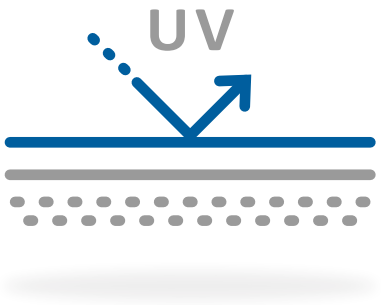
Conclusion

After 96 months of exposure to UV light, the leakage test results confirm that TAMCO dampers are the unequivocal solution wherever consistent leakage performance and jamb seal longevity are a priority! TAMCO silicone jamb seals are specifically engineered through design and special chemical composition to resist deterioration that may result from UV light exposure.

UV light testing over time proved the resilience and durability of TAMCO's silicone jamb seals. The TAMCO blade and jamb seals showed no change in appearance or suppleness, and stayed firmly inserted within the integral slots in the aluminum frames. The durability of our product makes TAMCO dampers a highly attractive and cost-effective choice.

The test damper's leakage rates changed very little over the course of eight years of testing. Consistent low leakage rates translate into energy savings over the entire service life of the damper.

The bottom line is, TAMCO damper reliability, consistent performance, and longevity add up to significant savings. TAMCO dampers can be relied on to provide consistent ultra-low leakage performance from the day they are installed, and for decades of dependable service life.



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