



Timberline Solar™

Solar Roofing System



Trusted GAF products combined with advanced GAF Energy solar shingle technology

Timberline Solar™ is a comprehensive building-integrated photovoltaic roofing system that incorporates energy shingles and roofing shingles to generate solar energy from either new or replacement roofs. It complies with all applicable building codes and is listed by Intertek to all required safety standards.



Timberline Solar ES™

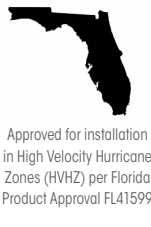
Nailable Energy Shingles

Electrical Characteristics¹

P_{max} (±5%)	46 W
V_{oc} (±5%)	10.9 V
I_{sc} (±5%)	5.40 A
V_{mp} (±5%)	9.03 V
I_{mp} (±5%)	5.16 A
Max. System Voltage	600 V
Max. Series Fuse	15 A
Protection Class	Class II
Positive + Negative Load Rating	1600 Pa
Max. Modules in Series	48
Max. Parallel Strings	2
Cell Type	Monocrystalline PERC
Connector Type	Staubli EVO2: PV-KST4-EVO2/6II-UR
Connector Compatibility	All Staubli MC4: PV-KBT4/2 - PV-KBT4/10
Temp. Coeff. I_{sc}	+0.04%/°C
Temp. Coeff. V_{oc}	-0.26%/°C
Temp. Coeff. P_{max}	-0.35%/°C

Mechanical Characteristics

Energy Shingle Dimensions	64 1/4" x 17 1/8" x 1" (1,632 x 435 x 26 mm)
Active exposure	60" x 7.56" (1,524 x 192 mm)
Energy Shingle Weight	10.1 lb. (4.58 kg)
Energy Shingle Coverage	Approximately 32 energy shingles per square (1.43 kW per square)
Installed System Weight	3.36 lb./sq. ft.
Allowed Roof Pitch	2:12 or greater
Sheathing Minimums	7/16" OSB or 15/32" plywood
Max. Installation Altitude	13,123 ft. (4,000 m)
Avg. Ambient Temp. Range	- 40°F to 104°F (- 40°C to 40°C)



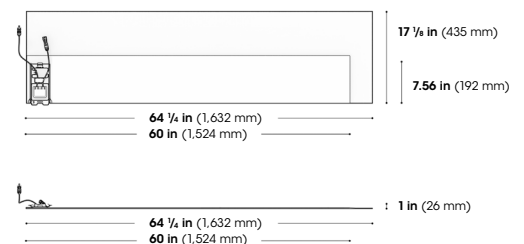
Certifications

■ Fire Certification ²	UL 790 Class A
■ Wind Classification	ASTM D3161 Class F
■ Rapid Shutdown	Article 690.12 NEC UL 3741
■ Module Certifications ³	UL 61730-1, -2 SECT 30 UL 1703
■ BIPV System Certification	UL 7103
■ Impact Resistance	UL 2218 Class 1

Model TLS-1

ETL Listed PV Hazard Control System
5022515

Florida Product Approval FL41599



For more information, visit gaf.energy/tls-info

¹ All electrical data shown under Standard Test Conditions (STC) (1000 W/m², 25°C ±2°, 1.5 AM)

² See installation manual for requirements to achieve a System Fire Class Rating with this product.

³ UL 61730-1 & UL 61730-2 superseded UL 1703 effective 12/4/19



Energy from every roof®