

BUILDING SCIENCE BRIEFING

WHY WINDOWS ARE THE BIGGEST SOURCE OF HEAT IN YOUR BUILDING.

What building science says about glazing, why it matters more in Malta than almost anywhere else in Europe, and what can be done about it — measured, without construction work, and without replacing a single pane.

60% of a building's total heat gain and loss can pass through its windows	360 W/m² peak solar heat gain on a west-facing pane in a hot climate — several space heaters pointed at the room	×2 Malta's cooling demand could double by 2050 — an exception in Europe, with Cyprus
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STANDARD GLASS



THERMOGLASSPRO
NEXT-GENERATION THERMAL COATING



Illustrative comparison. Untreated glass lets solar radiation through, where it becomes indoor heat. Coated glass blocks a large share of it at the surface. Actual reduction is measured live during your free on-site demo.

01 THE PHYSICS

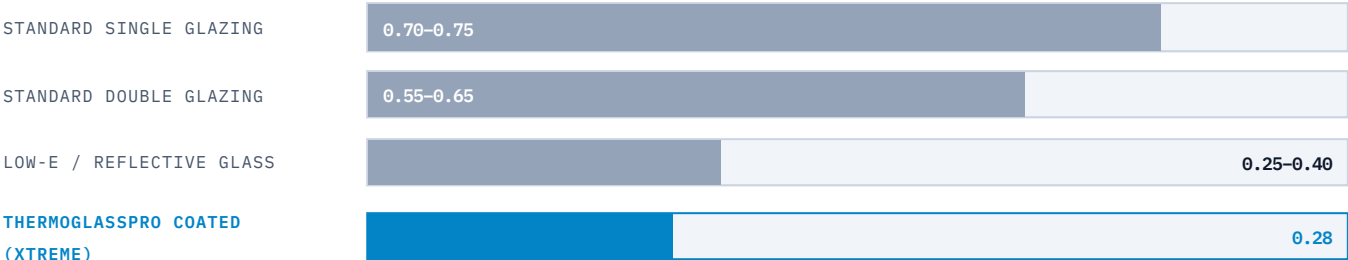
HOW HEAT ACTUALLY GETS IN THROUGH A WINDOW

A window is not just a weaker section of wall. It is an active entry point for heat, through three mechanisms acting at the same time — and in a climate like Malta's, the first one dominates.

01 Solar radiation Sunlight passes straight through the glass and heats floors, furniture and walls directly. Dominant in sunny climates.	02 Conduction Heat travels through the glass material itself, from the hot outside to the cooler inside, continuously.	03 Convection Air touching the warm glass heats up and circulates through the room, spreading the heat.
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The metric that matters: SHGC. The Solar Heat Gain Coefficient (0 to 1) measures the share of the sun's heat that passes through glass. Lower is better. Standard wall and roof insulation protects against slow conduction — but direct solar radiation through glass is a different mechanism entirely, and it is the one that dominates where sunlight is strong most of the year.

02 SHGC BY GLAZING TYPE — LOWER IS BETTER



Typical published SHGC ranges by glass type (building science literature, see sources p.4). Xtreme figure: manufacturer data, optical performance to EN 410.

A structural weak point. Single glazing sits around R-1 of thermal resistance, versus R-13 to R-30 for an insulated wall. That gap is why windows can account for up to 60% of a building's total heat gain and loss — even in an otherwise well-built structure.

03 WHY THIS MATTERS SPECIFICALLY IN MALTA

A EUROPEAN EXCEPTION

01 Cooling demand is set to double — here, not elsewhere

Climate-resilience analysis projects cooling demand to stay flat or decline across most of Europe by 2050. Malta and Cyprus are the exception: demand could more than double, driven by long, intense summers and solar exposure.

02 A building stock never designed for air conditioning

Malta's mild winters historically meant energy performance was not a central design factor. Much of the modern stock built after the mid-20th century is less thermally efficient than the older buildings that relied on passive design.

03 Residential energy use keeps rising, driven by cooling

European energy tracking (ODYSSEE-MURE) shows Maltese household energy consumption rising steadily since 2010, attributed mainly to growing demand for thermal comfort — above all, space cooling.

04 Malta's own authorities flag windows as a priority fix

Official Energy Performance Certificate guidance lists window upgrades, UV filters and shading among the most effective actions a property owner can take — specifically because of the islands' hot climate.

For apartments and managed blocks, the constraint is structural. Replacing glazing often means condominium approvals, façade rules, cost and timelines. Most heat gain enters through glass that residents and managers do not have the right — or the budget — to replace. Any serious solution has to work with the glass that is already there.

04 WHAT CAN ACTUALLY BE DONE

TWO ROUTES. ONE DOESN'T TOUCH THE BUILDING.

ROUTE 1

Replace the glazing

Double glazing or Low-E units lower the SHGC — but it is a structural change: high cost, construction timelines, and approvals often hard to obtain in Maltese apartment blocks and managed properties.

ROUTE 2 — THE THERMOGLASSPRO APPROACH

Treat the existing glass

A transparent heat-rejecting coating applied directly to the glass in place. No replacement, no wiring, no electricity draw, no construction work, no condominium approval.

THE COATING WE INSTALL — XTREME GRADE, MANUFACTURER DATA (EN 410)

99.6%

infrared (heat) rejection

99%

UV blocked — fading largely stopped

0.28

SHGC — 72% of solar heat blocked

10+ yrs

lifespan, backed by a 10-year written warranty

Verified on your glass, not promised on paper. Every engagement starts with a free on-site demo: we analyse your glazing, run a live test on a coated sample matching it, and leave you the measured figures and a fixed written quote. No obligation, nothing to pay for the quote.

BOOK YOUR FREE ON-SITE DEMO

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SCAN TO WHATSAPP US

SOURCES

ODYSSEE-MURE European energy efficiency data (Malta household consumption) · Malta Energy Performance Certificate (EPC) guidance on window upgrades · Climate-resilient building sensitivity analysis, EU cooling demand projections to 2050 · Published SHGC and R-value ranges: building science literature incl. InterNACHI and GreenBuildingAdvisor · Coating figures: manufacturer data for the Xtreme-grade system, optical performance to EN 410 — full test data available on request.

This document is provided for information by ThermoGlassPro, 125 Cameron Street, Gżira, Malta · VAT 24325236. Manufacturer data for the coating system we apply; the illustrative image depicts a mechanism, not a measured result. A free on-site demo remains the best way to assess the real effect on your own glazing. © 2026 ThermoGlassPro.