

THE ULTIMATE LEVEL OF CUSTOM-MADE SOLAR PANELS

Master Energy

GREECE - CYPRUS

The Building Facade of the Future: Energy-Generating and Aesthetic

A VINCI GROUP COMPANY



ERTEX SOLAR

AUSTRIA

THE PIONEER & WORLD LEADER IN BUILDING INTEGRATED PHOTOVOLTAICS (BIPV) SINCE 2004



VINCI GROUP

FRANCE

294,000 EMPLOYEES WORLDWIDE

373,100 WORKSITES

7,000 LOCATIONS

€7 BILLION IN FREE CASH FLOW

€74.6 BILLION IN REVENUE

+120 COUNTRIES

€15.5 BILLION IN MANAGED NET CASH AS OF DECEMBER 31, 2025

€22.0 BILLION VINCI REPORTED A TOTAL LIQUIDITY POSITION DECEMBER 31, 2025

€6.5 BILLION UNUSED CREDIT FACILITY: EXTENDED TO A NEW MATURITY DATE OF JANUARY 2031

A WORLD LEADER IN CONCESSIONS, ENERGY AND CONSTRUCTION SINCE 1899

Roofing

Balconies

Sky Lights

Spandrels

Brises Soleil

Ventilated Facades

Sound Walls

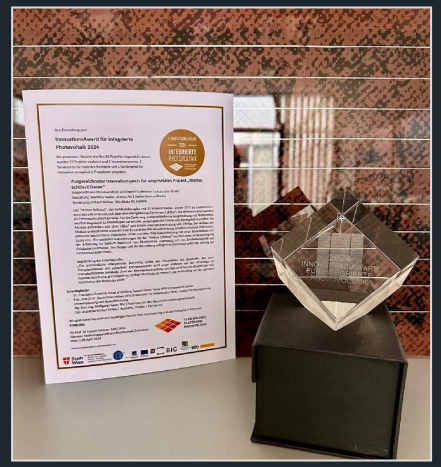
Curtain Walls

Active Building Skins

Walkable Floor

Canopies & Shade House

ERTEX SOLAR



MADE IN AUSTRIA

Global Energy Innovation & Quality Awards



Recognizing International Standards of Excellence

the world's only handcrafted solar panels

More than **22** years of creating Unique BIPV Solar Panels

More than **3.000** Unique Projects Worldwide

More than **70** years in the Glass Industry

More than **12 m²** panels

5,100 x 2,440 mm

is a World Record in the Solar Module Sector



Automotive–Grade PV Systems for Resilient Architecture



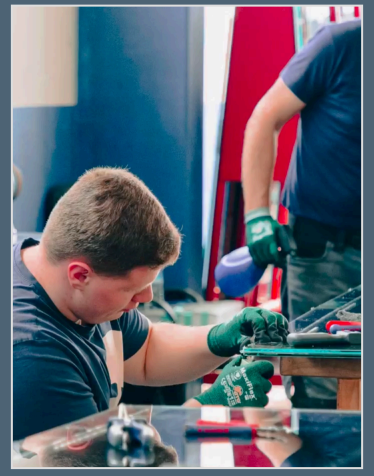
Secure – Sustainable – Bespoke

a unique, custom–engineered lamination line,
dedicated to manufacturing the world's only
handcrafted, automotive–grade PV modules

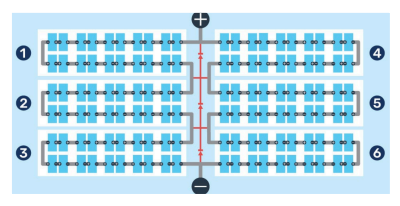


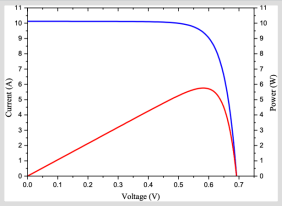
MADE IN AUSTRIA

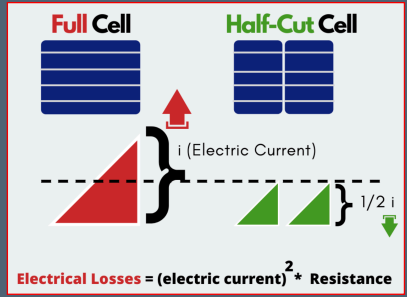


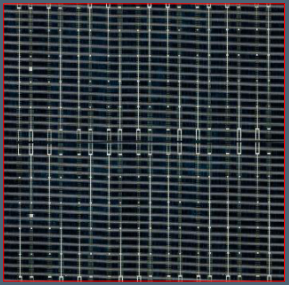


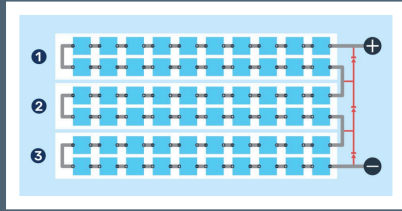


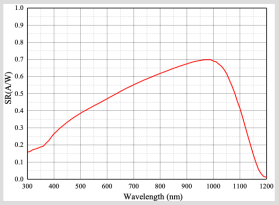












Efficiency(%)	Pmpp(Wp)	Umpp(V)	Impp(A)	Uoc(V)	Isc(A)	FF(%)
24.90-25.00	6.87	0.606	11.331	0.709	11.832	81.85

Voc.Temp.Coef.	-0.268%/K
Isc.Temp.Coef.	+0.042%/K
Pm.Temp.Coef.	-0.3%/K

half-cut new tech monocrystalline cells with ultimate performance, up to 20 busbars

- Reduced Resistance: By halving the current flowing through each cell, resistive power losses are significantly reduced, as the power loss is proportional to the square of the current ($P = I^2R$).
- Increased Efficiency: Less resistance leads to less energy wasted as heat, allowing more electricity to be captured and utilized, thus boosting the panel's overall efficiency.
- Improved Shading Tolerance: The panel's wiring is divided into two separate halves, connected in parallel. This design allows the other half to continue generating power even if one half is shaded, preventing a complete drop in output.
- Enhanced Durability: The reduced mechanical stress on smaller, half-cut cells can decrease the likelihood of micro-cracks developing, which can damage the panel over time.

excellent power generation performance ultimate conversion efficiency and reliability

Ventilated Facades Systems address the challenge of heat loss by integrating external insulation and a ventilated air gap

Energy efficiency meets the design

Experience the perfect symbiosis of functionality and aesthetics. By integrating photovoltaics into an insulating façade, you make a building more energy–independent and also transform it into an outstanding design object.

Facade with future

Solar cells in the building envelope allow the building to generate its electricity and at the same time save heating costs through insulation. In addition by protecting the environment, façades of this type are an important step towards a sustainable energy supply and an investment in the future. With our wide–ranging expertise in the fields of insulating glass and photovoltaics, we are constantly realising exceptional solar projects with insulating façades.

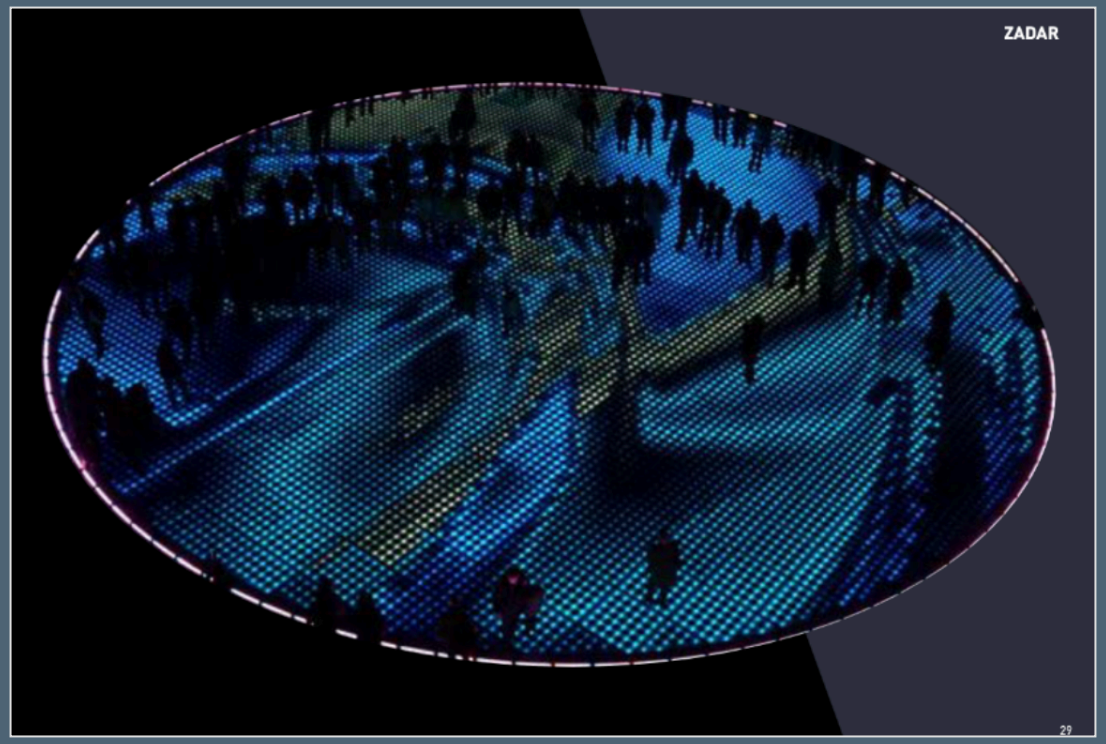
The global building integrated photovoltaics (BIPV) facade market is anticipated to grow significantly from 2024 to 2028, driven by a heightened focus on sustainability, renewable energy, energy efficiency, and cost savings.

BIPV facades, which incorporate solar panels directly into building exteriors, represent an innovative technology that has the potential to change how energy is generated and used in urban settings.

Colour design options

Our solutions consist of laminated safety glass into which photovoltaic elements are integrated. They fulfil the same standards as laminated safety glass in the construction industry and can, therefore, be integrated into any surface of the building envelope. The realisation of coloured variants is achieved by using coloured cells, coloured films, coloured or printed glass.

By integrating Solar Modules, the Façade is used not only for Protection, but also for Energy Generation



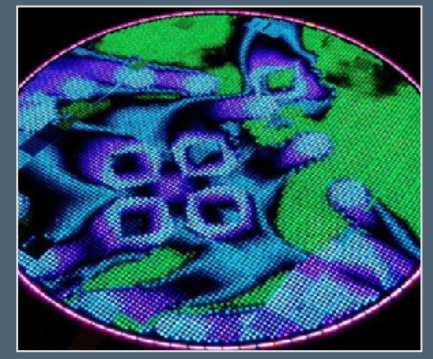
art & technology





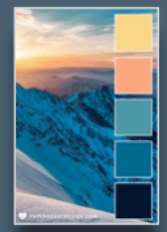
art & technology









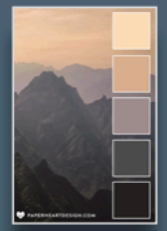


unique range of sizes, surface finishes and different colours

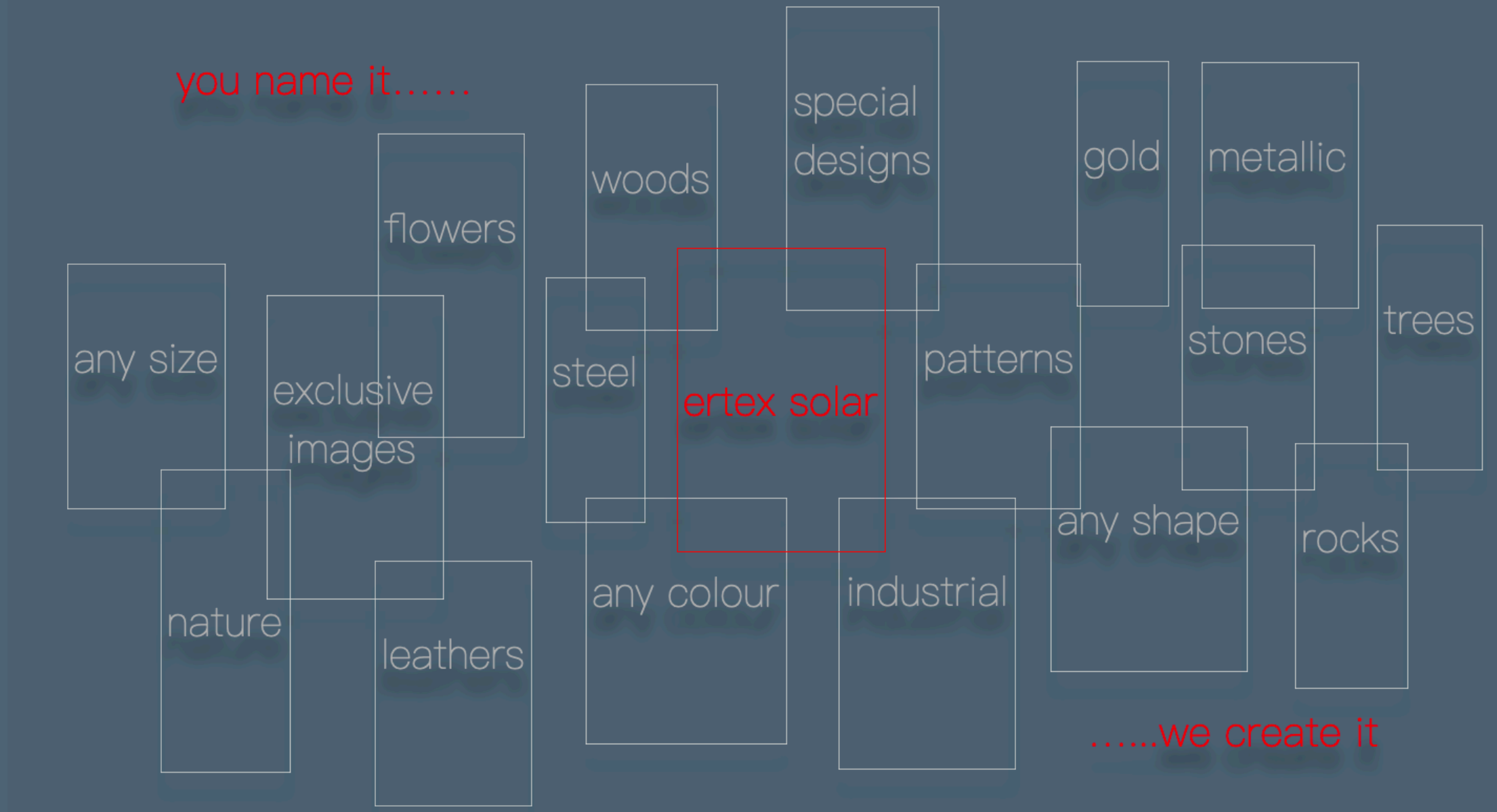




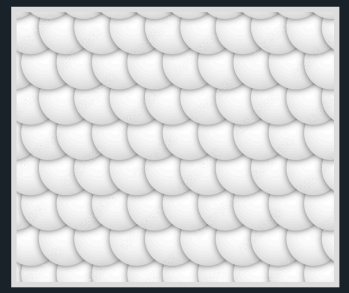
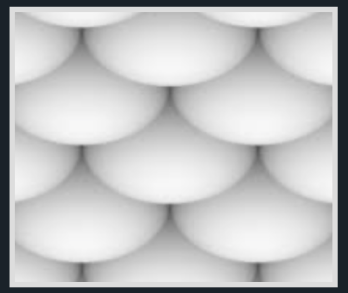
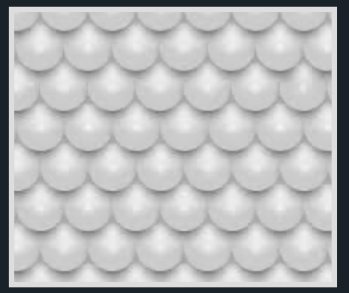
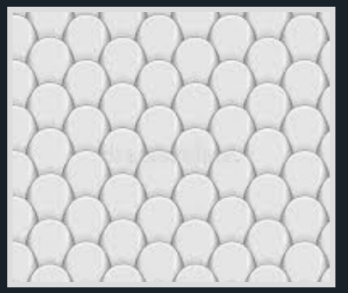

unique colour palettes to meet your architectural challenges

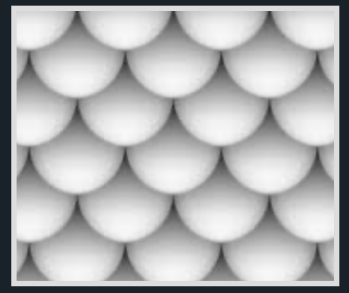
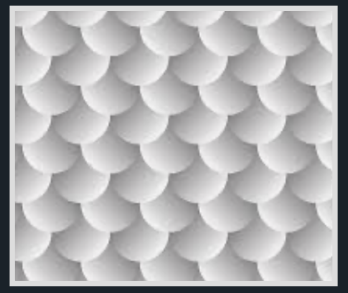
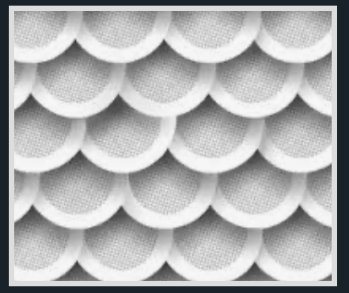
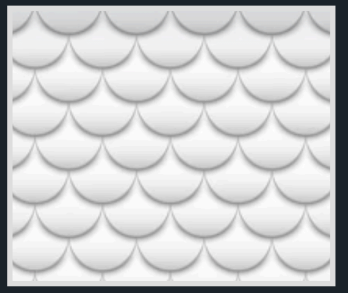


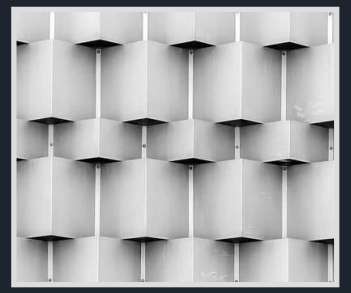
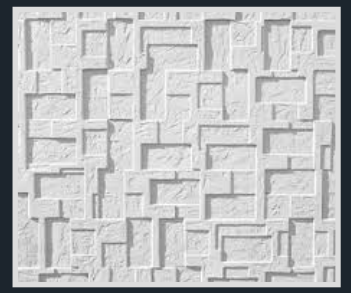
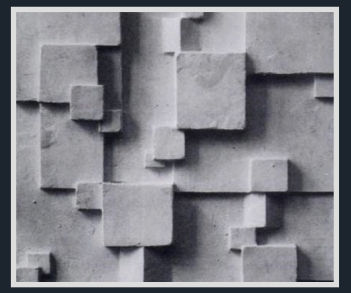


you name it……
flowers
woods
special designs
gold
metallic
any size
exclusive images
steel
ertex solar
patterns
stones
trees
nature
leathers
any colour
industrial
any shape
rocks
……we create it

here are just a few
from our huge range
of products and
projects worldwide

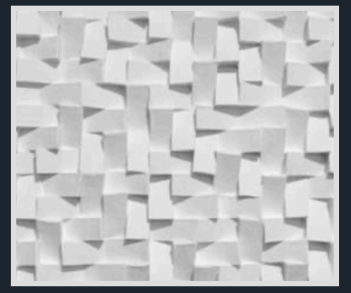
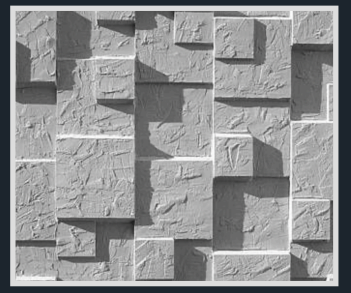
Modern Art Look

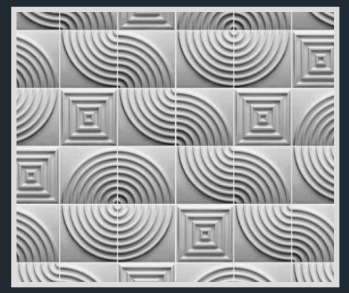
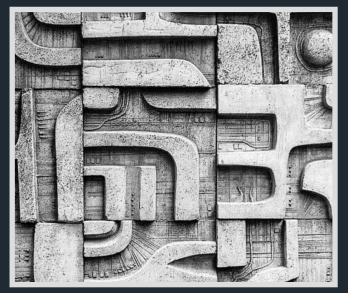
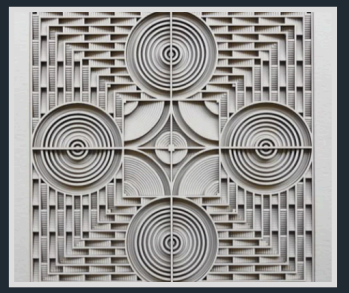
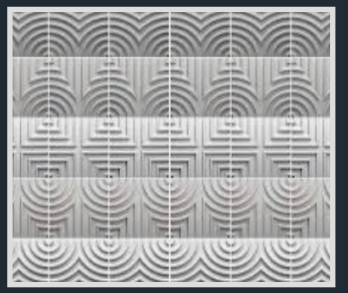





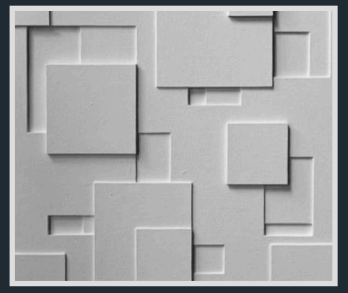

Classic Art Look



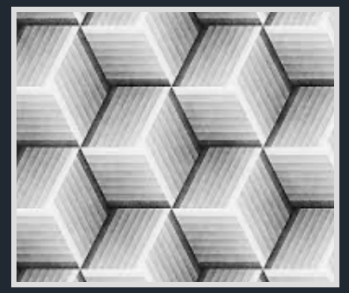
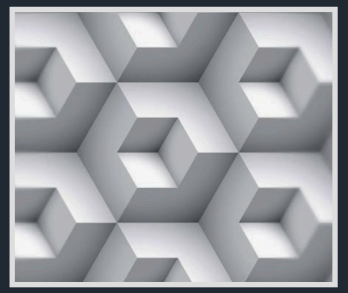
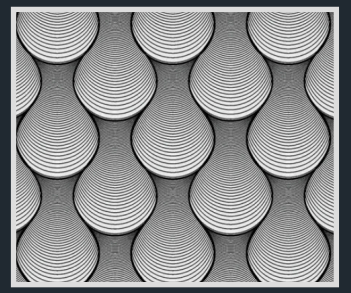
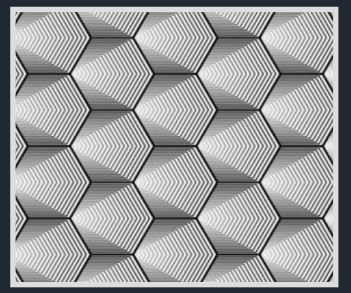



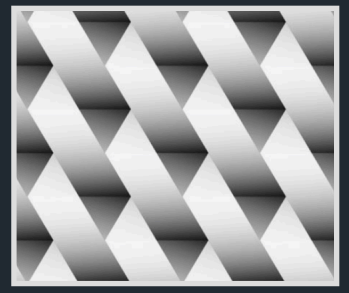
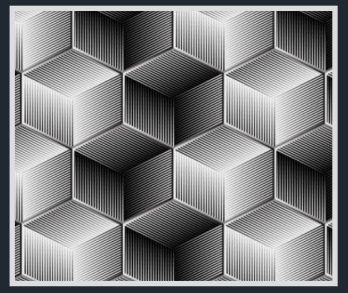
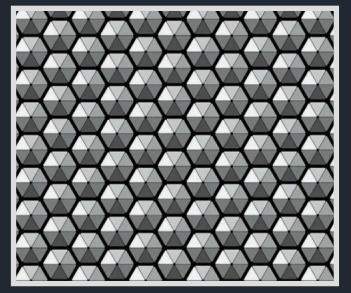
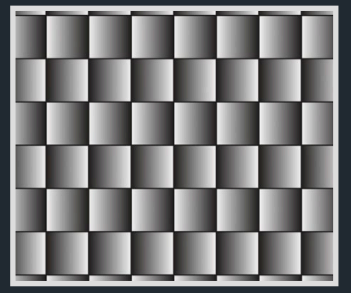
Unique Art Look

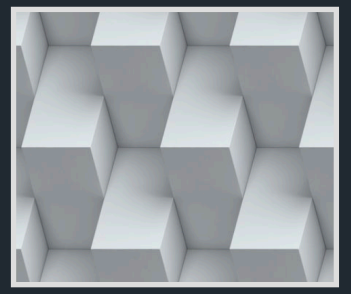


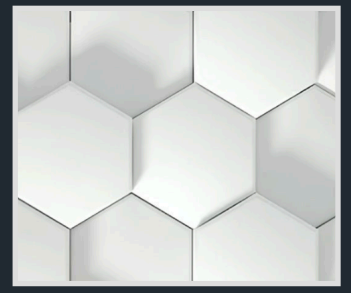
Modern Art Look

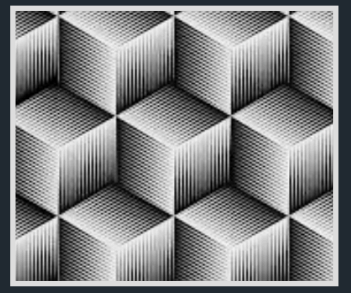





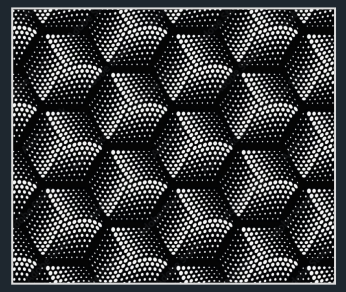
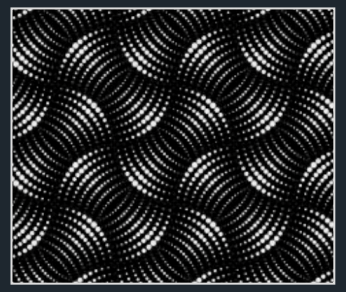
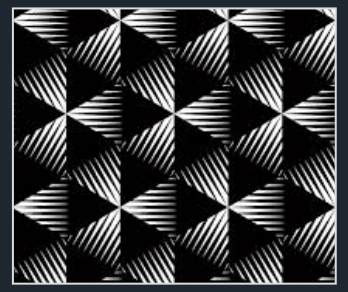
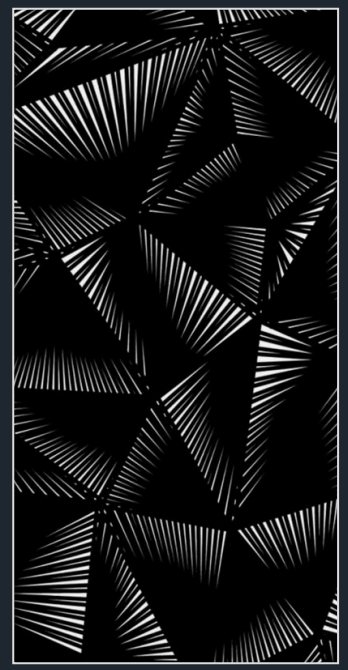




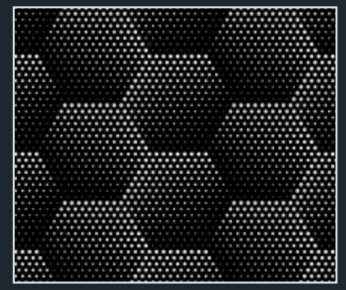
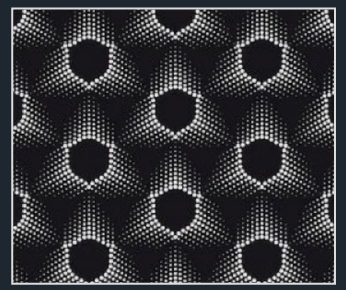
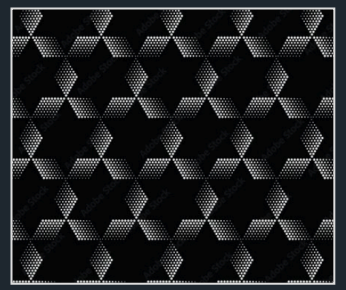

Modern Art Look

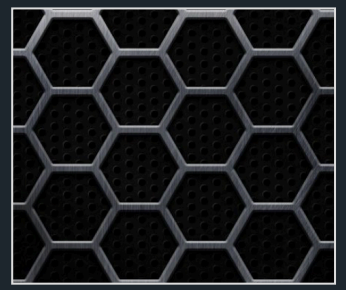
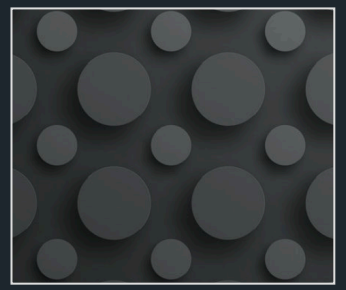
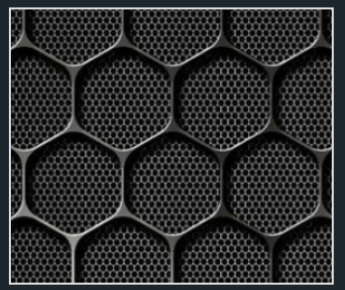
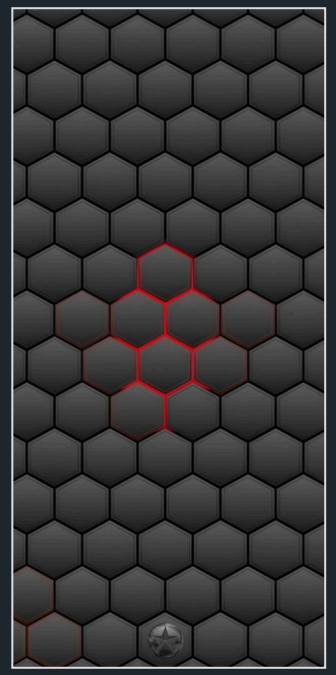


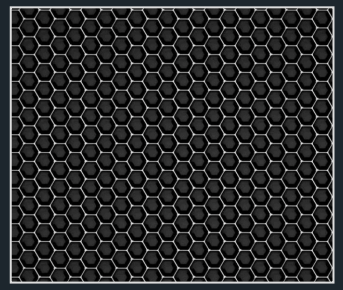
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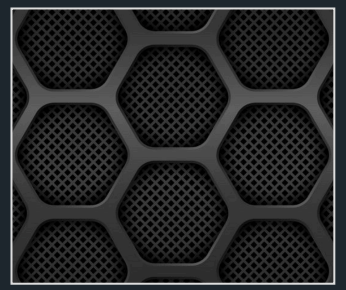
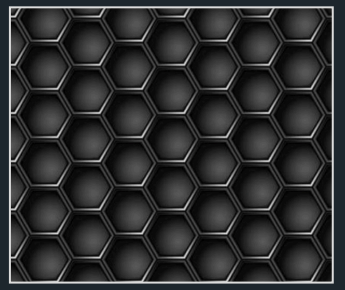




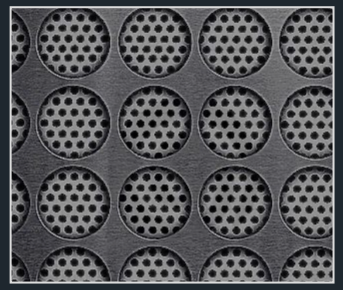
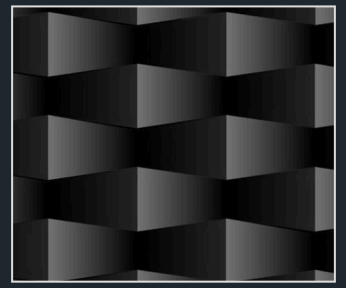
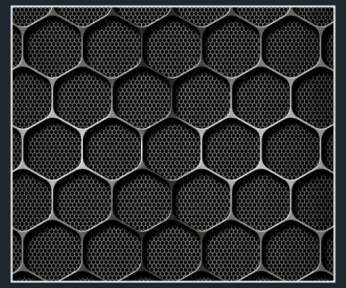
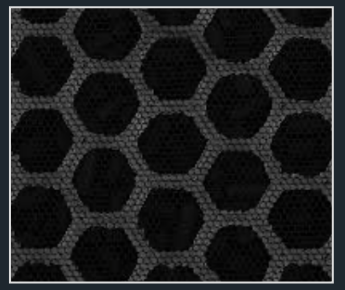
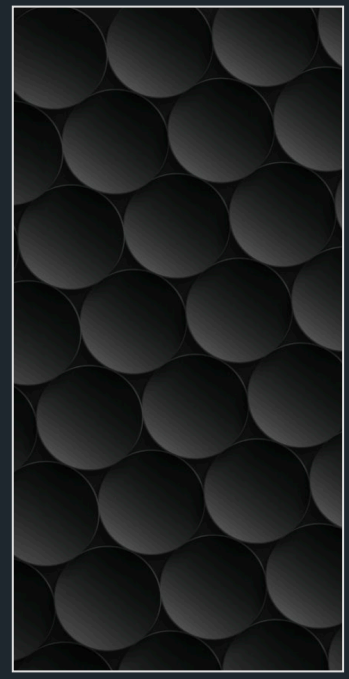


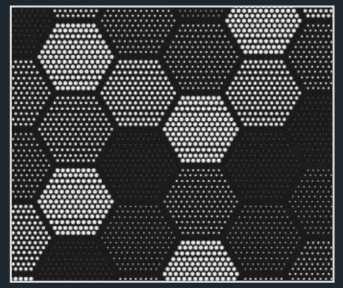
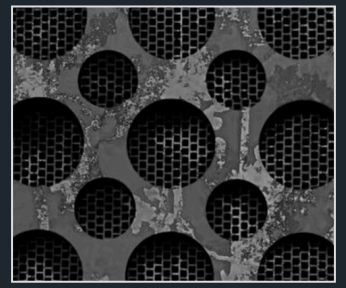
Unique Industrial Look



Unique Industrial Look



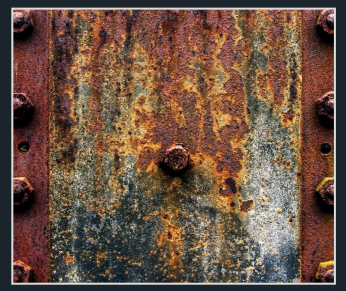


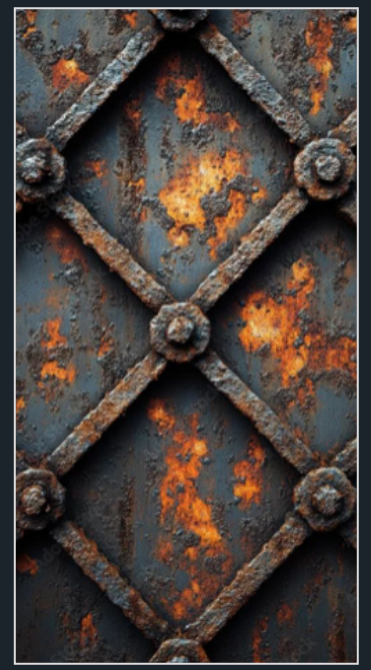



Unique Art Look

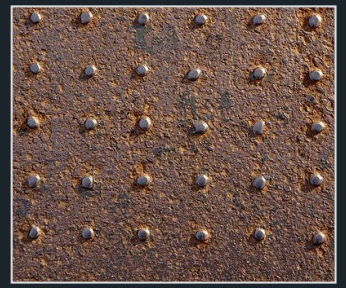




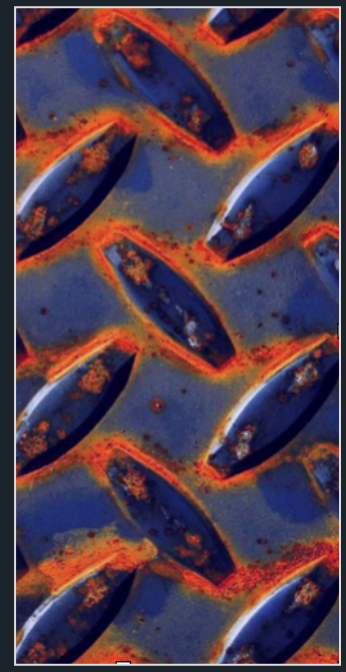
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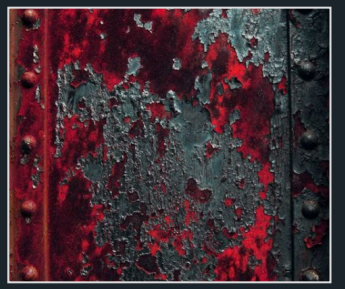


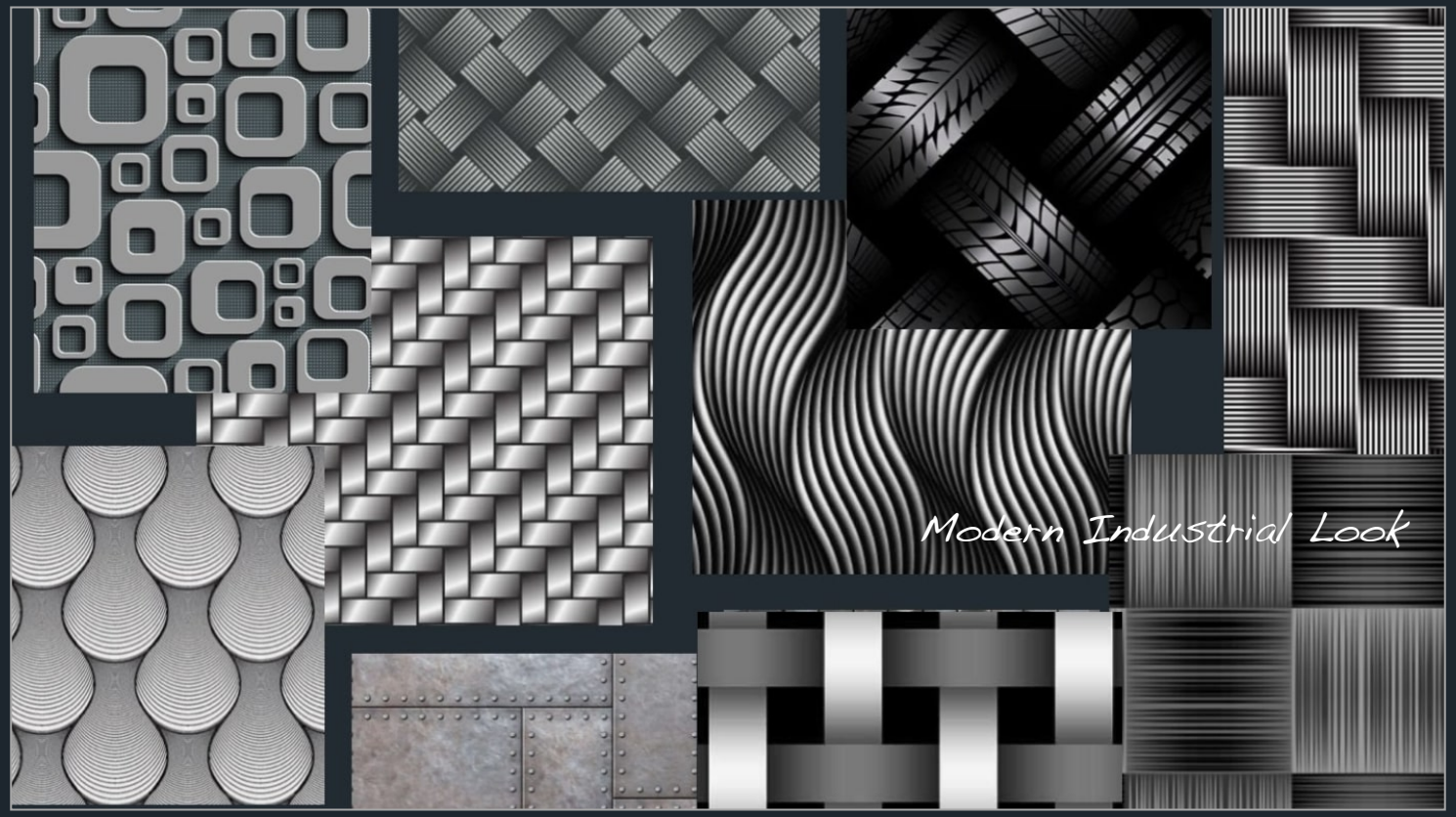


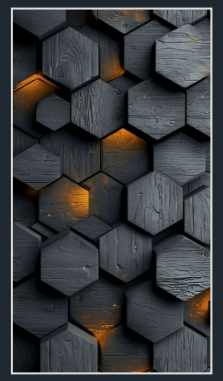


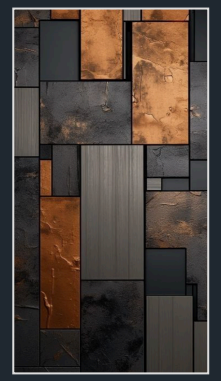
Unique Industrial Art Look



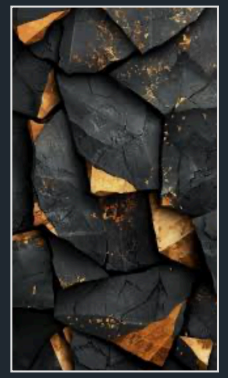



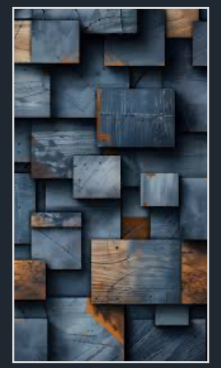

Modern Industrial Look

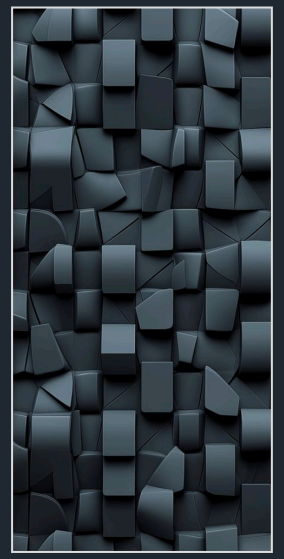


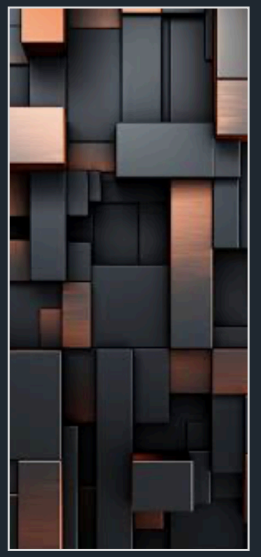


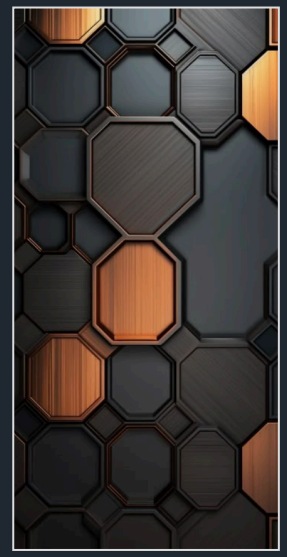
Modern Pattern Look

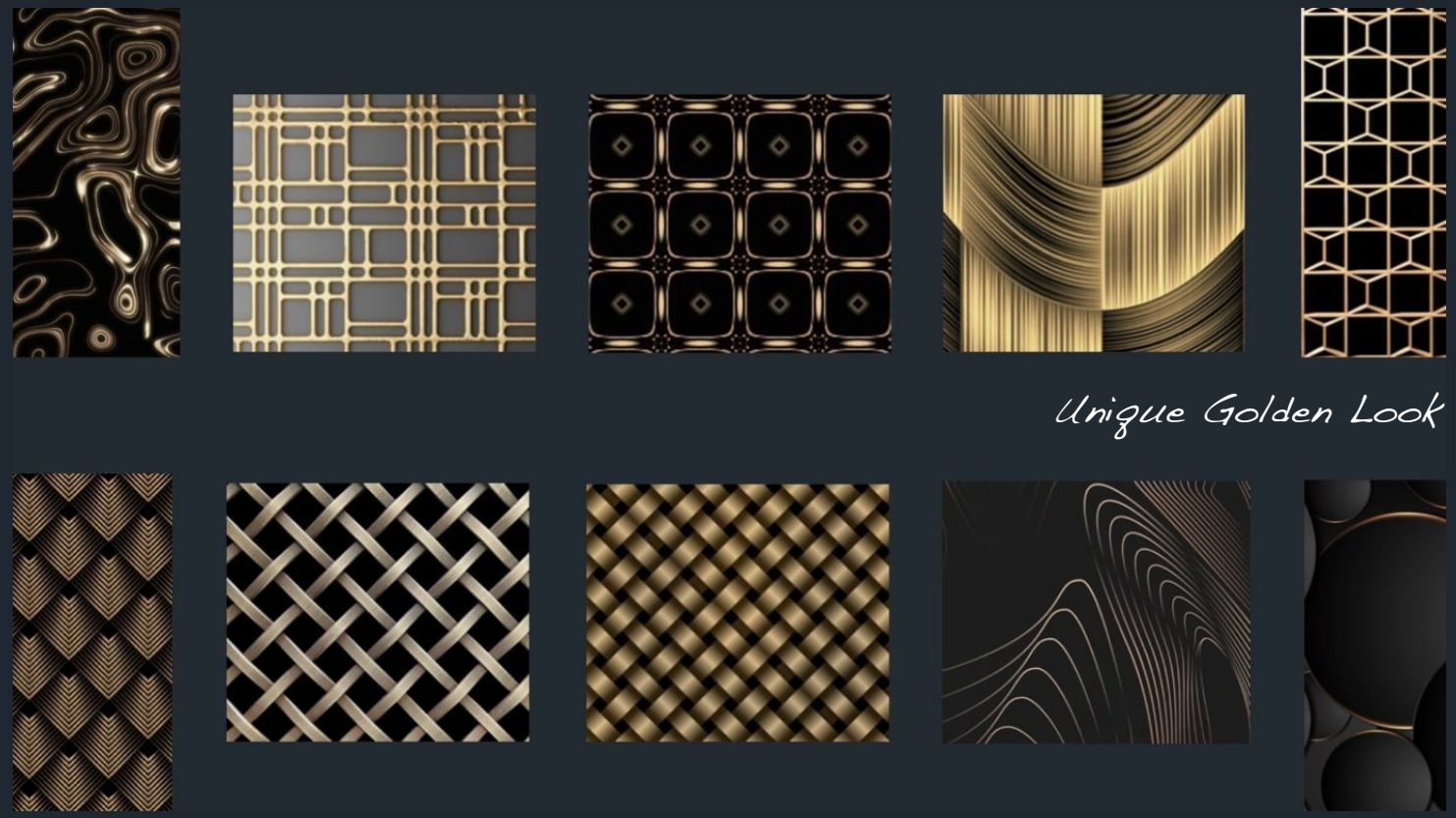




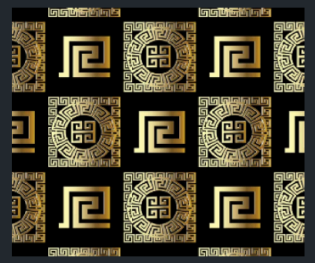






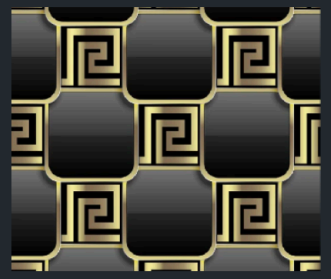

Unique Golden Look

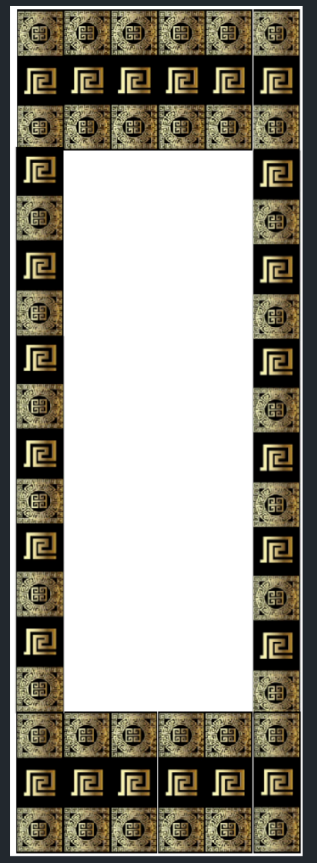




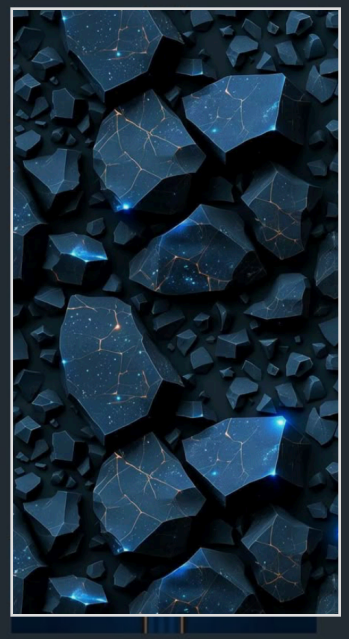
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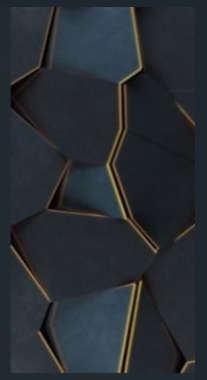




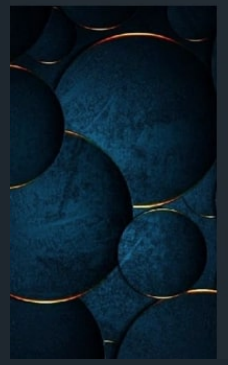
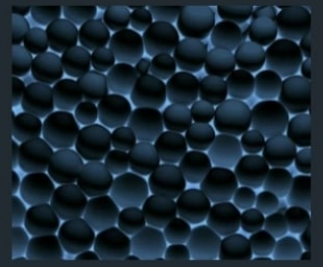




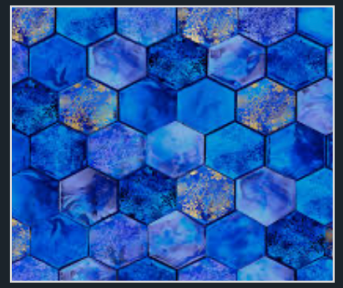
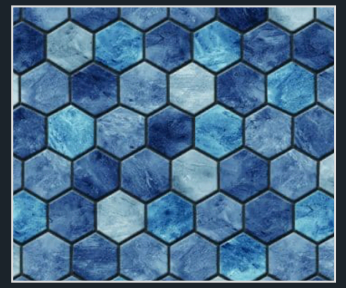




Modern Pattern Look

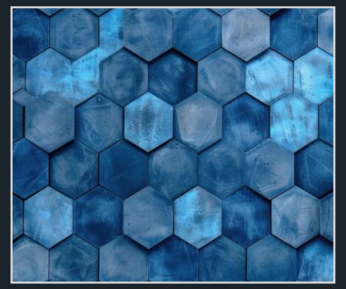




Modern Art Look



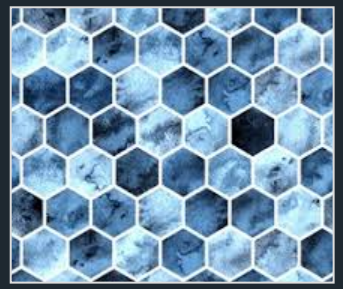


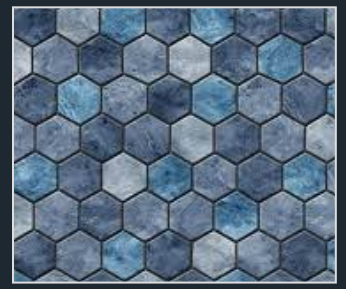


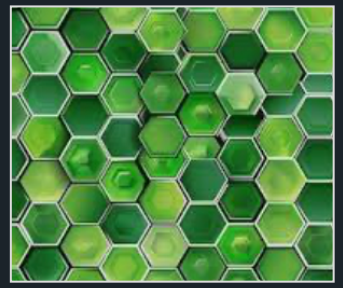
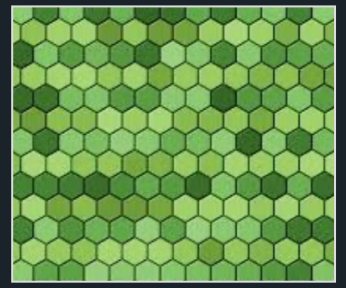
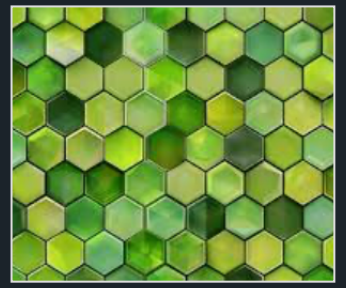
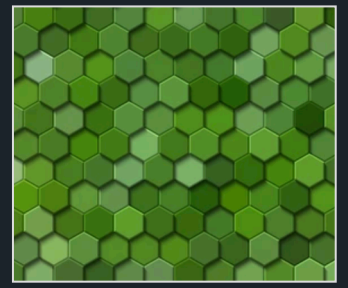




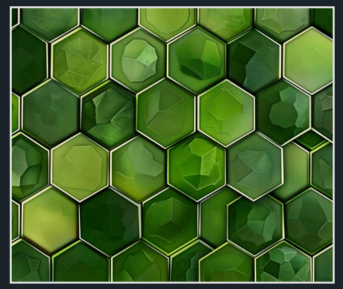
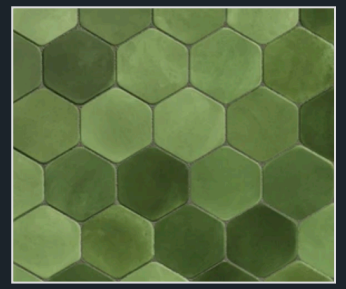
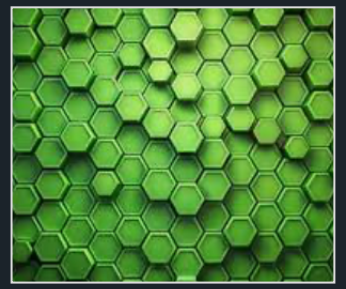
Modern Art Look



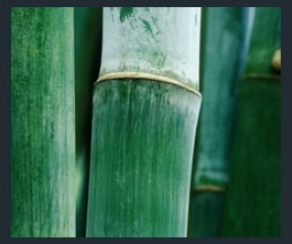





Modern Art Look







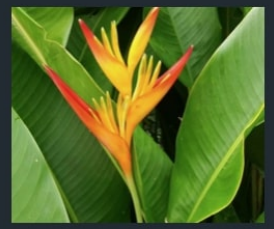
Unique Bamboo Look





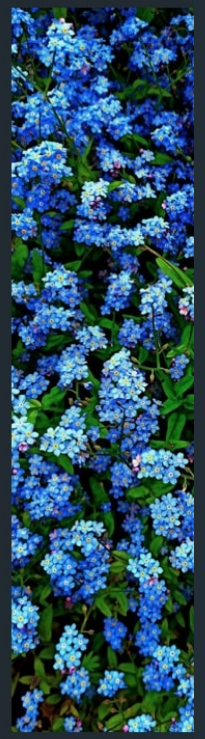




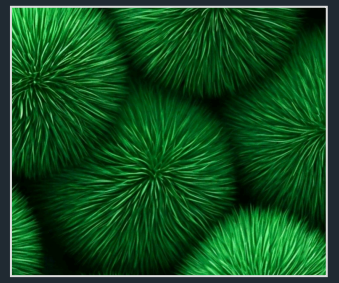



Unique Flower Look

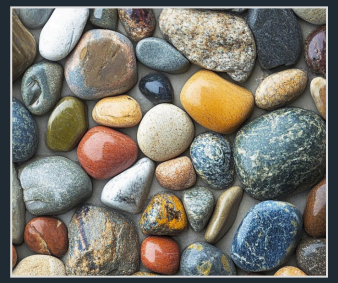









Unique Nature Look

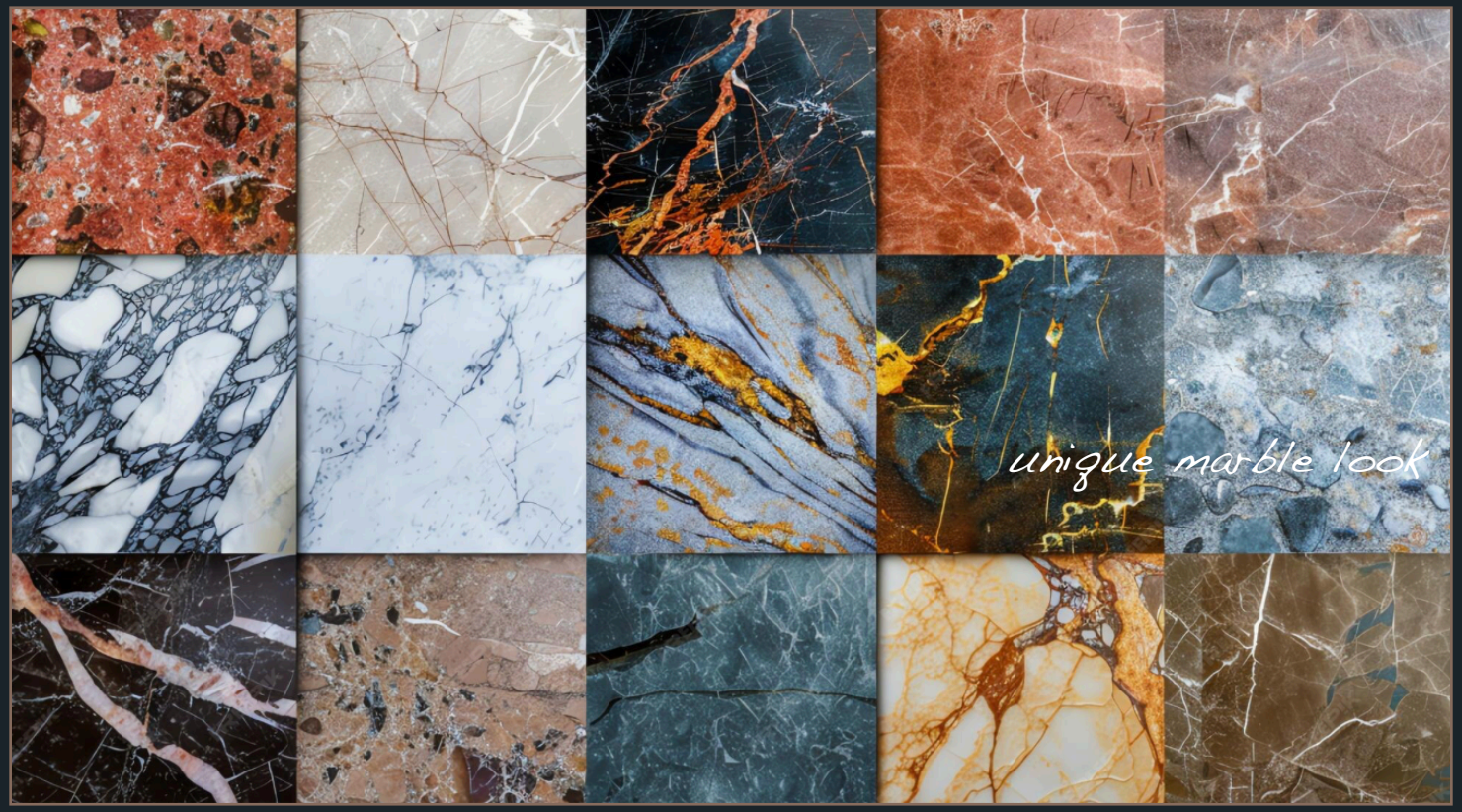





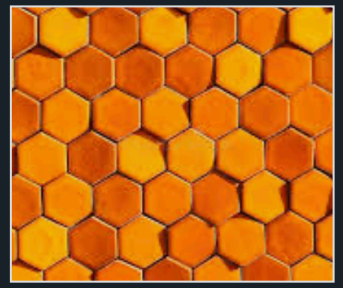
Unique Solar Panels
with Natural Wood Look

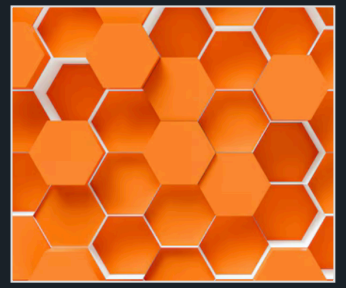

Natural Wood Look


Unique Solar Panels
with Natural Rock and Stone Look

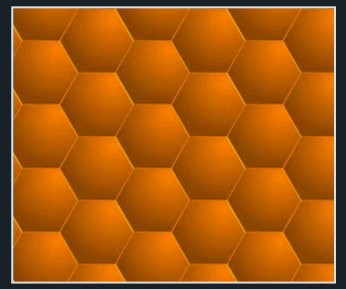
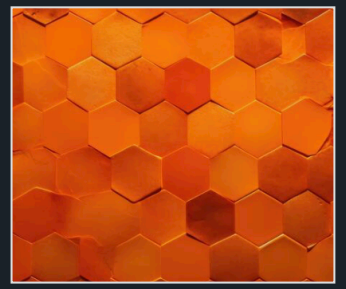

unique marble look


Unique Solar Panels
with Genuine Leather Look






Modern Art Look

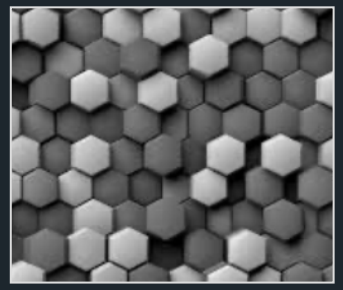










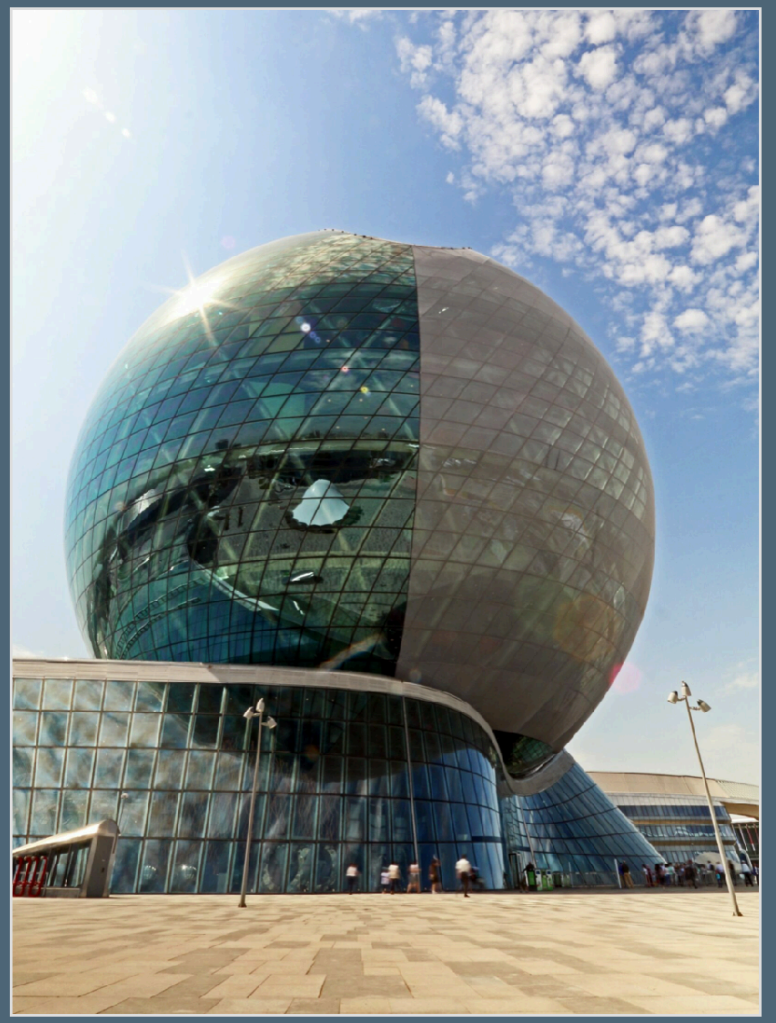
Modern Art Look





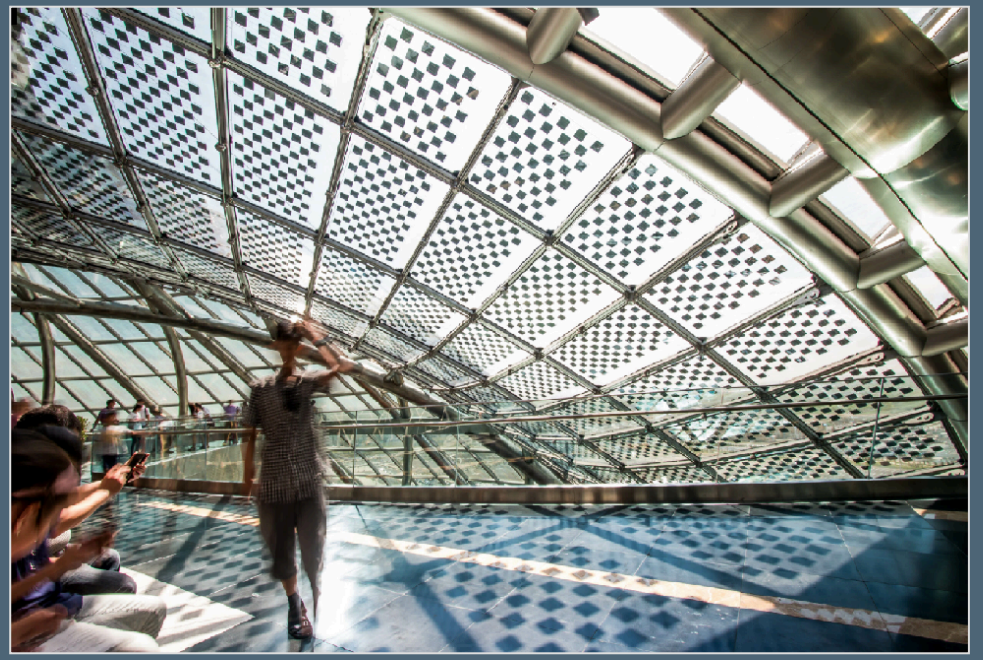

“ the sphere”

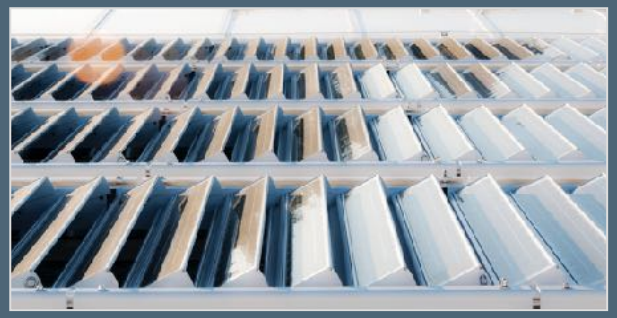
Astana Exhibition Center



“ the sphere”

Astana Exhibition Center





2.403 Transparent Panels

by Renzo Piano Building Workshop





Kimbell Art Museum



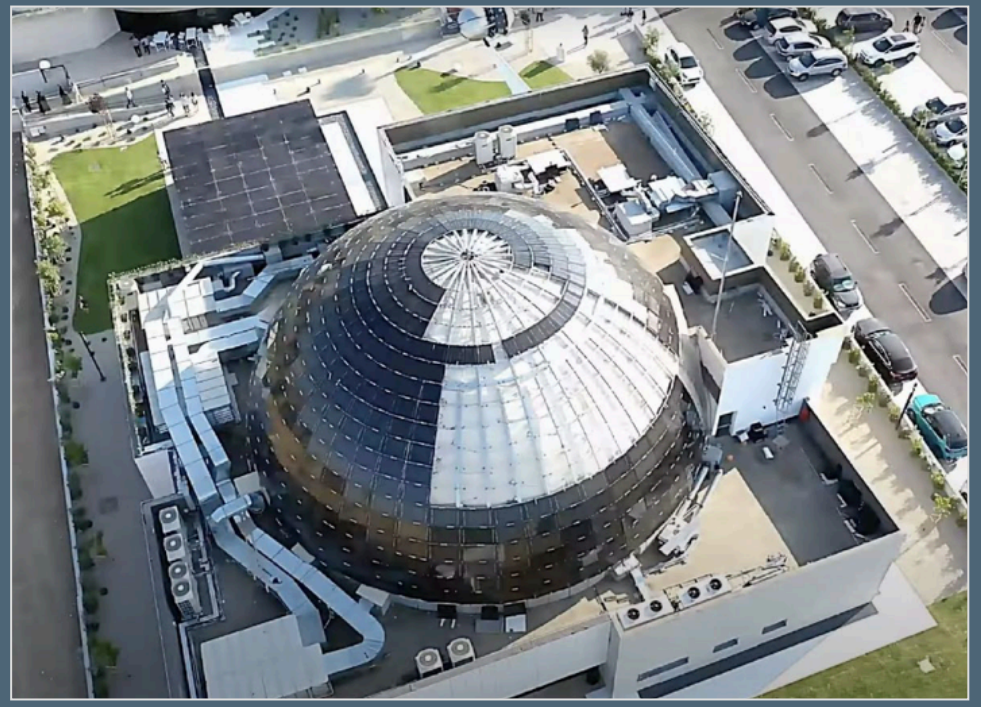
Dome Amphitheater

720 Custom–made P/V panels

17 different sizes

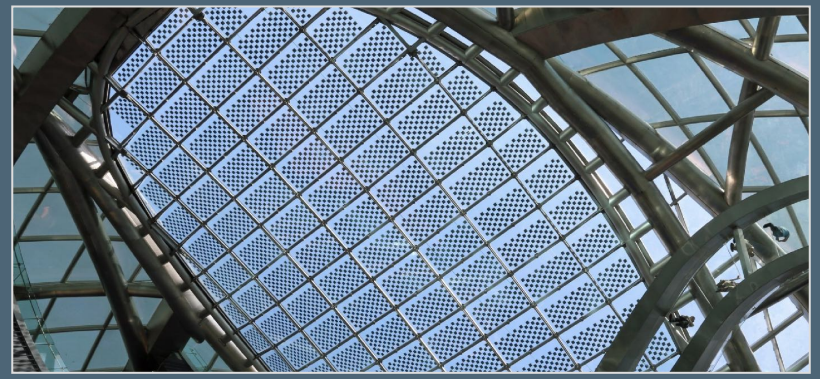
All trapezoidal in shape





amphitheatre

stadiums
sport centers





science center



unique facade

Audi experience center






AUDI
Brand Experience
Center - Munich

Audi Munich


AUDI
Brand Experience
Center - Munich


AUDI
Brand Experience
Center - Munich

Aesch – Switzerland

unique facade & roof installation

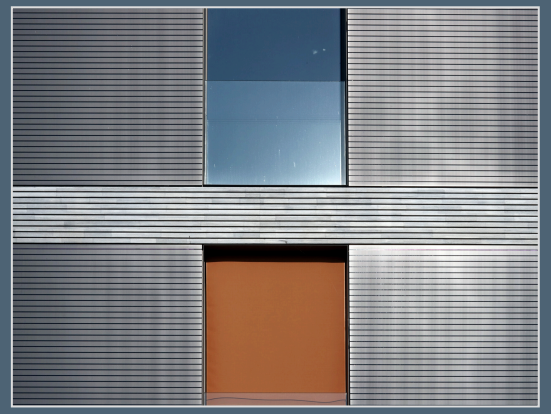


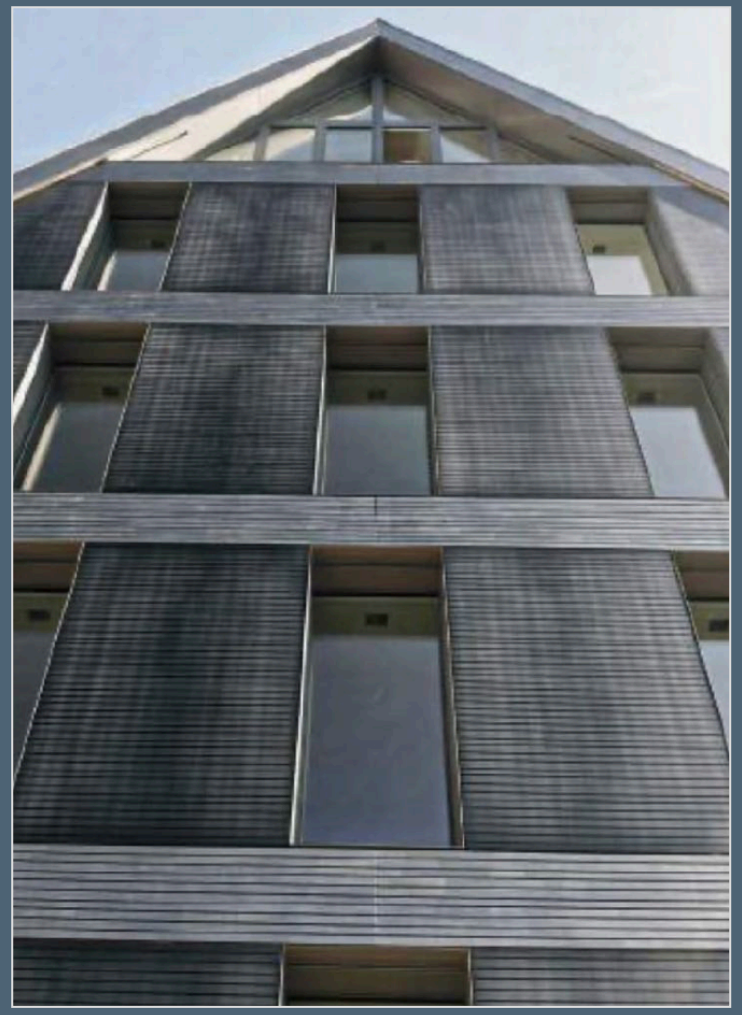




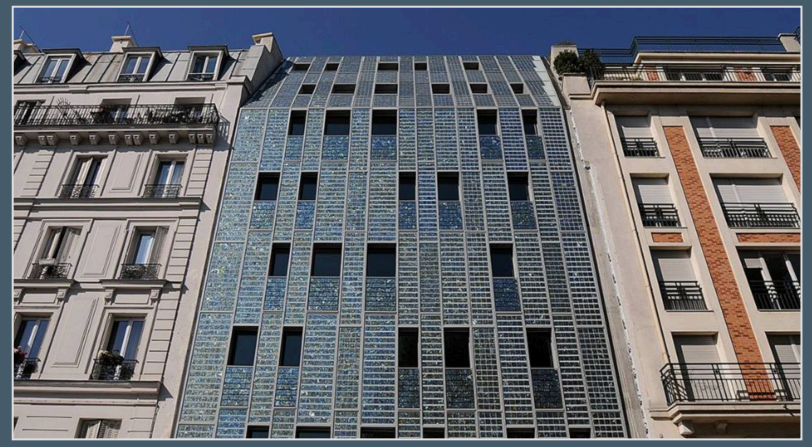


Roosli project



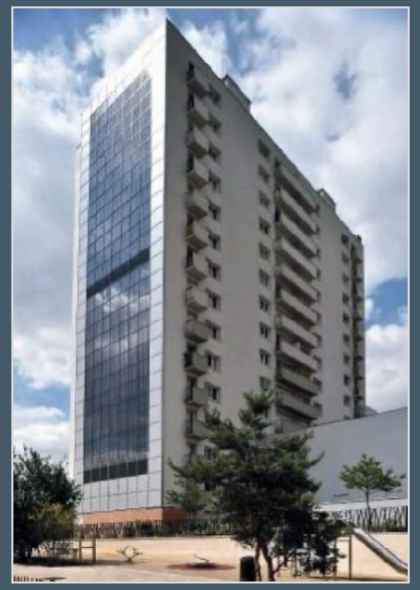


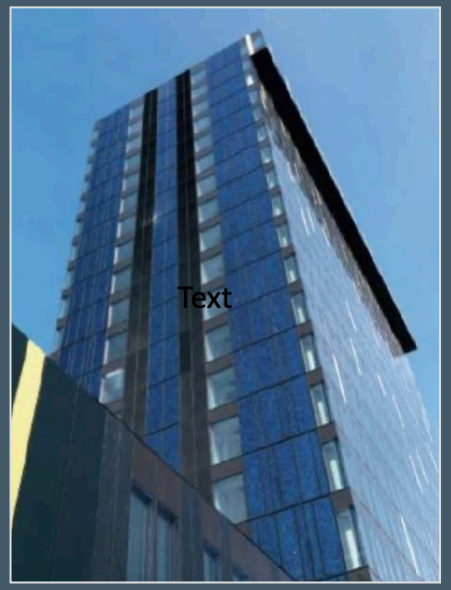
Emmaus Solidaritet
unique facade installation
Paris – France

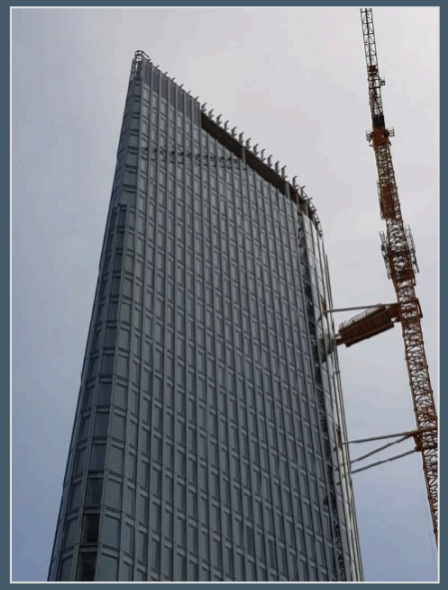




Towers













unique projects













unique projects













unique projects







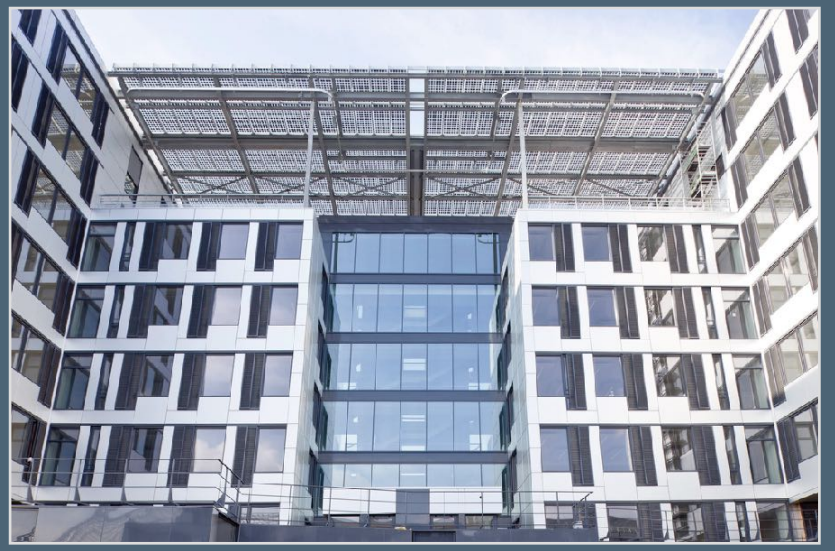
General Hospital Vienna







Headquarters
France



off–grid building

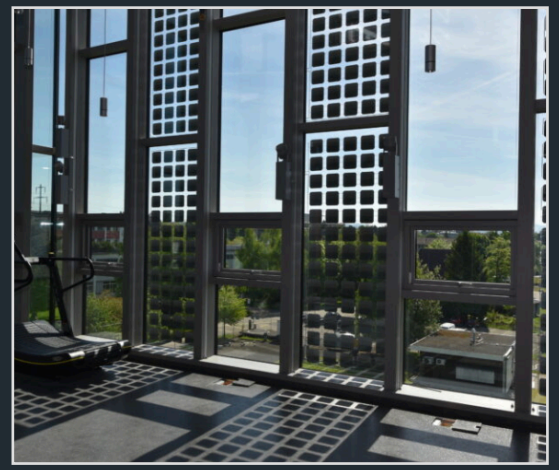


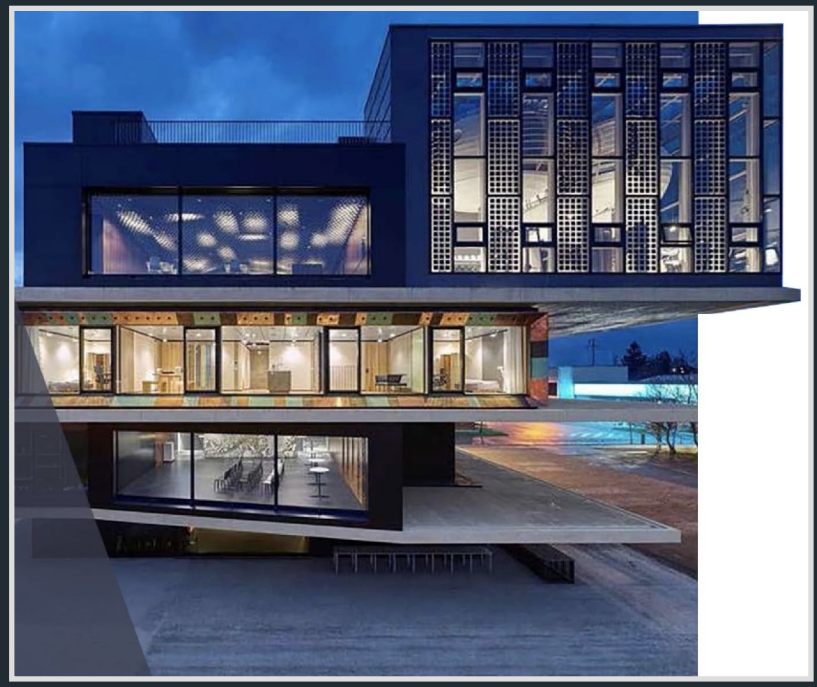
Biessenhofen
Germany





roof & facade installation





Dubendorf

Switzerland



Energiewurfel
Constance – Germany

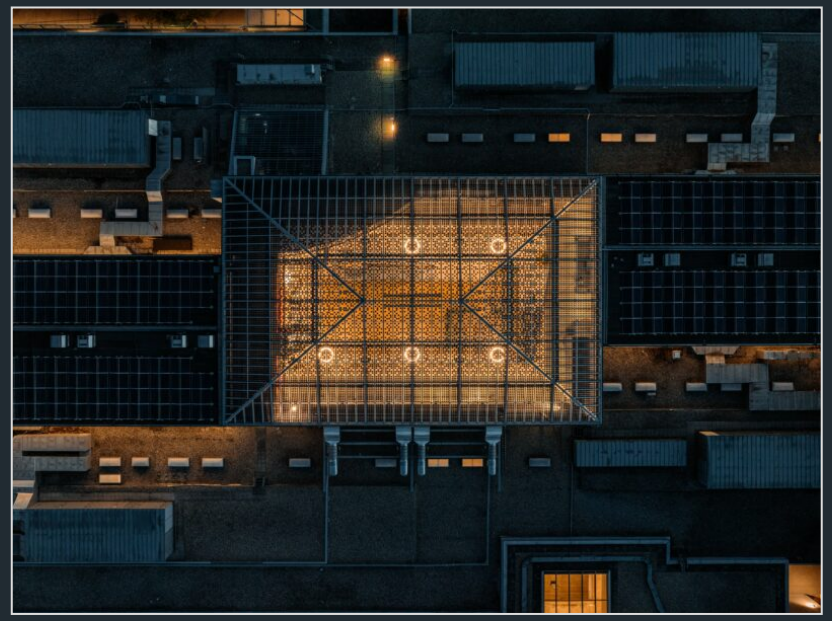


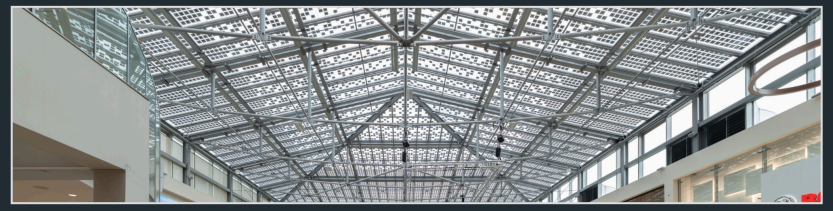
Pierre Arnaud Foundation



Pierre Arnaud France







shopping malls
transparent roofs



Marburg
Germany

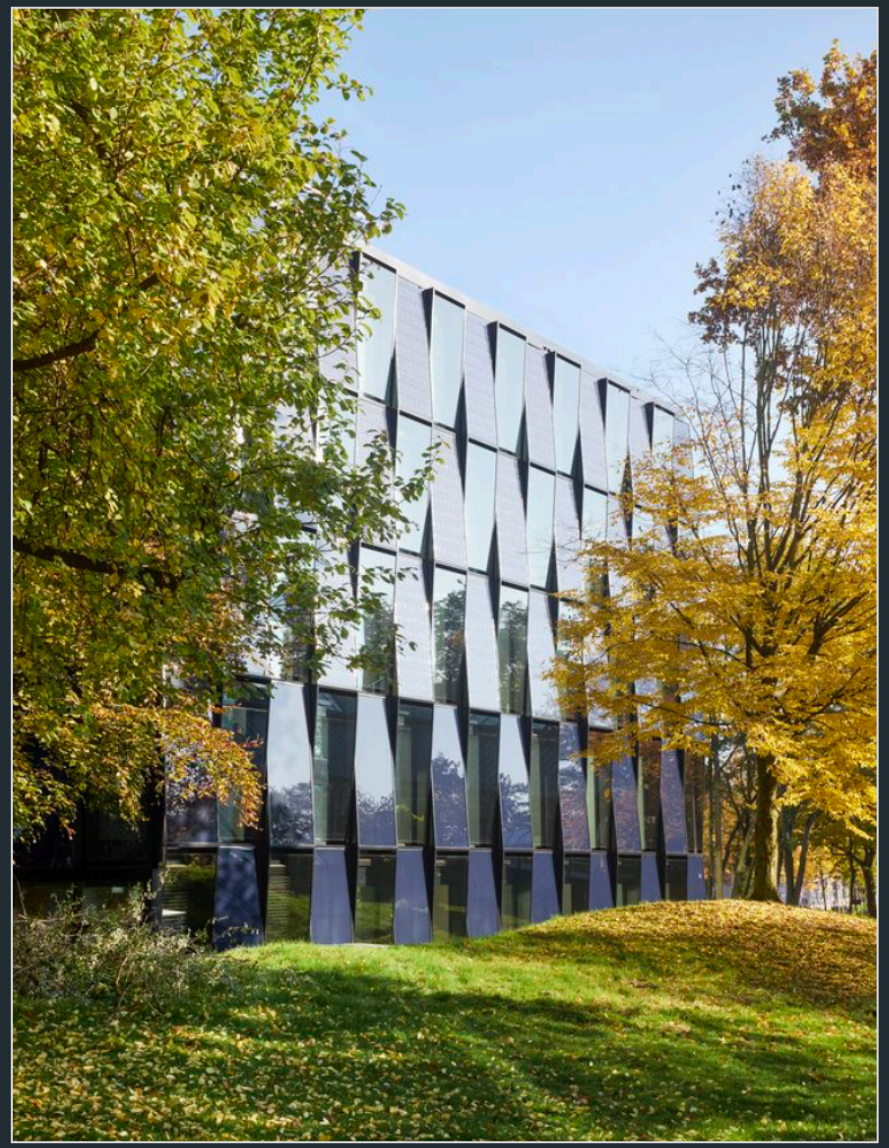


unique energy project



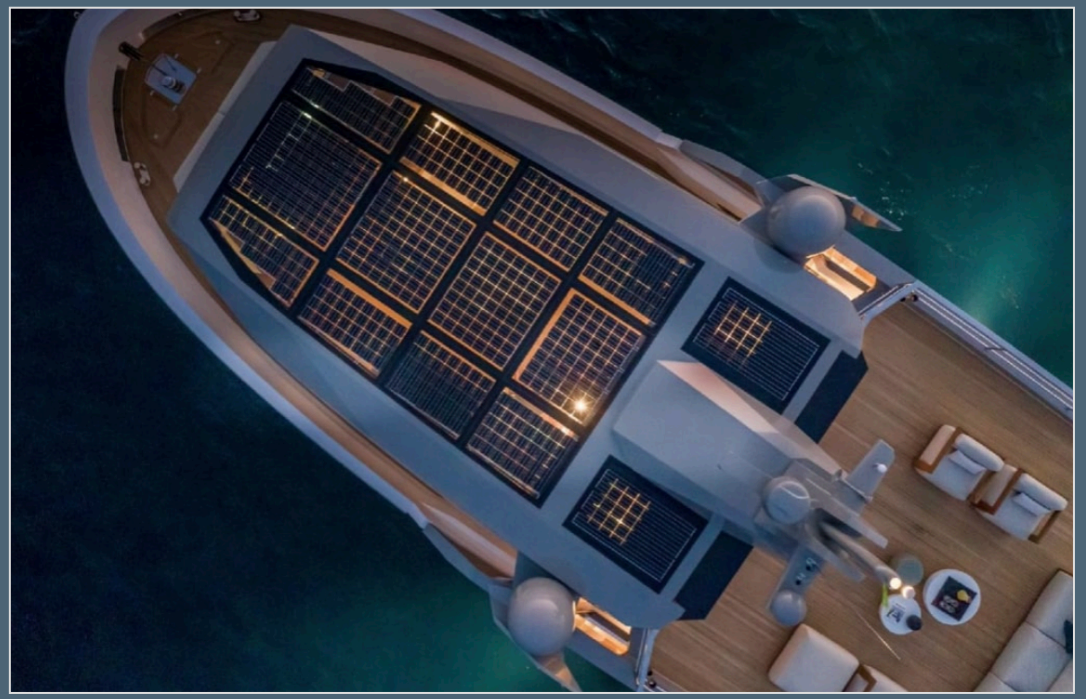


Headquarters
Mönchengladbach
Germany



yachts





yachts











unique cruise ships







cars











Fronius HQ









facade Empl

Canada









ventilated facades

roof & facade installation

Schweiz

Switzerland



ventilated facades





ventilated facades



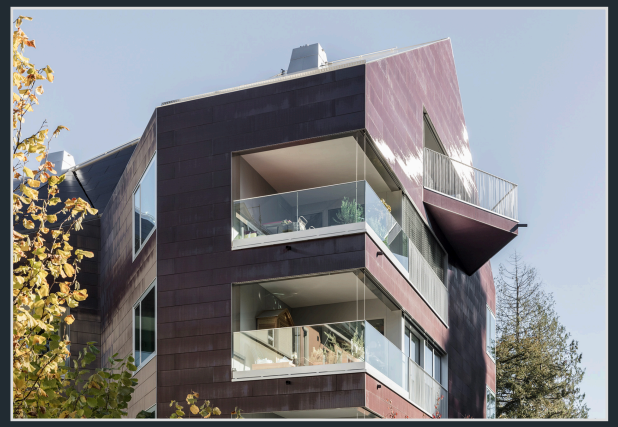
Coop Headquarters



facade & roof



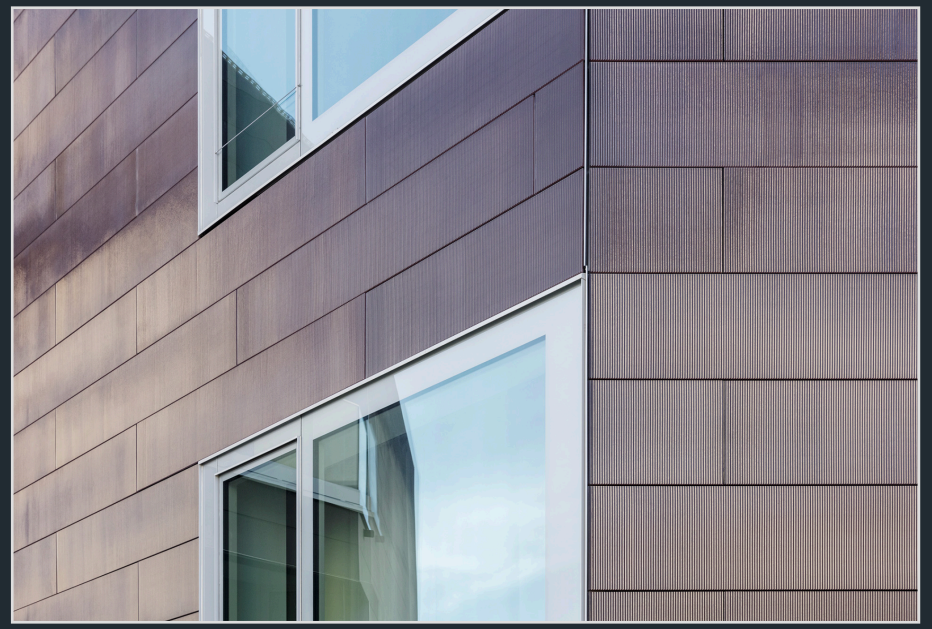
ventilated facades



Solaris

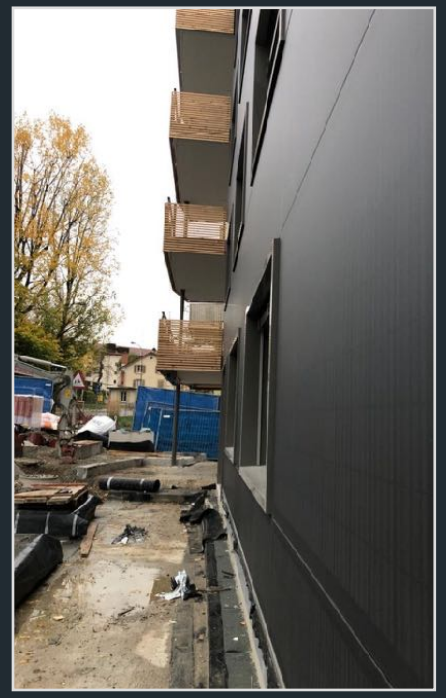
Zurich

Switzerland



zero energy building

ventilated facades



unique facades

Talstrasse
Zurich

Switzerland



ventilated facades

facade – roof

self–sufficient residence

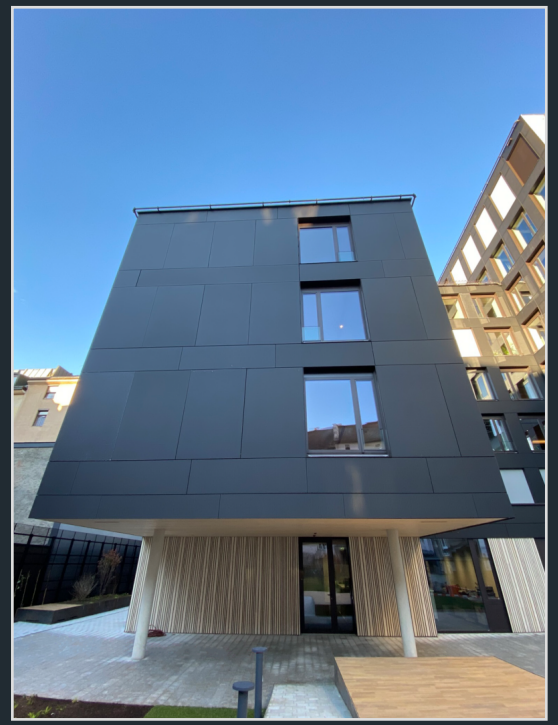


ventilated facades

self–sufficient office building

Tyrol







facades – roof

ventilated facades



self–sufficient
residences



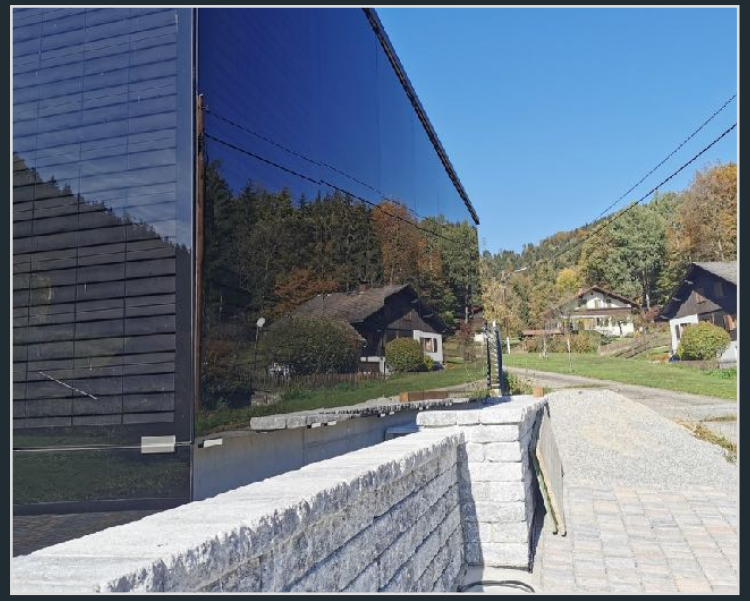
Sonnenpark project

ventilated facades



facades
roofs
balconies
storage





roof & facade



Unique Indoor Parking





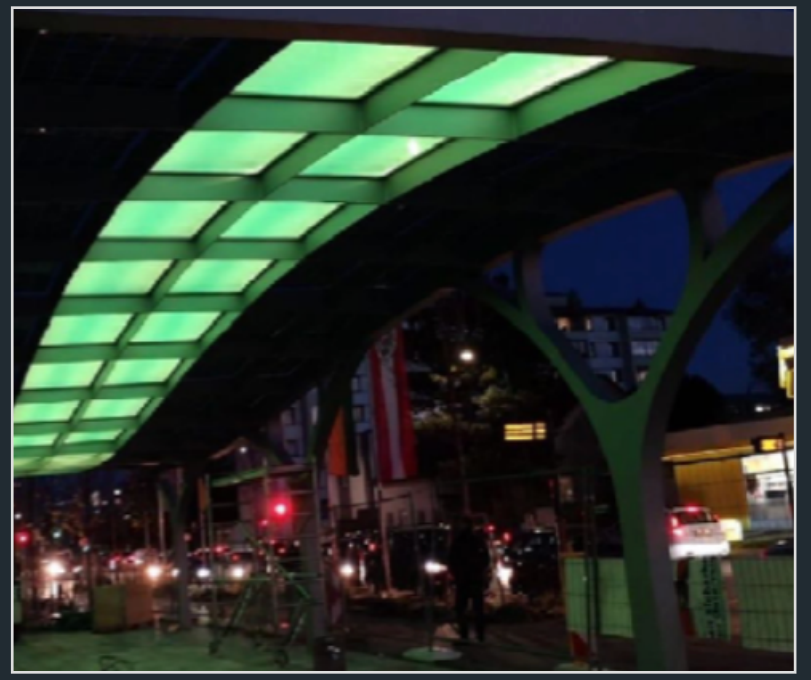


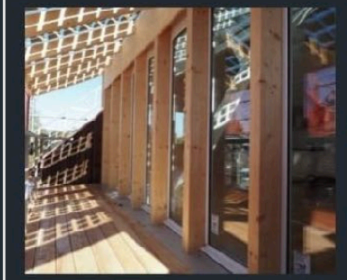
Fehlmann Areal Winterthur



unique projects “the waves”

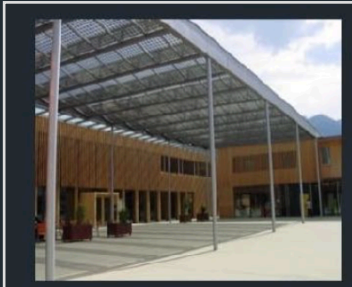
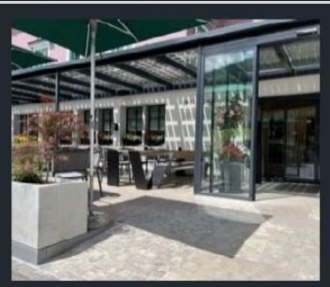
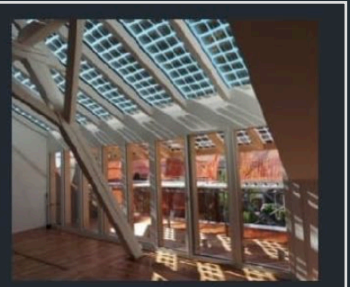








terraces

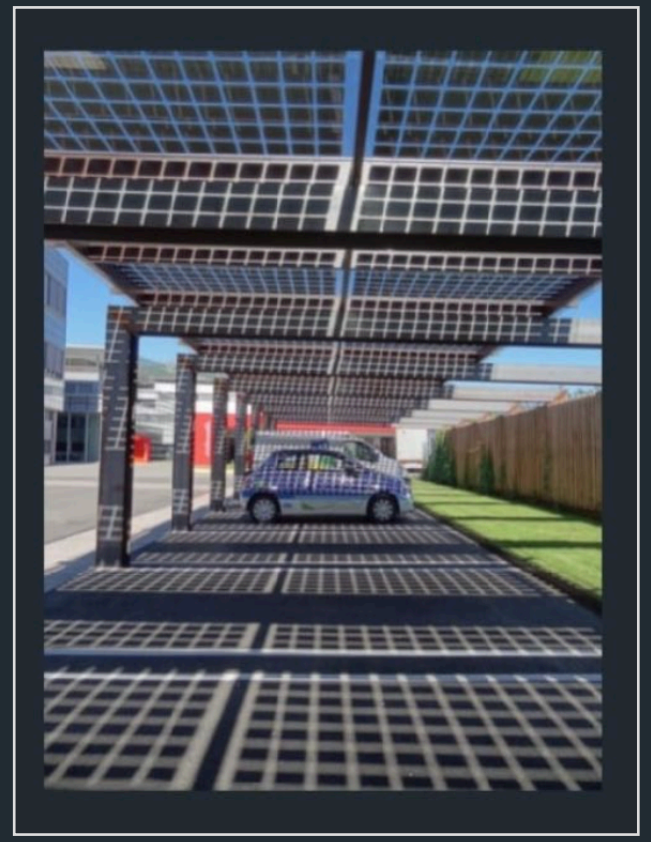




carports









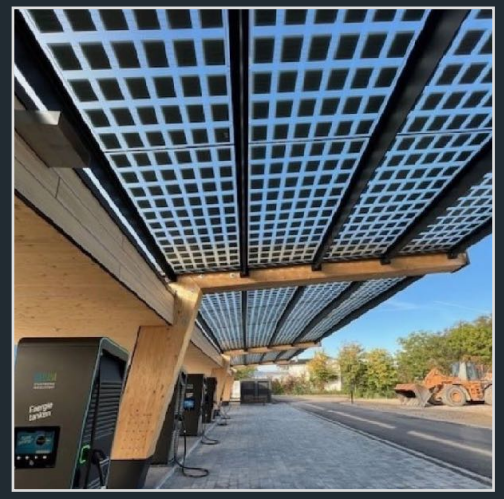




Audi



unique charging hubs



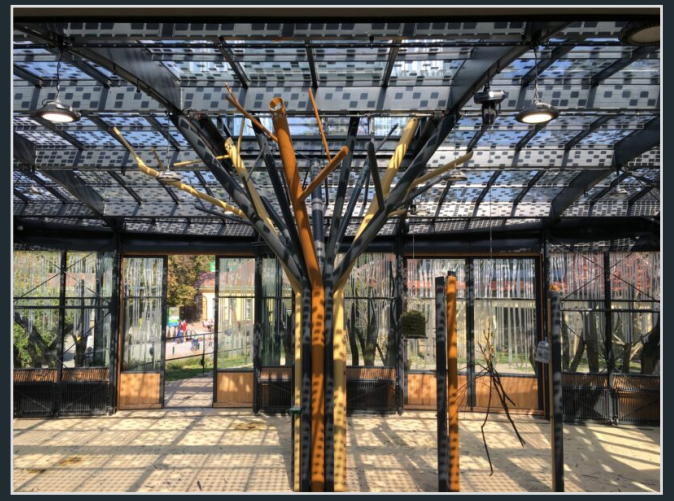






Schönbrunn Zoo

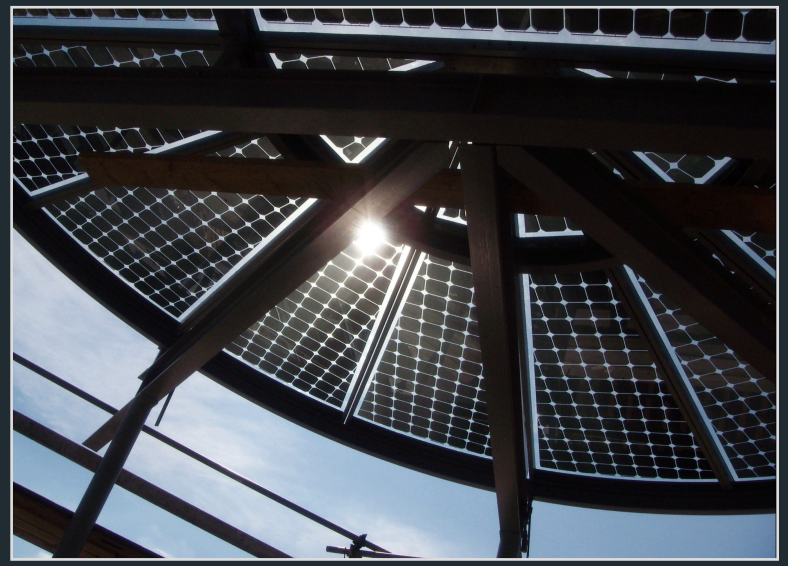






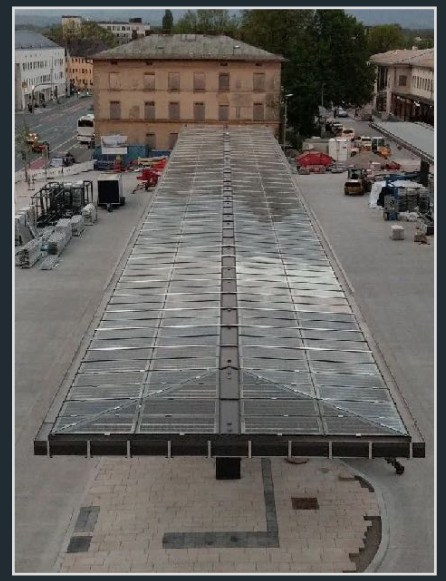
Båstad Tennis Stadium

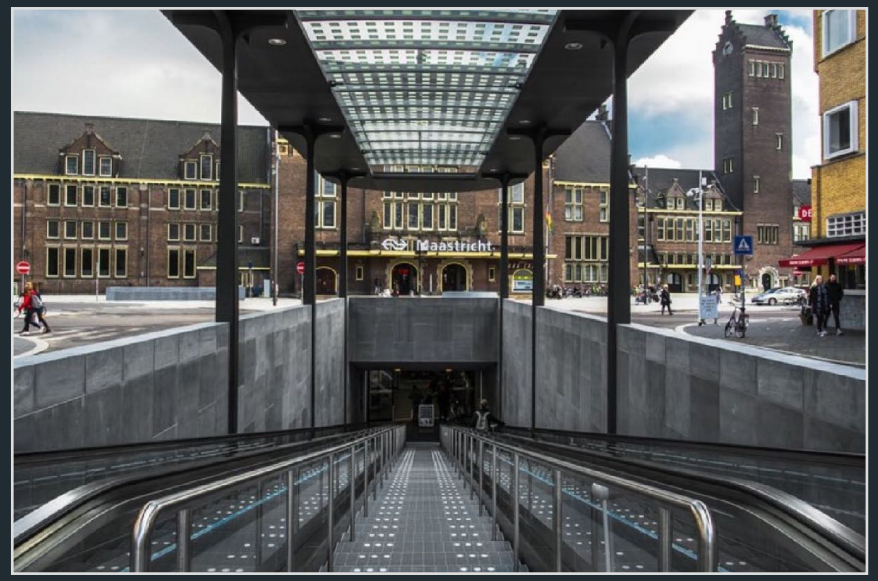




Swedish International Championship





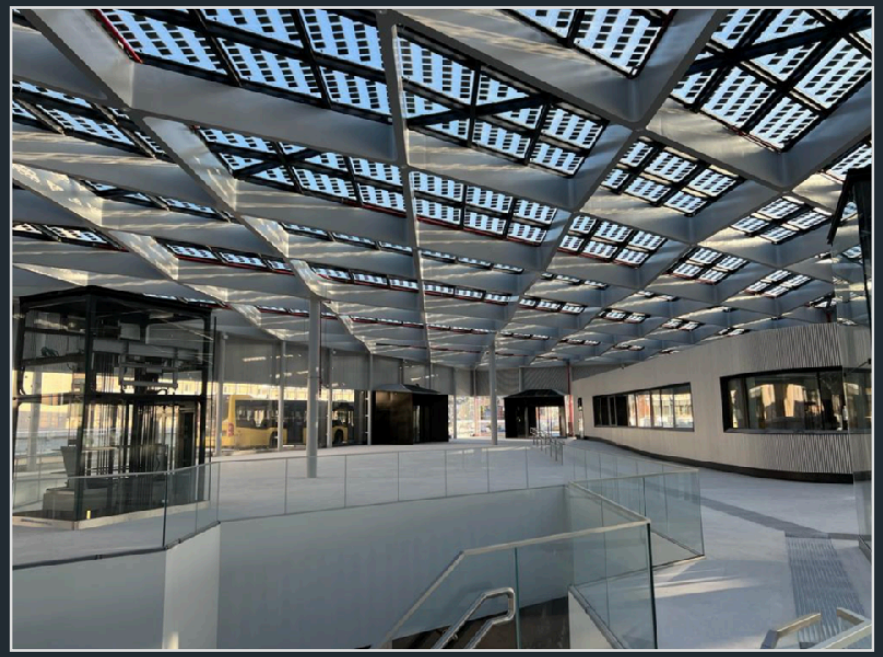


Maastricht



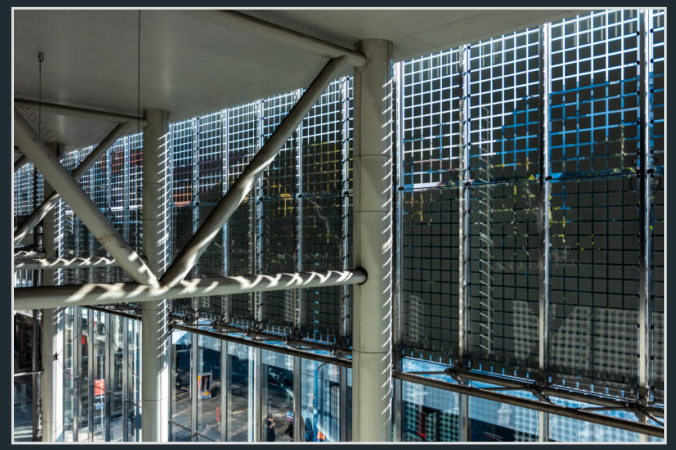
central bus station
8.000 m2
3.560 panels

Belgium

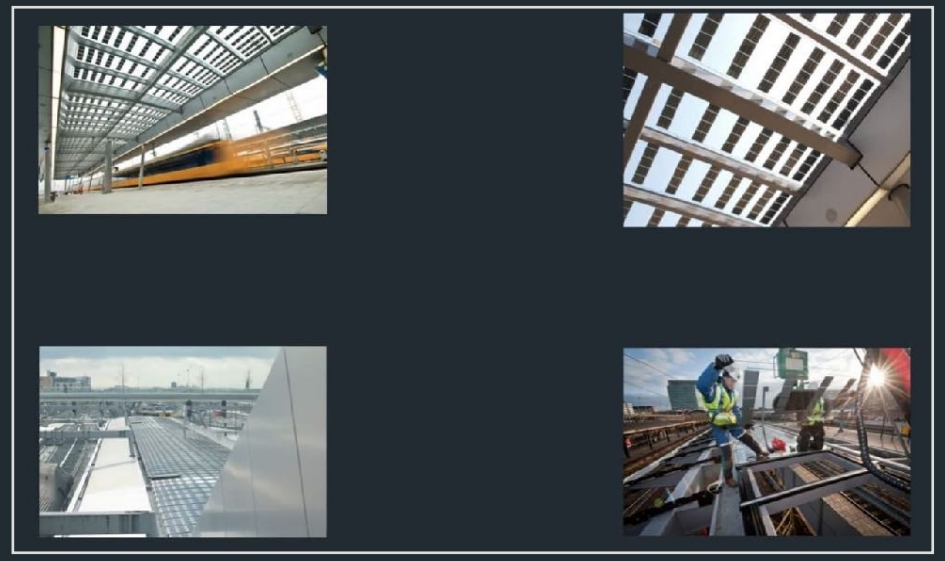




Vienna central train station









Utrecht central train station

panels of any size & shape





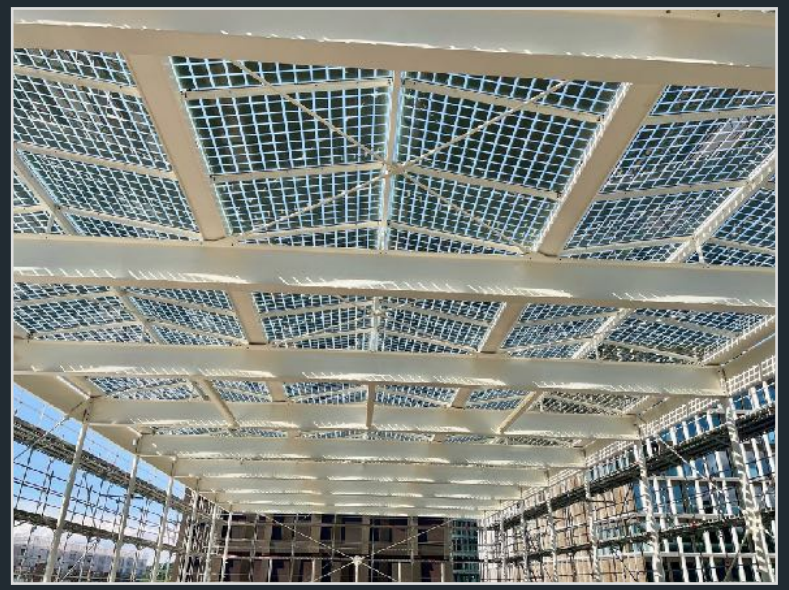
triple–side roof installation



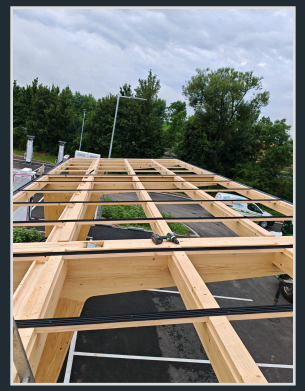
Switzerland

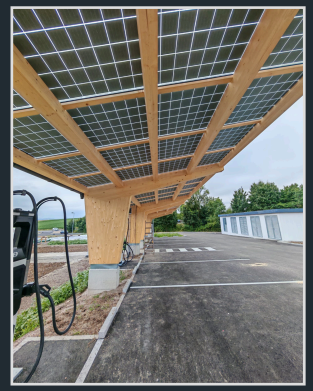


Zurich



Allmend School









public charging stations



wooden constructions



roofs and balconies



roofs
&
canopies




REWE
REWE
REWE
REWE





Unique Projects





perforated transparency







timber frame

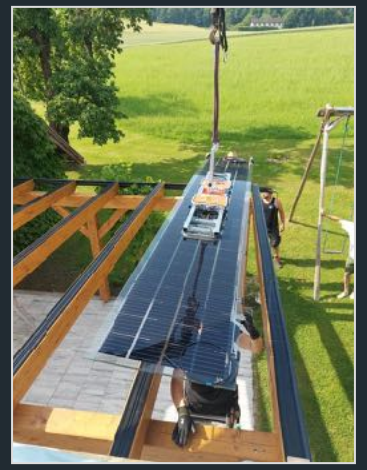


unique wooden construction



Switzerland

unique panels – length 5m









balconies







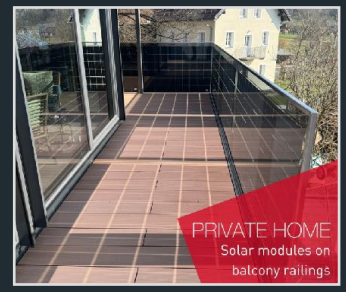












fences & balconies







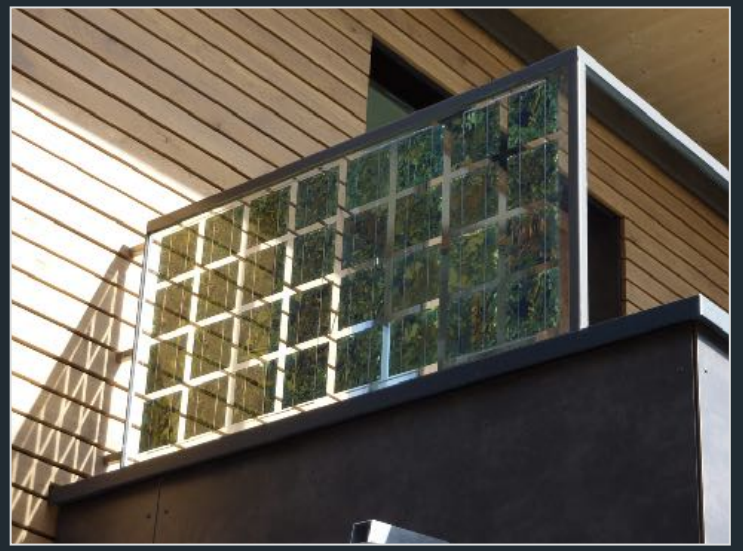




unique flower fence







country house



transparent flower balcony



Tamins
Switzerland

facade & roof installations

facade panels:
designed by Bruno Krucher







Leather Look



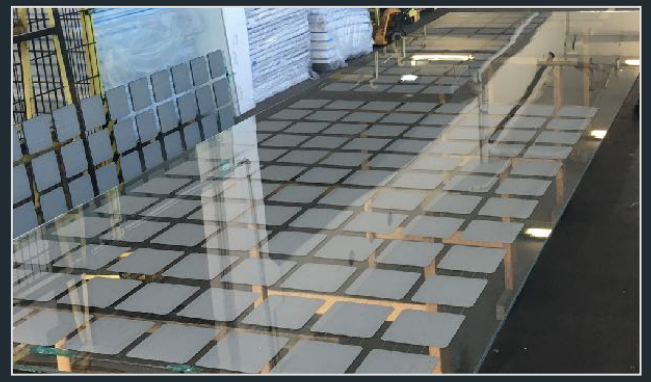


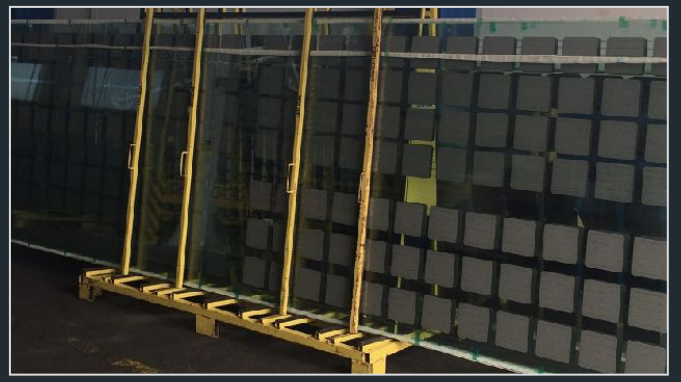
Weisses Schlössli
Davos





public places

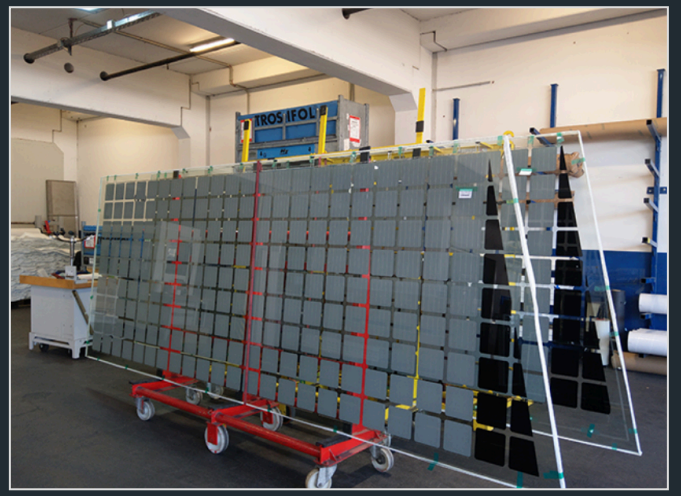




unique huge
custom–made panels
for special projects



5,100 x 2,440 mm
World Record



Austria's most
innovative Companies
at iLab of Austria's Pavilion

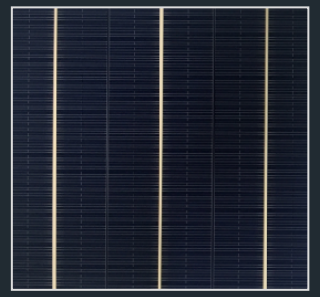


award – perforated cells

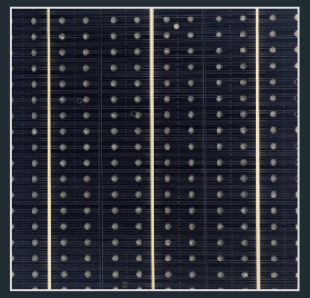


Dubai

handmade process
unique perforated transparency



before



after

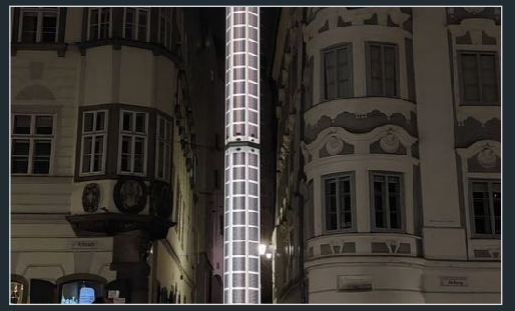


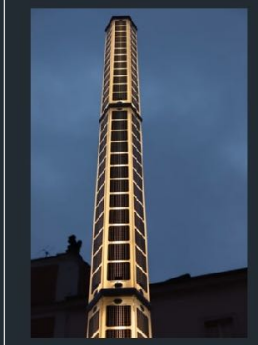
patented technology



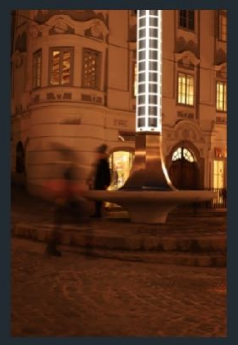
Lichtbrunnen

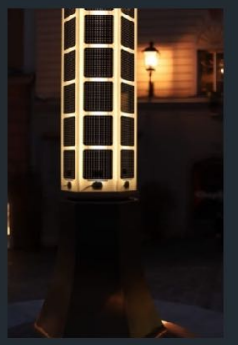
Linz – Austria

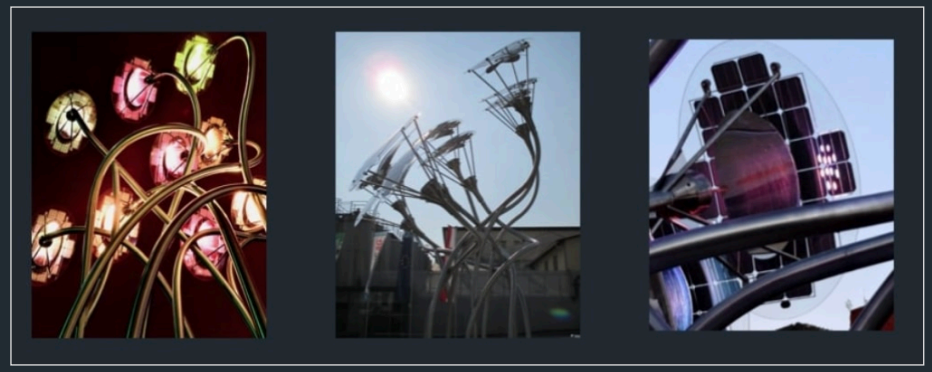












Sonnenblumen

Linz – Austria





ultra–modern museum
Germany





art & technology





Roofing

Balconies

Sky Lights

Spandrels

Brises Soleil

Ventilated Facades

Sound Walls

Curtain Walls

Active Building Skins

Walkable Floor

Canopies & Shade House


you name it...
flowers
woods
special designs
gold
metallic
any size
exclusive images
steel
master energy
patterns
stones
trees
nature
leathers
any colour
industrial
any shape
rocks
...we create it

Regulatory Framework & EU Law Compliance

Verified by Ertex Solar R&D Division

Ertex Solar Certifications

ISO 9001 STANDARD – QUALITY
ISO 9001–NORM – QUALITÄT
NORME ISO 9001 – QUALITÉ

ISO 14001 STANDARD – ENVIRONMENT
ISO 14001–NORM – UMGEBUNG
NORME ISO 14001 – ENVIRONNEMENT

IEC 61215 STANDARD – DESIGN QUALIFICATION AND TYPE APPROVAL
NORM IEC 61215 – BAUARTEIGNUNG UND BAUARTZULASSUNG
NORME IEC 61215 – QUALIFICATION DE LA CONCEPTION ET HOMOLOGATION

IEC 61730 STANDARD – SAFETY QUALIFICATION
NORM IEC 61730 – SICHERHEITSQUALIFIKATION
NORME IEC 61730 – SURETÉ DE FONCTIONNEMENT

EN 13501 STANDARD – CLASSIFICATION AND REACTION TO FIRE
NORM EN 13501 – KLASSIFIZIERUNG UND BRANDVERHALTEN
EN 13501– CLASSIFICATION ET REACTION AU FEU

EN 12600 STANDARD – IMPACT AND CLASSIFICATION OF FLAT GLASS
NORM EN 12600 – STOßPRÜFUNG UND KLASSIFIZIERUNG VON FLACHGLAS
NORME EN 12600 – IMPACT ET CLASSIFICATION DU VERRE PLA

ISO 9001	Quality Management
ISO 14001	Environmental management
IEC 61215	Crystalline silicon PV modules
IEC 61730	Operational reliability of PV modules
EN 12543	Laminated safety glass
EN 14449	Conformity assessment safety glass
EN 12600	Glass in construction — pendulum test

. Rigorous testing to meet building construction standards

. Impact tests: 1B1 according to 12600 standard

. Fire test: B s1 d0 according to EN 13501

. Thermal cycles (from –40˚C to +85˚C), humid environment

(1000h at 85˚C and 85% RH), salt fog resistance

We are one of only to hold certifications in construction, electronics and photovoltaic technology

certificates

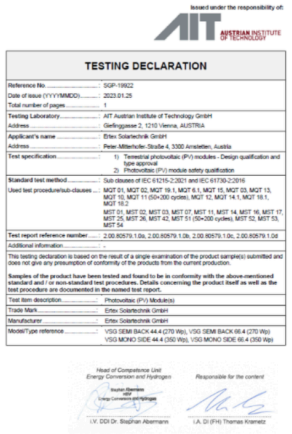
			EN 12758	Glass in building - Sound insulation
			EN 13501 - 1	Fire - Classification from reaction to fire tests
X8	C-Si framing for large area glass	TBD	EN 61730	PV module safety qualification
			EN ISO 12631	Curtain walling - Calculation of thermal transmittance
			EN 13022-1	Glass in building - Structural sealant glazing (SSG)
			**EN 13116	Curtain walling - Resistance to wind load - Requirements
			**EN 12179	Curtain walling - Resistance to wind load - Test
X9 to X11	C-Si semi-transparent low concentration and solar control BIPV system	Skylight	EN 1279-5	Glass in building - Insulating glass units - Conformity
			**EN 13830	Curtain walling - Product standard
			IEC 62108	CPV - Design qualification and type approval
			EN 410	Glass - Light & Solar
			**EN 13363-1	Solar protection devices - Light & Solar
			EN 673/674/675	Glass in building - U Value
			EN 12758	Glass in building - Sound insulation
		Façade	EN 13501 - 1	Fire - Classification from reaction to fire tests
			**EN 13116	Curtain walling - Resistance to wind load - Requirements
			**EN 12179	Curtain walling - Resistance to wind load - Test
X12	Glazed modules treated for improved passive properties	TBD	***EN ISO 12543 1-6	Glass in building - Laminated glass and laminated safety glass
			***EN 14449	Laminated glass
			EN 410	Glass - Light & Solar
			EN 673/674/675	Glass in building - U Value
			IEC 61215 c-Si	Design qualification and type approval
			EN 61730	PV module safety qualification

European Commission

Product		System for demonstration	Relevant standards according with EN 50583:2016	
X1/ X3	CIGS roofing shingle on metal substrate	Roofing shingles	IEC 61646 a-Si	TF modules - Design qualification and type approval
			EN 61730	PV module safety qualification
			50583-2 Annex A	PV in buildings. Rain penetration test
			EN 13501 - 1	Fire - Classification from reaction to fire tests
X2	CIGS large area flexible roofing membrane and bendable elements	Roofing membrane	IEC 61646 a-Si	TF modules - Design qualification and type approval
			EN 61730	PV module safety qualification
			**EN 13363-1	Solar protection devices - Light & Solar
			50583-2 Annex A	PV in buildings. Rain penetration test
			EN 13956	Flexible sheet for waterproofing
			EN 13501 - 1	Fire - Classification from reaction to fire tests
			EN 16002	Flexible sheets for waterproofing - Resistance to wind load
X4	CIGS large area elements on metal substrate	Large area tiles façade	IEC 61646 a-Si	TF modules - Design qualification and type approval
			EN 61730	PV module safety qualification
		Roof tiles on metal	EN ISO 6946	Construction - Thermal transmittance
			EN 14782-3	Self-supporting metal sheet (roofing, cladding, lining)
			EN 14783	Supported metal sheet and strip for roofing, cladding, lining
		Large area roofing shingles	EN 13501 - 1,2,5	Fire - Classification from reaction to fire tests
			**EN 13116	Curtain walling - Resistance to wind load - Requirements
			**EN 12179	Curtain walling - Resistance to wind load - Test
X5	C-Si glazed products with hidden bus bars and L interconnections	Ventilated façade	EN ISO 12543 1-6	Glass in building - Laminated glass and laminated safety glass
			EN 14449	Laminated glass
			IEC 61215 c-Si	c-Si modules - Design qualification and type approval
			EN 61730	PV module safety qualification
			EN 13501 - 1,2	Fire - Classification from reaction to fire tests
			**EN 13116	Curtain walling - Resistance to wind load - Requirements
			**EN 12179	Curtain walling - Resistance to wind load - Test
X6	Glass-glass products with back contact c-Si cells	Ventilated façade	IEC 61215 c-Si	c-Si modules - Design qualification and type approval
			EN 61730	PV module safety qualification
			*EN 410	Glass - Light & Solar
			*EN ISO 12543 1-6	Glass in building - Laminated glass and laminated safety glass
			*EN 12758	Glass in building - Sound insulation
			*EN 12600	Glass in building - Pendulum test
			*EN 13501 - 1,1	Fire - Classification from reaction to fire tests
			**EN 13116	Curtain walling - Resistance to wind load - Requirements
			**EN 12179	Curtain walling - Resistance to wind load - Test
X7	Curved glass-glass, CIGS technology	TBD	EN ISO 12543 1-6	Glass in building - Laminated glass and laminated safety glass
			EN 14449	Laminated glass
			EN 61730	PV module safety qualification
			EN 673/674/675	Glass in building - U Value

Zertifikate

EN61215-2/EN61730



issued under the responsibility of:

AIT AUSTRIAN INSTITUTE OF TECHNOLOGY

TESTING DECLARATION

Reference No.	SGP-19622
Date of issue (YYYYMMDD)	2023.01.25
Total number of pages	1
Testing Laboratory	AIT Austrian Institute of Technology GmbH
Address	Giefinggasse 2, 1210 Vienna, AUSTRIA
Applicant's name	Ertex Solartechnik GmbH
Address	Peter-Mitterhofer-Straße 4, 3300 Amstetten, Austria
Test specification	1) Terrestrial photovoltaic (PV) modules - Design qualification and type approval 2) Photovoltaic (PV) module safety qualification
Standard test method	Sub-clauses of IEC 61215-2:2021 and IEC 61730-2:2016
Used test procedure/sub-clauses	MQT 01, MQT 02, MQT 19.1, MQT 6.1, MQT 15, MQT 03, MQT 13, MQT 10, MQT 11 (50+200 cycles), MQT 12, MQT 14.1, MQT 16.1, MQT 18.2 MST 01, MST 02, MST 03, MST 07, MST 11, MST 14, MST 16, MST 17, MST 35, MST 26, MST 42, MST 51 (50+200 cycles), MST 52, MST 53, MST 54
Test report reference number	2.00.80579.1.0a, 2.00.80579.1.0b, 2.00.80579.1.0c, 2.00.80579.1.0d
Additional information	-

This testing declaration is based on the result of a single examination of the product sample(s) submitted and does not give any presumption of conformity of the products from the current production.

Samples of the product have been tested and found to be in conformity with the above-mentioned standard and / or non-standard test procedures. Details concerning the product itself as well as the test procedure are documented in the named test report.

Test item description	Photovoltaic (PV) Module(s)
Trade Mark	Ertex Solartechnik GmbH
Manufacturer	Ertex Solartechnik GmbH
Model/Type reference	VSG SEMI BACK 44.4 (270 Wp), VSG SEMI BACK 66.4 (270 Wp) VSG MONO SIDE 44.4 (350 Wp), VSG MONO SIDE 66.4 (350 Wp)

Head of Competence Unit Energy Conversion and Hydrogen — Responsible for the content

i.V. DDI Dr. Stephan Abermann — i.A. DI (FH) Thomas Krametz

Kugelfall / Pendelschlag



Stadt Wien | Prüf-, Inspektions- und Zertifizierungsstelle

ertex solartechnik GmbH
z.H. Herrn Ing. Christian ULRICH
Peter-Mitterhofer-Straße 4
3300 Amstetten

per E-Mail an: christian.ulrich@ertex-solar.at

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Telefon +43 1 4000 8039
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ma39.wien.at

MA 39 - 21-03445

Wien, 31. August 2021
Gesamtseiten: 8

Prüfbericht

über Kugelfall- und Pendelschlagprüfungen an Verbundglas mit Photovoltaik-Einlagen

Auftraggeber/ Werk	ertex solartechnik GmbH, Peter-Mitterhofer-Straße 4, 3300 Amstetten
Auftragsdatum	13. April 2021
Prüfgut	Verbundglas mit Photovoltaik-Zellnetz aus 2 x 6 mm Einscheiben-Sicherheitsglas beziehungsweise 2 x 6 mm teilvorgespanntem Glas
Prüfguteingang	10. Juni 2021
Auftrag	Kugelfallprüfung gemäß ÖNORM EN 14449 sowie Pendelschlagprüfung gemäß ÖNORM EN 12600

FEUER PRÜFUNG



Alu König Stahl GmbH
Goldschlagstraße 87-89
1150 Wien

IBS – Institut für Brandschutztechnik und Sicherheitsforschung Gesellschaft m.b.H. Prüf-, Inspektions- und Zertifizierungsstelle
Petzoldstraße 45 / 4020 Linz / Austria
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office@ibs-austria.at | www.ibs-austria.at
Firmenbuchnummer 89166
Landesgericht Linz | UID-Nr. ATU23287705

18. Jänner 2022
Roland BECK / AM
+43 732 7617 - 885

Nachweis über die weitere Verwendbarkeit des Prüfberichts Nr. 12120405-1,RevA vom 10. Jänner 2013

Prüfgegenstand:

Schüco SCC 60 Aluminium-Fassade mit PV-Modul-Ertex-VSG und Mineralwolledämmung

Prüfergebnisse:

positiver Nachweis

B-s1, d0

Grundlagen:

ÖNORM B 3800, Teil 5:
„Brandverhalten von Baustoffen und Bauteilen – Teil 5: Brandverhalten von Fassaden
Anforderungen, Prüfungen und Beurteilungen"
Ausgabe: 15. April 2013

Geltungsdauer:

Der Prüfbericht Nr. 12120405-1,RevA vom 10.09.2013 ist in Verbindung mit diesem Schreiben weiterhin bis zum **7. Juni 2027 bzw. bis zum Ende der Koexistenzperiode einer anwendbaren harmonisierten Produktnorm** verwendbar.

the **abZ** certificate is mandatory when it comes to the use of construction products that are not covered by harmonized European standards or other technical regulations.

Deutsches Institut für Bautechnik

DIBt

Stadt Wien | Prüf-, Inspektions- und Zertifizierungsstelle

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MA 39 – 23-08415

Wien, 7. September 2023
Gesamtseiten: 8

Prüfbericht

über Kugelfall- und Pendelschlagprüfungen an Verbund-Sicherheitsglas mit Photovoltaik-Einlagen

Auftraggeber/ Werk	ertex solartechnik GmbH, Peter-Mitterhofer-Straße 4, 3300 Amstetten
Auftragsdatum	13. April 2021
Prüfgut	Verbund-Sicherheitsglas mit Photovoltaik-Zellnetz aus 2 x 6 mm Einscheiben-Sicherheitsglas beziehungsweise 2 x 6 mm teilvorgespanntem Glas
Prüfguteingang	10. Juni 2021
Auftrag	Kugelfallprüfung gemäß ÖNORM EN 14449 sowie Pendelschlagprüfung gemäß ÖNORM EN 12600

Dieser Bericht ersetzt den Bericht MA 39 – 21-03445. Der ersetzte Bericht verliert damit seine Gültigkeit und darf nicht weiter verwendet werden. Der Austausch des Originals und aller Kopien fällt in den Verantwortungsbereich des Auftraggebers. Gegenüber dem Bericht MA 39 – 21-03445 wurde der Begriff Verbundglas durch Verbund-Sicherheitsglas (mit Stoffbezeichnung) ersetzt.

Zertifizierungsstelle für Produkte gemäß der ÖNORM EN ISO 9001:2015 und der ÖNORM B 2110: 2021-01-01 durch die Quality Austria. Akkreditiert als Prüf- und Inspektionsstelle gemäß ÖNAK gemäß Bescheid des Bundesministeriums für Digitalisierung und Wirtschaftsstandort vom Datum ÖNORM EN ISO/IEC 17020 und ÖNORM EN ISO/IEC 17025. Akkreditiert als Zertifizierungsstelle gemäß ÖNAK gemäß Bescheid des Bundesministeriums für Digitalisierung und Wirtschaftsstandort vom Datum ÖNORM EN ISO/IEC 17065. Notifizierte Stelle (Notified Body) gemäß Bauproduktenverordnung (EU) Nr. 305/2011 unter der Kennnummer 1020. Die Liste der Prüfgebiete finden Sie unter http://www.austrian-accreditation.at. Prüfergebnisse beziehen sich ausschließlich auf die Prüfgegenstände. Veröffentlichungen, Auszüge, Kopien bedürfen der schriftlichen Genehmigung der MA 39.
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Information gemäß Artikel 13 DSGVO: Ihre dabei über Ihre Person der Tätigkeiten der MA 39 erhobene Daten automatisiert verarbeitet und elektronisch archiviert.
Bankverbindung: Bank Austria, IBAN: AT643100000600990166, BIC: BKAUATWW, UID: ATU 64870305, Öffnungszeiten: Mo, Do, Fre: 7:30 - 15:30 Uhr und Fr: 7:30 - 13:30 Uhr.

1 Allgemeines

1.1 Auftrag

Die ertex solartechnik GmbH beauftragte die Magistratsabteilung 39 mit der Kugelfallprüfung gemäß ÖNORM EN 14449 sowie der Pendelschlagprüfung gemäß ÖNORM EN 12600 an unten beschriebenen Prüfgut.

1.2 Prüftermin

Die Kugelfallprüfung erfolgte am 26. Juli 2021. Die Pendelschlagprüfung erfolgte am 18. Juni 2021.

1.3 Verwendete Unterlagen

Die im Folgenden angeführten Unterlagen wurden für die Erstellung des Berichtes herangezogen und sind, soweit dies im Text erforderlich ist, nur mehr unter der Angabe der laufenden Nummer "[ ]" zitiert:

[1] ÖNORM EN 14449, Glas im Bauwesen – Verbundglas und Verbund-Sicherheitsglas – Konformitätsbewertung/Produktnorm, Ausgabe 1. Juli 2005
[2] ÖNORM EN 12600 Glas im Bauwesen – Pendelschlagversuch – Verfahren für die Stoßprüfung und die Klassifizierung von Flachglas, Ausgabe 1. Mai 2003

1.4 Prüfmittel

Kugelfall-Prüfrahmen:	Inventarnummer 6367
Stahlkugel:	Inventarnummer 9494
Pendelschlagprüfstand:	Inventarnummer 5681
Bügelmessschraube:	Inventarnummer 5756
Maßband:	Inventarnummer 5456

1.5 Prüfgut

Am 10. Juni 2021 wurden vom Auftraggeber folgende Gläser angeliefert.

- je 3 Stück Verbund-Sicherheitsglas, mit Photovoltaik-Einlage
  L x B = 500 mm x 500 mm
  aus 2 x 6 mm Einscheiben-Sicherheitsglas
- je 3 Stück Verbund-Sicherheitsglas, mit Photovoltaik-Einlage
  L x B = 500 mm x 500 mm
  aus 2 x 6 mm teilvorgespanntem Glas
- je 4 Stück Verbund-Sicherheitsglas, mit Photovoltaik-Einlage
  L x B = 876 mm x 1938 mm
  aus 2 x 6 mm Einscheiben-Sicherheitsglas

- je 4 Stück Verbund-Sicherheitsglas, mit Photovoltaik-Einlage
  L x B = 876 mm x 1938 mm
  aus 2 x 6 mm teilvorgespanntem Glas

Die Gläser waren eben und wiesen keinerlei augenscheinlich erkennbare Beschädigungen auf. Die Kanten der Prüfkörper waren symmetrisch ausgeführt, abgefast und die Seitenkanten geschliffen.

Die Verbund-Sicherheitsgläser aus Einscheiben-Sicherheitsglas wiesen im Eckbereich einen Email-Stempel auf:

„ERTEX A CE EN 12150 ESG"

Die Verbund-Sicherheitsgläser aus teilvorgespanntem Glas wiesen im Eckbereich einen Email-Stempel auf:

„ERTEX A CE EN 1863 TVG Z-70.4-93"

2 Versuchsdurchführung

2.1 Kugelfallprüfung

Die Durchführung der Kugelfallprüfung erfolgte gemäß [1], Punkt C.2, mit einer Probenanzahl von je 3 Stück pro Glastype.

Es wurde der Prüfrahmen für Kugelfallprüfungen gemäß [1], Pkt. C.2.2 herangezogen. Der Aufprallpunkt wurde im diagonalen Schnittpunkt der Gläser (innerhalb eines Kreises von 100 mm Durchmesser) sowie 4,00 m über der Glasoberfläche eingemessen. Die Bruchbilder gehen aus Bild 1 bis 5 hervor.

Die Temperatur im Prüfraum betrug 28°C, die relative Luftfeuchtigkeit betrug 47 %.

Die Dicke wurde an jeder Probe ermittelt. Die detaillierten Messergebnisse werden seitens der Magistratsabteilung 39 in Evidenz gehalten.

Die Ergebnisse der Kugelfallprüfung für VSG aus 2 x ESG sind in Tabelle 1 angeführt.

Glasart	Ergebnis
2 x 6 mm ESG	Versuch 1: kein Bruch, beide Gläser blieben intakt
	Versuch 2: Bruch beider Gläser
	Versuch 3: Bruch des oberen, aufprallseitigen Glases

Tabelle 1: Prüfergebnisse der Kugelfallprüfung für VSG aus 2 x 6 mm ESG

Die Ergebnisse der Pendelschlagprüfung für VSG aus 2 x 6 mm ESG gehen aus Tabelle 3 hervor:

Probe Nr.	Fallhöhe			Anmerkung
	190 mm	450 mm	1200 mm	
1	i.O.	i.O.	i.O.	kein Bruch
2	i.O.	i.O.	i.O.	
3	i.O.	i.O.	i.O.	
4	i.O.	i.O.	i.O.	

Tabelle 3, Ergebnisse der Pendelschlagprüfung für VSG aus 2 x 6 mm ESG

Die Ergebnisse der Pendelschlagprüfung für VSG aus 2 x 6 mm TVG gehen aus Tabelle 4 hervor:

Probe Nr.	Fallhöhe			Anmerkung
	190 mm	450 mm	1200 mm	
1	i.O.	i.O.	i.O.	kein Bruch
2	i.O.	i.O.	i.O.	
3	i.O.	i.O.	i.O.	
4	i.O.	i.O.	i.O.	

Tabelle 4, Ergebnisse der Pendelschlagprüfung für VSG aus 2 x 6 mm TVG

Michael Chval — Der Sachbearbeiter Ing. Michael Chval

Dieter Werner — Der Laborleiter Dipl.-Ing. Dieter Werner, MSc Oberstadtbaurat

Georg Pommer — Der Leiter der Prüf-, Inspektions- und Zertifizierungsstelle Dipl.-Ing. Georg Pommer Senatsrat

Das Dokument wurde elektronisch signiert (Aussteller: Stadt Wien Benutzer C9 A 2). Die händische Unterschrift wurde aus Sicherheitsgründen entfernt. Sollten Sie ein Dokument in Papierform mit händischen Unterschriften benötigen, kann dieses bei der MA 39 per Mail (post@ma39.wien.gv.at) angefordert werden.

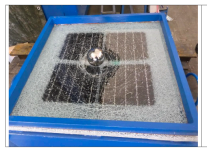


Bild Nr. 1
(P1040018.JPG)

VSG aus ESG
Glas 2,
Bruch beider Gläser

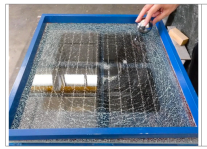


Bild Nr. 2
(P1040025.JPG)

VSG aus ESG
Glas 3,
Bruch des oberen Glases



Bild Nr. 4
(P1040056.JPG)

VSG aus TVG,
Glas 2,
Bruch beider Gläser

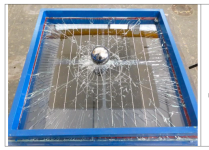


Bild Nr. 5
(P1040059.jpg)

VSG aus TVG,
Glas 3,
Bruch beider Gläser

Die Ergebnisse der Kugelfallprüfung für VSG aus 2 x TVG sind in Tabelle 2 angeführt.

Glasart	Ergebnis
2 x 6 mm TVG	Versuch 1: Bruch des unteren, aufprall-abgewandten Glases
	Versuch 2: Bruch beider Gläser
	Versuch 3: Bruch beider Gläser

Tabelle 2: Prüfergebnisse der Kugelfallprüfung für VSG aus 2 x 6 mm TVG

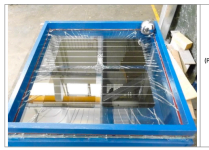


Bild Nr. 3
(P1040043.JPG.jpg)

VSG aus TVG,
Glas 1,
Bruch des unteren Glases

2.2 Pendelschlag

Die Durchführung der Pendelschlagprüfung erfolgte gemäß [2], Punkt 5.

Die Dicke wurde an jeder Probe ermittelt. Die detaillierten Messergebnisse werden seitens der Magistratsabteilung 39 in Evidenz gehalten.

Die Temperatur im Prüfraum betrug 26°C, die relative Luftfeuchtigkeit 45 %.

Der Einbau eines Verbund-Sicherheitsglases im Pendelschlag-Prüfstand ist in Bild 6 dargestellt.



Bild Nr. 6 (P1030533.JPG)

Verbund-Sicherheitsglas im Pendelschlag-Prüfstand

Institut für Brandschutztechnik und Sicherheitsforschung

Prüfbericht

Prüfgegenstand: Rückseite PV-Paneel „Ertex VSG"

Auftraggeber	**ertex-solartechnik GmbH** Peter-Mitterhofer-Straße 4 3300 Amstetten Österreich
Prüfgrundlagen	EN 13823:2020
Prüfdatum	09.02.2026
Geprüfte Stärke	13,5 mm
Probeneingang	27.01.2026
Prüfergebnisse	$FIGRA_{0,2}$ 59 $FIGRA_{0,4}$ 59 THR_{600s} 3,4 LFS < Rand des Probekörpers: ja FDP_{1200s} und FDP_{1-12} in den ersten 600 Sekunden nein SMOGRA: 1 TSP_{600s}: 4
Bearbeiter	Roland Beck

Bericht Nr.: **326011502-1**
Berichtsdatum: 18.04.2026
BecR / MarR

Dieser Prüfbericht enthält:
8 Textseiten und 3 Anlagen (siehe Seite 2)

Die Ergebnisse des Prüfberichtes beziehen sich nur auf die geprüften Gegenstand wie erhalten.

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Firmenbuchnummer 97116d | Landesgericht Linz | UID-Nr. ATU72389705

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1. Einleitung

Dieser Klassifizierungsbericht definiert die Klassifizierung, die dem Bauprodukt PV-Paneel „Ertex VSG" in Übereinstimmung mit dem Verfahren nach EN 13501-1:2018 zugeordnet wird.

2. Details zum klassifizierten Bauprodukt

2.1. Allgemeines

Das Bauprodukt PV-Paneel „Ertex VSG" gehört dem Produkttyp „vorgehängte hinterlüftete Fassade" an.

2.2. Produktbeschreibung

Beim Bauprodukt PV-Paneel „Ertex VSG" handelt es sich um die Rückseite einer PV-Fassadenplatte.

Eine genauere Beschreibung ist in den Berichten, auf die in 3.1 Bezug genommen wird, zu finden.

3. Prüfberichte und Ergebnisse als Grundlage dieser Klassifizierung

3.1. Berichte

Name der Prüfstelle[1]	Name des Auftraggebers	Nr. des Berichts	Prüfverfahren und Datum
IBS	ertex-solartechnik GmbH	326011502-1	EN 13823:2020
IBS	ertex-solartechnik GmbH	326011502-2	EN ISO 11925-2:2020

[1] **Name/Adresse sowie Notifizierungsnummer / Status der Prüfstelle:**
IBS - IBS - Institut für Brandschutztechnik und Sicherheitsforschung Gesellschaft m.b.H., Petzoldstraße 45, 4020 Linz / Österreich, Notifizierungsnummer: 1322

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4. Klassifizierung und Anwendungsbereich

4.1. Referenz zur Klassifizierung

Diese Klassifizierung wurde nach EN 13501-1:2018 durchgeführt.

4.2. Klassifizierung

Das Bauprodukt PV-Paneel „Ertex VSG" wird in Bezug auf sein Brandverhalten wie folgt klassifiziert:

B

Die Zusätzliche Klassifizierung in Bezug zur Rauchentwicklung ist:

s1

Die Zusätzliche Klassifizierung in Bezug auf das brennende Abtropfen/Abfallen ist:

d0

Das Format der Klassifizierung des Brandverhaltens für Bauprodukte mit Ausnahme von Bodenbelägen und Rohrisolierungen ist:

Brandverhalten		Rauchentwicklung			brennendes Abtropfen	
B	-	s	1	,	d	0

d.h.: **B-s1,d0**

Klassifizierung des Brandverhaltens: B-s1,d0

4.3. Anwendungsbereich

Diese Klassifizierung ist für die folgenden Produktparameter gültig:

- Produktaufbau wie geprüft (siehe Prüfberichte nach 3.1)

Diese Klassifizierung ist für die folgenden Endanwendungen gültig:

- Das Bauprodukt darf nur auf Untergründen entsprechend den Euroklassen A1 oder A2-s1,d0 (ausgenommen Gipsplatten) eingesetzt werden, mit einer Mindestdicke von 9 mm und einer Mindestrohdichte von 870 kg/m³.
- Das Bauprodukt darf nur mit Hinterlüftung verwendet werden.
- Als Wand- und Deckenbekleidung anwendbar.
- Horizontale und vertikale Fugen sind nicht zulässig.
- Nicht horizontal als Bodenbelag anwendbar.
- Diese Klassifizierung ist nur für die Rückseite des PV-Paneels anwendbar.

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5. Einschränkungen

Das Klassifizierungsdokument stellt keine Typgenehmigung oder Zertifizierung des Produktes dar.

Generell erlischt die Gültigkeit, wenn der Auftraggeber unzulässige technische Veränderungen vornimmt und die dem gegenständlichen Klassifizierungsbericht zu Grunde liegenden Zusammensetzungen über- bzw. unterschreitet (siehe Prüfberichte).

Weiters erlischt die Gültigkeit durch Änderungen in den verwendetet Prüf- und Klassifizierungsnormen und allenfalls beschränkende Bestimmungen in zukünftig erscheinenden Produktnormen.

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Akkreditierte Prüf-, Inspektions- und Zertifizierungsstelle

Unterzeichner	Roland Beck
Datum/Zeit-UTC	2026-04-20T08:49:50+02:00
Prüfung	Siehe http://www.signaturpruefung.gv.at
Hinweis	Diese Unterschrift ist gemäß EU-Verordnung Nr. 910/2014 (eIDAS) der handschriftlichen Unterschrift gleichgestellt.

Ing. Roland BECK
Techniker

Unterzeichner	Josef Stockinger
Datum/Zeit-UTC	2026-04-20T13:41:29+02:00
Prüfung	Siehe http://www.signaturpruefung.gv.at
Hinweis	Diese Unterschrift ist gemäß EU-Verordnung Nr. 910/2014 (eIDAS) der handschriftlichen Unterschrift gleichgestellt.

Ing. Josef STOCKINGER
Zeichnungsberechtigter

3.2. Ergebnisse

Rückseite

Prüfverfahren und Prüfbericht Nr.	Parameter	Anzahl der Prüfungen	Prüfergebnisse: stetige Parameter Mittelwert (m)	Prüfergebnisse: Übereinstimmung mit den Parametern / Grenzwerte aus EN 13501-1
EN 13823 326011502-1	$FIGRA_{0,2}$ [W/s]	3	59	übereinstimmend B: ≤ 120 W/s
	THR_{600s} [MJ]		3,4	übereinstimmend B: ≤ 7,5 MJ
	SMOGRA [m²/s²]		1	s1: ≤ 30 m²/s²
	TSP_{600s} [m²]		4	s1: ≤ 50 m²
	brennendes Abfallen / Abtropfen		nein	d0: kein Brennen d1: ≤ 10s Brenndauer d2: > 10s Brenndauer
	LFS < Rand des Probekörpers		ja erfüllt	< Rand des Probekörpers
EN ISO 11925-2 326011502-2 Beflammungszeit 30s	Kantenbeflammung	6	max. Wert: 0 mm	übereinstimmend Fs ≤ 150mm
	brennendes Abfallen / Abtropfen		nein	übereinstimmend d0: keine Entzündung des Filterpapiers
	Kantenbeflammung 90° gedreht	6	max. Wert: 0 mm	übereinstimmend Fs ≤ 150mm
	brennendes Abfallen / Abtropfen		nein	übereinstimmend d0: keine Entzündung des Filterpapiers
	Flächenbeflammung	6	max. Wert: 0 mm	übereinstimmend Fs ≤ 150mm
	brennendes Abfallen / Abtropfen		nein	übereinstimmend d0: keine Entzündung des Filterpapiers

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Anlage A – Fotodokumentation

Fotodokumentation zur Normprüfserie der Rückseite / Prüfung SBI 26-034


Bild 1:
Probekörper 1 vor der Prüfung


Bild 2:
Probekörper 1 während der Prüfung


Bild 3:
Probekörper 1 nach der Prüfung


Bild 4:
Beflammter Bereich von Probekörper 1

Fotodokumentation zur Normprüfserie der Rückseite / Prüfung SBI 26-035


Bild 5:
Probekörper 2 vor der Prüfung


Bild 6:
Probekörper 2 während der Prüfung


Bild 7:
Probekörper 2 nach der Prüfung

Fotodokumentation zur Normprüfserie der Rückseite / Prüfung SBI 26-036


Bild 8:
Probekörper 3 vor der Prüfung


Bild 9:
Probekörper 3 während der Prüfung


Bild 10:
Probekörper 3 nach der Prüfung


Bild 11:
Beflammter Bereich von Probekörper 3

5. Einschränkungen

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Generell erlischt die Gültigkeit, wenn der Auftraggeber unzulässige technische Veränderungen vornimmt und die dem gegenständlichen Klassifizierungsbericht zu Grunde liegenden Zusammensetzungen über- bzw. unterschreitet (siehe Prüfberichte).

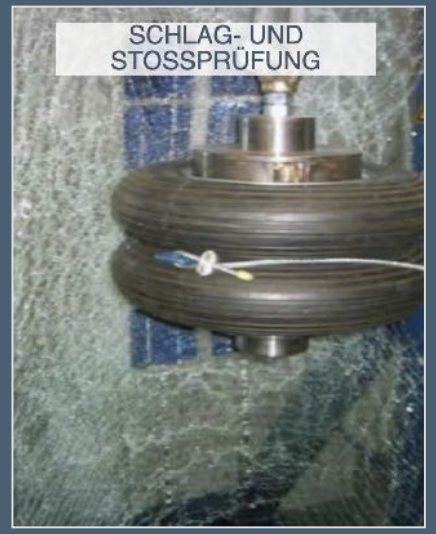
Weiters erlischt die Gültigkeit durch Änderungen in den verwendetet Prüf- und Klassifizierungsnormen und allenfalls beschränkende Bestimmungen in zukünftig erscheinenden Produktnormen.

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Ing. Roland BECK
Techniker

Ing. Josef STOCKINGER
Zeichnungsberechtigter

extreme impact test

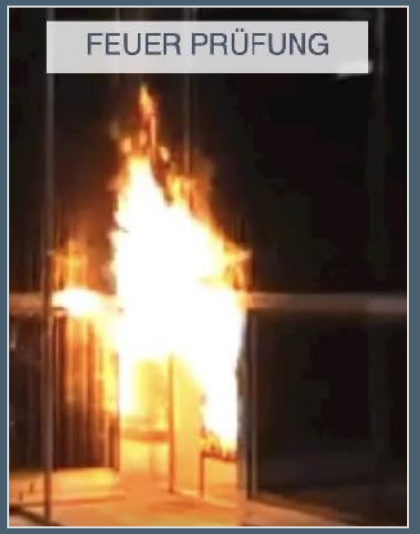


extreme hail test

Ice ball
diameter 70mm – speed 110km/h



extreme fire test



Overhead Photovoltaic Glass Systems (BIPV)

STRUCTURAL SAFETY IN OCCUPIED APPLICATIONS

SAFETY REQUIREMENTS

Photovoltaic glass systems installed above occupied areas are structural safety–relevant components.
Applications include pedestrian zones, buildings, parking structures, and public spaces.
Design shall consider permanent, variable, and accidental actions including impact.
Overhead systems require system–level structural verification.
Compliance with Eurocodes defines minimum structural safety baseline.
EN 12600 defines minimum impact resistance classification for glazing systems.

BEHAVIOR AND MATERIAL PERFORMANCE

System behavior under failure conditions is a primary design parameter.
Post–fracture performance shall be verified in addition to intact–state conditions.
Fragment detachment, collapse mechanisms, and debris release are critical safety risks.
Residual load–bearing capacity shall be demonstrated under defined failure scenarios.
Controlled failure behavior and fragment retention are required in overhead applications.

Laminated glass systems shall ensure post–impact cohesion and stability.
Interlayer performance must be validated under post–fracture conditions.
System safety cannot be assumed from component compliance alone.

ENGINEERING RESPONSIBILITY

Responsibility for structural safety remains with the design authority.
Compliance with standards does not transfer liability for system performance under failure conditions.
Safety must be demonstrated at system level for the intended application.

TECHNICAL POSITION NOTE

TECHNICAL SAFETY QUESTION :

WHEN PHOTOVOLTAIC GLASS SYSTEMS ARE INSTALLED ABOVE OCCUPIED AREAS

IS COMPLIANCE WITH EUROCODES AND HARMONISED STANDARDS SUFFICIENT TO DEMONSTRATE STRUCTURAL SAFETY

OR

IS VERIFIED POST–FRACTURE SYSTEM BEHAVIOR REQUIRED?

TECHNICAL SOLUTION :

Verified safety in overhead BIPV applications is achieved through automotive–grade laminated glass systems with validated post–fracture performance and controlled fragment retention.

Ertex Solar

Structural Energy Glass For Next–Generation Landmarks

Stadiums — Airports — Critical Public Infrastructure

IATF 16949

Modern large–scale architecture has fundamentally changed the role of the building envelope.

It is no longer a passive layer of protection.

It is a structural system.

An energy–generating surface.

And a critical safety component.

The **Ertex Solar** approach defines a distinct class of architectural BIPV systems, based on the integration of:

- full–surface structural lamination
- energy–active glass design
- automotive–grade manufacturing control

into a single, unified architectural element.

Unlike conventional photovoltaic integration methods, where mechanical and functional behavior is achieved through segmented or localized bonding strategies, this system is designed as a continuous structural body.

This enables uniform load distribution, stable mechanical response, and predictable long–term performance in real–world operating conditions.

The manufacturing process follows automotive industry standards, (**IATF 16949)** controlled production methodologies focused on precision, repeatability, and lifecycle stability.

This combination establishes a clear technological position within architectural BIPV:

not as a component supplier,

but as a provider of structural energy glass systems for landmark–scale applications.

For architecture where structure, energy, and safety converge into one system

Manufacturing Standard

All structural BIPV glass systems are produced under an automotive–grade quality framework aligned with:

This ensures controlled production, repeatability, and long–term stability for safety–critical architectural applications.

Where Structural Energy Glass Is Applied

Structural BIPV glazing systems are designed for deployment exclusively in architectural environments where glass operates above occupied public space and forms part of the building's structural and environmental system:

1. Stadiums & Sports Arenas

Roof structures and large–span canopies above spectators, where structural glazing must combine load resistance, safety performance, and energy generation.

2. Airports & Aviation Terminals

Large overhead glazing systems in passenger circulation zones, check–in halls, and boarding areas with continuous public occupancy and high operational load.

3. Railway & Metro Infrastructure

Covered platforms, concourses, and transit hubs where structural glazing is exposed to dynamic loads and constant pedestrian flow.

4. Mobility & Charging Infrastructure

EV charging hubs, transport interchanges, and integrated mobility shelters where energy generation and weather protection are combined within the same structural envelope.

5. Architectural Canopies & Urban Coverage Systems

Public walkways, civic spaces, and commercial environments requiring lightweight structural glazing systems with environmental protection functions.

6. Civic & Cultural Landmarks

Large–span architectural spaces such as museums, exhibition halls, and public atriums where transparency, structural performance, and energy integration converge.

System Principle

In all applications, the building envelope functions simultaneously as:

- a structural system
- an energy–generating surface
- an environmental protection layer
- and a public safety interface

For architecture that is built to perform above people, not beside them

Regulatory Compliance & Risk Management

Institutional Framework for High–Value Energy Infrastructure & Building Envelope Systems

1. Fiduciary Duty & Director's Liability (Duty of Care):
Under international corporate law and the Business Judgment Rule, executive officers bear personal liability for procurement decisions. Selecting a supplier exhibiting systemic financial instability or a downward trajectory in solvency, may be categorised as Breach of Fiduciary Duty or Gross Negligence in the event of future warranty default.

2. Anti–Money Laundering (AML) & Source of Funds Compliance:
Pursuant to EU Directive 2018/1673 and the 6th Anti–Money Laundering Directive, all major infrastructure projects are subject to strict Source of Funds verification. Suppliers maintaining operations despite persistent financial losses through opaque funding mechanisms are classified as "High–Risk Entities" by regulatory bodies. Procurement from such entities without exhaustive Know Your Business (KYB) verification exposes the Board to severe compliance risks and potential criminal liability.

3. EU Corporate Sustainability Due Diligence (CSDDD 2024/1760):
The EU CSDDD mandates that large–scale enterprises prioritize supply chain resilience. Opting for "lower–cost alternatives" from non–sustainable entities that lack certified Insolvency–Protected Reinsurance invalidates a company's ESG (Environmental, Social, and Governance) status. This oversight exposes the Board to regulatory penalties and litigation by shareholders seeking to protect asset value.

4. Foreign Subsidies Regulation (FSR – EU 2022/2560):
European law strictly prohibits the distortion of the internal market via non–EU state subsidies that allow non–market–performing bidders to offer artificially low prices. Contracts awarded to subsidised, non–market–performing bidders are subject to immediate annulment and heavy fines under the jurisdiction of the European Commission.

5. Professional Liability of Design & Lead Consultants:
Lead Architects, Engineers, and Project Managers carry professional civil liability for their specifications. The failure to conduct a rigorous Financial Due Diligence on manufacturers of 25–year components constitutes a professional oversight that shifts the legal liability for future system failure directly onto the consulting firm.

6. Compliance & Innovation Integrity:
In accordance with Article 107 TFEU and the General Block Exemption Regulation (GBER) 651/2014, EU funding is strictly dedicated to the incremental costs of Research & Development. To ensure fair competition, these grants must support the creation of new or significantly improved products and cannot be used as operating aid to subsidize the production or sale costs of existing commercial offerings. Adherence to these standards protects the project from potential audit risks and the mandatory recovery of funds."

Beyond Infrastructure

The next generation of sustainability systems should not remain hidden technical equipment disconnected from architecture, public space and human experience.

Renewable infrastructure can evolve into publicly visible landmarks.

Energy systems can become part of civic identity.

Architectural sustainability can move beyond compliance and contribute to the long-term cultural and environmental presence of cities, waterfronts and internationally visible destinations.

The Landmark Sustainability Platform was created around a simple principle:

The most meaningful sustainability systems of the future will not only generate energy.

They will also generate:
- **presence,**
- **interaction,**
- **emotion,**
- **and long-term identity.**

By combining selected international renewable and architectural systems within curated flagship environments, the platform aims to contribute to a new generation of publicly visible sustainability landmarks designed for enduring environmental, architectural and civic value.

Sustainability is no longer only performance.

It is becoming part of architecture itself.



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Certified Manufacturing Excellence



We are committed to the highest standards of integrity, transparency, and technical excellence.

Our bids are structured to reflect the actual project requirements and technical specifications, ensuring full alignment with International Compliance Standards and ESG (Environmental, Social and Governance) reporting mandates.

We strictly adhere to anti–fraud and anti–corruption policies. Each bid is intended for the authentic implementation of the project and provides a reliable basis for Audit Committees, financial institutions, and certification bodies (e.g. LEED).

We do not participate in or facilitate practices that may misrepresent the project cost or jeopardize the legal status of the final investor or the structural integrity of the final construction.