

glass made for the sun

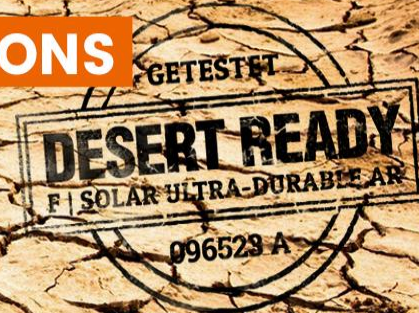


**GLASS MADE FOR EXTREME CONDITIONS**

**ULTRA-DURABLE AR COATING**

**THIN FLOAT GLASS FOR GLASS-GLASS MODULES**

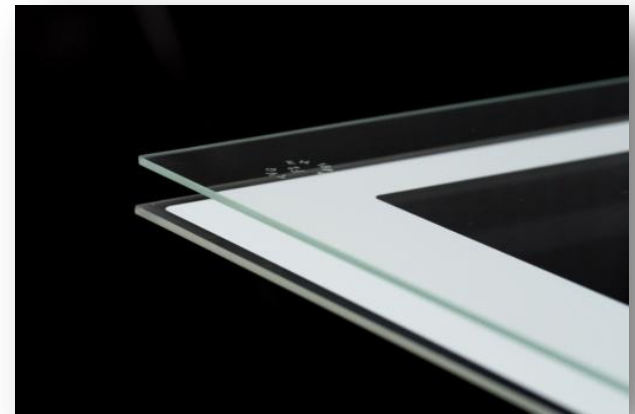
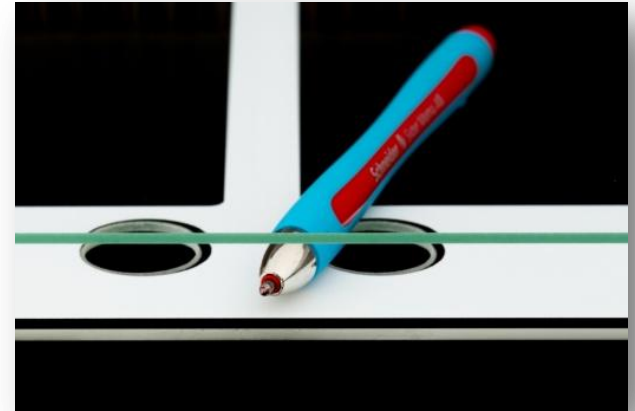
**LARGE SCALE IN-HOUSE PRODUCTION**



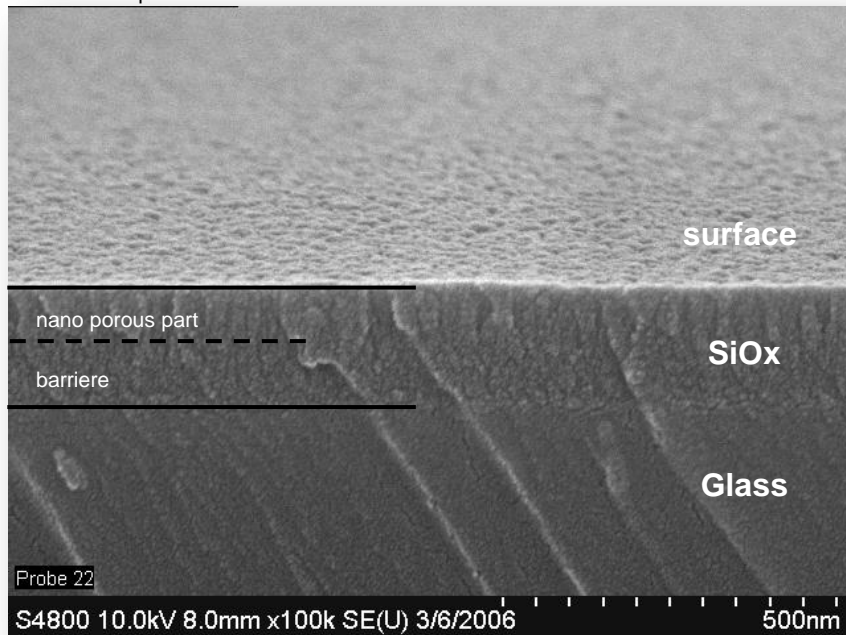
### 2 mm heat strengthened glass (TVG) with general technical approval “abZ” awarded by the DiBt in Berlin

- From large-scale production
- Float glass technology for consistently high quality
- Tight manufacturing tolerance & low defect density
- Typical bending tensile strength of 120 N/mm<sup>2</sup>
- Outstanding flatness
- With ultra-durable AR Coating
- For use in Glass-Glass-PV-Modules and BIPV

**Available now!**



Source: Interpane



## f | solarfloat HT

- Made under purest vacuum conditions
- Ultra-durable
- Diffusion barrier included
- Available on 2 mm thick glass
- ~ 4% increase in yield (kW/h per kW/p)
- > 10m m<sup>2</sup> in the field

Long-life, robust “ $\lambda/4$ -layer” with adjusted index of refraction and thickness

**Energy transmittance  $T_{e,PV} \sim 94\%$  on the basis of 2 mm glass**

# The ultra-durable AR Coating



Source: Interpane

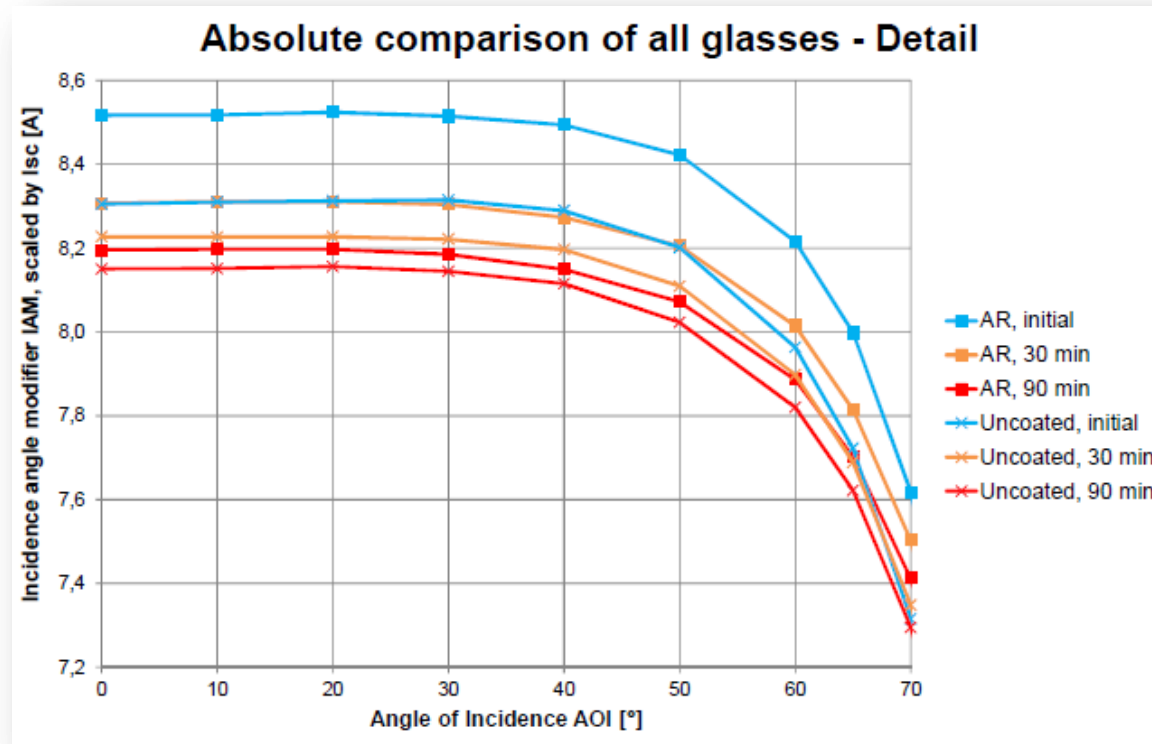


> 500 hours constant climate conditions at 58 °C and 98 %rH

**f | solarfloat HT shows better resistance to corrosion than uncoated**

# The ultra-durable AR Coating

Source: TÜV Rheinland Energie und Umwelt GmbH



Sand and dust abrasion testing according to MIL-STD-810G Method 510.5

After a sand test duration of 90 min the transmission of the AR coated glass is still higher than the transmission of the uncoated glass after the same test duration

## After a test duration of 90 min the AR coating is still effective

Source: Thomas Weber, Photovoltaik-Institut Berlin (PVMRW 2015)

## 5) Abrasion

### 5.2) Results comparing two ARC



#### Investigation on two different ARC's:

- change of transmission degree  $\Delta\tau$  was determined

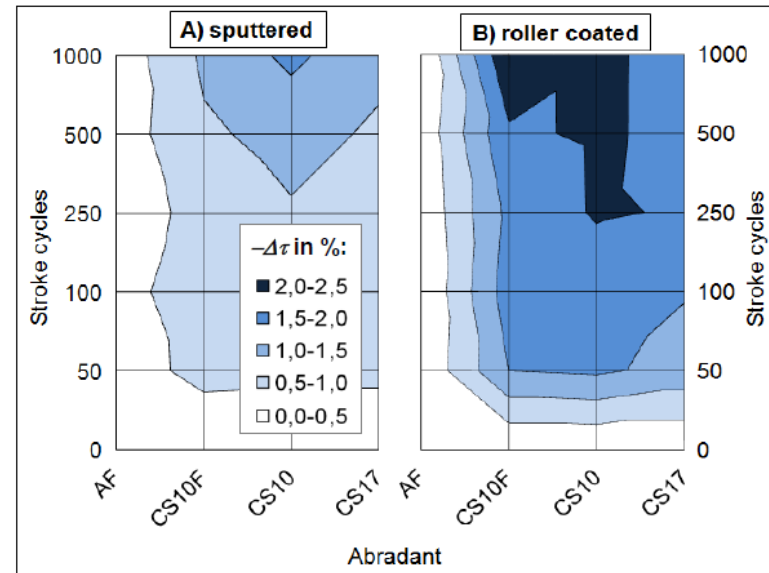
#### Results:

- elastic soft (CS10) abrasant show fastest results for investigated ARC's

#### → At Maximum abrasion for

**Sputtered:  $\Delta\tau = -1.6\%$**

**Roller-Coated:  $\Delta\tau = -2.5\%$**



AF	CS10F	CS10	CS17
Abrasion felt	elastic extrem soft	elastic Soft	Elastic hard

#### Conclusion:

- The sputtered ARC (A) has a better abrasion resistance than the roller coated (B)

# Large-scale in-house production



**The standard for solar glass processing:  
Large-scale in-house production of low-iron float glass**

- Start float glass production in Sept. 2009
- Investment > 188 Mio. €
- Capacity glass production ~ 700 t / d = ~ 22 Mio. m<sup>2</sup> p.a.
- Capacity glass coating ~ 10 Mio. m<sup>2</sup> p.a.
- Capacity glass processing ~ 4,5 Mio. m<sup>2</sup> p.a.
- Wide range of 2 mm to 12 mm thickness available
- Worldwide unique AR-coating technology
- Constant high material- and system availability

**Hybrid, large-scale in-house float glass production**





## Innovative Strength – Competitiveness – Internationality

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Combined experience in the manufacture of high-quality glass products

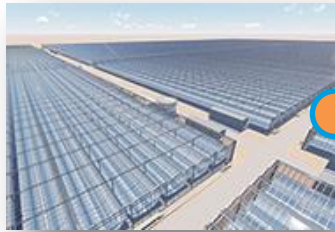


PV – Photovoltaics 



 CPV – Concentrated Solar Power

STE – Solar Thermal 



 EOR – Enhanced Oil Recovery

Horticulture – Greenhouses 



 CSP – Concentrated Solar Power

Sources (top-down): f | glass, Soitec Solar, Sovosolar, GlassPoint Solar, f | glass, BrightSource Energy



**Quality management system**  
EN ISO 9001

**Environmental management system**  
EN ISO 14001

**Energy management system**  
ISO 50001

**Occupational Safety and Health**  
OHSAS 18001

- Antimony-free float glass is 100% recyclable
- Unique power efficiency
- Reduced carbon dioxide emissions
- Purification of waste gases at highest level
- Using cogeneration
- Using photovoltaics
- Energy management system (EMS)
- Cradle to Cradle®



**Green products – green factory**

- Ultra-durable AR-Coating ensures a constant high system performance
- Quality leadership in the matter of 2 mm and 3 mm tempered glass
- Large-scale in-house solar glass production - „Ready for growth“
- Independency from the volatility of the PV industry resulting from float glass technology and a broad market- and customer portfolio
- Innovative Strength – Competitiveness – Internationality