

SCHOTT  
glass made of ideas

MIROGARD®

Anti-Reflective Glass  
for Art Glazing



MAINTENANCE ESTIMATION VERY SHORT PER-  
IODS OF THE OPERATIONS  
WILL BE REQUIRED FOR THE DURATION  
THE WALL AFTER THE YEAR

THE WALL DOES NOT  
CLEAN IN THE YEAR

CAN BE USED FOR PROTECTING THE  
FRONT OF THE WALL FROM THE AREA

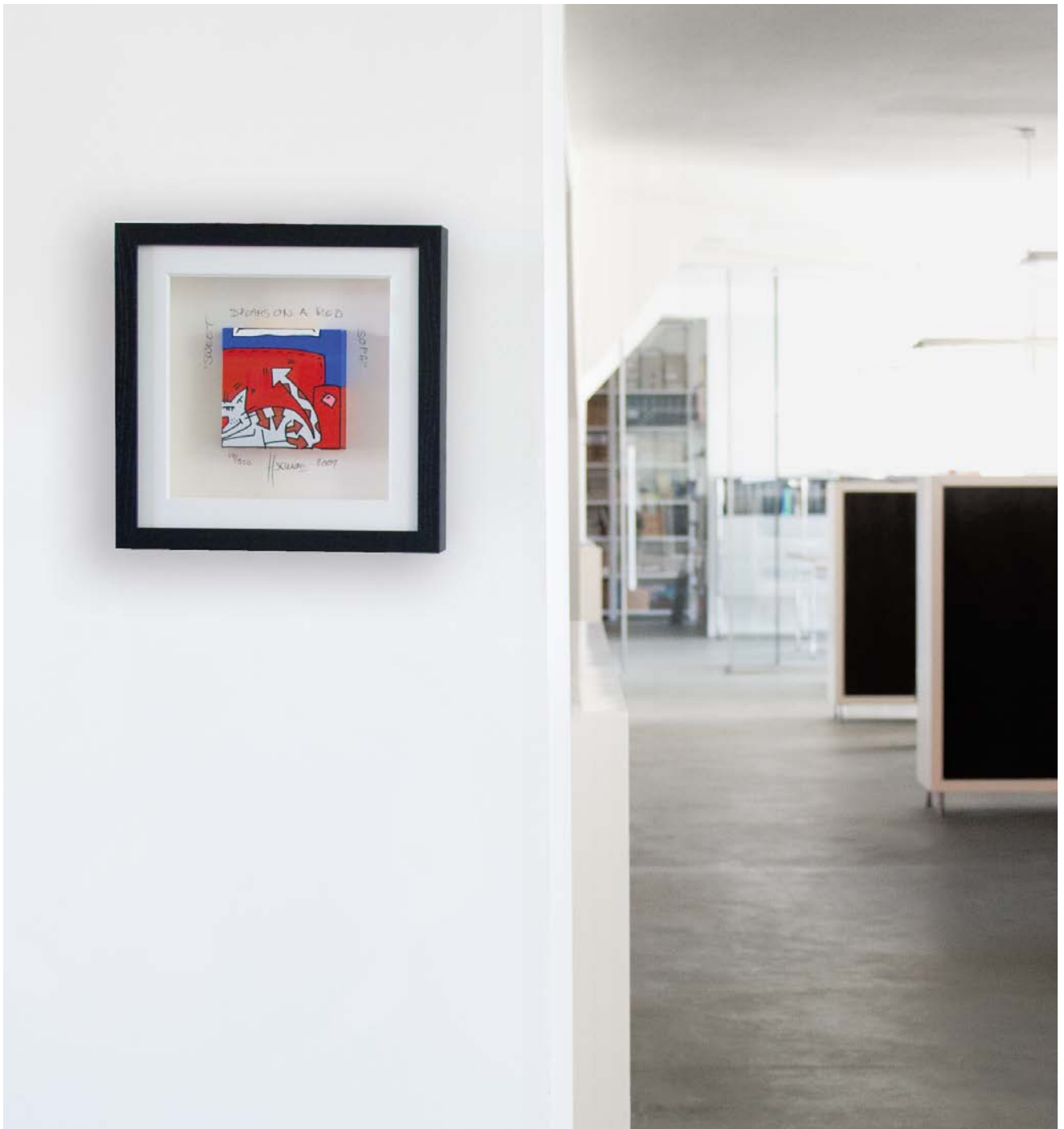
THE WALLING WITH A THICK  
AND FOR THE YEAR OF THE  
WALLING WITH A THICK  
WALLING OF THE YEAR

THE WALLING WITH A THICK  
AND FOR THE YEAR OF THE  
WALLING WITH A THICK  
WALLING OF THE YEAR

SCHOTT is a leading international technology group in the areas of specialty glass and glass-ceramics. With more than 130 years of outstanding development, materials and technology expertise we offer a broad portfolio of high-quality products and intelligent solutions that contribute to our customers' success.

SCHOTT works closely with architects and designers to extend the boundaries of design and create new opportunities for building culture – in terms of design and space, indoors and outdoors, aesthetics and functionality. That's what makes SCHOTT a qualified partner for architecture.

SCHOTT MIROGARD® is an anti-reflective, completely transparent glass for use in glazing pictures. In addition it is available in two versions: MIROGARD® plus and MIROGARD® Protect, which also features enhanced UV-protection. It minimizes reflections to less than 1% and provides artlovers with an experience of the work that is true to the original. The ideal invisible protection – for Old Masters and young talents alike.



## Masterful picture glazing

### Low in reflection, neutral in color, nearly invisible

Museums, collections and galleries all over the world have been relying on SCHOTT MIROGARD® Anti-Reflective Glass for decades. This practically invisible glass features an anti-reflective optical interference coating that protects valuable works of art without disturbing the pleasure of looking at them.

Conventional glass reflects approximately 8 % of incident light, creating undesirable reflections. MIROGARD® Anti-Reflective Glass reduces reflections to under 1 %, giving viewers an unobstructed view of the artwork. MIROGARD® Anti-Reflective Glass is also completely neutral in color, which means the brilliance of the glazed artwork remains true to the original and is rendered in its natural colors.

#### UV-protection made to order

MIROGARD® Anti-Reflective Glass also protects paintings, graphics and prints from the destructive effects of UV-radiation. 48 % of the UV-radiation in wavelengths from 300 to 380 nanometers is absorbed and reflected. This means MIROGARD® Anti-Reflective Glass already offers better protection than other art glazing products, even in its standard version. Extremely sensitive artworks can be displayed with MIROGARD® plus and MIROGARD® Protect, giving them added protection that absorbs or reflects up to 99 % of UV-radiation.

#### High-tech manufacturing

SCHOTT invest a great deal of effort to ensure that art lovers the world over are not distracted by the glazing. MIROGARD® Anti-Reflective Glass is dip coated using the sol-gel process. The coating production process takes place under clean room conditions. Multiple titanium dioxide and silicon dioxide layers are applied one after another with nanometer accuracy and then burned in. The result is a high-tech, anti-reflective art glass of the highest quality with a surface that is extremely stable and easy to clean.

#### SCHOTT MIROGARD® – Anti-Reflective Glass for Art Glazing

- Anti-reflective to the highest extent possible
- Up to less than 1 % residual reflection
- Highly transparent
- Up to 99 % light transmission
- Color rendering index up to  $R_a=100$
- Durable
- Easy to clean
- Product variations **MIROGARD® plus** and **MIROGARD® Protect** are available for higher and even the highest UV protection.

Left: MIROGARD® Anti-Reflective Glass in the Ciurlionis Museum in Lithuania

Right: Various graphic works from Pablo Picasso's art books from the exhibition "Picasso Art Books" at the Museum Brandhorst, Munich

© Succession Picasso/VG Bild-Kunst, Bonn 2011





19

ESB

23

20

1928 Aufnahme am zweiten Weltfriedenskongress in Sheffield | participates at the second world peace conference in Sheffield

1928 Vertagung des Lenin-Friedenspreises | is awarded the Lenin peace medal

1951 Gemälde Mascaras in Korea als Protest gegen die amerikanische Invasion Koreas | painting Mascaras in Korea as protest against the American invasion of Korea

1952 Kandidat für den Friedensnobelpreis | candidate for the Nobel Peace Prize

1953 Portrait Stalins für die Zeitung «Les Lettres Françaises» als Auslöser für den Bruch mit der kommunistischen Partei, Begegnung mit Jacqueline Roque, seiner zweiten Frau | portrait of Stalin for a newspaper provokes break with Communist Party, meets Jacqueline Roque, his second wife

1954 Protokoll an die kommunistische Partei wegen des Einmarschs russischer Truppen in Ungarn | letter of protest to the Communist Party because of Russian invasion of Hungary

1957-58 Wandgemälde Der Sturz des Narziss für das UNESCO-Gebäude in Paris | mural The Fall of Narcissus for the UNESCO building in Paris

1958/59 Beschäftigung mit den grafischen Techniken Linolschnitt und Zellophan | occupation with the graphic techniques linocut and Zellulose



Black-and-white photography displayed with minimal reflections and UV protected by MIROGARD® Anti-Reflective Glass in a living room.

## SCHOTT MIROGARD® – Anti-Reflective Glass for Art Glazing

### Proven and innovative

The anti-reflective specialty glass MIROGARD® has been constantly further developed since it was first introduced in the 1970s. For instance, SCHOTT recently optimized the color shade of its minimal residual reflection based on intensive research by its experts. The coating that the company has further developed improves the visual impression of the residual reflection that can be seen from certain viewing angles. Now, the color shade no longer distracts attention from the actual artwork.

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# SCHOTT MIROGARD® – Anti-Reflective Glass for Art Glazing

## Technical Data Sheet

| Dimensions<br>(net/without<br>dipping edge<br>(min.))               | Thickness / (Type) |        | Thickness<br>tolerance | Standard box contents |   |                 | Luminous<br>reflectance | Luminous<br>trans-<br>mittance | UV trans-<br>mittance | Color<br>rendering<br>index |
|---|--------------------|--------|------------------------|-----------------------|---|-----------------|-------------------------|--------------------------------|-----------------------|-----------------------------|
|   | inches x inches    | inches |                        | inches                | sq ft   | Pieces          |                         |                                |                       |                             |
| <b>MIROGARD®</b>  |                    |        |                        |                       |   |                 |                         |                                |                       |                             |
| 69 <sup>11</sup> / <sub>16</sub> x 48 <sup>1</sup> / <sub>32</sub>  | 0.08               |        | 0<br>-0.01             | approx.<br>355        | 5 small-scale-<br>packaging<br>à 3 sheets,<br>approx. 77 lbs  | approx.<br>573  | 0.9                     | 99                             | 52                    | 100                         |
| 69 <sup>11</sup> / <sub>16</sub> x 48 <sup>1</sup> / <sub>32</sub>  | 0.08               |        | 0<br>-0.01             | approx.<br>538        | 23  | approx.<br>727  | 0.9                     | 99                             | 52                    | 100                         |
| 34 <sup>27</sup> / <sub>32</sub> x 48 <sup>1</sup> / <sub>32</sub>  | 0.08               |        | 0<br>-0.01             | approx.<br>592        | 10 small-scale-<br>packaging<br>à 5 sheets,<br>approx. 64 lbs | approx.<br>738  | 0.9                     | 99                             | 52                    | 100                         |
| 34 <sup>27</sup> / <sub>32</sub> x 48 <sup>1</sup> / <sub>32</sub>  | 0.08               |        | 0<br>-0.01             | approx.<br>538        | 46  | approx.<br>683  | 0.9                     | 99                             | 52                    | 100                         |
| 69 <sup>11</sup> / <sub>16</sub> x 48 <sup>1</sup> / <sub>32</sub>  | 0.12               |        | 0<br>-0.01             | approx.<br>430        | 18  | approx.<br>815  | 0.9                     | 99                             | 51                    | 100                         |
| 69 <sup>11</sup> / <sub>16</sub> x 48 <sup>1</sup> / <sub>32</sub>  | 0.16               |        | 0<br>-0.01             | approx.<br>323        | 14  | approx.<br>926  | 0.9                     | 99                             | 49                    | 100                         |
| 125 <sup>3</sup> / <sub>16</sub> x 69 <sup>11</sup> / <sub>16</sub> | 0.12               |        | 0<br>-0.01             | approx.<br>1507       | 25  | approx.<br>2866 | 0.9                     | 99                             | 51                    | 100                         |
| 125 <sup>3</sup> / <sub>16</sub> x 69 <sup>11</sup> / <sub>16</sub> | 0.16               |        | 0<br>-0.01             | approx.<br>1335       | 22  | approx.<br>2976 | 0.9                     | 99                             | 49                    | 100                         |
| <b>MIROGARD® plus</b>   |                    |        |                        |                       |   |                 |                         |                                |                       |                             |
| 69 <sup>11</sup> / <sub>16</sub> x 48 <sup>1</sup> / <sub>32</sub>  | 0.08               |        | 0<br>-0.01             | approx.<br>355        | 5 small-scale-<br>packaging<br>à 3 sheets,<br>approx. 77 lbs  | approx.<br>573  | 1.1                     | 98                             | 18 ± 2                | 98                          |
| 69 <sup>11</sup> / <sub>16</sub> x 48 <sup>1</sup> / <sub>32</sub>  | 0.08               |        | 0<br>-0.01             | approx.<br>538        | 23  | approx.<br>727  | 1.1                     | 98                             | 18 ± 2                | 98                          |
| 34 <sup>27</sup> / <sub>32</sub> x 48 <sup>1</sup> / <sub>32</sub>  | 0.08               |        | 0<br>-0.01             | approx.<br>538        | 46  | approx.<br>683  | 1.1                     | 98                             | 18 ± 2                | 98                          |
| 34 <sup>27</sup> / <sub>32</sub> x 48 <sup>1</sup> / <sub>32</sub>  | 0.08               |        | 0<br>-0.01             | approx.<br>581        | 10 small-scale-<br>packaging<br>à 5 sheets,<br>approx. 64 lbs | approx.<br>738  | 1.1                     | 98                             | 18 ± 2                | 98                          |
| 69 <sup>11</sup> / <sub>16</sub> x 48 <sup>1</sup> / <sub>32</sub>  | 0.12               |        | 0<br>-0.01             | approx.<br>409        | 18  | approx.<br>815  | 1.1                     | 98                             | 18 ± 2                | 98                          |
| 125 <sup>3</sup> / <sub>16</sub> x 69 <sup>11</sup> / <sub>16</sub> | 0.12               |        | 0<br>-0.01             | approx.<br>1507       | 25  | approx.<br>2866 | 1.1                     | 98                             | 18 ± 2                | 98                          |
| 125 <sup>3</sup> / <sub>16</sub> x 69 <sup>11</sup> / <sub>16</sub> | 0.16               |        | 0<br>-0.01             | approx.<br>1335       | 22  | approx.<br>2976 | 1.1                     | 98                             | 18 ± 2                | 98                          |
| <b>MIROGARD® Protect</b>  |                    |        |                        |                       |   |                 |                         |                                |                       |                             |
| 69 <sup>11</sup> / <sub>16</sub> x 48 <sup>1</sup> / <sub>32</sub>  | 0.17               | 4/2    | 0<br>-0.02             | approx.<br>161        | 7   | approx.<br>573  | 0.9                     | 98                             | < 1                   | 100                         |
| 69 <sup>11</sup> / <sub>16</sub> x 48 <sup>1</sup> / <sub>32</sub>  | 0.25               | 6/2    | 0<br>-0.02             | approx.<br>161        | 7   | approx.<br>683  | 0.9                     | 98                             | < 1                   | 100                         |
| 69 <sup>11</sup> / <sub>16</sub> x 48 <sup>1</sup> / <sub>32</sub>  | 0.33               | 8/2    | 0<br>-0.02             | approx.<br>140        | 6   | approx.<br>716  | 0.9                     | 98                             | < 1                   | 100                         |
| <b>MIROGARD® Protect Ultra</b>                                      |                    |        |                        |                       |   |                 |                         |                                |                       |                             |
| 69 <sup>11</sup> / <sub>16</sub> x 48 <sup>1</sup> / <sub>32</sub>  | 0.12               |        | ± 0.01                 | approx.<br>409        | 18  | approx.<br>683  | 0.9                     | 98                             | < 0.05                | 100                         |

\* (300 nm to 380 nm)

# SCHOTT MIROGARD® – Anti-Reflective Glass for Art Glazing

## Technical Data Sheet

### Virtually no reflections

Conventional glass reflects about 8% of light. This results in an undesirable reflection effect. With SCHOTT's optical interference coated Anti-Reflective Glass, reflection is reduced to approx. 1%, which means it is virtually eliminated.

### Highest transparency

Normal glass has light transmission of only 91%. With MIROGARD® glasses, it is close to 99%. This means that MIROGARD®, MIROGARD® plus, MIROGARD® Protect and MIROGARD® Protect Ultra are nearly invisible under normal viewing conditions. MIROGARD®, MIROGARD® Protect and MIROGARD® Protect Ultra portray the colors of the pictures glazed as neutrally as possible thanks to their high color rendering index  $R_a = 100$ . The result: The brilliance of colors in works of art is reproduced without losing any of its original quality.

### Lightweight and very thin

Because it is only 0.12 inches thick, MIROGARD® Protect Ultra can easily be used in existing standard picture framing solutions. At the time it is extremely mechanical stable and weighs only 14.33 lbs/sq ft.

### Protection from UV-radiation

All types of MIROGARD® glass reduce UV-radiation by absorption and reflection. Various versions of the product are available, depending on the level of protection required.

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