

kvadrat expert centre



Textile performance reporting of Kvadrat Casera in conjunction with reference glazing of EN 14501-2021

Report with textile performance measurements, calculations and glare classification in compliance with EN 14500:2021 & EN 14501:2021

Kvadrat Expert Centre

Kvadrat Shade together with Kvadrat High Performance Textiles (KHPT), formerly known as Verosol, is well-known as the specialist in designing and manufacturing technically superior textiles for curtains and internal blinds. Kvadrat Expert Centre as part of KHPT can play an important role in the design phase of a building project.

We have a modern, well equipped, laboratory to measure the performances of textiles according to the latest standards (EN14500:2021). We calculate according to the detailed method EN 52022-3:2017. This enables us to create custom-made reports of the impact our shades in conjunction with building specific glazing. We do this at Kvadrat's Expert Centre, where we aim to create ever more sustainable advantaged and superior value. By engaging with design teams at the earliest possible stage, Kvadrat can maximise the impact of the shading system. We assist architects, consultants and façade engineers to create the optimal combination of shades with glazing. Our aim is to consistently maximise natural (day)light without creating thermal or visual discomfort. Put it simple, minimise energy cost for the building without compromising occupant comfort.

This report shows the results of curtain Casera in combination with the reference glazings, the most common glazing types, from EN14501:2021 to give an impression on the achievements that can be made. If you wish a tailor made report for your project, please contact the local Kvadrat sales contact.



ing. Evert Bos



ir. Lindsay Hovenier

Glass composition and performance data

Performance calculations are made with all relevant reference glazings from EN 14501:2021. The glazings A and B are configured with integrated performance values, glazings F, G, H and I are configured with panes with full spectral data that are included in the standard. Full spectral data is required to perform accurate and detailed calculations in compliance with EN-ISO 52022-3

| No | Glazing composition from outdoor to indoor | U-value | g-value | LT-value |
|----|---|---------|---------|----------|
| 1 | Reference glazing A single (EN 14051-2021) Pane : EN14501:2021 clear glass 4 mm | 6.0 | 0.88 | 0.91 |
| 2 | Reference glazing B double (EN 14501-2021) Pane : EN14501:2021 clear glass 4 mm Gap : Air 12 mm Pane : EN14501:2021 clear glass 4 mm | 3.0 | 0.80 | 0.82 |
| 3 | Reference F double Low-E (EN 14501-2021) Pane : EN14501:2021 clear glass 4 mm Gap : Air-Argon 10/90 15 mm Pane : EN14501:2021 low-E reference 4 mm | 1.1 | 0.65 | 0.82 |
| 4 | Reference G double Solar Control (EN 14501-2021) Pane : EN14501:2021 Reference Solar Control 6 mm Gap : Air-Argon 10/90 16 mm Pane : EN14501:2021 clear glass 4 mm | 1.0 | 0.33 | 0.70 |
| 5 | Reference H triple Low-E (EN 14501-2021) Pane : EN14501:2021 low-E reference 4 mm Gap : Air-Argon 10/90 12 mm Pane : EN14501:2021 clear glass 4 mm Gap : Air-Argon 10/90 12 mm Pane : EN14501:2021 low-E reference 4 mm | 0.7 | 0.53 | 0.74 |
| 6 | Glazing I triple Solar Control with reference panes Pane : EN14501:2021 Reference Solar Control 6 mm Gap : Air-Argon 10/90 14 mm Pane : EN14501:2021 clear glass 4 mm Gap : Air-Argon 10/90 14 mm Pane : EN14501:2021 low-E reference 4 mm | 0.6 | 0.31 | 0.64 |

1. Reference glazing A is a single clear glass.
2. Reference glazing B is a double clear glass.
3. Reference glazing F is a double insulation glazing, coating on position 3.
4. Reference Glazing G is a double solar control glazing coating on position 2.
5. Reference Glazing H is a triple insulation glazing, coating on positions 2 and 5.
6. Glazing I is a triple solar control glazing, coatings on positions 2 and 5, composed with full spectral reference panes from outdoor to indoor: Pane 3 (Tables A-18/19) - Pane 1 (Tables A-14/15) - Pane 2 (Tables 16/17) out of EN14501:2021.

Textile Performance Indicators

Measured performances acc. EN 14500:2021

| Shading textile | Solar Reflec- tion | Solar Trans- mission | Visible Trans- mission | UV Trans- mission | Open- ness Factor | IR- Emis- sivity | Ra |
|--------------------|--------------------------|----------------------------|------------------------------|-------------------------|-------------------------|------------------------|----|
| Casera colour 0123 | 0.38 | 0.20 | 0.17 | 0.03 | 1% | 0.80 | 86 |
| Casera colour 0133 | 0.33 | 0.16 | 0.13 | 0.03 | 1% | 0.80 | 84 |
| Casera colour 0203 | 0.52 | 0.30 | 0.26 | 0.04 | 1% | 0.80 | 85 |
| Casera colour 0223 | 0.38 | 0.19 | 0.13 | 0.02 | 1% | 0.80 | 71 |
| Casera colour 0233 | 0.35 | 0.17 | 0.13 | 0.02 | 1% | 0.80 | 74 |
| Casera colour 0253 | 0.22 | 0.10 | 0.06 | 0.02 | 1% | 0.80 | 70 |
| Casera colour 0263 | 0.17 | 0.05 | 0.04 | 0.01 | 1% | 0.80 | 88 |
| Casera colour 0323 | 0.40 | 0.22 | 0.18 | 0.03 | 1% | 0.80 | 83 |
| Casera colour 0343 | 0.28 | 0.12 | 0.08 | 0.02 | 1% | 0.80 | 77 |
| Casera colour 0363 | 0.17 | 0.04 | 0.03 | 0.01 | 1% | 0.80 | 78 |
| Casera colour 0373 | 0.13 | 0.04 | 0.02 | 0.01 | 1% | 0.80 | 86 |
| Casera colour 0393 | 0.07 | 0.02 | 0.02 | 0.01 | 1% | 0.80 | 95 |
| Casera colour 0633 | 0.36 | 0.20 | 0.16 | 0.04 | 1% | 0.80 | 85 |
| Casera colour 0653 | 0.34 | 0.21 | 0.15 | 0.06 | 1% | 0.80 | 81 |
| Casera colour 0723 | 0.44 | 0.25 | 0.16 | 0.03 | 1% | 0.80 | 93 |
| Casera colour 0753 | 0.27 | 0.14 | 0.06 | 0.02 | 1% | 0.80 | 88 |
| Casera colour 0773 | 0.09 | 0.03 | 0.02 | 0.01 | 1% | 0.80 | 93 |
| Casera colour 0793 | 0.06 | 0.02 | 0.01 | 0.01 | 1% | 0.80 | 97 |
| Casera colour 0923 | 0.39 | 0.22 | 0.19 | 0.03 | 1% | 0.80 | 89 |
| Casera colour 0953 | 0.21 | 0.09 | 0.06 | 0.02 | 1% | 0.80 | 93 |

Performances classifications acc. EN 14501:2021

| Shading textile | Glare Control Class | Visual Contact Class | Daylight use Class | Night Privacy Class |
|--------------------|---------------------|----------------------|--------------------|---------------------|
| Casera colour 0123 | 2 | 0 | 2 | 2 |
| Casera colour 0133 | 2 | 1 | 2 | 2 |
| Casera colour 0203 | 1 | 0 | 2 | 2 |
| Casera colour 0223 | 2 | 1 | 2 | 2 |
| Casera colour 0233 | 2 | 1 | 2 | 2 |
| Casera colour 0253 | 3 | 1 | 1 | 2 |
| Casera colour 0263 | 4 | 2 | 1 | 2 |
| Casera colour 0323 | 2 | 0 | 2 | 2 |
| Casera colour 0343 | 3 | 1 | 1 | 2 |
| Casera colour 0363 | 4 | 2 | 1 | 2 |
| Casera colour 0373 | 4 | 2 | 0 | 2 |
| Casera colour 0393 | 4 | 2 | 0 | 2 |
| Casera colour 0633 | 2 | 1 | 2 | 2 |
| Casera colour 0653 | 2 | 1 | 2 | 2 |
| Casera colour 0723 | 2 | 1 | 2 | 2 |
| Casera colour 0753 | 3 | 1 | 1 | 2 |
| Casera colour 0773 | 4 | 2 | 0 | 2 |
| Casera colour 0793 | 4 | 2 | 0 | 2 |
| Casera colour 0923 | 2 | 0 | 2 | 2 |
| Casera colour 0953 | 3 | 1 | 1 | 2 |

All reflection and transmission properties are measured in compliance with EN 14500:2021. These properties are based on averages and are subject to production tolerances, misprints, errors and technical modifications

Ra = Colour Rendering Index and is an indicator for natural daylight passing through the shade. Ra = 100 is best. For offices Ra should be at least 80.

Glare Control Class = Glare control - Classification, determined in compliance with Table 7 from EN 14501:2021. Results are without Cut-Off angle measurements. In future the glare control classification it might be improved after these measurements.

View Through Class = Visual contact with the outside - Classification, determined in compliance with Table 9 from EN 14501:2021.

Daylight Use Class = Daylight utilization - Classification, determined in compliance with Table 10 from EN 14501:2021 using formula 32 from EN 14500:2021. Smart shade control systems will/can neutralise the low Daylight Use rating.

Night privacy Class = Privacy night - Classification, determined in compliance with Table 8 from EN 14501:2021.

Classifications classes: 0 - very little effect; 1 - little effect; 2 - moderate effect; 3 - good effect; 4-very good effect.

Calculated Fenestration Performances

All calculations are made in WIS 3.0.1.sp2 and are in compliance with EN-ISO 52022-3:2017 under reference conditions. Calculated values are mid-pane values. Framing and spacerbars are not taken into account.

The cavity between glazing and blind is set at 300mm and is assumed to be free ventilated due to small gaps at the perimeter of the blind.

All values have been rounded to two decimal places. Any apparent similarities or small differences are due to rounding and do not affect the accuracy of the underlying data.

| Reference glazing A single (EN 14051-2021) | U-tot value | g-tot value | LT-tot value | FC-value |
|--|-------------|-------------|--------------|----------|
| Glazing only | 6.0 | 0.88 | 0.91 | |
| + Casera colour 0123 | 3.73 | 0.46 | 0.17 | 0.52 |
| + Casera colour 0133 | 3.73 | 0.47 | 0.12 | 0.54 |
| + Casera colour 0203 | 3.73 | 0.42 | 0.26 | 0.47 |
| + Casera colour 0223 | 3.73 | 0.46 | 0.13 | 0.52 |
| + Casera colour 0233 | 3.73 | 0.47 | 0.12 | 0.53 |
| + Casera colour 0253 | 3.73 | 0.51 | 0.05 | 0.58 |
| + Casera colour 0263 | 3.73 | 0.52 | 0.04 | 0.58 |
| + Casera colour 0323 | 3.73 | 0.46 | 0.17 | 0.51 |
| + Casera colour 0343 | 3.73 | 0.49 | 0.07 | 0.55 |
| + Casera colour 0363 | 3.73 | 0.52 | 0.03 | 0.58 |
| + Casera colour 0373 | 3.73 | 0.53 | 0.02 | 0.60 |
| + Casera colour 0393 | 3.73 | 0.56 | 0.01 | 0.63 |
| + Casera colour 0633 | 3.73 | 0.47 | 0.15 | 0.54 |
| + Casera colour 0653 | 3.73 | 0.49 | 0.15 | 0.55 |
| + Casera colour 0723 | 3.73 | 0.45 | 0.16 | 0.50 |
| + Casera colour 0753 | 3.73 | 0.50 | 0.06 | 0.56 |
| + Casera colour 0773 | 3.73 | 0.55 | 0.02 | 0.62 |
| + Casera colour 0793 | 3.73 | 0.56 | 0.01 | 0.63 |
| + Casera colour 0923 | 3.73 | 0.46 | 0.18 | 0.52 |
| + Casera colour 0953 | 3.73 | 0.51 | 0.06 | 0.58 |

| Reference glazing B double (EN 14501-2021) | U-tot value | g-tot value | LT-tot value | FC-value |
|--|-------------|-------------|--------------|----------|
| Glazing only | 3.0 | 0.80 | 0.82 | |
| + Casera colour 0123 | 2.22 | 0.48 | 0.16 | 0.60 |
| + Casera colour 0133 | 2.22 | 0.50 | 0.12 | 0.63 |
| + Casera colour 0203 | 2.22 | 0.43 | 0.25 | 0.54 |
| + Casera colour 0223 | 2.22 | 0.48 | 0.12 | 0.60 |
| + Casera colour 0233 | 2.22 | 0.49 | 0.12 | 0.61 |
| + Casera colour 0253 | 2.22 | 0.55 | 0.05 | 0.69 |
| + Casera colour 0263 | 2.22 | 0.56 | 0.04 | 0.70 |
| + Casera colour 0323 | 2.22 | 0.47 | 0.17 | 0.59 |
| + Casera colour 0343 | 2.22 | 0.52 | 0.07 | 0.65 |
| + Casera colour 0363 | 2.22 | 0.57 | 0.03 | 0.71 |
| + Casera colour 0373 | 2.22 | 0.58 | 0.02 | 0.73 |
| + Casera colour 0393 | 2.22 | 0.61 | 0.01 | 0.76 |
| + Casera colour 0633 | 2.22 | 0.50 | 0.15 | 0.62 |
| + Casera colour 0653 | 2.22 | 0.51 | 0.14 | 0.64 |
| + Casera colour 0723 | 2.22 | 0.46 | 0.15 | 0.58 |
| + Casera colour 0753 | 2.22 | 0.53 | 0.05 | 0.66 |
| + Casera colour 0773 | 2.22 | 0.60 | 0.01 | 0.75 |
| + Casera colour 0793 | 2.22 | 0.61 | 0.01 | 0.76 |
| + Casera colour 0923 | 2.22 | 0.48 | 0.17 | 0.60 |
| + Casera colour 0953 | 2.22 | 0.55 | 0.06 | 0.69 |

| Reference F double Low-E (EN 14501-2021) | U-tot value | g-tot value | LT-tot value | FC-value |
|--|-------------|-------------|--------------|----------|
| Glazing only | 1.1 | 0.65 | 0.82 | |
| + Casera colour 0123 | 0.94 | 0.45 | 0.16 | 0.69 |
| + Casera colour 0133 | 0.94 | 0.47 | 0.11 | 0.72 |
| + Casera colour 0203 | 0.94 | 0.39 | 0.24 | 0.61 |
| + Casera colour 0223 | 0.94 | 0.45 | 0.12 | 0.70 |
| + Casera colour 0233 | 0.94 | 0.46 | 0.11 | 0.71 |
| + Casera colour 0253 | 0.94 | 0.51 | 0.05 | 0.79 |
| + Casera colour 0263 | 0.94 | 0.52 | 0.04 | 0.81 |
| + Casera colour 0323 | 0.94 | 0.44 | 0.16 | 0.68 |
| + Casera colour 0343 | 0.94 | 0.49 | 0.07 | 0.76 |
| + Casera colour 0363 | 0.94 | 0.53 | 0.03 | 0.82 |
| + Casera colour 0373 | 0.94 | 0.54 | 0.02 | 0.83 |
| + Casera colour 0393 | 0.94 | 0.56 | 0.01 | 0.87 |
| + Casera colour 0633 | 0.94 | 0.46 | 0.14 | 0.71 |
| + Casera colour 0653 | 0.94 | 0.47 | 0.14 | 0.73 |
| + Casera colour 0723 | 0.94 | 0.43 | 0.15 | 0.67 |
| + Casera colour 0753 | 0.94 | 0.50 | 0.05 | 0.77 |
| + Casera colour 0773 | 0.94 | 0.56 | 0.01 | 0.86 |
| + Casera colour 0793 | 0.94 | 0.56 | 0.01 | 0.87 |
| + Casera colour 0923 | 0.94 | 0.45 | 0.17 | 0.69 |
| + Casera colour 0953 | 0.94 | 0.51 | 0.06 | 0.80 |

| Reference G double Solar Control (EN 14501-2021) | U-tot value | g-tot value | LT-tot value | FC-value |
|--|-------------|-------------|--------------|----------|
| Glazing only | 1.0 | 0.33 | 0.70 | |
| + Casera colour 0123 | 0.85 | 0.22 | 0.14 | 0.65 |
| + Casera colour 0133 | 0.85 | 0.23 | 0.10 | 0.70 |
| + Casera colour 0203 | 0.85 | 0.19 | 0.21 | 0.56 |
| + Casera colour 0223 | 0.85 | 0.22 | 0.10 | 0.67 |
| + Casera colour 0233 | 0.85 | 0.23 | 0.10 | 0.68 |
| + Casera colour 0253 | 0.85 | 0.26 | 0.04 | 0.79 |
| + Casera colour 0263 | 0.85 | 0.27 | 0.03 | 0.80 |
| + Casera colour 0323 | 0.85 | 0.22 | 0.14 | 0.65 |
| + Casera colour 0343 | 0.85 | 0.25 | 0.06 | 0.74 |
| + Casera colour 0363 | 0.85 | 0.27 | 0.02 | 0.81 |
| + Casera colour 0373 | 0.85 | 0.28 | 0.02 | 0.84 |
| + Casera colour 0393 | 0.85 | 0.29 | 0.01 | 0.88 |
| + Casera colour 0633 | 0.85 | 0.23 | 0.12 | 0.68 |
| + Casera colour 0653 | 0.85 | 0.24 | 0.12 | 0.72 |
| + Casera colour 0723 | 0.85 | 0.22 | 0.13 | 0.65 |
| + Casera colour 0753 | 0.85 | 0.26 | 0.04 | 0.77 |
| + Casera colour 0773 | 0.85 | 0.29 | 0.01 | 0.87 |
| + Casera colour 0793 | 0.85 | 0.29 | 0.01 | 0.88 |
| + Casera colour 0923 | 0.85 | 0.22 | 0.14 | 0.65 |
| + Casera colour 0953 | 0.85 | 0.26 | 0.05 | 0.79 |

| Reference H triple Low-E (EN 14501-2021) | U-tot value | g-tot value | LT-tot value | FC-value |
|--|-------------|-------------|--------------|----------|
| Glazing only | 0.7 | 0.53 | 0.74 | |
| + Casera colour 0123 | 0.64 | 0.39 | 0.15 | 0.73 |
| + Casera colour 0133 | 0.64 | 0.41 | 0.11 | 0.76 |
| + Casera colour 0203 | 0.64 | 0.35 | 0.23 | 0.65 |
| + Casera colour 0223 | 0.64 | 0.39 | 0.11 | 0.74 |
| + Casera colour 0233 | 0.64 | 0.40 | 0.10 | 0.75 |
| + Casera colour 0253 | 0.64 | 0.44 | 0.05 | 0.84 |
| + Casera colour 0263 | 0.64 | 0.45 | 0.03 | 0.85 |
| + Casera colour 0323 | 0.64 | 0.39 | 0.15 | 0.73 |
| + Casera colour 0343 | 0.64 | 0.42 | 0.06 | 0.80 |
| + Casera colour 0363 | 0.64 | 0.46 | 0.02 | 0.86 |
| + Casera colour 0373 | 0.64 | 0.47 | 0.02 | 0.88 |
| + Casera colour 0393 | 0.64 | 0.48 | 0.01 | 0.91 |
| + Casera colour 0633 | 0.64 | 0.40 | 0.13 | 0.75 |
| + Casera colour 0653 | 0.64 | 0.41 | 0.13 | 0.78 |
| + Casera colour 0723 | 0.64 | 0.38 | 0.14 | 0.72 |
| + Casera colour 0753 | 0.64 | 0.43 | 0.05 | 0.82 |
| + Casera colour 0773 | 0.64 | 0.48 | 0.01 | 0.90 |
| + Casera colour 0793 | 0.64 | 0.48 | 0.01 | 0.91 |
| + Casera colour 0923 | 0.64 | 0.39 | 0.16 | 0.73 |
| + Casera colour 0953 | 0.64 | 0.44 | 0.05 | 0.84 |

| Glazing triple Solar Control with reference panes | U-tot value | g-tot value | LT-tot value | FC-value |
|---|-------------|-------------|--------------|----------|
| Glazing only | 0.6 | 0.31 | 0.64 | |
| + Casera colour 0123 | 0.56 | 0.22 | 0.13 | 0.71 |
| + Casera colour 0133 | 0.56 | 0.23 | 0.09 | 0.75 |
| + Casera colour 0203 | 0.56 | 0.19 | 0.20 | 0.63 |
| + Casera colour 0223 | 0.56 | 0.23 | 0.09 | 0.73 |
| + Casera colour 0233 | 0.56 | 0.23 | 0.09 | 0.74 |
| + Casera colour 0253 | 0.56 | 0.26 | 0.04 | 0.84 |
| + Casera colour 0263 | 0.56 | 0.26 | 0.03 | 0.84 |
| + Casera colour 0323 | 0.56 | 0.22 | 0.13 | 0.71 |
| + Casera colour 0343 | 0.56 | 0.24 | 0.05 | 0.79 |
| + Casera colour 0363 | 0.56 | 0.26 | 0.02 | 0.86 |
| + Casera colour 0373 | 0.56 | 0.27 | 0.01 | 0.88 |
| + Casera colour 0393 | 0.56 | 0.28 | 0.01 | 0.92 |
| + Casera colour 0633 | 0.56 | 0.23 | 0.11 | 0.74 |
| + Casera colour 0653 | 0.56 | 0.24 | 0.11 | 0.77 |
| + Casera colour 0723 | 0.56 | 0.22 | 0.12 | 0.71 |
| + Casera colour 0753 | 0.56 | 0.25 | 0.04 | 0.82 |
| + Casera colour 0773 | 0.56 | 0.28 | 0.01 | 0.91 |
| + Casera colour 0793 | 0.56 | 0.28 | 0.01 | 0.91 |
| + Casera colour 0923 | 0.56 | 0.22 | 0.13 | 0.71 |
| + Casera colour 0953 | 0.56 | 0.26 | 0.04 | 0.83 |