

# ISO 10077-2:2012-03 (E)

## Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - Part 2: Numerical method for frames

---

| <b>Contents</b>   |  | <b>Page</b> |
|---|--|-------------|
| Foreword .....  |  | iv          |
| Introduction .....  |  | v           |
| 1   | Scope .....  | 1           |
| 2   | Normative references .....   | 1           |
| 3   | Terms, definitions and symbols .....                               | 1           |
| 4   | Calculation method .....   | 2           |
| 4.1   | General principle .....  | 2           |
| 4.2   | Validation of the calculation programme .....                      | 3           |
| 4.3   | Determination of the thermal transmittance .....                   | 3           |
| 5   | Treatment of solid sections and boundaries .....                   | 3           |
| 5.1   | Solid materials .....  | 3           |
| 5.2   | Emissivity of surfaces .....                                       | 3           |
| 5.3   | Boundaries .....   | 4           |
| 5.4   | Roller shutter boxes .....   | 4           |
| 5.5   | Extensions of window frame profiles .....                          | 6           |
| 6   | Treatment of cavities .....  | 6           |
| 6.1   | General .....  | 6           |
| 6.2   | Cavities in glazing .....  | 6           |
| 6.3   | Unventilated air cavities in frames and roller shutter boxes ..... | 6           |
| 6.4   | Ventilated air cavities and grooves .....                          | 10          |
| 7   | Report .....   | 11          |
| 7.1   | General .....  | 11          |
| 7.2   | Geometrical data .....   | 12          |
| 7.3   | Thermal data .....   | 12          |
| 7.4   | Results .....  | 12          |
| Annex A (informative) Thermal conductivity of selected materials .....          |  | 13          |
| Annex B (normative) Surface resistances .....                                   |  | 15          |
| Annex C (normative) Determination of the thermal transmittance .....            |  | 17          |
| Annex D (normative) Examples for the validation of calculation programmes ..... |  | 21          |
| Annex E (informative) Wood species listed in Annex A .....                      |  | 33          |
| Bibliography .....  |  | 36          |