**C402.1.4.3 Thermal Resistance of Spandrel Panels.**

U-factors of opaque assemblies within fenestration framing systems shall be determined in accordance with Table C402.1.4.3, ASTM C1363, or ANSI/NFRC 100.

**TABLE C402.1.4.3** **EFFECTIVE *U*-FACTORS FOR SPANDREL PANELSa**

|  |  |
| --- | --- |
| Rated R-value of Insulation within Panel Assembly |  |
| R-4 | R-7 | R-10 | R-15 | R-20 | R-25 | R-30 |
| Frame Type | Spandrel Panel | Default U-factor |
| Aluminum without Thermal Breakb | Single glass pane, stone, or metal panel | 0.285 | 0.259 | 0.247 | 0.236 | 0.230 | 0.226 | 0.224 |
| Double ~~glass~~ glazing with no low-e coatings | 0.273 | 0.254 | 0.244 | 0.234 | 0.229 | 0.226 | 0.223 |
| Triple glazing or double glazing with low-e glass | 0.263 | 0.249 | 0.241 | 0.233 | 0.228 | 0.225 | 0.223 |
| Aluminum with Thermal Breakc | Single glass pane, stone, or metal panel | 0.243 | 0.212 | 0.197 | 0.184 | 0.176 | 0.172 | 0.169 |
| Double ~~glass~~ glazing with no low-e coatings | 0.228 | 0.205 | 0.193 | 0.182 | 0.175 | 0.171 | 0.168 |
| Triple glazing or double glazing with low-e glass | 0.217 | 0.199 | 0.189 | 0.180 | 0.174 | 0.170 | 0.167 |
| Structural Glazingd | Single glass pane, stone, or metal panel | 0.217 | 0.180 | 0.161 | 0.145 | 0.136 | 0.130 | 0.126 |
| Double ~~glass~~ glazing with no low-e coatings | 0.199 | 0.172 | 0.157 | 0.143 | 0.135 | 0.129 | 0.126 |
| Triple glazing or double glazing with low-e glass | 0.186 | 0.165 | 0.152 | 0.140 | 0.133 | 0.128 | 0.125 |
| No framing or Insulation is Continuouse | Single glass pane, stone, or metal panel | 0.160 | 0.108 | 0.082 | 0.058 | 0.045 | 0.037 | 0.031 |
| Double ~~glass~~ glazing with no low-e coatings | 0.147 | 0.102 | 0.078 | 0.056 | 0.044 | 0.036 | 0.030 |
| Triple glazing or double glazing with low-e glass | 0.139 | 0.098 | 0.076 | 0.055 | 0.043 | 0.035 | 0.030 |
| a. | ~~Opaque assembly U-factors based on designs tested in accordance with ASTM C1363 or NFRC 100 shall be permitted.~~  Extrapolation outside of the table shall not be permitted.  Assemblies with distance between framing less than 30”, or not included in the default table, shall have a U-factor determined by testing in compliance with ASTM C1363 or modeling in compliance with ANSI/NFRC 100. Spandrel panel assemblies in the table do not include metal backpans. For designs with metal backpans, multiply the U-factor by 1.20. |
| b. | Aluminum frame without a thermal break shall be used for systems that do not contain a nonmetallic element that separates the metal exposed to the exterior from the metal that is exposed to the interior condition. |
| c. | Aluminum frame with a thermal break shall be used for systems where a urethane or other nonmetallic element separates the metal exposed to the exterior from the metal that is exposed to the interior condition. |
| d. | Structural glazing frame type shall be used for systems that have no exposed mullion on the ~~interior~~ exterior. |
| e. | No framing or insulation that is continuous shall be used for systems where there is no framing or the insulation is continuous and uninterrupted between framing.  |