

Petunjuk Penggunaan

# Metoda grafis

untuk menghitung

# OTTV

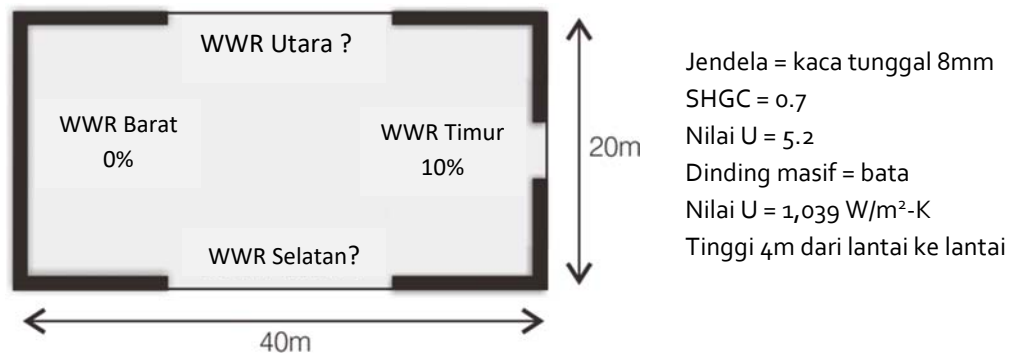
Yogyakarta

Metoda grafis ini sangat berguna dalam tahap awal pengembangan rancangan untuk mengetahui dengan mudah dan cepat apakah konsep rancangan selubung bangunan yang dikembangkan sudah memenuhi persyaratan OTTV yang berlaku.

Grafik ini berlaku untuk konstruksi dinding bata dengan Nilai-U  $1.039 \text{ W/m}^2\text{-K}$  dan panel jendela kaca tunggal 8 mm tanpa peneduh eksternal. Karena transmisi panas melalui dinding tidak signifikan, metoda ini juga dapat diterapkan untuk konstruksi dinding lainnya dengan Nilai-U (*U-Value*) yang serupa.

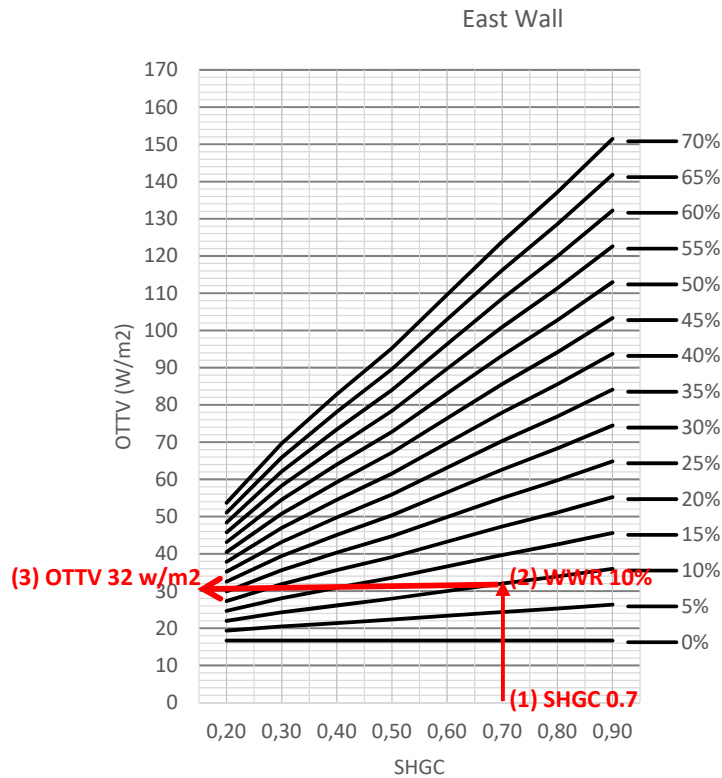
Jika menggunakan *double glazing unit*, gunakan nilai SHGC double glazing unit tersebut, yang dikeluarkan oleh pabrik/supplier.

Untuk memberikan gambaran penerapan metoda grafis guna memenuhi peraturan yang ada, contoh perhitungan WWR untuk setiap orientasi dengan menggunakan ilustrasi bangunan sederhana persegi panjang 20m x 40m diuraikan di bawah ini:



*Berapa maksimal WWR jendela Utara dan jendela Selatan untuk memenuhi OTTV maksimal  $45 \text{ W/m}^2$ ?*

**Langkah 1.** Dengan menggunakan grafik dinding timur di atas, tentukan OTTV untuk dinding timur dan dinding barat. Hasil: OTTV dinding Timur dan dinding Barat adalah masing-masing  $32 \text{ W/m}^2$  dan  $17 \text{ W/m}^2$ .



**Langkah 2.** Menghitung OTTV untuk dinding Utara dan dinding Selatan

| Orientasi permukaan | OTTV (W/m <sup>2</sup> ) | Luas permukaan (m <sup>2</sup> ) | Total perolehan panas eksternal (W) |
|---------------------|--------------------------|----------------------------------|-------------------------------------|
|                     | (OTTV)                   | (A)                              | (OTTV x A)                          |
| Timur (T)           | 32                       | 80                               | 2560                                |
| Barat (B)           | 17                       | 80                               | 1360                                |
| Utara (U)           | ?                        | 160                              | ?                                   |
| Selatan (S)         | ?                        | 160                              | ?                                   |
| Total               | 45                       | 480                              | 21600                               |

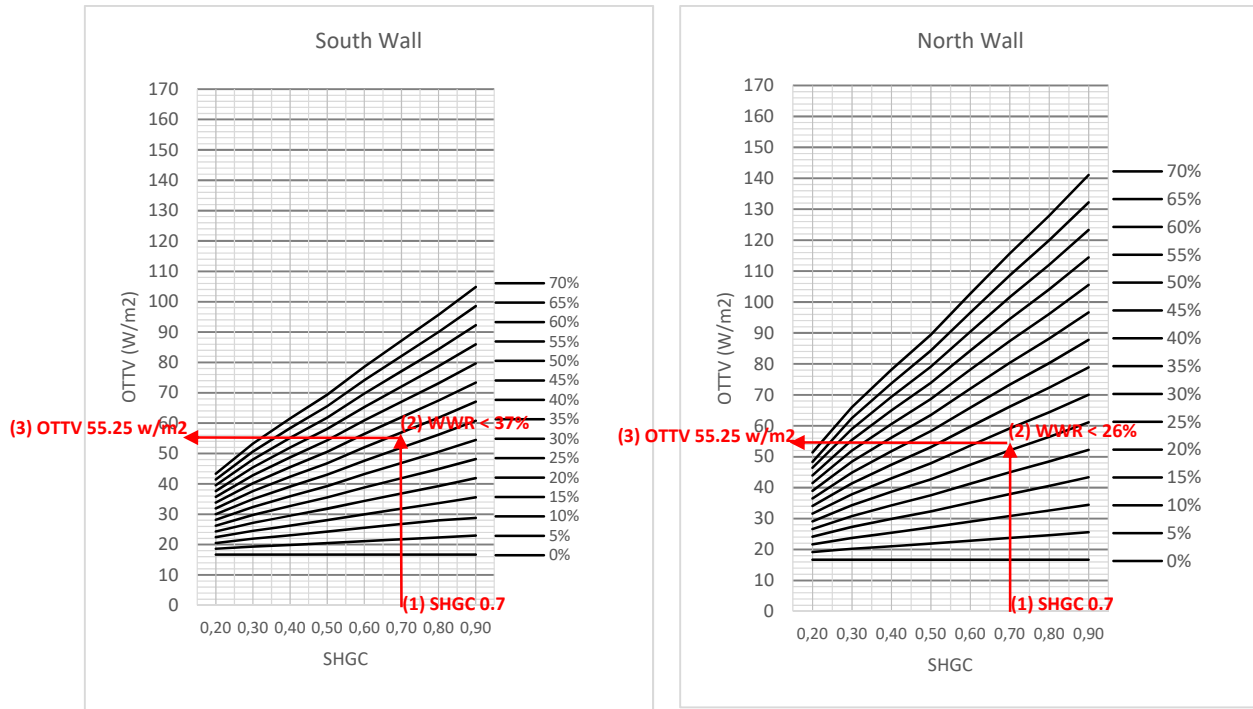
Untuk menghitung OTTV dinding Utara dan dinding Selatan dapat digunakan formula berikut:

$$\text{OTTV Total} = \frac{(\text{OTTV}_1 \times A_1) + (\text{OTTV}_2 \times A_2) + \dots + (\text{OTTV}_i \times A_i)}{A_1 + A_2 + \dots + A_i}$$

| Orientasi permukaan | OTTV (W/m <sup>2</sup> ) | Luas permukaan (m <sup>2</sup> ) | Total perolehan panas eksternal (W) |
|---------------------|--------------------------|----------------------------------|-------------------------------------|
|                     | (OTTV)                   | (A)                              | (OTTV x A)                          |
| Timur (T)           | 18                       | 80                               | 1440                                |
| Barat (B)           | 5                        | 80                               | 400                                 |
| Utara (U)           | 55.25                    | 160                              | 8840                                |

|             |       |     |       |
|-------------|-------|-----|-------|
| Selatan (S) | 55.25 | 160 | 8840  |
| Total       | 45    | 480 | 21600 |

**Langkah 3.** Tentukan WWR untuk dinding Utara dan dinding Selatan dengan menggunakan grafik pada **Gambar 7** diatas. Gambar di bawah menunjukkan bahwa untuk memenuhi persyaratan OTTV 45 W/m<sup>2</sup>, WWR untuk dinding Utara dan dinding Selatan harus lebih kecil dari 26% dan 37%.



Memiliki peneduh eksternal (*external shading*) dapat meningkatkan kinerja jendela secara signifikan dengan menghalangi radiasi matahari yang berakibat pada penurunan nilai SHGC. Nilai SHGC atau SC dari sistem jendela (*fenestration*) yang menggabungkan efek material kaca dan peneduh eksternal dapat dihitung dengan menggunakan formula berikut (SNI 03-6389):

$$SC = SC_k \times SC_{eff}$$

SC = koefisien peneduh jendela (sistem fenestrasi)

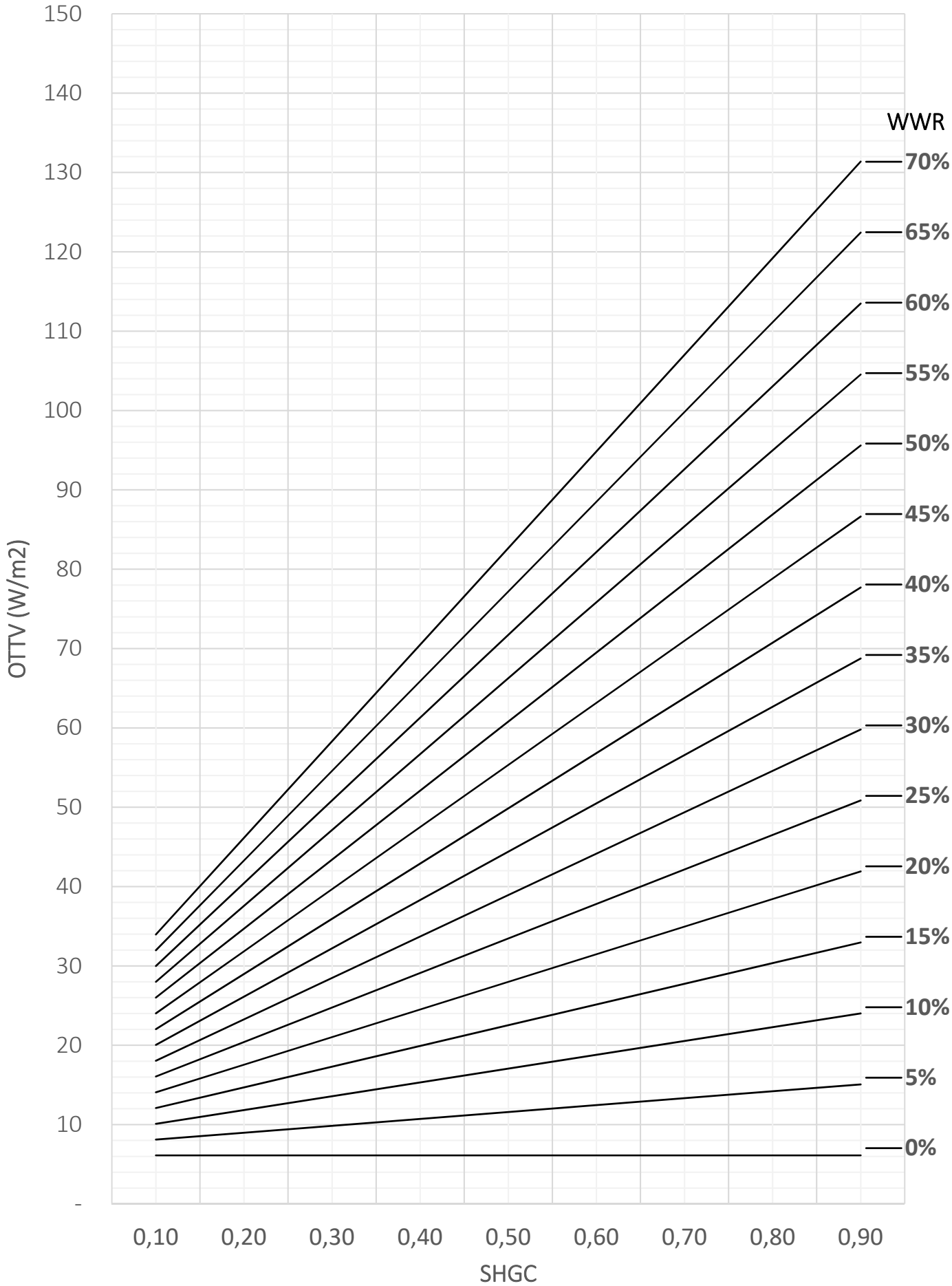
SC<sub>k</sub> = koefisien peneduh material kaca

SC<sub>eff</sub> = koefisien peneduh efektif dari peralatan peneduh luar (*external shading devices*)

SHGC = 0.86 SC.

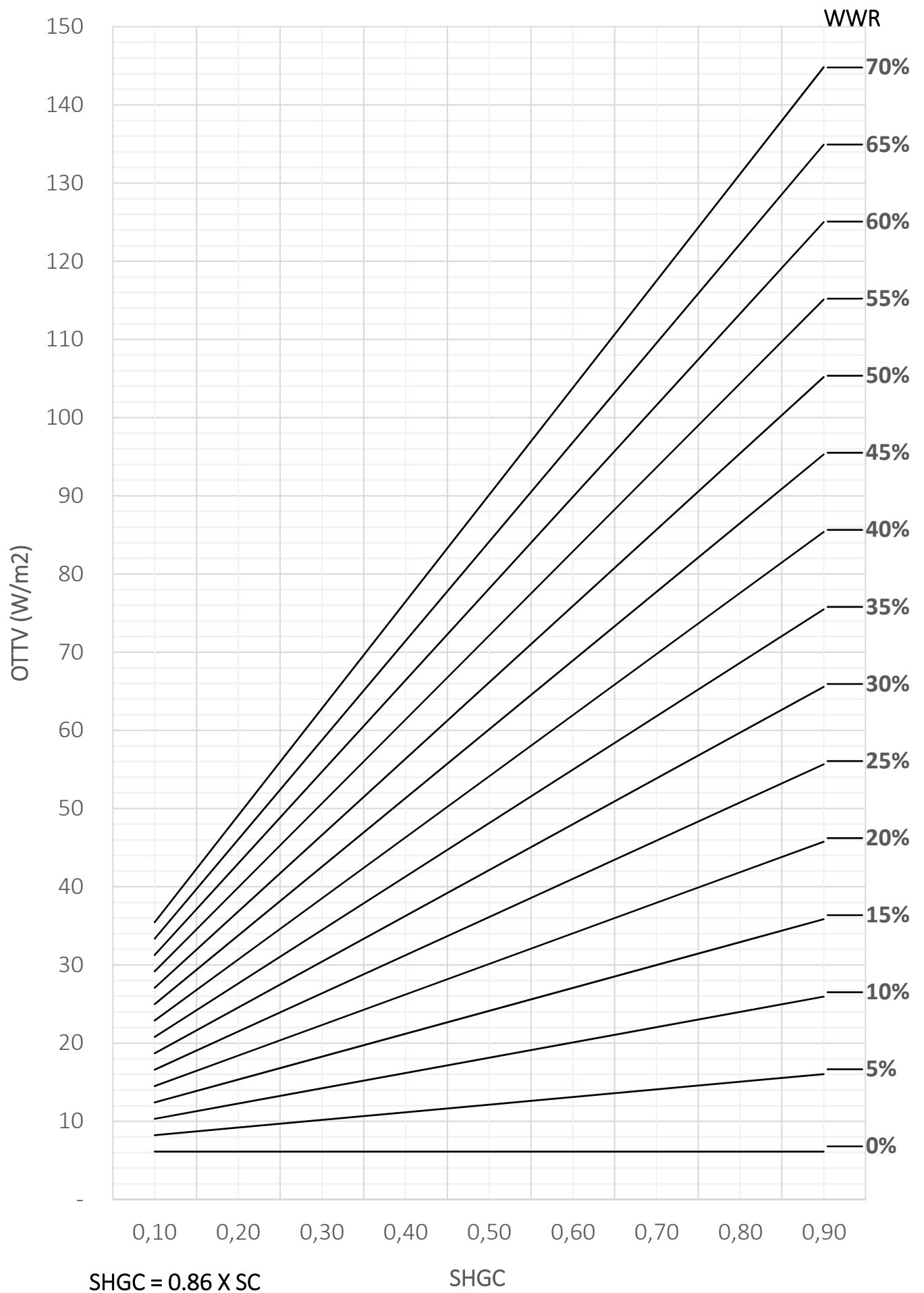
Nilai SC<sub>eff</sub> untuk berbagai konfigurasi peneduh eksternal dan orientasi diuraikan di **Lampiran Tabel dibawah**.

# Dinding Utara

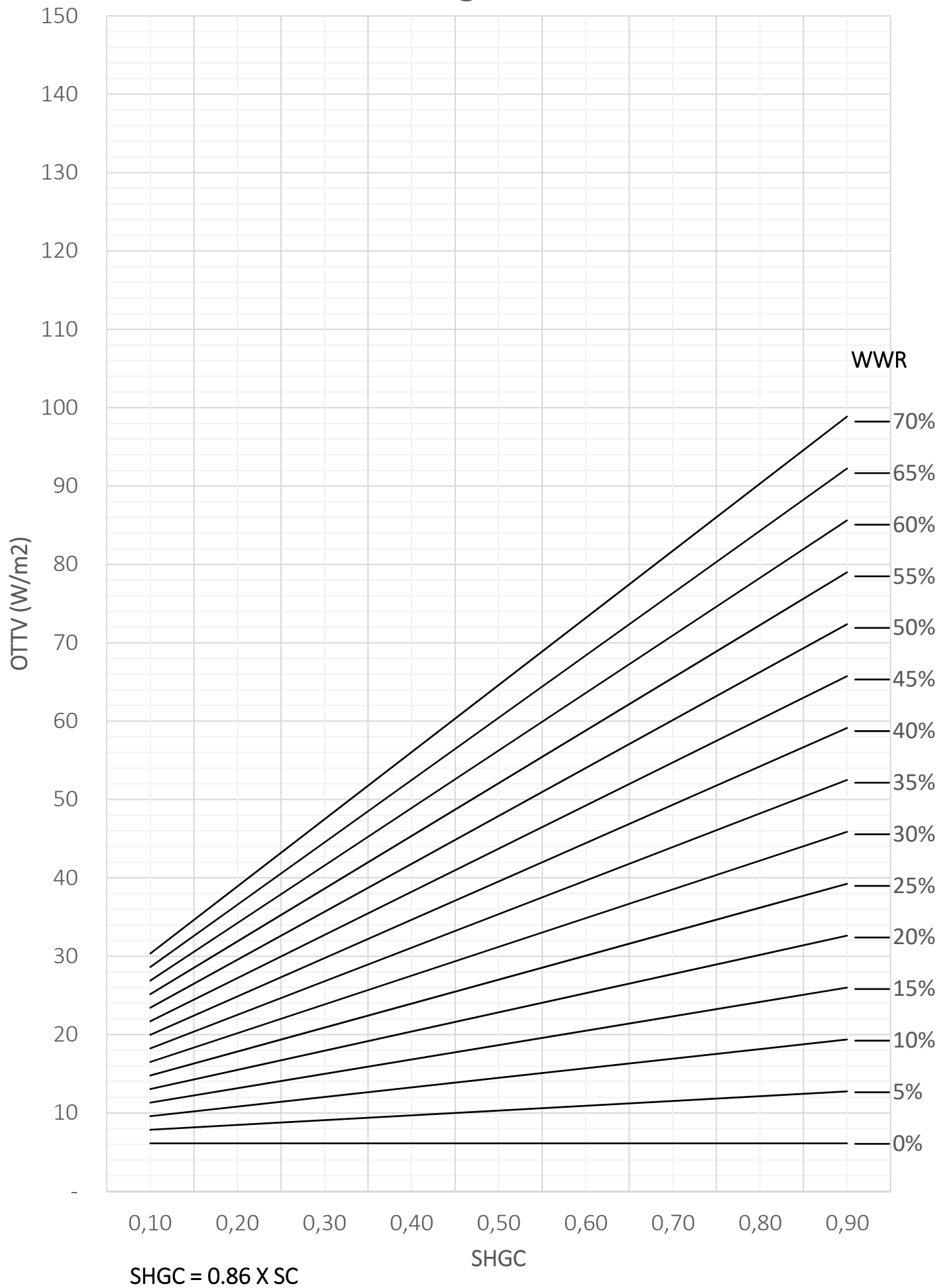


$SHGC = 0.86 \times SC$

# Dinding Timur

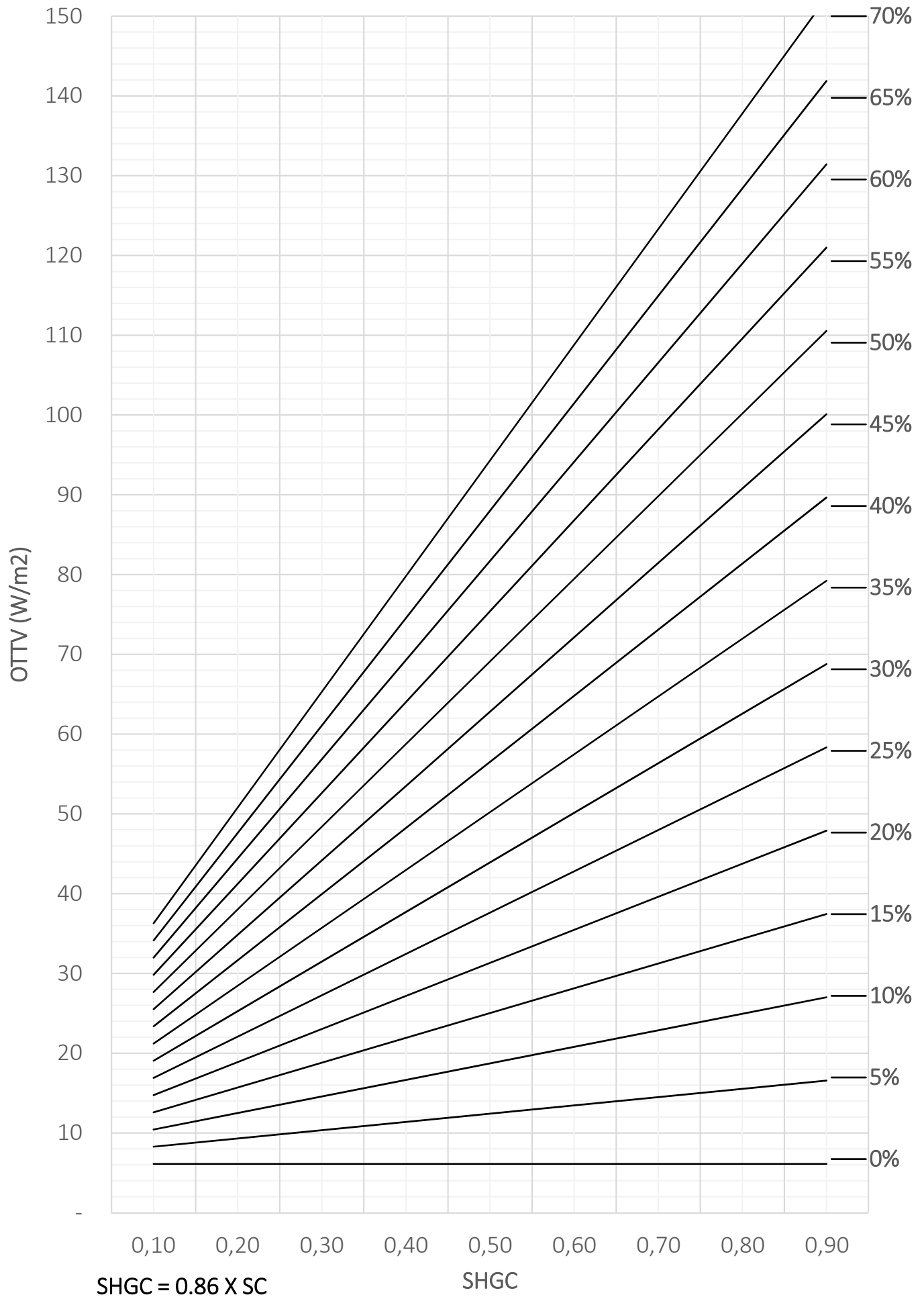


# Dinding Selatan

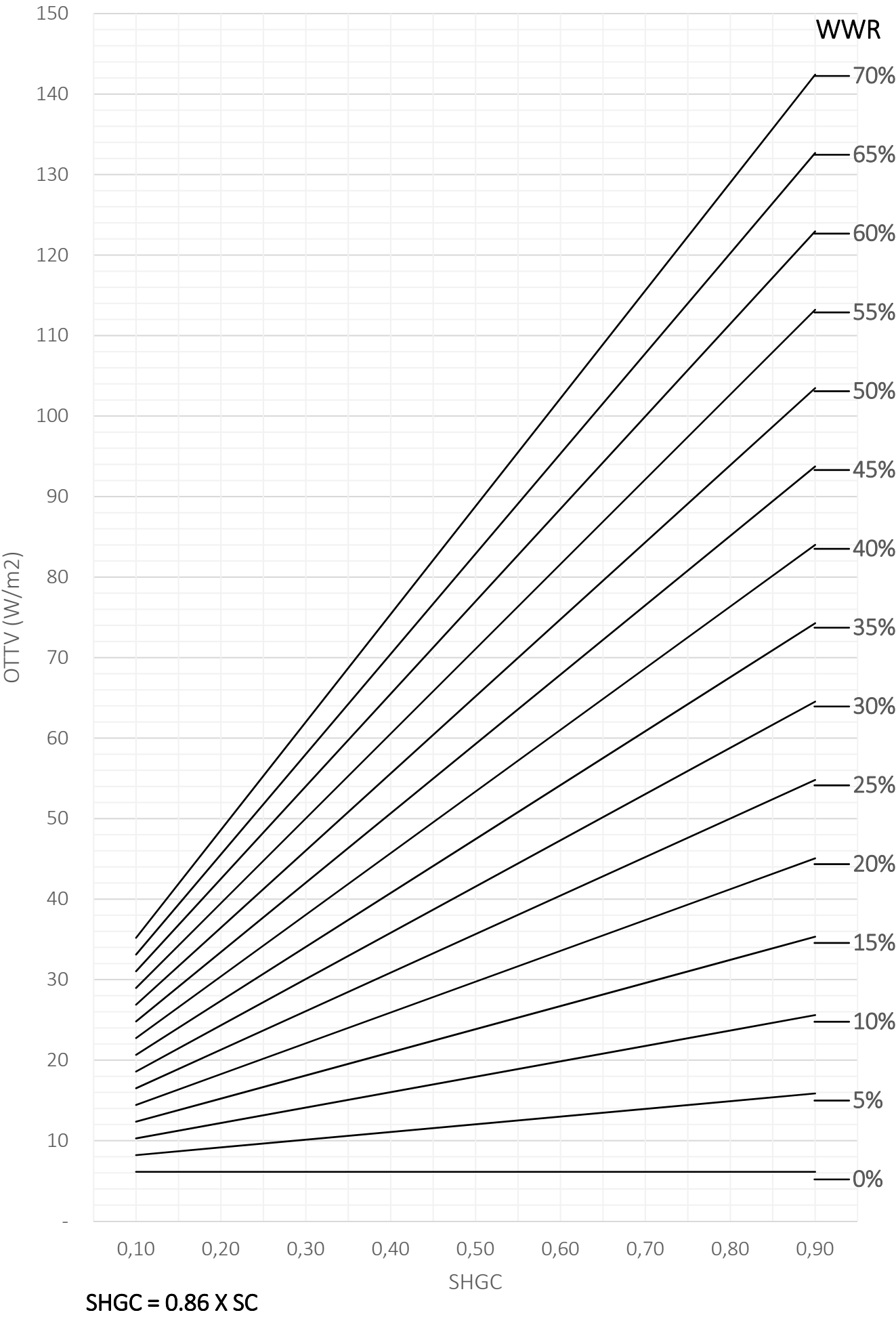


# Dinding Barat

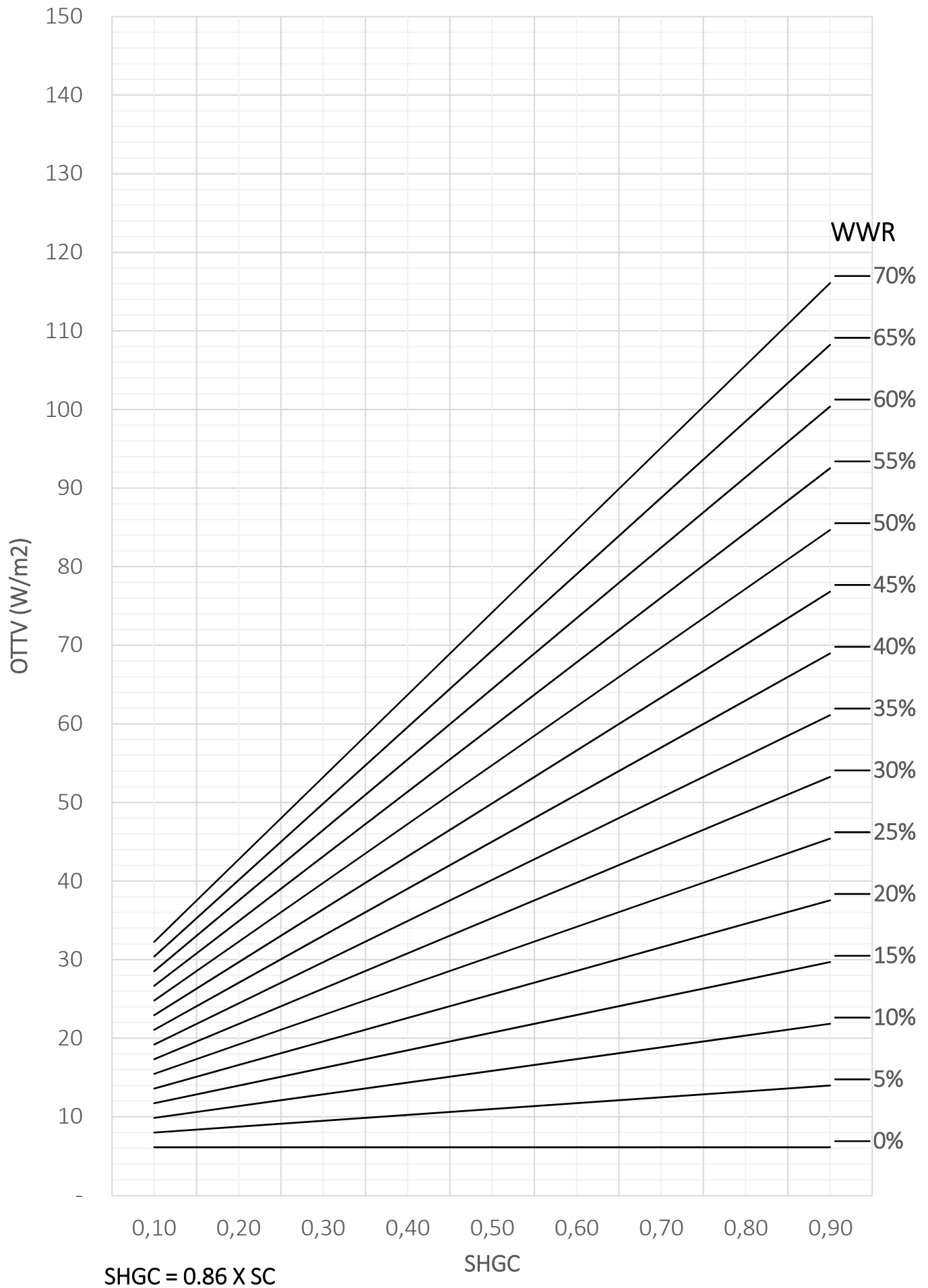
WWR



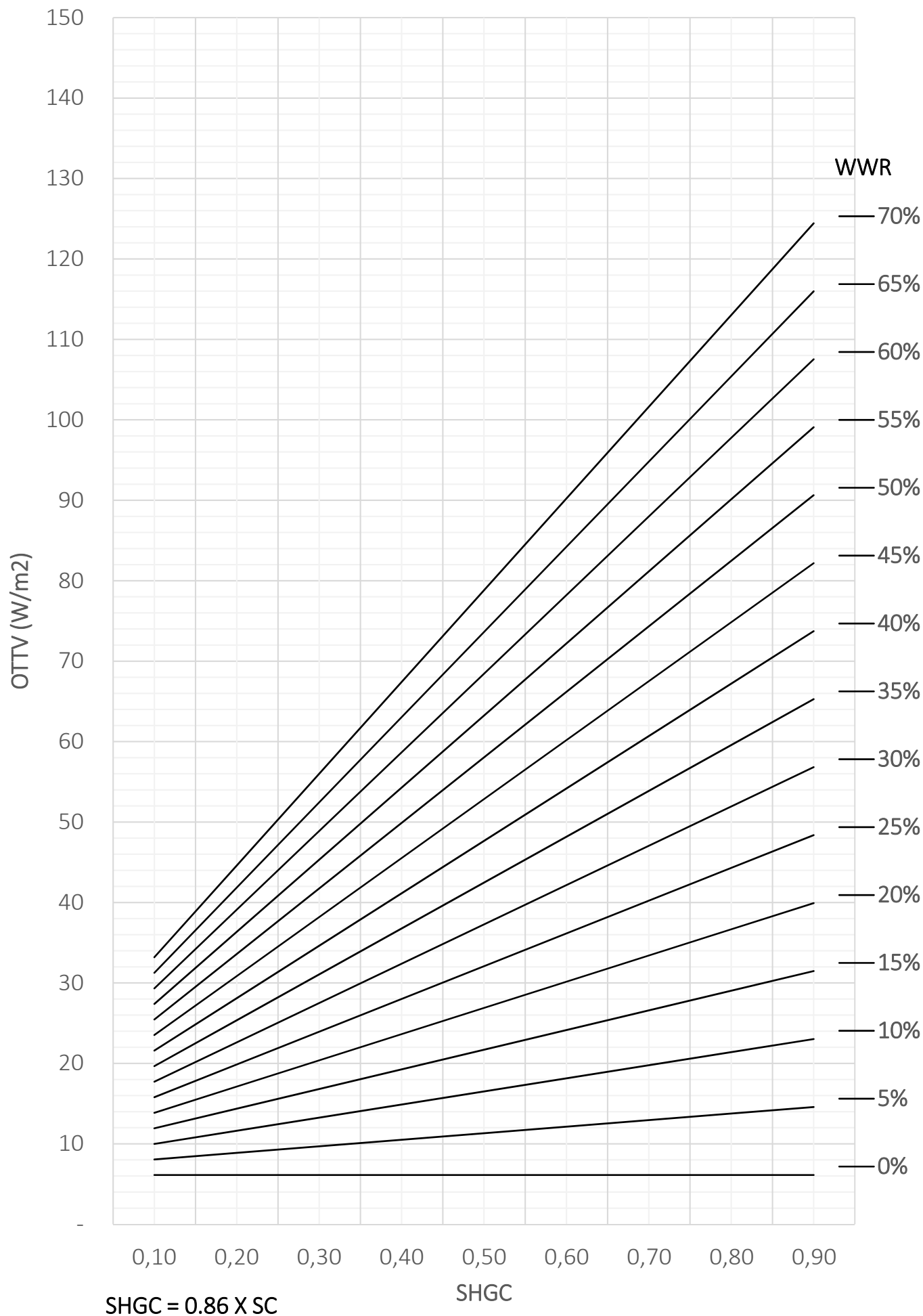
Dinding Timur Laut



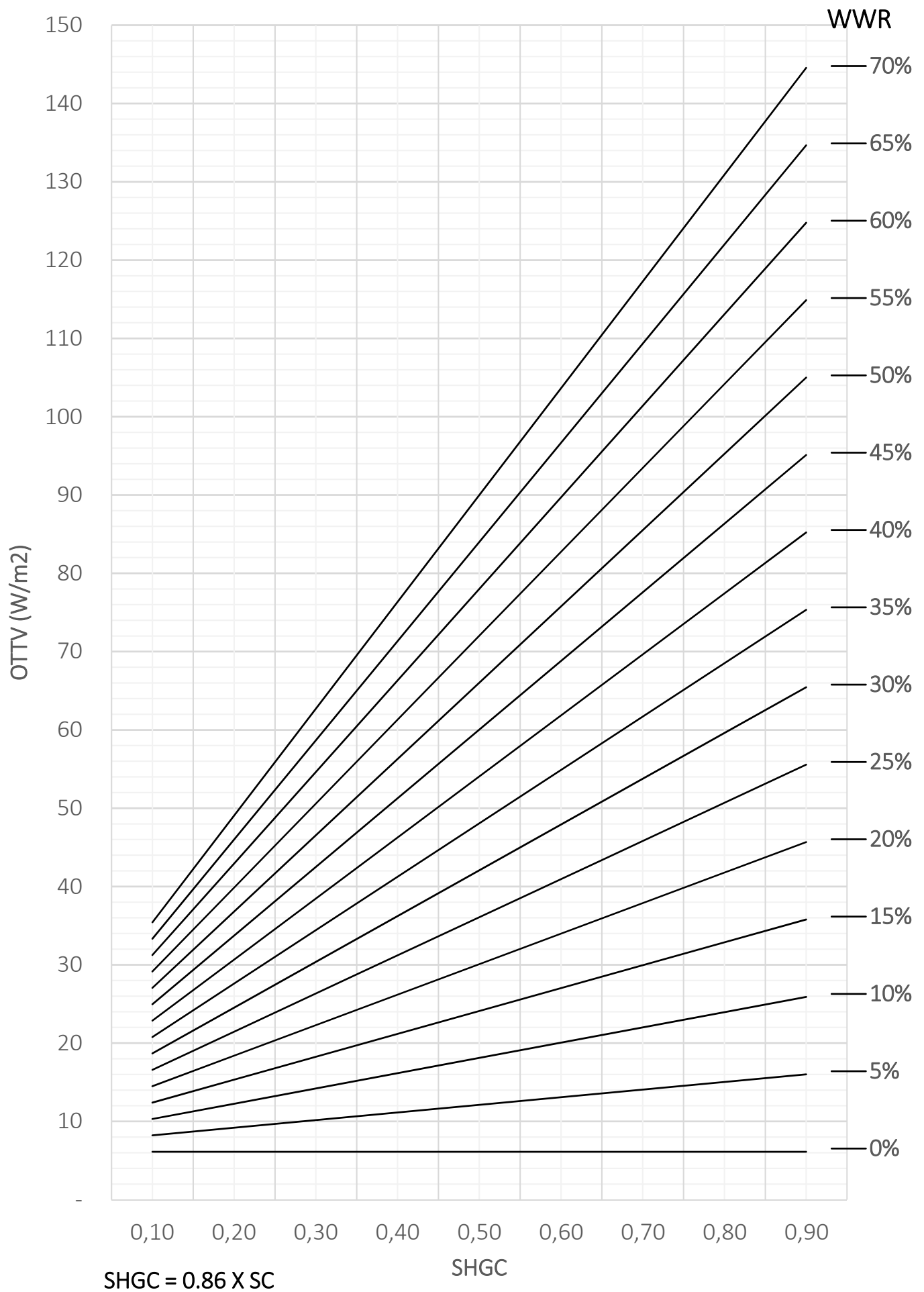
# Dinding Tenggara



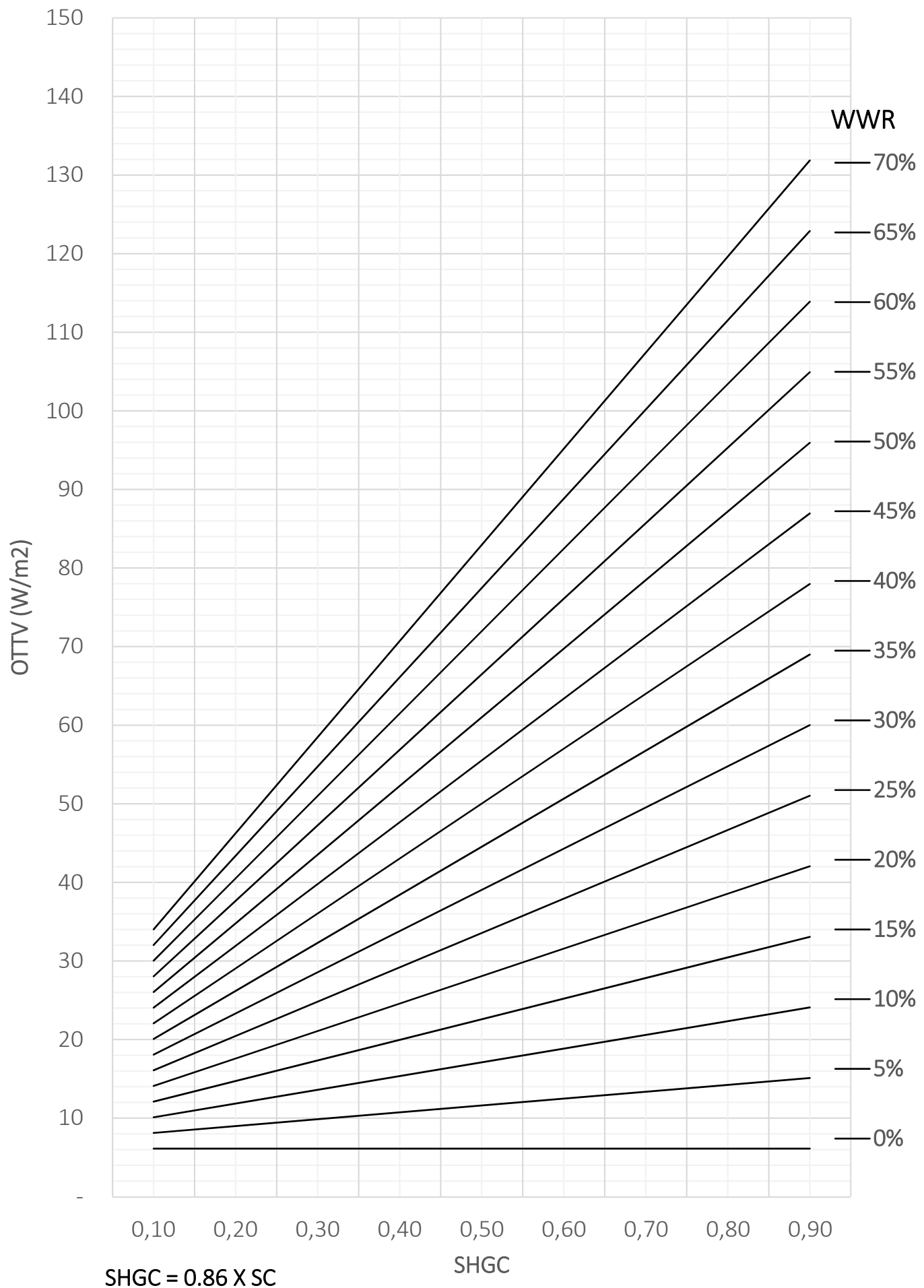
# Dinding Barat Daya



# Dinding Barat Laut



# Rerata Seluruh Orientasi



## LAMPIRAN

### Shading Coefficient Table – SNI 6389-2011

Lampiran ini digunakan untuk menghitung koefisien peneduh. Nilai koefisien peneduh ini ( $SC_{Eff}$ ) digunakan sebagai factor pengali nilai SC kaca ( $SC_k$ ) untuk mendapatkan nilai  $SC$  total sistem bukaan (jendela) tersebut.  $SC = SC_k \times SC_{Eff}$

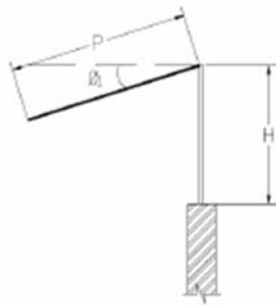
$$SHGC = 0.86 \times SC$$

Kunci-kunci untuk tabel SC efektif pada peralatan peneduh luar

Kunci 1 Proyeksi mendatar (tabel 11 – 15)

$$R_1 = \frac{P}{H}$$

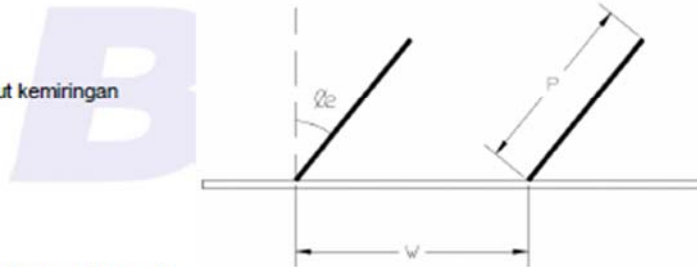
$\Phi 1$  = sudut kemiringan



Kunci 2 Proyeksi vertikal (tabel 16-19)

$$R_2 = \frac{P}{W}$$

$\Phi 2$  = sudut kemiringan

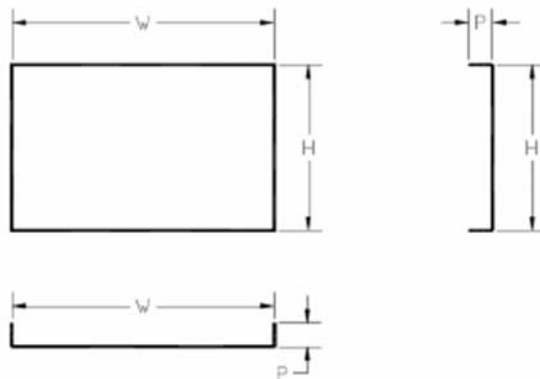


Kunci 3 Louver Egg-crate (tabel 20-23)

$$R_1 = \frac{P}{H}$$

$$R_2 = \frac{P}{W}$$

$\Phi 1$  = sudut kemiringan



Tabel A.5 –  
Koefisien peneduh efektif untuk proyeksi horizontal pada  
berbagai sudut kemiringan  
Orientasi : Utara dan Selatan

| R <sub>i</sub> | 0°     | 10°    | 20°    | 30°    | 40°    | 50°    |
|----------------|--------|--------|--------|--------|--------|--------|
| 0.1            | 0.9380 | 0.9330 | 0.9300 | 0.9291 | 0.9303 | 0.9336 |
| 0.2            | 0.8773 | 0.8674 | 0.8613 | 0.8595 | 0.8619 | 0.8685 |
| 0.3            | 0.8167 | 0.8017 | 0.7927 | 0.7899 | 0.7935 | 0.8033 |
| 0.4            | 0.7560 | 0.7392 | 0.7288 | 0.7245 | 0.7263 | 0.7382 |
| 0.5            | 0.7210 | 0.7080 | 0.7001 | 0.6950 | 0.6927 | 0.6938 |
| 0.6            | 0.7041 | 0.6921 | 0.6848 | 0.6804 | 0.6774 | 0.6760 |
| 0.7            | 0.6923 | 0.6842 | 0.6775 | 0.6723 | 0.6689 | 0.6672 |
| 0.8            | 0.6871 | 0.6779 | 0.6702 | 0.6661 | 0.6641 | 0.6626 |
| 0.9            | 0.6819 | 0.6718 | 0.6670 | 0.6643 | 0.6621 | 0.6604 |
| 1.0            | 0.6767 | 0.6690 | 0.6655 | 0.6625 | 0.6600 | 0.6583 |
| 1.1            | 0.6731 | 0.6678 | 0.6640 | 0.6607 | 0.6584 | 0.6577 |
| 1.2            | 0.6713 | 0.6667 | 0.6635 | 0.6599 | 0.6577 | 0.6577 |
| 1.3            | 0.6705 | 0.6656 | 0.6611 | 0.6582 | 0.6577 | 0.6577 |
| 1.4            | 0.6698 | 0.6644 | 0.6596 | 0.6577 | 0.6577 | 0.6577 |
| 1.5            | 0.6690 | 0.6633 | 0.6588 | 0.6577 | 0.6577 | 0.6577 |
| 1.6            | 0.6683 | 0.6622 | 0.6582 | 0.6577 | 0.6577 | 0.6577 |
| 1.7            | 0.6675 | 0.6610 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.8            | 0.6667 | 0.6599 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.9            | 0.6660 | 0.6594 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 2.0            | 0.6652 | 0.6589 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 2.1            | 0.6645 | 0.6585 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 2.2            | 0.6637 | 0.6581 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 2.3            | 0.6630 | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 2.4            | 0.6622 | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 2.5            | 0.6614 | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 2.6            | 0.6607 | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 2.7            | 0.6604 | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 2.8            | 0.6601 | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 2.9            | 0.6599 | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 3.0            | 0.6596 | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |

**Tabel A.6 –  
Koefisien peneduh efektif untuk proyeksi horizontal pada  
berbagai sudut kemiringan  
Orientasi : Timur dan Barat**

| $R_i$ | 0°     | 10°    | 20°    | 30°    | 40°    | 50°    |
|-------|--------|--------|--------|--------|--------|--------|
| 0.1   | 0.9363 | 0.9268 | 0.9195 | 0.9147 | 0.9124 | 0.9129 |
| 0.2   | 0.8752 | 0.8565 | 0.8416 | 0.8309 | 0.8257 | 0.8257 |
| 0.3   | 0.8228 | 0.7947 | 0.7723 | 0.7563 | 0.7470 | 0.7448 |
| 0.4   | 0.7703 | 0.7330 | 0.7036 | 0.6820 | 0.6693 | 0.6664 |
| 0.5   | 0.7248 | 0.6842 | 0.6550 | 0.6231 | 0.6045 | 0.5946 |
| 0.6   | 0.6911 | 0.6424 | 0.6013 | 0.5691 | 0.5467 | 0.5349 |
| 0.7   | 0.6574 | 0.6006 | 0.5559 | 0.5249 | 0.5012 | 0.4581 |
| 0.8   | 0.6237 | 0.5693 | 0.5273 | 0.4923 | 0.4651 | 0.4467 |
| 0.9   | 0.5998 | 0.5463 | 0.4991 | 0.4608 | 0.4389 | 0.4237 |
| 1.0   | 0.5827 | 0.5232 | 0.4727 | 0.4442 | 0.4222 | 0.4062 |
| 1.1   | 0.5656 | 0.5002 | 0.4587 | 0.4296 | 0.4075 | 0.4010 |
| 1.2   | 0.5485 | 0.4828 | 0.4468 | 0.4154 | 0.4036 | 0.3969 |
| 1.3   | 0.5314 | 0.4739 | 0.4349 | 0.4089 | 0.3999 | 0.3963 |
| 1.4   | 0.5156 | 0.4650 | 0.4230 | 0.4059 | 0.3969 | 0.3963 |
| 1.5   | 0.5051 | 0.4561 | 0.4147 | 0.4029 | 0.3963 | 0.3963 |
| 1.6   | 0.4995 | 0.4472 | 0.4123 | 0.3999 | 0.3963 | 0.3963 |
| 1.7   | 0.4939 | 0.4383 | 0.4101 | 0.3974 | 0.3963 | 0.3963 |
| 1.8   | 0.4882 | 0.4294 | 0.4079 | 0.3963 | 0.3963 | 0.3963 |
| 1.9   | 0.4826 | 0.4237 | 0.4057 | 0.3963 | 0.3963 | 0.3963 |
| 2.0   | 0.4770 | 0.4204 | 0.4035 | 0.3963 | 0.3963 | 0.3963 |
| 2.1   | 0.4713 | 0.4190 | 0.4013 | 0.3963 | 0.3963 | 0.3963 |
| 2.2   | 0.4657 | 0.4176 | 0.3991 | 0.3963 | 0.3963 | 0.3963 |
| 2.3   | 0.4601 | 0.4163 | 0.3978 | 0.3963 | 0.3963 | 0.3963 |
| 2.4   | 0.4544 | 0.4149 | 0.3968 | 0.3963 | 0.3963 | 0.3963 |
| 2.5   | 0.4488 | 0.4135 | 0.3963 | 0.3963 | 0.3963 | 0.3963 |
| 2.6   | 0.4432 | 0.4122 | 0.3963 | 0.3963 | 0.3963 | 0.3963 |
| 2.7   | 0.4400 | 0.4108 | 0.3963 | 0.3963 | 0.3963 | 0.3963 |
| 2.8   | 0.4369 | 0.4094 | 0.3963 | 0.3963 | 0.3963 | 0.3963 |
| 2.9   | 0.4339 | 0.4081 | 0.3963 | 0.3963 | 0.3963 | 0.3963 |
| 3.0   | 0.4333 | 0.4067 | 0.3963 | 0.3963 | 0.3963 | 0.3963 |

Tabel A.7 –  
Koefisien peneduh efektif untuk proyeksi horizontal pada  
berbagai sudut kemiringan  
Orientasi : Timur Laut dan Barat Laut

| R <sub>i</sub> | 0°     | 10°    | 20°    | 30°    | 40°    | 50°    |
|----------------|--------|--------|--------|--------|--------|--------|
| 0.1            | 0.9273 | 0.9193 | 0.9137 | 0.9106 | 0.9101 | 0.9122 |
| 0.2            | 0.8630 | 0.8471 | 0.8355 | 0.8285 | 0.8263 | 0.8291 |
| 0.3            | 0.8054 | 0.7820 | 0.7644 | 0.7533 | 0.7489 | 0.7515 |
| 0.4            | 0.7563 | 0.7278 | 0.7055 | 0.6895 | 0.6803 | 0.6799 |
| 0.5            | 0.7171 | 0.6824 | 0.6546 | 0.6345 | 0.6228 | 0.6198 |
| 0.6            | 0.6787 | 0.6443 | 0.6165 | 0.5946 | 0.5793 | 0.5710 |
| 0.7            | 0.6549 | 0.6166 | 0.5842 | 0.5587 | 0.5420 | 0.5320 |
| 0.8            | 0.6327 | 0.5889 | 0.5563 | 0.5360 | 0.5200 | 0.5088 |
| 0.9            | 0.6105 | 0.5681 | 0.5412 | 0.5184 | 0.5026 | 0.4919 |
| 1.0            | 0.5922 | 0.5560 | 0.5261 | 0.5051 | 0.4900 | 0.4826 |
| 1.1            | 0.5809 | 0.5440 | 0.5148 | 0.4939 | 0.4840 | 0.4790 |
| 1.2            | 0.5722 | 0.5321 | 0.5046 | 0.4877 | 0.4809 | 0.4759 |
| 1.3            | 0.5634 | 0.5243 | 0.4971 | 0.4850 | 0.4782 | 0.4759 |
| 1.4            | 0.5547 | 0.5165 | 0.4921 | 0.4825 | 0.4759 | 0.4759 |
| 1.5            | 0.5466 | 0.5086 | 0.4894 | 0.4802 | 0.4759 | 0.4759 |
| 1.6            | 0.5413 | 0.5037 | 0.4874 | 0.4780 | 0.4759 | 0.4759 |
| 1.7            | 0.5359 | 0.5001 | 0.4854 | 0.4759 | 0.4759 | 0.4759 |
| 1.8            | 0.5306 | 0.4965 | 0.4837 | 0.4759 | 0.4759 | 0.4759 |
| 1.9            | 0.5253 | 0.4949 | 0.4821 | 0.4759 | 0.4759 | 0.4759 |
| 2.0            | 0.5200 | 0.4936 | 0.4804 | 0.4759 | 0.4759 | 0.4759 |
| 2.1            | 0.5162 | 0.4923 | 0.4784 | 0.4759 | 0.4759 | 0.4759 |
| 2.2            | 0.5141 | 0.4909 | 0.4770 | 0.4759 | 0.4759 | 0.4759 |
| 2.3            | 0.5119 | 0.4897 | 0.4759 | 0.4759 | 0.4759 | 0.4759 |
| 2.4            | 0.5097 | 0.4886 | 0.4770 | 0.4759 | 0.4759 | 0.4759 |
| 2.5            | 0.5075 | 0.4876 | 0.4759 | 0.4759 | 0.4759 | 0.4759 |
| 2.6            | 0.5053 | 0.4865 | 0.4759 | 0.4759 | 0.4759 | 0.4759 |
| 2.7            | 0.5047 | 0.4855 | 0.4759 | 0.4759 | 0.4759 | 0.4759 |
| 2.8            | 0.5042 | 0.4844 | 0.4759 | 0.4759 | 0.4759 | 0.4759 |
| 2.9            | 0.5036 | 0.4834 | 0.4759 | 0.4759 | 0.4759 | 0.4759 |
| 3.0            | 0.5031 | 0.4823 | 0.4759 | 0.4759 | 0.4759 | 0.4759 |

Tabel A.8 –  
Koefisien peneduh efektif untuk proyeksi horizontal pada  
berbagai sudut kemiringan  
Orientasi : Tenggara dan Barat Daya

| R <sub>i</sub> | 0°     | 10°    | 20°    | 30°    | 40°    | 50°    |
|----------------|--------|--------|--------|--------|--------|--------|
| 0.1            | 0.9253 | 0.9167 | 0.9107 | 0.9072 | 0.9065 | 0.9086 |
| 0.2            | 0.8574 | 0.8405 | 0.8280 | 0.8203 | 0.8177 | 0.8204 |
| 0.3            | 0.7964 | 0.7715 | 0.7527 | 0.7406 | 0.7355 | 0.7377 |
| 0.4            | 0.7413 | 0.7100 | 0.6862 | 0.6692 | 0.6601 | 0.6597 |
| 0.5            | 0.6981 | 0.6615 | 0.6321 | 0.6109 | 0.5985 | 0.5951 |
| 0.6            | 0.6578 | 0.6179 | 0.5890 | 0.6553 | 0.5503 | 0.5417 |
| 0.7            | 0.6289 | 0.5891 | 0.5555 | 0.5289 | 0.5107 | 0.5004 |
| 0.8            | 0.6059 | 0.5604 | 0.5251 | 0.5044 | 0.4880 | 0.4765 |
| 0.9            | 0.5828 | 0.5372 | 0.5096 | 0.4863 | 0.4702 | 0.4592 |
| 1.0            | 0.5619 | 0.5248 | 0.4542 | 0.4727 | 0.4573 | 0.4493 |
| 1.1            | 0.5502 | 0.5124 | 0.4826 | 0.4613 | 0.4507 | 0.4459 |
| 1.2            | 0.5413 | 0.5003 | 0.4722 | 0.4551 | 0.4477 | 0.4429 |
| 1.3            | 0.5323 | 0.4923 | 0.4646 | 0.4516 | 0.4451 | 0.4429 |
| 1.4            | 0.5234 | 0.4843 | 0.4596 | 0.4492 | 0.4429 | 0.4429 |
| 1.5            | 0.5150 | 0.4763 | 0.4558 | 0.4471 | 0.4429 | 0.4429 |
| 1.6            | 0.5096 | 0.4714 | 0.4538 | 0.4449 | 0.4429 | 0.4429 |
| 1.7            | 0.5042 | 0.4678 | 0.4521 | 0.4429 | 0.4429 | 0.4429 |
| 1.8            | 0.4988 | 0.4642 | 0.4505 | 0.4429 | 0.4429 | 0.4429 |
| 1.9            | 0.4933 | 0.4610 | 0.4489 | 0.4429 | 0.4429 | 0.4429 |
| 2.0            | 0.4879 | 0.4595 | 0.4472 | 0.4429 | 0.4429 | 0.4429 |
| 2.1            | 0.4841 | 0.4585 | 0.4456 | 0.4429 | 0.4429 | 0.4429 |
| 2.2            | 0.4820 | 0.4572 | 0.4440 | 0.4429 | 0.4429 | 0.4429 |
| 2.3            | 0.4798 | 0.4562 | 0.4429 | 0.4429 | 0.4429 | 0.4429 |
| 2.4            | 0.4777 | 0.4552 | 0.4429 | 0.4429 | 0.4429 | 0.4429 |
| 2.5            | 0.4755 | 0.4542 | 0.4429 | 0.4429 | 0.4429 | 0.4429 |
| 2.6            | 0.4734 | 0.4532 | 0.4429 | 0.4429 | 0.4429 | 0.4429 |
| 2.7            | 0.4712 | 0.4521 | 0.4429 | 0.4429 | 0.4429 | 0.4429 |
| 2.8            | 0.4699 | 0.4511 | 0.4429 | 0.4429 | 0.4429 | 0.4429 |
| 2.9            | 0.4694 | 0.4501 | 0.4429 | 0.4429 | 0.4429 | 0.4429 |
| 3.0            | 0.4688 | 0.4491 | 0.4429 | 0.4429 | 0.4429 | 0.4429 |

Tabel A.9 –  
Koefisien peneduh efektif untuk proyeksi horizontal pada  
berbagai sudut kemiringan  
Orientasi : Utara dan Selatan

| R <sub>2</sub> | 0°     | 10°    | 20°    | 30°     | 40°    | 50°    |
|----------------|--------|--------|--------|---------|--------|--------|
| 0.1            | 0.9526 | 0.9534 | 0.9549 | 0.9571  | 0.9606 | 0.9638 |
| 0.2            | 0.9066 | 0.9082 | 0.9110 | 0.9155  | 0.9225 | 0.9289 |
| 0.3            | 0.8605 | 0.8630 | 0.8672 | 0.8739  | 0.8844 | 0.8940 |
| 0.4            | 0.8144 | 0.8177 | 0.8236 | 0.8325  | 0.8463 | 0.8591 |
| 0.5            | 0.7752 | 0.7800 | 0.7892 | 0.8005  | 0.8159 | 0.8277 |
| 0.6            | 0.7540 | 0.7563 | 0.7632 | 0.7768  | 0.7950 | 0.8078 |
| 0.7            | 0.7379 | 0.7434 | 0.7464 | 0.7560  | 0.7771 | 0.7920 |
| 0.8            | 0.7290 | 0.7306 | 0.7348 | 0.7423  | 0.7637 | 0.7807 |
| 0.9            | 0.7202 | 0.7230 | 0.7269 | 0.7319  | 0.7507 | 0.7699 |
| 1.0            | 0.7114 | 0.7183 | 0.7190 | 0.7246  | 0.7388 | 0.7595 |
| 1.1            | 0.7060 | 0.7137 | 0.7144 | 0.71173 | 0.7308 | 0.7523 |
| 1.2            | 0.7022 | 0.7091 | 0.7098 | 0.7099  | 0.7251 | 0.7451 |
| 1.3            | 0.7000 | 0.7045 | 0.7053 | 0.7055  | 0.7206 | 0.7379 |
| 1.4            | 0.6977 | 0.6999 | 0.7007 | 0.7022  | 0.7173 | 0.7307 |
| 1.5            | 0.6954 | 0.6961 | 0.6981 | 0.7003  | 0.7141 | 0.7236 |
| 1.6            | 0.6932 | 0.6939 | 0.6960 | 0.6983  | 0.7109 | 0.7173 |
| 1.7            | 0.6909 | 0.6916 | 0.6940 | 0.6964  | 0.7077 | 0.7131 |
| 1.8            | 0.6886 | 0.6894 | 0.6919 | 0.6945  | 0.7044 | 0.7105 |
| 1.9            | 0.6864 | 0.6889 | 0.6899 | 0.6926  | 0.7012 | 0.7078 |
| 2.0            | 0.6841 | 0.6886 | 0.6878 | 0.6907  | 0.6980 | 0.7052 |
| 2.1            | 0.6818 | 0.6884 | 0.6858 | 0.6888  | 0.6948 | 0.7056 |
| 2.2            | 0.6796 | 0.6881 | 0.6853 | 0.6869  | 0.6915 | 0.7000 |
| 2.3            | 0.6773 | 0.6879 | 0.6849 | 0.6849  | 0.6910 | 0.6979 |
| 2.4            | 0.6750 | 0.6876 | 0.6845 | 0.6830  | 0.6909 | 0.6967 |
| 2.5            | 0.6728 | 0.6873 | 0.6841 | 0.6811  | 0.6908 | 0.6954 |
| 2.6            | 0.6705 | 0.6871 | 0.6837 | 0.6792  | 0.6908 | 0.6942 |
| 2.7            | 0.6695 | 0.6868 | 0.6833 | 0.6773  | 0.6907 | 0.6930 |
| 2.8            | 0.6686 | 0.6866 | 0.6829 | 0.6754  | 0.6906 | 0.6917 |
| 2.9            | 0.6677 | 0.6863 | 0.6826 | 0.6735  | 0.6905 | 0.6905 |
| 3.0            | 0.6668 | 0.6860 | 0.6822 | 0.6716  | 0.6904 | 0.6893 |

Tabel A.10 –  
Koefisien peneduh efektif untuk proyeksi vertikal pada berbagai  
sudut kemiringan  
Orientasi : Timur dan Barat

| R <sub>2</sub> | 0°     | 10°    | 20°    | 30°    | 40°    | 50°    |
|----------------|--------|--------|--------|--------|--------|--------|
| 0.1            | 0.9805 | 0.9751 | 0.9704 | 0.9653 | 0.9584 | 0.9520 |
| 0.2            | 0.9807 | 0.9499 | 0.9406 | 0.9302 | 0.9166 | 0.9038 |
| 0.3            | 0.9409 | 0.9247 | 0.9108 | 0.8952 | 0.8747 | 0.8555 |
| 0.4            | 0.9223 | 0.9007 | 0.8821 | 0.8614 | 0.8338 | 0.8578 |
| 0.5            | 0.9047 | 0.8774 | 0.8537 | 0.8275 | 0.7931 | 0.7606 |
| 0.6            | 0.8870 | 0.8543 | 0.8259 | 0.7939 | 0.7523 | 0.7133 |
| 0.7            | 0.8694 | 0.8313 | 0.7980 | 0.7616 | 0.7129 | 0.6671 |
| 0.8            | 0.8518 | 0.8090 | 0.7728 | 0.7312 | 0.6753 | 0.6227 |
| 0.9            | 0.8348 | 0.7884 | 0.7476 | 0.7014 | 0.6406 | 0.5823 |
| 1.0            | 0.8193 | 0.7678 | 0.7233 | 0.6747 | 0.6098 | 0.5493 |
| 1.1            | 0.8057 | 0.7471 | 0.7015 | 0.6511 | 0.5850 | 0.5184 |
| 1.2            | 0.7921 | 0.7287 | 0.6810 | 0.6320 | 0.5605 | 0.4880 |
| 1.3            | 0.7785 | 0.7120 | 0.6631 | 0.6135 | 0.5361 | 0.4633 |
| 1.4            | 0.7654 | 0.6960 | 0.6482 | 0.5949 | 0.5120 | 0.4577 |
| 1.5            | 0.7541 | 0.6826 | 0.6334 | 0.5764 | 0.4899 | 0.4526 |
| 1.6            | 0.7441 | 0.6696 | 0.6187 | 0.5579 | 0.4820 | 0.4474 |
| 1.7            | 0.7349 | 0.6589 | 0.6042 | 0.5397 | 0.4790 | 0.4422 |
| 1.8            | 0.7257 | 0.6485 | 0.5908 | 0.5220 | 0.4760 | 0.4371 |
| 1.9            | 0.7185 | 0.6381 | 0.5770 | 0.5065 | 0.4730 | 0.4319 |
| 2.0            | 0.7122 | 0.6276 | 0.5634 | 0.4982 | 0.4700 | 0.4268 |
| 2.1            | 0.7070 | 0.6172 | 0.5497 | 0.4906 | 0.4670 | 0.4221 |
| 2.2            | 0.7036 | 0.6076 | 0.5362 | 0.4850 | 0.4641 | 0.4185 |
| 2.3            | 0.7019 | 0.5987 | 0.5232 | 0.4834 | 0.4611 | 0.4158 |
| 2.4            | 0.7007 | 0.5987 | 0.5101 | 0.4818 | 0.4581 | 0.4145 |
| 2.5            | 0.6999 | 0.5988 | 0.4971 | 0.4802 | 0.4551 | 0.4132 |
| 2.6            | 0.6990 | 0.5718 | 0.4849 | 0.4886 | 0.4521 | 0.4119 |
| 2.7            | 0.6982 | 0.5629 | 0.4747 | 0.4870 | 0.4491 | 0.4105 |
| 2.8            | 0.6974 | 0.5539 | 0.4668 | 0.4859 | 0.4461 | 0.4092 |
| 2.9            | 0.6965 | 0.5450 | 0.4616 | 0.4850 | 0.4431 | 0.4082 |
| 3.0            | 0.6957 | 0.5360 | 0.4591 | 0.4841 | 0.4401 | 0.4080 |

Tabel A.11 –  
Koefisien peneduh efektif untuk proyeksi vertikal pada berbagai  
sudut kemiringan  
Orientasi : Timur Laut dan Barat Laut

| R <sub>2</sub> | 0°     | 10°    | 20°    | 30°    | 40°    | 50°    |
|----------------|--------|--------|--------|--------|--------|--------|
| 0.1            | 0.9517 | 0.9445 | 0.9389 | 0.9346 | 0.9317 | 0.9314 |
| 0.2            | 0.9074 | 0.8931 | 0.8819 | 0.8729 | 0.8670 | 0.8650 |
| 0.3            | 0.8646 | 0.8436 | 0.8268 | 0.8131 | 0.8036 | 0.8005 |
| 0.4            | 0.8262 | 0.7991 | 0.7770 | 0.7585 | 0.7449 | 0.7381 |
| 0.5            | 0.7912 | 0.7573 | 0.7297 | 0.7068 | 0.6895 | 0.6809 |
| 0.6            | 0.7562 | 0.7155 | 0.6824 | 0.6546 | 0.6342 | 0.6239 |
| 0.7            | 0.7230 | 0.6740 | 0.6356 | 0.6043 | 0.5832 | 0.5701 |
| 0.8            | 0.6899 | 0.6352 | 0.6038 | 0.5836 | 0.5643 | 0.5493 |
| 0.9            | 0.6575 | 0.6158 | 0.5921 | 0.5683 | 0.5465 | 0.5296 |
| 1.0            | 0.6359 | 0.6069 | 0.5806 | 0.5530 | 0.5288 | 0.5104 |
| 1.1            | 0.6300 | 0.5981 | 0.5691 | 0.5380 | 0.5125 | 0.5005 |
| 1.2            | 0.6240 | 0.5892 | 0.5576 | 0.5241 | 0.5038 | 0.4958 |
| 1.3            | 0.6181 | 0.5802 | 0.5461 | 0.5146 | 0.4984 | 0.4915 |
| 1.4            | 0.6121 | 0.5715 | 0.5348 | 0.5091 | 0.4946 | 0.4898 |
| 1.5            | 0.6061 | 0.5626 | 0.5257 | 0.5050 | 0.4908 | 0.4884 |
| 1.6            | 0.6002 | 0.5537 | 0.5201 | 0.5028 | 0.4881 | 0.4869 |
| 1.7            | 0.6042 | 0.5449 | 0.5161 | 0.5006 | 0.4874 | 0.4854 |
| 1.8            | 0.5883 | 0.5365 | 0.5120 | 0.4985 | 0.4867 | 0.4840 |
| 1.9            | 0.5823 | 0.5291 | 0.5094 | 0.4963 | 0.4860 | 0.4825 |
| 2.0            | 0.5763 | 0.5235 | 0.5079 | 0.4941 | 0.4853 | 0.4811 |
| 2.1            | 0.5704 | 0.5198 | 0.5064 | 0.4939 | 0.4846 | 0.4798 |
| 2.2            | 0.5644 | 0.5166 | 0.5050 | 0.4936 | 0.4839 | 0.4795 |
| 2.3            | 0.5590 | 0.5135 | 0.5035 | 0.4933 | 0.4831 | 0.4791 |
| 2.4            | 0.5541 | 0.5104 | 0.5020 | 0.4931 | 0.4824 | 0.4788 |
| 2.5            | 0.5494 | 0.5073 | 0.5005 | 0.4928 | 0.4817 | 0.4785 |
| 2.6            | 0.5452 | 0.5042 | 0.4991 | 0.4925 | 0.4810 | 0.4781 |
| 2.7            | 0.5410 | 0.5027 | 0.4976 | 0.4923 | 0.4803 | 0.4778 |
| 2.8            | 0.5376 | 0.5014 | 0.4961 | 0.4920 | 0.4793 | 0.4775 |
| 2.9            | 0.5349 | 0.5002 | 0.4946 | 0.4917 | 0.4788 | 0.4772 |
| 3.0            | 0.5323 | 0.4989 | 0.4941 | 0.4914 | 0.4781 | 0.4768 |

Tabel A.12 –  
Koefisien peneduh efektif untuk proyeksi vertikal pada berbagai  
sudut kemiringan  
Orientasi : Tenggara dan Barat Daya

| R <sub>i</sub> | 0°     | 10°    | 20°    | 30°    | 40°    | 50°    |
|----------------|--------|--------|--------|--------|--------|--------|
| 0.1            | 0.9528 | 0.9457 | 0.9396 | 0.9351 | 0.9317 | 0.9304 |
| 0.2            | 0.9081 | 0.8938 | 0.8815 | 0.8724 | 0.8654 | 0.8624 |
| 0.3            | 0.8650 | 0.8437 | 0.8253 | 0.8113 | 0.8005 | 0.7955 |
| 0.4            | 0.8257 | 0.7988 | 0.7748 | 0.7555 | 0.7395 | 0.7307 |
| 0.5            | 0.7907 | 0.7570 | 0.7269 | 0.7029 | 0.6829 | 0.6715 |
| 0.6            | 0.7561 | 0.7153 | 0.6791 | 0.6504 | 0.6264 | 0.6127 |
| 0.7            | 0.7229 | 0.6743 | 0.6313 | 0.5978 | 0.5698 | 0.5539 |
| 0.8            | 0.6897 | 0.6342 | 0.5861 | 0.5629 | 0.5412 | 0.5242 |
| 0.9            | 0.6565 | 0.5987 | 0.5700 | 0.5474 | 0.5235 | 0.5045 |
| 1.0            | 0.6233 | 0.5663 | 0.5584 | 0.5324 | 0.5059 | 0.4850 |
| 1.1            | 0.6056 | 0.5771 | 0.5470 | 0.5185 | 0.4894 | 0.4737 |
| 1.2            | 0.5983 | 0.5685 | 0.5357 | 0.5046 | 0.4792 | 0.4670 |
| 1.3            | 0.5915 | 0.5599 | 0.5244 | 0.4946 | 0.4717 | 0.4627 |
| 1.4            | 0.5853 | 0.5513 | 0.5130 | 0.4882 | 0.4677 | 0.4586 |
| 1.5            | 0.5791 | 0.5427 | 0.5037 | 0.4831 | 0.4642 | 0.4572 |
| 1.6            | 0.5730 | 0.5341 | 0.4966 | 0.4790 | 0.4612 | 0.4557 |
| 1.7            | 0.5668 | 0.5255 | 0.4915 | 0.4771 | 0.4583 | 0.4543 |
| 1.8            | 0.5606 | 0.5169 | 0.4876 | 0.4752 | 0.4577 | 0.4528 |
| 1.9            | 0.5547 | 0.5096 | 0.4836 | 0.4734 | 0.4571 | 0.4514 |
| 2.0            | 0.5499 | 0.5043 | 0.4796 | 0.4715 | 0.4565 | 0.4499 |
| 2.1            | 0.5451 | 0.5000 | 0.4772 | 0.4696 | 0.4558 | 0.4485 |
| 2.2            | 0.5403 | 0.4938 | 0.4757 | 0.4677 | 0.4552 | 0.4471 |
| 2.3            | 0.5355 | 0.4909 | 0.4741 | 0.4662 | 0.4546 | 0.4456 |
| 2.4            | 0.5307 | 0.4879 | 0.4726 | 0.4661 | 0.4540 | 0.4446 |
| 2.5            | 0.5258 | 0.4850 | 0.4711 | 0.4660 | 0.4534 | 0.4443 |
| 2.6            | 0.5210 | 0.4820 | 0.4695 | 0.4659 | 0.4528 | 0.4439 |
| 2.7            | 0.5168 | 0.4790 | 0.4680 | 0.4658 | 0.4522 | 0.4435 |
| 2.8            | 0.5135 | 0.4761 | 0.4665 | 0.4657 | 0.4516 | 0.4432 |
| 2.9            | 0.5110 | 0.4735 | 0.4649 | 0.4656 | 0.4510 | 0.4429 |
| 3.0            | 0.5084 | 0.4715 | 0.4634 | 0.4655 | 0.4504 | 0.4429 |

**Tabel A.13 –**  
**Koefisien Peneduh Efektif untuk Peneduh berbentuk Kotak**  
**(Egg-Crate Louvers) dengan berbagai Sudut Kemiringan Peneduh Sirip Horizontal**  
**Orientasi : Utara dan Selatan**

| R <sub>1</sub> | R <sub>2</sub> | 0°     | 10°    | 20°    | 30°    | 40°    |
|----------------|----------------|--------|--------|--------|--------|--------|
| 0.2            | 0.2            | 0.8125 | 0.8053 | 0.8011 | 0.8002 | 0.8025 |
| 0.2            | 0.4            | 0.7476 | 0.7432 | 0.7409 | 0.7409 | 0.7431 |
| 0.2            | 0.6            | 0.7086 | 0.7059 | 0.7047 | 0.7050 | 0.7068 |
| 0.2            | 0.8            | 0.6945 | 0.6926 | 0.6917 | 0.6920 | 0.6934 |
| 0.2            | 1.0            | 0.6850 | 0.6836 | 0.6829 | 0.5832 | 0.6843 |
| 0.2            | 1.2            | 0.6802 | 0.6790 | 0.6785 | 0.6787 | 0.6796 |
| 0.2            | 1.4            | 0.6779 | 0.6768 | 0.6764 | 0.6766 | 0.6774 |
| 0.2            | 1.6            | 0.6756 | 0.6747 | 0.6743 | 0.6744 | 0.6752 |
| 0.2            | 1.8            | 0.6733 | 0.6725 | 0.6722 | 0.6723 | 0.6729 |
| 0.4            | 0.2            | 0.7284 | 0.7070 | 0.7002 | 0.6977 | 0.6995 |
| 0.4            | 0.4            | 0.6808 | 0.6747 | 0.6716 | 0.6709 | 0.6727 |
| 0.4            | 0.6            | 0.6631 | 0.6604 | 0.6593 | 0.6594 | 0.6605 |
| 0.4            | 0.8            | 0.6601 | 0.6586 | 0.6581 | 0.6581 | 0.6587 |
| 0.4            | 1.0            | 0.6587 | 0.6580 | 0.6578 | 0.6578 | 0.6580 |
| 0.4            | 1.2            | 0.6582 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 0.4            | 1.4            | 0.6581 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 0.4            | 1.6            | 0.6581 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 0.4            | 1.8            | 0.6581 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 0.6            | 0.2            | 0.6840 | 0.6769 | 0.6728 | 0.6703 | 0.6687 |
| 0.6            | 0.4            | 0.6638 | 0.6618 | 0.6608 | 0.6602 | 0.6599 |
| 0.6            | 0.6            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 0.6            | 0.8            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 0.6            | 1.0            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 0.6            | 1.2            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 0.6            | 1.4            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 0.6            | 1.6            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 0.6            | 1.8            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |

Tabel A.13 – (lanjutan)

| R <sub>1</sub> | R <sub>2</sub> | 0°     | 10°    | 20°    | 30°    | 40°    |
|----------------|----------------|--------|--------|--------|--------|--------|
| 0.8            | 0.2            | 0.6740 | 0.6688 | 0.6645 | 0.6622 | 0.6612 |
| 0.8            | 0.4            | 0.6609 | 0.6598 | 0.6589 | 0.6584 | 0.6583 |
| 0.8            | 0.6            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 0.8            | 0.8            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 0.8            | 1.0            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 0.8            | 1.2            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 0.8            | 1.4            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 0.8            | 1.6            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 0.8            | 1.8            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.0            | 0.2            | 0.6681 | 0.6638 | 0.6619 | 0.6603 | 0.6590 |
| 1.0            | 0.4            | 0.6595 | 0.6586 | 0.6584 | 0.6581 | 0.6579 |
| 1.0            | 0.6            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.0            | 0.8            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.0            | 1.0            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.0            | 1.2            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.0            | 1.4            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.0            | 1.6            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.0            | 1.8            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.2            | 0.2            | 0.6651 | 0.6626 | 0.6603 | 0.6584 | 0.6577 |
| 1.2            | 0.4            | 0.6588 | 0.6585 | 0.6581 | 0.6578 | 0.6577 |
| 1.2            | 0.6            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.2            | 0.8            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.2            | 1.0            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.2            | 1.2            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.2            | 1.4            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.2            | 1.6            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.2            | 1.8            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |

| R <sub>1</sub> | R <sub>2</sub> | 0°     | 10°    | 20°    | 30°    | 40°    |
|----------------|----------------|--------|--------|--------|--------|--------|
| 1.4            | 0.2            | 0.6642 | 0.6613 | 0.6587 | 0.6577 | 0.6577 |
| 1.4            | 0.4            | 0.6587 | 0.6583 | 0.6579 | 0.6577 | 0.6577 |
| 1.4            | 0.6            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.4            | 0.8            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.4            | 1.0            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.4            | 1.2            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.4            | 1.4            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.4            | 1.6            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.4            | 1.8            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.6            | 0.2            | 0.6634 | 0.6601 | 0.6580 | 0.6577 | 0.6577 |
| 1.6            | 0.4            | 0.6586 | 0.6581 | 0.6578 | 0.6577 | 0.6577 |
| 1.6            | 0.6            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.6            | 0.8            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.6            | 1.0            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.6            | 1.2            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.6            | 1.4            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.6            | 1.6            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.6            | 1.8            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.8            | 0.2            | 0.6626 | 0.6589 | 0.6577 | 0.6577 | 0.6577 |
| 1.8            | 0.4            | 0.6584 | 0.6579 | 0.6577 | 0.6577 | 0.6577 |
| 1.8            | 0.6            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.8            | 0.8            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.8            | 1.0            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.8            | 1.2            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.8            | 1.4            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.8            | 1.6            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |
| 1.8            | 1.8            | 0.6577 | 0.6577 | 0.6577 | 0.6577 | 0.6577 |

**Koefisien Peneduh Efektif untuk Peneduh berbentuk Kotak (*Egg-Crate Louvers*) dengan berbagai Sudut Kemiringan Peneduh Sirip Horizontal  
Orientasi : Timur dan Barat**

| R <sub>1</sub> | R <sub>2</sub> | 0°     | 10°    | 20°    | 30°    | 40°     |
|----------------|----------------|--------|--------|--------|--------|---------|
| 0.2            | 0.2            | 0.8482 | 0.8308 | 0.8165 | 0.8064 | 0.8013  |
| 0.2            | 0.4            | 0.8212 | 0.8047 | 0.7914 | 0.7818 | 0.7769  |
| 0.2            | 0.6            | 0.7942 | 0.7788 | 0.7663 | 0.7572 | 0.75258 |
| 0.2            | 0.8            | 0.7672 | 0.7529 | 0.7412 | 0.7327 | 0.7282  |
| 0.2            | 1.0            | 0.7417 | 0.7284 | 0.7175 | 0.7095 | 0.7052  |
| 0.2            | 1.2            | 0.7190 | 0.7068 | 0.6965 | 0.6890 | 0.6850  |
| 0.2            | 1.4            | 0.6968 | 0.6852 | 0.6758 | 0.6688 | 0.6652  |
| 0.2            | 1.6            | 0.6786 | 0.6677 | 0.6589 | 0.6524 | 0.6490  |
| 0.2            | 1.8            | 0.6626 | 0.6523 | 0.6440 | 0.6379 | 0.6348  |
| 0.4            | 0.2            | 0.7513 | 0.7162 | 0.6883 | 0.6678 | 0.6556  |
| 0.4            | 0.4            | 0.7323 | 0.6993 | 0.6730 | 0.6535 | 0.6418  |
| 0.4            | 0.6            | 0.7133 | 0.6825 | 0.6577 | 0.6393 | 0.6280  |
| 0.4            | 0.8            | 0.6943 | 0.6658 | 0.6424 | 0.6251 | 0.6143  |
| 0.4            | 1.0            | 0.6754 | 0.6488 | 0.6271 | 0.6108 | 0.6006  |
| 0.4            | 1.2            | 0.6570 | 0.6322 | 0.6118 | 0.5967 | 0.5871  |
| 0.4            | 1.4            | 0.6389 | 0.6158 | 0.5968 | 0.5827 | 0.5738  |
| 0.4            | 1.6            | 0.6235 | 0.6017 | 0.5840 | 0.5708 | 0.5625  |
| 0.4            | 1.8            | 0.6096 | 0.5890 | 0.5723 | 0.5599 | 0.5523  |
| 0.6            | 0.2            | 0.6768 | 0.6307 | 0.5717 | 0.5611 | 0.5398  |
| 0.6            | 0.4            | 0.6626 | 0.6190 | 0.5822 | 0.5532 | 0.5329  |
| 0.6            | 0.6            | 0.6483 | 0.6073 | 0.5726 | 0.5452 | 0.5260  |
| 0.6            | 0.8            | 0.6341 | 0.5958 | 0.5630 | 0.5372 | 0.5191  |
| 0.6            | 1.0            | 0.6198 | 0.5840 | 0.5535 | 0.5293 | 0.5121  |
| 0.6            | 1.2            | 0.6056 | 0.5723 | 0.5439 | 0.5213 | 0.5052  |
| 0.6            | 1.4            | 0.5915 | 0.5607 | 0.5344 | 0.5134 | 0.4984  |
| 0.6            | 1.6            | 0.5788 | 0.5500 | 0.5254 | 0.5058 | 0.4917  |
| 0.6            | 1.8            | 0.5668 | 0.5398 | 0.5167 | 0.4983 | 0.4852  |

| R <sub>1</sub> | R <sub>2</sub> | 0°     | 10°    | 20°    | 30°    | 40°    |
|----------------|----------------|--------|--------|--------|--------|--------|
| 0.8            | 0.2            | 0.6135 | 0.5615 | 0.5215 | 0.4881 | 0.4622 |
| 0.8            | 0.4            | 0.6033 | 0.5537 | 0.5157 | 0.4839 | 0.4593 |
| 0.8            | 0.6            | 0.5931 | 0.5459 | 0.5099 | 0.4798 | 0.4564 |
| 0.8            | 0.8            | 0.5829 | 0.5381 | 0.5041 | 0.4756 | 0.4534 |
| 0.8            | 1.0            | 0.5727 | 0.5304 | 0.4983 | 0.4714 | 0.4505 |
| 0.8            | 1.2            | 0.5625 | 0.5226 | 0.4925 | 0.4673 | 0.4476 |
| 0.8            | 1.4            | 0.5523 | 0.5148 | 0.4867 | 0.4631 | 0.4447 |
| 0.8            | 1.6            | 0.5421 | 0.5070 | 0.4809 | 0.4589 | 0.4418 |
| 0.8            | 1.8            | 0.5320 | 0.4992 | 0.4751 | 0.4548 | 0.4389 |
| 1.0            | 0.2            | 0.5744 | 0.5178 | 0.4695 | 0.4422 | 0.4212 |
| 1.0            | 0.4            | 0.5661 | 0.5123 | 0.4663 | 0.4401 | 0.4201 |
| 1.0            | 0.6            | 0.5578 | 0.5068 | 0.4631 | 0.4381 | 0.4191 |
| 1.0            | 0.8            | 0.5495 | 0.5014 | 0.4599 | 0.4361 | 0.4180 |
| 1.0            | 1.0            | 0.5412 | 0.4959 | 0.4567 | 0.4341 | 0.4170 |
| 1.0            | 1.2            | 0.5329 | 0.4904 | 0.4535 | 0.4321 | 0.4159 |
| 1.0            | 1.4            | 0.5246 | 0.4849 | 0.4503 | 0.4301 | 0.4149 |
| 1.0            | 1.6            | 0.5163 | 0.4795 | 0.4471 | 0.4280 | 0.4138 |
| 1.0            | 1.8            | 0.5080 | 0.4740 | 0.4439 | 0.4260 | 0.4128 |
| 1.2            | 0.2            | 0.5420 | 0.4791 | 0.4447 | 0.4144 | 0.4033 |
| 1.2            | 0.4            | 0.5354 | 0.4754 | 0.4426 | 0.4137 | 0.4030 |
| 1.2            | 0.6            | 0.5289 | 0.4717 | 0.4405 | 0.4130 | 0.4027 |
| 1.2            | 0.8            | 0.5223 | 0.4680 | 0.4384 | 0.4123 | 0.4024 |
| 1.2            | 1.0            | 0.5158 | 0.4643 | 0.4363 | 0.4117 | 0.4021 |
| 1.2            | 1.2            | 0.5092 | 0.4606 | 0.4342 | 0.4110 | 0.4018 |
| 1.2            | 1.4            | 0.5027 | 0.4569 | 0.4321 | 0.4103 | 0.4015 |
| 1.2            | 1.6            | 0.4961 | 0.4532 | 0.4300 | 0.4096 | 0.4012 |
| 1.2            | 1.8            | 0.4896 | 0.4495 | 0.4279 | 0.4089 | 0.4009 |

| R <sub>1</sub> | R <sub>2</sub> | 0°     | 10°    | 20°    | 30°    | 40°    |
|----------------|----------------|--------|--------|--------|--------|--------|
| 1.4            | 0.2            | 0.5107 | 0.4621 | 0.4220 | 0.4055 | 0.3969 |
| 1.4            | 0.4            | 0.5058 | 0.4592 | 0.4210 | 0.4051 | 0.3969 |
| 1.4            | 0.6            | 0.5008 | 0.4563 | 0.4200 | 0.4047 | 0.3969 |
| 1.4            | 0.8            | 0.4959 | 0.4535 | 0.4190 | 0.4043 | 0.3969 |
| 1.4            | 1.0            | 0.4910 | 0.4506 | 0.4180 | 0.4039 | 0.3969 |
| 1.4            | 1.2            | 0.4860 | 0.4477 | 0.4170 | 0.4035 | 0.3969 |
| 1.4            | 1.4            | 0.4811 | 0.4449 | 0.4160 | 0.4031 | 0.3969 |
| 1.4            | 1.6            | 0.4762 | 0.4420 | 0.4150 | 0.4028 | 0.3969 |
| 1.4            | 1.8            | 0.4712 | 0.4391 | 0.4140 | 0.4024 | 0.3969 |
| 1.6            | 0.2            | 0.4951 | 0.4451 | 0.4117 | 0.3998 | 0.3963 |
| 1.6            | 0.4            | 0.4907 | 0.4431 | 0.4110 | 0.3997 | 0.3963 |
| 1.6            | 0.6            | 0.4863 | 0.4410 | 0.4103 | 0.3996 | 0.3963 |
| 1.6            | 0.8            | 0.4820 | 0.4390 | 0.4098 | 0.3995 | 0.3963 |
| 1.6            | 1.0            | 0.4776 | 0.4369 | 0.4089 | 0.3994 | 0.3963 |
| 1.6            | 1.2            | 0.4732 | 0.4349 | 0.4083 | 0.3993 | 0.3963 |
| 1.6            | 1.4            | 0.4688 | 0.4329 | 0.4076 | 0.3992 | 0.3963 |
| 1.6            | 1.6            | 0.4644 | 0.4308 | 0.4069 | 0.3991 | 0.3963 |
| 1.6            | 1.8            | 0.4600 | 0.4288 | 0.4062 | 0.3990 | 0.3963 |
| 1.8            | 0.2            | 0.4844 | 0.4281 | 0.4075 | 0.3963 | 0.3963 |
| 1.8            | 0.4            | 0.4805 | 0.4269 | 0.4070 | 0.3963 | 0.3963 |
| 1.8            | 0.6            | 0.4767 | 0.4257 | 0.4065 | 0.3963 | 0.3963 |
| 1.8            | 0.8            | 0.4728 | 0.4245 | 0.4061 | 0.3963 | 0.3963 |
| 1.8            | 1.0            | 0.4690 | 0.4233 | 0.4056 | 0.3963 | 0.3963 |
| 1.8            | 1.2            | 0.4651 | 0.4221 | 0.4051 | 0.3963 | 0.3963 |
| 1.8            | 1.4            | 0.4613 | 0.4208 | 0.4047 | 0.3963 | 0.3963 |
| 1.8            | 1.6            | 0.4574 | 0.4196 | 0.4042 | 0.3963 | 0.3963 |
| 1.8            | 1.8            | 0.4536 | 0.4184 | 0.4037 | 0.3963 | 0.3963 |

Tabel A.15 –  
Koefisien Peneduh Efektif untuk Peneduh berbentuk Kotak (*Egg-Crate Louvers*) dengan berbagai Sudut Kemiringan Peneduh Sirip Horizontal  
Orientasi : Timur Laut & Barat Laut

SNI 6389:2011

| R <sub>1</sub> | R <sub>2</sub> | 0°     | 10°    | 20°    | 30°    | 40°    |
|----------------|----------------|--------|--------|--------|--------|--------|
| 0.2            | 0.2            | 0.8019 | 0.7886 | 0.7788 | 0.7727 | 0.7705 |
| 0.2            | 0.4            | 0.7439 | 0.7331 | 0.7250 | 0.7198 | 0.7178 |
| 0.2            | 0.6            | 0.6944 | 0.6857 | 0.6790 | 0.6746 | 0.6727 |
| 0.2            | 0.8            | 0.6452 | 0.6384 | 0.6332 | 0.6298 | 0.6281 |
| 0.2            | 1.0            | 0.6024 | 0.5973 | 0.5935 | 0.5909 | 0.5897 |
| 0.2            | 1.2            | 0.5626 | 0.5880 | 0.5844 | 0.5820 | 0.5809 |
| 0.2            | 1.4            | 0.5829 | 0.5786 | 0.5754 | 0.5732 | 0.5722 |
| 0.2            | 1.6            | 0.5732 | 0.5693 | 0.5663 | 0.5644 | 0.5635 |
| 0.2            | 1.8            | 0.5634 | 0.5599 | 0.5573 | 0.5555 | 0.5548 |
| 0.4            | 0.2            | 0.7138 | 0.6898 | 0.6709 | 0.6573 | 0.6494 |
| 0.4            | 0.4            | 0.6724 | 0.6527 | 0.6371 | 0.6258 | 0.6192 |
| 0.4            | 0.6            | 0.6369 | 0.6207 | 0.6079 | 0.5986 | 0.5933 |
| 0.4            | 0.8            | 0.6013 | 0.5887 | 0.5787 | 0.5715 | 0.5673 |
| 0.4            | 1.0            | 0.5688 | 0.5593 | 0.5519 | 0.5466 | 0.5436 |
| 0.4            | 1.2            | 0.5613 | 0.5524 | 0.5455 | 0.5407 | 0.5380 |
| 0.4            | 1.4            | 0.5537 | 0.5456 | 0.5392 | 0.5348 | 0.5325 |
| 0.4            | 1.6            | 0.5462 | 0.5387 | 0.5329 | 0.5290 | 0.5270 |
| 0.4            | 1.8            | 0.5386 | 0.5318 | 0.5266 | 0.5231 | 0.5214 |
| 0.6            | 0.2            | 0.6479 | 0.6186 | 0.5951 | 0.5766 | 0.5636 |
| 0.6            | 0.4            | 0.6178 | 0.5934 | 0.5741 | 0.5588 | 0.5481 |
| 0.6            | 0.6            | 0.5920 | 0.5718 | 0.5560 | 0.5435 | 0.5348 |
| 0.6            | 0.8            | 0.5663 | 0.5502 | 0.5379 | 0.5282 | 0.5214 |
| 0.6            | 1.0            | 0.5416 | 0.5294 | 0.5204 | 0.5134 | 0.5085 |
| 0.6            | 1.2            | 0.5353 | 0.5240 | 0.5159 | 0.5095 | 0.5051 |
| 0.6            | 1.4            | 0.5289 | 0.5186 | 0.5113 | 0.5056 | 0.5018 |
| 0.6            | 1.6            | 0.5225 | 0.5132 | 0.5067 | 0.5017 | 0.4984 |
| 0.6            | 1.8            | 0.5161 | 0.5078 | 0.5022 | 0.4979 | 0.4950 |

| R <sub>1</sub> | R <sub>2</sub> | 0°     | 10°    | 20°    | 30°    | 40°    |
|----------------|----------------|--------|--------|--------|--------|--------|
| 0.8            | 0.2            | 0.6089 | 0.5719 | 0.5445 | 0.5270 | 0.5133 |
| 0.8            | 0.4            | 0.5855 | 0.5551 | 0.5328 | 0.5182 | 0.5067 |
| 0.8            | 0.6            | 0.5652 | 0.5403 | 0.5225 | 0.5104 | 0.5010 |
| 0.8            | 0.8            | 0.5449 | 0.5255 | 0.5122 | 0.5027 | 0.4952 |
| 0.8            | 1.0            | 0.5252 | 0.5109 | 0.5019 | 0.4949 | 0.4895 |
| 0.8            | 1.2            | 0.5199 | 0.5070 | 0.4989 | 0.4927 | 0.4879 |
| 0.8            | 1.4            | 0.5147 | 0.5030 | 0.4960 | 0.4905 | 0.4863 |
| 0.8            | 1.6            | 0.5095 | 0.4991 | 0.4930 | 0.4883 | 0.4847 |
| 0.8            | 1.8            | 0.5042 | 0.4952 | 0.4900 | 0.4861 | 0.4831 |
| 1.0            | 0.2            | 0.5750 | 0.5440 | 0.5183 | 0.5005 | 0.4878 |
| 1.0            | 0.4            | 0.5579 | 0.5321 | 0.5105 | 0.4960 | 0.4856 |
| 1.0            | 0.6            | 0.5429 | 0.5218 | 0.5039 | 0.4922 | 0.4839 |
| 1.0            | 0.8            | 0.5279 | 0.5114 | 0.4972 | 0.4884 | 0.4822 |
| 1.0            | 1.0            | 0.5129 | 0.5010 | 0.4905 | 0.4847 | 0.4805 |
| 1.0            | 1.2            | 0.5087 | 0.4981 | 0.4888 | 0.4836 | 0.4799 |
| 1.0            | 1.4            | 0.5045 | 0.4952 | 0.4870 | 0.4825 | 0.4793 |
| 1.0            | 1.6            | 0.5002 | 0.4922 | 0.4852 | 0.4814 | 0.4787 |
| 1.0            | 1.8            | 0.4960 | 0.4893 | 0.4834 | 0.4803 | 0.4781 |
| 1.2            | 0.2            | 0.5577 | 0.5232 | 0.5002 | 0.4857 | 0.4802 |
| 1.2            | 0.4            | 0.5434 | 0.5144 | 0.4958 | 0.4838 | 0.4795 |
| 1.2            | 0.6            | 0.5309 | 0.5069 | 0.4922 | 0.4822 | 0.4787 |
| 1.2            | 0.8            | 0.5185 | 0.4994 | 0.4888 | 0.4806 | 0.4780 |
| 1.2            | 1.0            | 0.5060 | 0.4919 | 0.4850 | 0.4789 | 0.4773 |
| 1.2            | 1.2            | 0.5025 | 0.4900 | 0.4839 | 0.4785 | 0.4771 |
| 1.2            | 1.4            | 0.4990 | 0.4880 | 0.4827 | 0.4781 | 0.4769 |
| 1.2            | 1.6            | 0.4955 | 0.4860 | 0.4816 | 0.4777 | 0.4767 |
| 1.2            | 1.8            | 0.4919 | 0.4840 | 0.4804 | 0.4773 | 0.4765 |

Tabel A.15 – (lanjutan)

| R <sub>1</sub> | R <sub>2</sub> | 0°     | 10°    | 20°    | 30°    | 40°    |
|----------------|----------------|--------|--------|--------|--------|--------|
| 1.4            | 0.2            | 0.5424 | 0.5101 | 0.4894 | 0.4851 | 0.4750 |
| 1.4            | 0.4            | 0.5303 | 0.5039 | 0.4868 | 0.4805 | 0.4750 |
| 1.4            | 0.6            | 0.5199 | 0.4987 | 0.4846 | 0.4796 | 0.4750 |
| 1.4            | 0.8            | 0.5095 | 0.4936 | 0.4825 | 0.4786 | 0.4750 |
| 1.4            | 1.0            | 0.4991 | 0.4884 | 0.4803 | 0.4777 | 0.4750 |
| 1.4            | 1.2            | 0.4963 | 0.4868 | 0.4797 | 0.4774 | 0.4750 |
| 1.4            | 1.4            | 0.4935 | 0.4853 | 0.4791 | 0.4772 | 0.4750 |
| 1.4            | 1.6            | 0.4907 | 0.4837 | 0.4785 | 0.4770 | 0.4750 |
| 1.4            | 1.8            | 0.4879 | 0.4821 | 0.4779 | 0.4767 | 0.4750 |
| 1.6            | 0.2            | 0.5310 | 0.4994 | 0.4856 | 0.477  | 0.4750 |
| 1.6            | 0.4            | 0.5208 | 0.4952 | 0.4838 | 0.4774 | 0.4750 |
| 1.6            | 0.6            | 0.5122 | 0.4917 | 0.4822 | 0.4771 | 0.4750 |
| 1.6            | 0.8            | 0.5036 | 0.4883 | 0.4806 | 0.4768 | 0.4750 |
| 1.6            | 1.0            | 0.4949 | 0.4848 | 0.4790 | 0.4765 | 0.4750 |
| 1.6            | 1.2            | 0.4926 | 0.4837 | 0.4785 | 0.4764 | 0.4750 |
| 1.6            | 1.4            | 0.4902 | 0.4825 | 0.4781 | 0.4763 | 0.4750 |
| 1.6            | 1.6            | 0.4879 | 0.4814 | 0.4777 | 0.4762 | 0.4750 |
| 1.6            | 1.8            | 0.4855 | 0.4803 | 0.4773 | 0.4761 | 0.4750 |
| 1.8            | 0.2            | 0.5221 | 0.4930 | 0.4826 | 0.4759 | 0.4750 |
| 1.8            | 0.4            | 0.5137 | 0.4897 | 0.4815 | 0.4759 | 0.4750 |
| 1.8            | 0.6            | 0.5067 | 0.4869 | 0.4803 | 0.4759 | 0.4750 |
| 1.8            | 0.8            | 0.4997 | 0.4841 | 0.4792 | 0.4759 | 0.4750 |
| 1.8            | 1.0            | 0.4926 | 0.4813 | 0.4780 | 0.4759 | 0.4750 |
| 1.8            | 1.2            | 0.4906 | 0.4806 | 0.4777 | 0.4759 | 0.4750 |
| 1.8            | 1.4            | 0.4885 | 0.4798 | 0.4775 | 0.4759 | 0.4750 |
| 1.8            | 1.6            | 0.4864 | 0.4791 | 0.4772 | 0.4759 | 0.4750 |
| 1.8            | 1.8            | 0.4843 | 0.4784 | 0.4769 | 0.4759 | 0.4750 |

**Tabel A.16 –  
Koefisien Peneduh Efektif untuk Peneduh berbentuk Kotak (*Egg-Crate Louvers*) dengan berbagai Sudut Kemiringan Peneduh Sirip Horizontal  
Orientasi : Tenggara & Barat Daya**

| <b>R<sub>1</sub></b> | <b>R<sub>2</sub></b> | <b>0°</b> | <b>10°</b> | <b>20°</b> | <b>30°</b> | <b>40°</b> |
|----------------------|----------------------|-----------|------------|------------|------------|------------|
| 0.2                  | 0.2                  | 0.7951    | 0.7808     | 0.7702     | 0.7634     | 0.7608     |
| 0.2                  | 0.4                  | 0.7351    | 0.7233     | 0.7144     | 0.7087     | 0.7064     |
| 0.2                  | 0.6                  | 0.6842    | 0.6745     | 0.6672     | 0.6623     | 0.6602     |
| 0.2                  | 0.8                  | 0.6340    | 0.6264     | 0.6205     | 0.6167     | 0.6149     |
| 0.2                  | 1.0                  | 0.5838    | 0.5782     | 0.5739     | 0.5710     | 0.5696     |
| 0.2                  | 1.2                  | 0.5669    | 0.5620     | 0.5581     | 0.5555     | 0.5542     |
| 0.2                  | 1.4                  | 0.5570    | 0.5525     | 0.5489     | 0.5465     | 0.5453     |
| 0.2                  | 1.6                  | 0.5471    | 0.5430     | 0.5397     | 0.5475     | 0.5364     |
| 0.2                  | 1.8                  | 0.5372    | 0.5334     | 0.5305     | 0.5285     | 0.5275     |
| 0.4                  | 0.2                  | 0.6979    | 0.6713     | 0.6510     | 0.5356     | 0.6285     |
| 0.4                  | 0.4                  | 0.6555    | 0.6334     | 0.6165     | 0.5044     | 0.5977     |
| 0.4                  | 0.6                  | 0.6193    | 0.6008     | 0.5868     | 0.5768     | 0.5713     |
| 0.4                  | 0.8                  | 0.5831    | 0.5683     | 0.5572     | 0.5492     | 0.5449     |
| 0.4                  | 1.0                  | 0.5469    | 0.5358     | 0.5275     | 0.5216     | 0.5185     |
| 0.4                  | 1.2                  | 0.5361    | 0.5263     | 0.5188     | 0.5135     | 0.5107     |
| 0.4                  | 1.4                  | 0.5286    | 0.5196     | 0.5127     | 0.5078     | 0.5053     |
| 0.4                  | 1.6                  | 0.5212    | 0.5129     | 0.5066     | 0.5022     | 0.4999     |
| 0.4                  | 1.8                  | 0.5137    | 0.5063     | 0.5005     | 0.4965     | 0.4944     |
| 0.6                  | 0.2                  | 0.6266    | 0.5923     | 0.5677     | 0.5483     | 0.5347     |
| 0.6                  | 0.4                  | 0.5959    | 0.5670     | 0.5466     | 0.5305     | 0.5192     |
| 0.6                  | 0.6                  | 0.5694    | 0.5452     | 0.5283     | 0.5150     | 0.5057     |
| 0.6                  | 0.8                  | 0.5430    | 0.5235     | 0.5101     | 0.4996     | 0.4923     |
| 0.6                  | 1.0                  | 0.5166    | 0.5018     | 0.4919     | 0.4842     | 0.4788     |
| 0.6                  | 1.2                  | 0.5091    | 0.4957     | 0.4868     | 0.4798     | 0.4751     |
| 0.6                  | 1.4                  | 0.5030    | 0.4905     | 0.4824     | 0.4761     | 0.4718     |
| 0.6                  | 1.6                  | 0.4969    | 0.4853     | 0.4780     | 0.4723     | 0.4685     |
| 0.6                  | 1.8                  | 0.4907    | 0.4801     | 0.4736     | 0.4685     | 0.4652     |

Tabel A.16 – (lanjutan)

| R <sub>1</sub> | R <sub>2</sub> | 0°     | 10°    | 20°    | 30°    | 40°    |
|----------------|----------------|--------|--------|--------|--------|--------|
| 0.8            | 0.2            | 0.5821 | 0.5434 | 0.5133 | 0.4354 | 0.4814 |
| 0.8            | 0.4            | 0.5586 | 0.5284 | 0.5016 | 0.4865 | 0.4747 |
| 0.8            | 0.6            | 0.5381 | 0.5114 | 0.4912 | 0.4787 | 0.4689 |
| 0.8            | 0.8            | 0.5176 | 0.4964 | 0.4808 | 0.4709 | 0.4631 |
| 0.8            | 1.0            | 0.4971 | 0.4815 | 0.4705 | 0.4630 | 0.4573 |
| 0.8            | 1.2            | 0.4914 | 0.4773 | 0.4675 | 0.4609 | 0.4557 |
| 0.8            | 1.4            | 0.4863 | 0.4734 | 0.4646 | 0.4587 | 0.4541 |
| 0.8            | 1.6            | 0.4812 | 0.4695 | 0.4616 | 0.4565 | 0.4525 |
| 0.8            | 1.8            | 0.4761 | 0.4656 | 0.4587 | 0.4543 | 0.4509 |
| 1.0            | 0.2            | 0.5448 | 0.5129 | 0.4864 | 0.4682 | 0.4552 |
| 1.0            | 0.4            | 0.5277 | 0.5009 | 0.4786 | 0.4637 | 0.4531 |
| 1.0            | 0.6            | 0.5125 | 0.4904 | 0.4719 | 0.4599 | 0.4514 |
| 1.0            | 0.8            | 0.4973 | 0.4800 | 0.4652 | 0.4561 | 0.4497 |
| 1.0            | 1.0            | 0.4822 | 0.4695 | 0.4585 | 0.4523 | 0.4480 |
| 1.0            | 1.2            | 0.4779 | 0.4666 | 0.4566 | 0.4512 | 0.4474 |
| 1.0            | 1.4            | 0.4738 | 0.4637 | 0.4548 | 0.4501 | 0.4468 |
| 1.0            | 1.6            | 0.4696 | 0.4608 | 0.4530 | 0.4490 | 0.4461 |
| 1.0            | 1.8            | 0.4654 | 0.4579 | 0.4512 | 0.4478 | 0.4455 |
| 1.2            | 0.2            | 0.5269 | 0.4915 | 0.4679 | 0.4532 | 0.4471 |
| 1.2            | 0.4            | 0.5125 | 0.4827 | 0.4636 | 0.4513 | 0.4464 |
| 1.2            | 0.6            | 0.5000 | 0.4751 | 0.4600 | 0.4497 | 0.4457 |
| 1.2            | 0.8            | 0.4874 | 0.4675 | 0.4564 | 0.4481 | 0.4450 |
| 1.2            | 1.0            | 0.4748 | 0.4600 | 0.4528 | 0.4465 | 0.4443 |
| 1.2            | 1.2            | 0.4713 | 0.4579 | 0.4516 | 0.4461 | 0.4441 |
| 1.2            | 1.4            | 0.4648 | 0.4559 | 0.4504 | 0.4456 | 0.4439 |
| 1.2            | 1.6            | 0.4643 | 0.4539 | 0.4493 | 0.4452 | 0.4438 |
| 1.2            | 1.8            | 0.4608 | 0.4519 | 0.4481 | 0.4447 | 0.4436 |

| R <sub>1</sub> | R <sub>2</sub> | 0°     | 10°    | 20°    | 30°    | 40°    |
|----------------|----------------|--------|--------|--------|--------|--------|
| 1.4            | 0.2            | 0.5112 | 0.4781 | 0.4571 | 0.4483 | 0.4429 |
| 1.4            | 0.4            | 0.4991 | 0.4719 | 0.4545 | 0.4474 | 0.4429 |
| 1.4            | 0.6            | 0.4886 | 0.4668 | 0.4524 | 0.4465 | 0.4429 |
| 1.4            | 0.8            | 0.4781 | 0.4616 | 0.4502 | 0.4456 | 0.4429 |
| 1.4            | 1.0            | 0.4676 | 0.4564 | 0.4481 | 0.4447 | 0.4429 |
| 1.4            | 1.2            | 0.4647 | 0.4548 | 0.4474 | 0.4445 | 0.4429 |
| 1.4            | 1.4            | 0.4619 | 0.4532 | 0.4468 | 0.4442 | 0.4429 |
| 1.4            | 1.6            | 0.4590 | 0.4516 | 0.4462 | 0.4440 | 0.4429 |
| 1.4            | 1.8            | 0.4562 | 0.4500 | 0.4455 | 0.4438 | 0.4429 |
| 1.6            | 0.2            | 0.4995 | 0.4672 | 0.4522 | 0.4446 | 0.4429 |
| 1.6            | 0.4            | 0.4893 | 0.4631 | 0.4506 | 0.4443 | 0.4429 |
| 1.6            | 0.6            | 0.4806 | 0.4597 | 0.4491 | 0.4440 | 0.4429 |
| 1.6            | 0.8            | 0.4719 | 0.4563 | 0.4475 | 0.4437 | 0.4429 |
| 1.6            | 1.0            | 0.4633 | 0.4529 | 0.4460 | 0.4435 | 0.4429 |
| 1.6            | 1.2            | 0.4608 | 0.4517 | 0.4456 | 0.4434 | 0.4429 |
| 1.6            | 1.4            | 0.4584 | 0.4505 | 0.4452 | 0.4433 | 0.4429 |
| 1.6            | 1.6            | 0.4560 | 0.4493 | 0.4448 | 0.4432 | 0.4429 |
| 1.6            | 1.8            | 0.4536 | 0.4481 | 0.4444 | 0.4432 | 0.4429 |
| 1.8            | 0.2            | 0.4904 | 0.4609 | 0.4494 | 0.4429 | 0.4429 |
| 1.8            | 0.4            | 0.4821 | 0.4576 | 0.4483 | 0.4429 | 0.4429 |
| 1.8            | 0.6            | 0.4750 | 0.4549 | 0.4472 | 0.4429 | 0.4429 |
| 1.8            | 0.8            | 0.4680 | 0.4521 | 0.4461 | 0.4429 | 0.4429 |
| 1.8            | 1.0            | 0.4610 | 0.4493 | 0.4451 | 0.4429 | 0.4429 |
| 1.8            | 1.2            | 0.4588 | 0.4485 | 0.4448 | 0.4429 | 0.4429 |
| 1.8            | 1.4            | 0.4567 | 0.4477 | 0.4445 | 0.4429 | 0.4429 |
| 1.8            | 1.6            | 0.4545 | 0.4470 | 0.4442 | 0.4429 | 0.4429 |
| 1.8            | 1.8            | 0.4524 | 0.4462 | 0.4442 | 0.4429 | 0.4429 |