

ISO 24194:2022-05 (E)

Solar energy - Collector fields - Check of performance

| Contents | | Page |
|--------------------|---|-------------|
| Foreword | | iv |
| Introduction | | v |
| 1 | Scope | 1 |
| 2 | Normative references | 1 |
| 3 | Terms and definitions | 1 |
| 4 | Symbols | 1 |
| 5 | Procedure for checking the power performance of solar thermal collector fields | 5 |
| 5.1 | Stating an estimate for the thermal power output of a collector field | 5 |
| 5.2 | Calculating power output | 5 |
| 5.2.1 | General | 5 |
| 5.2.2 | Non-concentrating collectors -- Formula (1) | 6 |
| 5.2.3 | Non- or low-focussing collectors -- Formula (2) | 7 |
| 5.2.4 | Focussing collectors with high concentration ratio -- Formula (3) | 7 |
| 5.3 | Stating a performance estimate | 7 |
| 5.4 | Restrictions on operating conditions | 7 |
| 5.5 | Shadows | 8 |
| 5.5.1 | Shadows on fixed collectors in rows | 8 |
| 5.5.2 | Shadows on one-axis tracking collectors in row | 9 |
| 5.6 | Collector incidence angle | 11 |
| 5.7 | Example of setting up an equation for calculating performance estimate | 11 |
| 5.8 | Determination of potential valid periods | 12 |
| 5.9 | Checking collector field power performance | 12 |
| 6 | Procedure for checking the daily yield of solar thermal collector fields | 14 |
| 6.1 | Stating an estimate for the daily yield of a collector field | 14 |
| 6.2 | Calculating daily energy yield | 14 |
| 6.2.1 | General | 14 |
| 6.2.2 | Non-tracking and non-concentrating collectors -- Formula (20) | 15 |
| 6.3 | Stating a performance estimate | 15 |
| 6.4 | Restrictions on operating conditions | 16 |
| 6.5 | Shadows | 16 |
| 6.6 | Collector incidence angle | 16 |
| 6.7 | Example of setting up an equation for calculating performance estimate | 16 |
| 6.8 | Determination of potential valid periods | 17 |
| 6.9 | Checking collector field daily yield performance | 18 |
| 7 | Measurements needed | 18 |
| 7.1 | General | 18 |
| 7.2 | Requirements on measurements and sensors | 20 |
| 7.2.1 | Accuracy | 20 |
| 7.2.2 | Time | 21 |
| 7.2.3 | Solar radiation measurement | 22 |
| 7.2.4 | Temperature measurements | 23 |
| 7.2.5 | Flow rate measurement | 24 |
| 7.2.6 | Power measurement/calculation | 24 |
| 7.2.7 | Measurement of wind speed | 24 |

| | | |
|------------|---|-----------|
| 7.3 | Valid data records | 24 |
| | Annex A (informative) Recommended reporting format -- Power method | 26 |
| | Annex B (informative) Recommended reporting format -- Daily yield method | 29 |
| | Bibliography | 30 |