

# ISO/TR 22131:2023-02 (E)

## Railway applications - Railway braking - Country specific applications for ISO 20138-1

---

| <b>Contents</b>    |  | <b>Page</b> |
|--------------------|--|-------------|
| Foreword .....     |  | iv          |
| <b>1</b>           | <b>Scope .....</b>   | <b>1</b>    |
| <b>2</b>           | <b>Normative references .....</b>  | <b>1</b>    |
| <b>3</b>           | <b>Terms and definitions .....</b>   | <b>1</b>    |
| <b>4</b>           | <b>Slowing or stopping distance calculation using a method implemented in France .....</b>               | <b>1</b>    |
| 4.1                | General .....  | 1           |
| 4.2                | Symbols and abbreviations .....  | 1           |
| 4.3                | Slowing or stopping distance calculation .....   | 2           |
| 4.3.1              | French model for "G" position .....  | 2           |
| 4.3.2              | Calculation using ISO 20138-1:2018, 5.7.5.1 step model .....   | 4           |
| 4.4                | Example of calculation .....   | 4           |
| 4.4.1              | Test results .....   | 4           |
| 4.4.2              | Comparison of calculation models with test results .....   | 5           |
| <b>5</b>           | <b>Calculation of braking performance implemented in Japan .....</b>                                     | <b>5</b>    |
| 5.1                | General .....  | 5           |
| 5.2                | Brake ratio for a single vehicle .....   | 5           |
| 5.3                | Example for brake ratio calculation .....  | 6           |
| 5.4                | Equivalent response time .....   | 7           |
| 5.4.1              | General .....  | 7           |
| 5.4.2              | Case 1: Determination based on train speed .....   | 8           |
| 5.4.3              | Case 2: Determination based on BC pressure response .....  | 8           |
| <b>6</b>           | <b>Stopping or slowing distance calculation methods for some particular rolling stock in China .....</b> | <b>9</b>    |
| 6.1                | General .....  | 9           |
| 6.2                | Symbols and abbreviations .....  | 9           |
| 6.3                | Train resistance retarding forces .....  | 10          |
| 6.3.1              | Basic running resistance .....   | 10          |
| 6.3.2              | Curve resistance .....   | 12          |
| 6.4                | Train braking force .....  | 13          |
| 6.4.1              | Total braking force of train .....   | 13          |
| 6.4.2              | Real friction coefficient .....  | 14          |
| 6.4.3              | Conversion friction coefficient .....  | 14          |
| 6.4.4              | Real brake block force .....   | 15          |
| 6.4.5              | Nominal values of rigging efficiency .....   | 16          |
| 6.4.6              | Emergency brake cylinder pressure .....  | 16          |
| 6.4.7              | Conversion brake block force .....   | 17          |
| 6.4.8              | Conversion braking ratio .....   | 18          |
| 6.4.9              | Train unit brake ratio .....   | 20          |
| 6.4.10             | Dynamic brake force .....  | 20          |
| 6.4.11             | Coefficient of adhesion .....  | 21          |
| 6.5                | Brake calculation .....  | 21          |
| 6.5.1              | Braking time .....   | 21          |
| 6.5.2              | Free running time .....  | 22          |
| 6.5.3              | Stopping/slowing distance .....  | 22          |
| Bibliography ..... |  | 24          |