

# DIN EN 16031:2012-09 (E)

## Adjustable telescopic aluminium props - Product specifications, design and assessment by calculation and tests

---

| <b>Contents</b>    |  | <b>Page</b> |
|--------------------|--|-------------|
| Foreword .....     |  | 4           |
| Introduction ..... |  | 5           |
| 1                  | Scope .....  | 6           |
| 2                  | Normative references .....   | 6           |
| 3                  | Terms and definitions .....  | 6           |
| 4                  | Symbols .....  | 9           |
| 5                  | Classification .....   | 10          |
| 6                  | Designations .....   | 11          |
| 7                  | Materials .....  | 12          |
| 8                  | Requirements .....   | 12          |
| 8.1                | Tubes .....  | 12          |
| 8.2                | Welding .....  | 12          |
| 8.3                | Length adjustment device .....   | 12          |
| 8.4                | Permanent prevention against unintentional disengagement .....           | 12          |
| 8.5                | Anti hand trap .....   | 13          |
| 8.6                | Overlapping length .....   | 13          |
| 8.7                | Endplates .....  | 14          |
| 9                  | Verification .....   | 14          |
| 9.1                | General .....  | 14          |
| 9.2                | Calculation of prop strength .....                                       | 15          |
| 9.2.1              | General .....  | 15          |
| 9.2.2              | Imperfections .....  | 15          |
| 9.2.3              | Behaviours of inner and outer tube .....                                 | 17          |
| 9.2.4              | Boundary conditions .....  | 17          |
| 9.2.5              | Verification of prop strength .....                                      | 21          |
| 9.3                | Verification of the strength of length adjustment device .....           | 22          |
| 9.4                | Verification of the prevention against unintentional disengagement ..... | 22          |
| 9.5                | Confirmation of the calculation results by testing .....                 | 22          |
| 10                 | Tests .....  | 22          |
| 10.1               | General .....  | 22          |
| 10.2               | Detail tests .....   | 22          |
| 10.2.1             | Compression tests on unthreaded tubes .....                              | 22          |
| 10.2.2             | Compression tests on threaded tube .....                                 | 23          |
| 10.2.3             | Bending tests on threaded tube .....                                     | 25          |
| 10.2.4             | Tests for the limit eccentricities of prop ends .....                    | 27          |
| 10.2.5             | Compression tests on length adjustment device .....                      | 30          |
| 10.3               | Test of the prevention against unintentional disengagement .....         | 30          |
| 10.3.1             | Purpose of test .....  | 30          |
| 10.3.2             | Test arrangement .....   | 31          |
| 10.3.3             | Evaluation of test results .....   | 31          |

|               |   |           |
|---------------|---|-----------|
| <b>10.4</b>   | <b>Confirmation test for the prop strength .....</b>          | <b>31</b> |
| <b>10.4.1</b> | <b>Material properties .....</b>                              | <b>31</b> |
| <b>10.4.2</b> | <b>Global test .....</b>                                      | <b>32</b> |
| <b>11</b>     | <b>Documentation of test results .....</b>                    | <b>32</b> |
| <b>12</b>     | <b>Marking .....</b>  | <b>32</b> |
| <b>13</b>     | <b>Assessment .....</b>                                       | <b>33</b> |
| <b>14</b>     | <b>User manual .....</b>                                      | <b>33</b> |
|               | <b>Annex A (informative) Ongoing production control .....</b> | <b>34</b> |
|               | <b>Bibliography .....</b>                                     | <b>36</b> |