**TABLE IS:** Chemical composition in wt.-% of the 42CrMo4 (AISI 4140) steel studied.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| C | Cr | Mn | Mo | Si | P | S |
| 0.40 | 0.83 | 0.78 | 0.23 | 0.54 | 0.02 | < 0.01 |

**TABLE IIS:** Parameter of plasma-nitriding treatment including temperature *T*, pressure *p*, ratio of hydrogen to nitrogen in nitriding atmosphere H2:N2, and time *t*.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | T [°C] | p [Pa] | H2:N2 [l/h] | t [h] |
| Step 1 | | 420 | 400 | 80:20 | 1 |
| Step 2 | Batch 1 | 570 | 400 | 90:10 | 16 |
| Batch 2 | 2 |

**TABLE IIIS:** Nitriding hardness depth, core hardness and residual stresses of batches 1 and 2.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **NHD [mm]** | **Core hardness HV10** | **Residual compressive stresses**  **[MPa]** | |
| **surface** | **d = 0.7 mm** |
| **Batch 1** | 0.47 | 349 | -100 | 0 |
| **Batch 2** | 0.225 | 369 | -450 | -100 |