

| Series | Description |
|--|--|
| NI-WH <i>metric and imperial sizes</i> | Induction hardened and ground hollow linear shafts steel grade: C60E / OD: $\varnothing 16 - 50 \text{ mm} / \varnothing 5/8'' - 2''$ |

Steel grades correspondents

| EN | Werkstoff | DIN | B.S. | UNI | JIS | GOST | AISI SAE ASTM |
|------|-----------|------|----------------|-----|------|---------------|---------------------|
| C60E | 1.1221 | Ck60 | 060A62, 070M60 | C60 | S58C | 60, 60G, 60GA | 1064 |

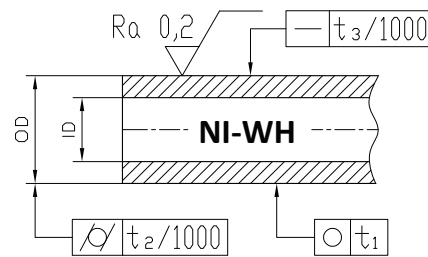
Chemical composition - % by weight

| Steel grade | Norm | C | Si | Mn | P | S | Cr | Ni. | Mo | V |
|-------------|------------|-------------|----------|-------------|------------|------------|-----------|-----------|----------|---|
| C60E | EN 10083-2 | 0.57 ÷ 0.65 | max. 0.4 | 0.60 ÷ 0.90 | max. 0.030 | max. 0.035 | max. 0.40 | max. 0.40 | max. 0.1 | - |

Mechanical properties for hollow shafts

| Steel grade | Yield strength | Tensile strength | Elongation |
|-------------|---------------------------------|----------------------------|------------|
| | $R_{p0.2}$ N/mm ² | R_m N/mm ² | A_5 % |
| C60+NBK | min. 390 | 720 - 900 | min. 14 |

NBK = normalized in a protective atmosphere.



| Outside Diameter OD | Inside Diameter ID | Weight | Series | Standard length | Hardening depth SHD | Roundness (circularity) t1 | Parallelism (cylindricity) t2 | Straightness t3 | Standard tolerance ISO h6 |
|------------------------|-----------------------|--------|-------------|-----------------|------------------------|-------------------------------|----------------------------------|--------------------|------------------------------|
| mm | mm | kg/m | | mm | mm | μm | μm | mm/m | μm |
| 16 | 7 | 1.28 | NI-WH 16x7 | 6000 | 0.6 | 5 | 8 | 0.20 | 0 / -11 |
| 20 | 14 | 1.25 | NI-WH 20x14 | 6000 | 0.9 | 6 | 9 | 0.20 | 0 / -13 |
| 25 | 15 | 2.47 | NI-WH 25x15 | 6000 | 0.9 | 6 | 9 | 0.15 | 0 / -13 |
| 30 | 18 | 3.55 | NI-WH 30x18 | 6000 | 0.9 | 6 | 9 | 0.15 | 0 / -13 |
| 40 | 28 | 5.03 | NI-WH 40x28 | 6000 | 1.2 | 7 | 11 | 0.15 | 0 / -16 |
| 40 | 26 | 5.70 | NI-WH 40x26 | 6000 | 1.2 | 7 | 11 | 0.15 | 0 / -16 |
| 50 | 30 | 9.87 | NI-WH 50x30 | 6000 | 1.5 | 7 | 11 | 0.15 | 0 / -16 |

| Outside Diameter OD | | Inside Diameter ID | | Weight | Series | Standard length | Hardening depth SHD | Roundness (circularity) t1 | Parallelism (cylindricity) t2 | Straightness t3 | Standard tolerance Class "L" |
|------------------------|------|-----------------------|-------|--------|--------------------|-----------------|------------------------|-------------------------------|----------------------------------|--------------------|---------------------------------|
| mm | inch | mm | inch | kg/m | | inch | inch | inch | inch | in/ft | inch |
| 15.875 | 5/8 | 6.35 | 0.25 | 1.30 | NI-WH 15.875x6.35 | 236.22 | 0.0236 | 0.000197 | 0.000315 | 0.00246 | -0.0005 / -0.001 |
| 19.05 | 3/4 | 11.125 | 0.438 | 1.48 | NI-WH 19.05x11.125 | 236.22 | 0.0354 | 0.000236 | 0.000354 | 0.00246 | -0.0005 / -0.001 |
| 25.4 | 1 | 15.494 | 0.61 | 2.50 | NI-WH 25.4x15.494 | 236.22 | 0.0354 | 0.000236 | 0.000354 | 0.00185 | -0.0005 / -0.001 |
| 31.75 | 1¼ | 18.288 | 0.72 | 4.15 | NI-WH 31.75x18.288 | 236.22 | 0.0354 | 0.000236 | 0.000354 | 0.00185 | -0.0005 / -0.001 |
| 38.1 | 1½ | 22.606 | 0.89 | 5.80 | NI-WH 38.1x22.606 | 236.22 | 0.0472 | 0.000276 | 0.000433 | 0.00185 | -0.0006 / -0.0011 |
| 50.8 | 2 | 31.75 | 1.25 | 9.69 | NI-WH 50.8x31.75 | 236.22 | 0.0591 | 0.000276 | 0.000433 | 0.00185 | -0.0006 / -0.0013 |

- ✓ Surface hardness: 62±2 HRC
- ✓ Surface roughness: Ra: max. 0.20 μm
- ✓ Length tolerance: ±200 mm
- ✓ Hardening depth, SHD: according to EN ISO 15787
- ✓ On request: special lengths, tolerances and dimensions

- ✓ The hardening depth (SHD according to EN ISO 15787 or Rht according to DIN 6773) is defined as the distance from the steel surface up to the point where the hardness value is 80% of minimum guaranteed value of the surface hardness and is established in accordance with ISO 13012, depending on shaft's size.

- ✓ Approximately 75 mm of both shaft ends are not guaranteed to be either in diameter tolerance or in the standard hardness values.