

Data sheet P 650

Revision 3

1. CHEMICAL COMPOSITION

„P650“ is a special nonmagnetic, austenitic Mn-Cr-Mo-N-steel with a high pitting corrosion resistance, specifically developed for oilfield applications.

C	Mn	Cr	Mo	Ni	N
max. 0,06	19,50-20,50	18,00-19,00	1,70-2,00	3,00-4,50	0,55-0,65

2. MECHANICAL PROPERTIES

Following mechanical properties (tested at room temperature) are achieved by a special cold-working process over the full length of the collar:

Yield Strength (min.):	OD up to 9 ¹ / ₄ "	140 ksi	965 N/mm ²
0,2%-offset method	OD 9 ¹ / ₂ " and larger	130 ksi	900 N/mm ²
Tensile Strength (min.):		150 ksi	1035 N/mm ²
Elongation (min.):		20%	20%
Reduction of area (min.):		50%	50%
Impact energy (min.):		60 ft.lb	82 J
Endurance Strength / N=10 ⁷ (min.):		60 ksi	414 N/mm ²
Hardness Brinell:		330-430 HB	330-430 HB

3. MAGNETIC PROPERTIES

Relative permeability: ≤ 1,005.

4. CORROSION RESISTANCE

- **Transgranular SCC:** Prevented by special surface treatments (Hammer peening, roller burnishing, shot peening).
- **Intergranular SCC:** The occurrence of material sensitization is prevented by quenching after warmforging. Each collar is tested according to ASTM A 262, Pract.A and E, last edition.
- **Pitting Corrosion:** Due to a high chromium-, molybdenum- and nitrogen contents a high resistance to pitting corrosion is given.

5. NON-DESTRUCTIVE TESTING

- **Magnetic inspection:** Drill collars are 100% tested by a proprietary probe-testing process using a Förster Magnetomat 1.782. ("Hot Spot"-test). Magnetic permeability of each collar is certified with the printout of probe-testing.
- **Ultrasonic inspection:** Each collar is ultrasonically inspected over 100% of the volume according to ASTM E 114, last edition as a minimum level.

P650 Non-Magnetic Drill Collars meet all requirements of API Spec. 7.1, last edition.
All tests are carried out according to ASTM-Standards, last editions.
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