

# CENTRIFUGALLY CAST ROLLS

## ICDP (NTV 4M) Indefinite chilled layer

Shell

Material Barrel	Chemical composition [%]									Barrel Hardness [HSh“C“]
	C	Mn	Si	P max.	S max.	Cr	Ni	Mo	Others	
NTV 4M	3,2/3,5	0,5/1,2	0,8/1,5	0,06	0,02	1,5/2,0	4,0/5,0	0,3/1,2	carb.form. elem.'s	75-85

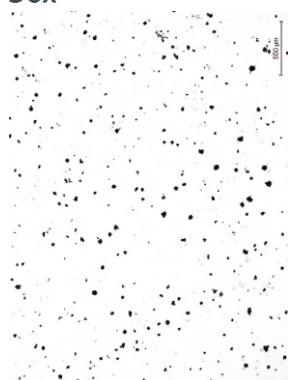
- Dimensional and weight limits:**

Ø 550-1050 mm / 6.000 mm / 22.000 kg

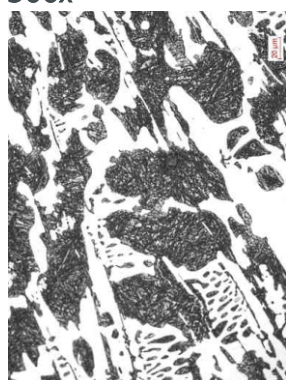
- Barrel Structure**

metallic matrix with transformed martensite, bainite and ledeburite, high content of primary and eutectic carbides and small fractions of globular graphite

50x



500x



- Heat Treatment**

Low tempering and/or stress relieving

BARREL HARDNESS DECREASE WITH DEPTH MAX. 3 SHORE C.  
HARDNESS DISTRIBUTION ± 1,5 SHORE C (EACH SURFACE)

- Physical and mechanical properties**

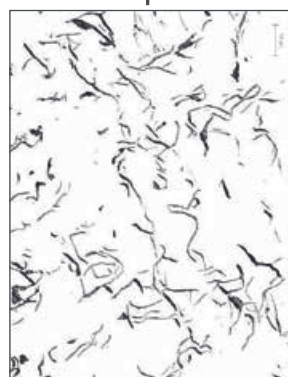
	NTV 4M
TENSILE STRENGTH - Rm [MPa]	500
BENDING STRENGTH - Rmi [MPa]	810
YOUNG MODULUS - E.10 <sup>3</sup> [MPa]	170
COEFFICIENT OF THERMAL EXPANSION [m/K]	11 x 10 <sup>-6</sup>
THERMAL CONDUCTIVITY [W/m °K]	20 - 30

Core

Material	Chemical composition [%]									Barrel Hardness [HSh“C“]
	C	Mn	Si	P max.	S max.	Cr	Ni	Mo	Others	
Core - Neck										
Lamellar iron	2,9/3,2	0,5/1,0	1,9/2,2	0,1	0,03	0,6	0,80/1,20	0,02/0,20		36 - 43
Nodular iron	2,8/3,5	0,1/1,0	1,5/2,5	0,1	0,02	0,5	0,60/1,00	0,02/0,20	Mg = 0,030 /0,080	37 - 45

### Core Structure

Lamellar Graphite 100x



Nodular Graphite - 100x



- Physical and mechanical properties**

	Lamellar Iron	Nodular Iron
TENSILE STRENGTH - Rm [MPa]	250	350
BENDING STRENGTH - Rmi [MPa]	450	540
YOUNG MODULUS - E.10 <sup>3</sup> [MPa]	115	165

- NON-Destructive testing:**

Ultrasonic Test of Shell Depth and Bond Integrity

- Product certificates**

Shell and Core Chemistry

Mechanical Testing

Hardness Measurement Report of Barrel and Necks

Dimensional Inspection of Body and Journal Diameters

Ultrasonic Report of Shell Depth and Bond Integrity

- Application**

Work rolls for finishing stands of hot strip mills

