MATERIAL GRADES
Indefinite chilled layer ICDP (NTV 3M)

vítkovické slévárny

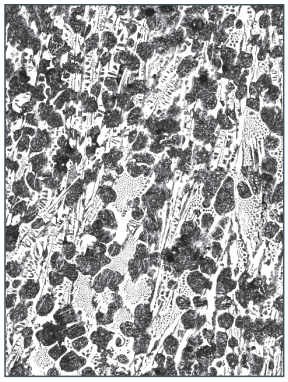
Shell

Material Barrel	Chemical composition [%]									Barrel Hardness
	C	Mn	Si	P max.	S max.	Cr	Ni	Mo	Others	[HSh"C"]
NTV 3 M	3,2/3,5	0,5/1,2	0,8/1,5	0,06	0,02	1,5/2,0	4,0/4,8	0,3/1,0	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 and ledeburite and small fractions of globular graphite

100x



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**

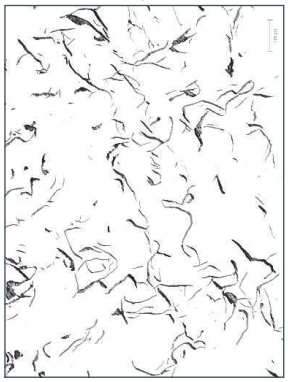
	NTV 3 M
TENSILE STRENGTH - Rm [MPa]	500
BENDING STRENGTH - Rmi [MPa]	810
YOUNG MODULUS - E.10^3 [MPa]	170
COEFFICIENT OF THERMAL EXPANSION [m/K]	11 x 10^{-6}
THERMAL CONDUCTIVITY [W/m°K]	20 - 30

Core

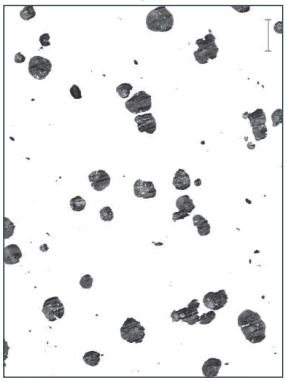
Material Core - Neck	Chemical composition [%]									Barrel Hardness
	C	Mn	Si	P max.	S max.	Cr	Ni	Mo	Others	[HSh"C"]
Lamelar iron	2,9/3,2	0,5/1,0	1,9/2,2	0,1	0,03	0,6	0,80/1,20	0,02/0,20		36 - 43
Nodular iron	2,8/3,5	0,1/1,0	1,5/2,5	0,1	0,02	0,5	0,60/1,00	0,02/0,20	Mg = 0,030 /0,080	37 - 45

- **Core Structure**

Lamelar Graphite 100x



Nodular Graphite - 100x



- **Physical and mechanical properties**

	Lamelar Iron	Nodular Iron
TENSILE STRENGTH - Rm [MPa]	250	350
BENDING STRENGTH - Rmi [MPa]	450	540
YOUNG MODULUS - E.10^3 [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