Abridged version

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Strengthening Mechanism of Cr Alloyed Steel Powder for High Strength Sintered Parts

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Synopsis :
A prealloyed 1Cr -0.3Mo-0.3V (mass%) steel powder, KIP 103 V, has been developed to obtain the high compressibility of powder and the high strength of sintered compacts without heat -treatment after sintering. The as -sintered steel without heat -treatment made from this new powder with 0.9 mass% graphite addition gives as high strength as heat-treated sintered steel. Tensile strength is 1 000 MPa and the endurance limit of rotating bending fatigue strength is 310 MPa. The improvement of the strength is attribu ted to a narrow pearlite lamellar spacing, a decrease in manganese oxide and a precipitation hardening by vanadium carbonitrides.

The body can be viewed from the next page.

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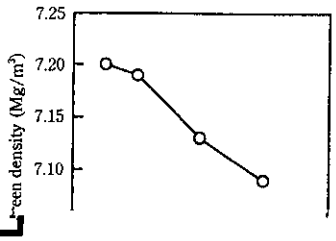
Synopsis:

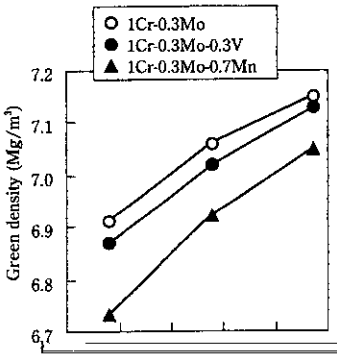
A prealloyed 1Cr-0.3Mo-0.3V (mass%) steel powder,

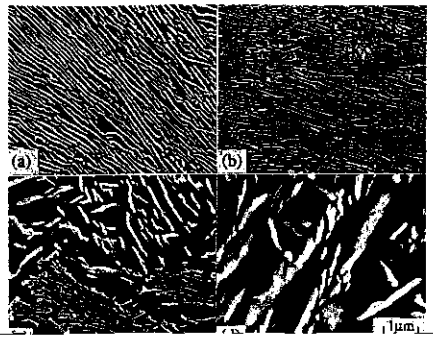
Table 1 Chemical compositions of powders used

(mass%)

	Cr	Mn	Mo	V	Ni	Cu
0.5Cr	0.50	0.05	0.01	—	—	—
1Cr	1.09	0.02	0.01	—	—	—
2Cr	2.05	0.04	0.01	—	—	—
3Cr	3.18	0.05	0.01	—	—	—

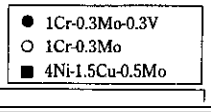


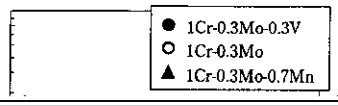


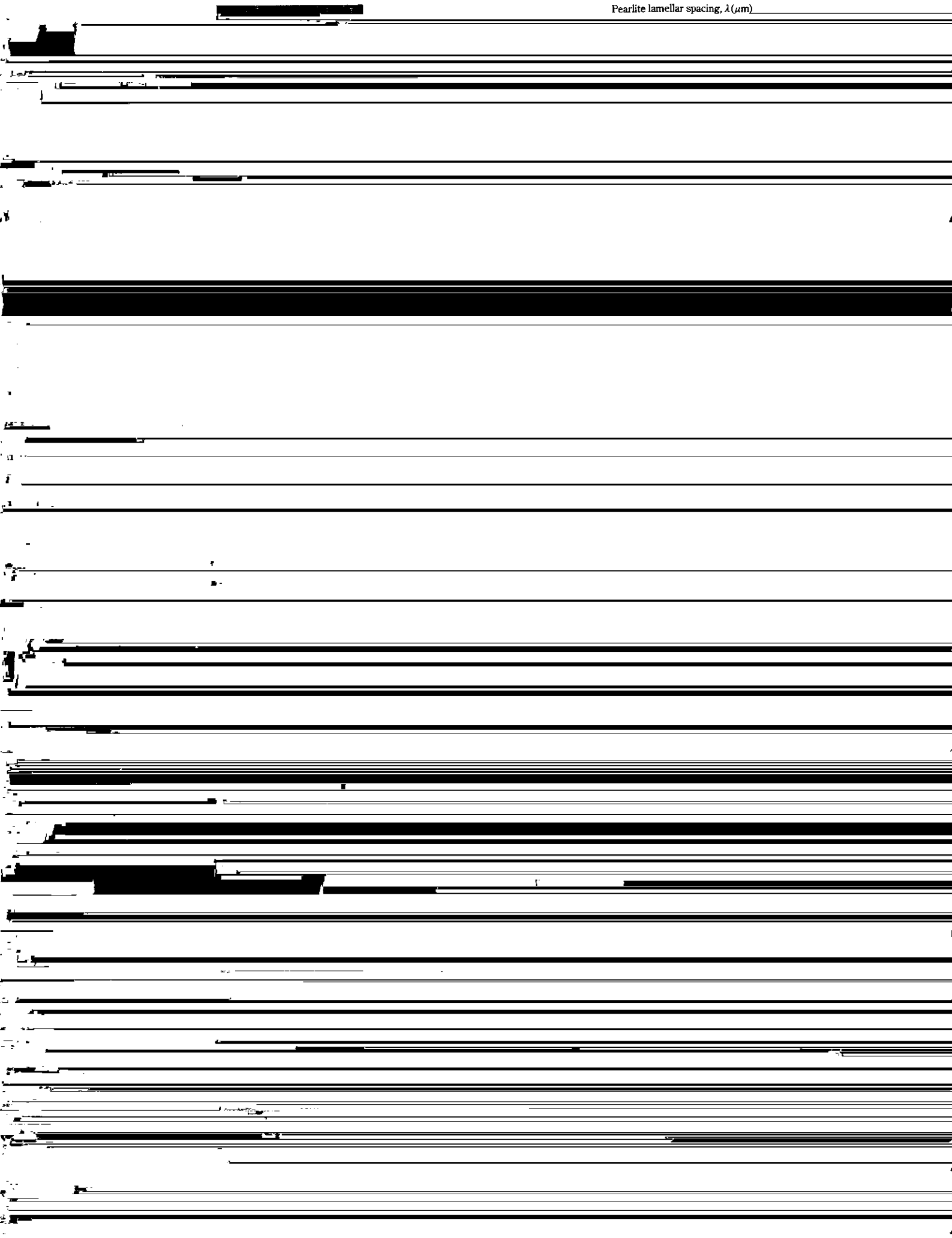


Compacting pressure (MPa)

Photo 1 Microstructures of 1Cr-0.3Mo sintered


1Cr-0.3Mo-0.3V
1Cr-0.3Mo
4Ni-1.5Cu-0.5Mo


0.1
1Cr-0.3Mo-0.3V
1Cr-0.3Mo
1Cr-0.3Mo-0.7Mn


Pearlite lamellar spacing, λ (μm)

obtained are summarized as follows: