

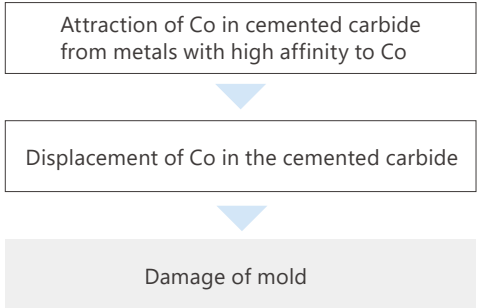
Cemented carbide for stamping of metals high affinity to cobalt - MC20

Cemented carbide for stamping of metals high affinity to cobalt (Adhesive wear-resistance by seizure)

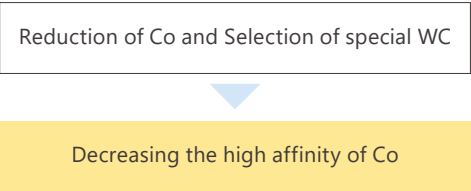
Excellent product life against manufacturing for pure iron or copper which are easy to be seizure.
Excellent performance for EDM and corrosion-resistance.

Explanation	Adhesive wear and seizure resistance by adopting special WC and reducing binder phase of Co. Excellent high hardness, performance of EDM and corrosion resistance by optimizing WC particle and composition design.
Applications	Press mold for lead frame and connector made of copper. Press mold for SPC type steels. Breakage resistance for mold demanded high hardness when EDM, etc.

Usual material problem

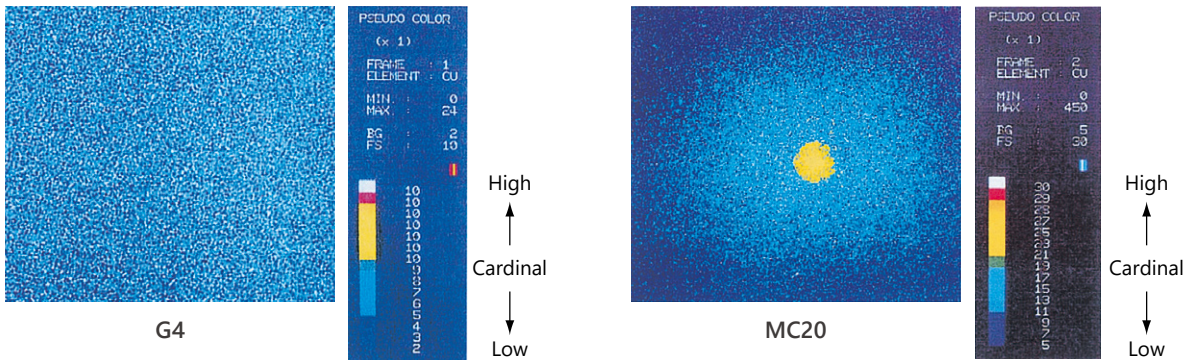


Characteristic of MC20



Comparison of reaction to copper (Analysis of EPMA)

Comparative reaction test between MC20 and G4 grade.
Above-shown photos are the cross-section surface of the test pieces which are compacted wire copper in center of MC20 and G4 after sintering and treated by HIP.
Result;
MC20: Copper wire remains in the original position without diffusing.
G4: Copper wire has diffused in the material.



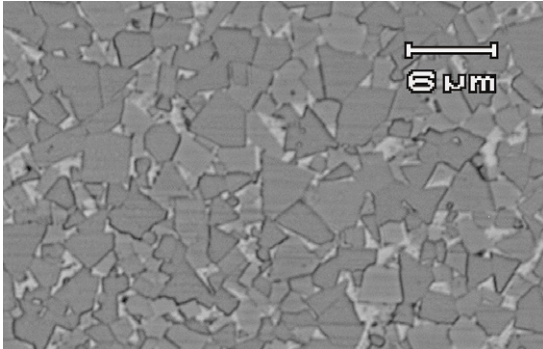
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Physical property of MC20

Our grade	WC grain size [μm]	Co content [%]	Density [×10 ³ kg/m ³ {g/cm ³ }]	Hardness HRA	TRS* [GPa]
MC20	2.5 - 5.0	6	14.9	90.0	2.8
G3	1.0 - 2.5	8	14.8	90.0	2.7

(Typical figures)

Micrographs of MC20



By metallurgical microscope (×1000)

Wear comparative example

Compare item	G3	MC20
Manufacturing condition	Workpiece : S65C Workpiece : 1.3 mm Press method : Punching	
Stroke number	50-150 thousand	180 thousand
Wear condition of punch edge (with microscope)		
Wear condition of punch edge (with SEM)		
Work adhesive condition (Mapping of iron element)		
Comment	(Upper pictures are composition of SEM observation and mapping of Iron element. The red points show Iron.) Position of adhered material accord with Iron detection. Even though the stroke number of MC20 is larger than G3, the amount of adherence to MC20 is smaller than G3.	