



INJECTION MOLDING

MULTI-METALS

Multi-Metals controls the entire manufacturing process beginning with grade formulation. We incorporate a state-of-the-art powder processing plant to convert raw material into standard and custom grade formulations to meet industry and application-specific requirements. This capability allows us to maintain the tightest control possible on the metallurgy of the finished product.

Advanced technologies like injection molding as well as conventional compaction techniques are utilized to bring product to life. The most advanced robotics and process controls are implemented throughout our plant to ensure we deliver the product you specify and the quality you expect.

Process flexibility allows us to manufacture your product using the technology that serves you, our customer, the best. Our diverse sintering technologies include conventional vacuum, sinter-HIP (Hot Isostatic Press), and controlled-atmosphere, continuous-flow furnaces.

A complete metallurgical laboratory, featuring a Scanning Electron Microscope and an impressive array of other testing and analysis equipment, gives us the on-site capability to ensure that our quality standards are never compromised. Additionally, our technical expertise allows us to provide outstanding customer support in the form of failure analysis and process troubleshooting.

Customer satisfaction is our primary goal and our staff is among the most knowledgeable in the world. We support a multi-million dollar inventory spanning hundreds of part numbers allowing us to deliver your product quickly. We also offer custom stocking programs for non-standard items.



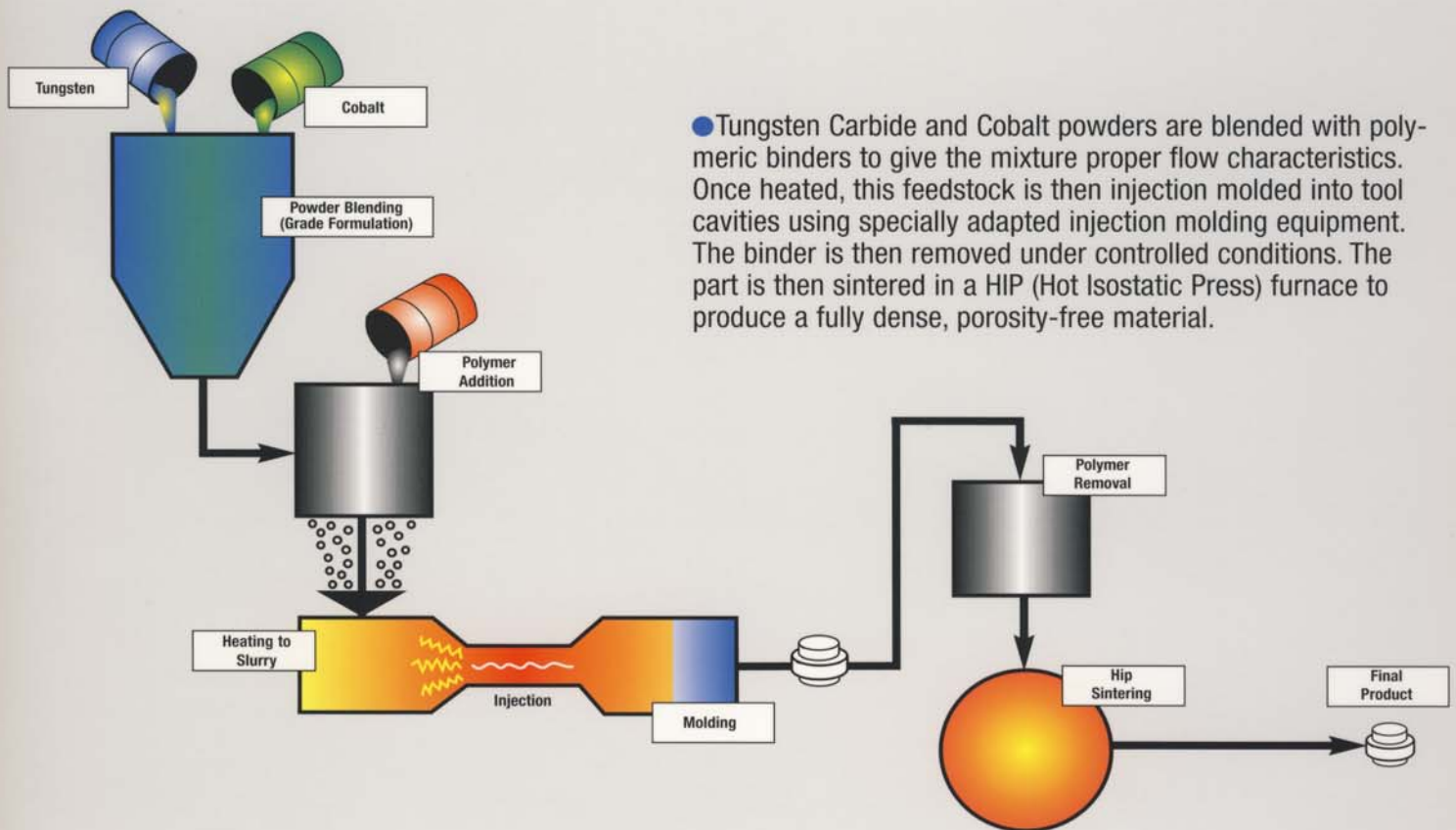
Multi-Metals possesses several pieces of injection molding equipment of varying sizes and capabilities to allow us the flexibility to produce in the most economical and efficient manner, with an eye first and foremost on quality of the end product. While it took years of research and development to bring this technology to market, we are now one of only a few hardmetal manufactures in the world to utilize the benefits of injection molding.

Small, high-volume parts with complex geometries are the ideal candidates for Multi-Metals' injection molding technology. The capabilities of the process enable the end user to dramatically reduce or eliminate finishing operations such as EDM or grinding to reach final product dimensions.

In coordination with our injection molding equipment, advanced material handling robotics are used to further reduce costs. Parts can be automatically ejected from the molds, degated, and separated for debinding while never being touched by a human hand. Further processing of the surface to improve brazing characteristics is also available.



Contact us with your requirements and allow our Product Development Team show you how this unique technology can benefit you!



● Tungsten Carbide and Cobalt powders are blended with polymeric binders to give the mixture proper flow characteristics. Once heated, this feedstock is then injection molded into tool cavities using specially adapted injection molding equipment. The binder is then removed under controlled conditions. The part is then sintered in a HIP (Hot Isostatic Press) furnace to produce a fully dense, porosity-free material.

**WARNING
TUNGSTEN CARBIDE/COBALT/NICKEL**

Exposure to cobalt/nickel powder, to dust or to coolant mist from grinding this product may cause nose, throat, skin, or eye irritation, or temporary or permanent respiratory disease, which may lead to disability or death. If you experience any symptoms of these problems, such as tightness in chest, shortness of breath, coughing, wheezing, loss of appetite, or nausea, immediately discontinue exposure to the powder, dust or mist, consult a physician and advise physician you have been exposed to cobalt and/or nickel.



- Avoid breathing powder, dust or coolant mist from grinding.
- Avoid skin contact with powder, dust or coolant mist.
- Use protective devices and adequate ventilation.
- Keep dust level below OSHA and ACGIH levels.
- Wash hands thoroughly after using and before smoking or eating.
- Dispose of materials in accordance with local, state and/or Federal regulations.

Grade Chart

Grade	Cobalt%	Other	HRA	Density (g/cc)	TRS (PSI)
Submicron					
XM4	6.00	0.15% TaC	93.0-94.0	14.85-15.05	280,000
XM10	10.00	0.2% VC	91.8-92.8	14.32-14.52	390,000
Fine					
RD55	5.50		92.0-93.0	14.90-15.10	315,000
HOM2	6.00	0.2% VC	91.6-92.4	14.925-14.975	320,000
OM3	4.50		91.7-92.7	15.00-15.20	240,000
OM2	6.00		91.2-92.2	14.85-15.05	333,000
Medium					
1M2	6.00		90.5-91.5	14.85-15.05	390,000
HOM1	8.50		90.0-90.9	14.675-14.725	335,000
OM1	9.00		89.5-90.5	14.55-14.75	390,000
1M12	10.50		89.0-90.0	14.40-14.60	400,000
1M13	12.00		88.0-89.5	14.25-14.45	400,000
Coarse					
2M2	6.00		89.5-90.5	14.85-15.05	335,000
2M12	10.50		88.0-89.0	14.40-14.60	400,000
2M16	16.00		86.2-87.2	13.85-14.05	420,000
2M25	25.00		83.0-84.0	13.05-13.25	435,000
Extra Coarse					
25M12	10.50		87.5-88.5	14.40-14.60	400,000
25M16	16.00		85.4-86.4	13.85-14.05	430,000
Metalcutting					
MC85	8.50	8% TiC, 11.5% TaC	90.8-91.8	12.45-12.65	276,000
MC90	9.00	6% TiC, 9.85% TaC	90.8-91.8	12.90-13.10	290,000
MC115	11.50	4% TiC, 9.05% TaC	90.0-91.0	13.20-13.40	348,000
Nickel Grades					
NF10		10% nickel	89.5-90.5	14.35-14.55	319,000
CN10		10% nickel	87.6-88.6	14.35-14.55	334,000

Terms & Conditions

1. Warranty: We will replace any material which is proven defective within 90 days after receipt of same by customer when properly used for the purpose specified in the order, but no claim for labor or damage will be allowed. Claims for errors must be made on receipt of material.
2. Over and Under Shipments: We reserve the right to over or under ship 10% of the specified quantity and orders will be closed out and invoiced with shortages or overages.
3. Terms and Conditions of all quotations are contingent upon strikes, accidents and other causes beyond our reasonable control.
4. Dies and tools used in manufacturing shall remain the property of Multi-Metals.
5. Material can only be returned after obtaining authorization. Returned material must be carefully packed and insured for shipment as we will not accept responsibility for damaged or lost product while enroute to us.
6. Special, non-standard items cannot be canceled or returned for exchange or credit. Standard items can only be returned after our consent is first obtained and after determining whether or not our standard 15% handling charge is applicable.
7. Modification: No terms or conditions, other than those stated herein, and no agreement or understanding in any way modifying the terms and conditions herein stated, shall be binding upon the seller unless made in writing and signed by the authorized sales agent.
8. Delivery: Estimated delivery is based on production time required to process order commencing with date order is received by us.
9. Verification of Credit Rating: Quotations are submitted subject to verification of a satisfactory credit rating.



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