

MAXIMIZE YOUR MOULD PERFORMANCE BY USING MIPALLOY MOULD MATERIALS

INCREASE PRODUCTIVITY BY MIN. 20%

SAVE 20-50%
COOLING TIME

HIGH RATE
OF
HEAT TRANSFER



Plastic Medical Syringe
Mould

EXCELLENT
TENSILE
STRENGTH

ABILITY TO
COOL PARTS
MORE EVENLY



mipalloy®



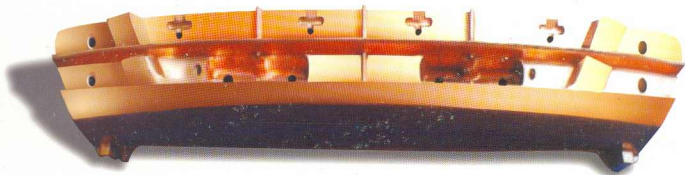
Complete Competence In Copper

*** 2% BERYLLIUM COPPER (MIPALLOY 4)**
*** 0.55% BERYLLIUM COPPER (MIPALLOY 100) AS PLASTIC MOULD MATERIALS**

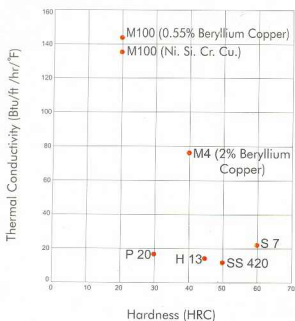
When it comes to injection mould & blow mould materials nothing speeds up production like Copper alloys. Mipalloy 100's thermal conductivity is almost 10 times greater than tool steels, so it offers faster, more uniform heat dissipation. This means more than 20% shorter cycle times. But speed of production is not the only factor. Current research at Western Michigan University shows Beryllium Copper cores exceed most of the production requirements. For extreme conditions such as long runs of 30% Glass-filled Nylon, Beryllium Copper lasts longer than P-20 Steel cores.

The plastics industry has proven Mipalloy 100 & Mipalloy 4 as the material of choice for injection moulding & blow moulding applications.

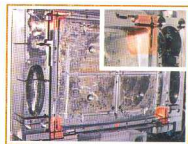
Mould Material	Thermal Conductivity (Btu/ft ² /hr/°F)	Hardness (HRC)	Tensile Strength (Ksi.)	Coefficient of Thermal Expansion (x10 ⁻⁶ /°F)
0.55% Beryllium Copper (Mipalloy 100) - C17510	145	20	120	9.8
Ni. Si. Cr. Cu. (Mipalloy 100) - C18000	135	20	100	9.7
2% Beryllium Copper (Mipalloy 4) - C17200	75	38- 42	190	9.9
P-20 (Steel)	17	30	140	7.1
H-13 (Steel)	15	45	210	7.1
SS 420 (Steel)	13	50	255	6.1
S 7 (Steel)	21	60	210	7.1



Minivan Front Bumper Mould



The injection moulding cycle is made up of a number of elements. They include the filling portion, the cooling portion & the mould open portion. The cooling portion is always the longest & is usually 65% of the overall cycle. Therefore the longest element in the overall cycle is where the greatest benefit can be obtained in improving the injection moulding cycle & where Beryllium Copper works best.



Mipalloy 4 & Mipalloy 100 inserts used in mould cavity corners for Polypropylene Television cabinets to obtain better cooling efficiency & easier ejection.

Increase Productivity by min. 20%

In addition to its superior thermal conductivity, Mipalloy 100 / Mipalloy 4 offers the following advantages;

- Maintains high surface finish.
- Accepts etching & texturing.
- Requires no additional heat treatment. Supplied in heat treated condition.
- Can be readily machined using conventional machining practices as well as Electrical Discharge Machining (EDM)

Mipalloy manufactures & stocks Beryllium Copper in various shapes & sizes;

Special sizes can be manufactured with short lead time.

Mipalloy has a large inventory of Mipalloy100 & Mipalloy 4 materials and standard Sizes can be supplied ex-stock.

Recommended blow mould applications;

- Blow pins : High thermal conductivity for efficient heat removal, reducing cycle time.
- Mould Inserts : Inserts at pinch off & neck areas of Aluminium mould increasing both hardness & conductivity.
- Complete moulds : resistant to attack in PVC applications. Mipalloy material alone or with hardened pinch offs for use in moulds with complex parting lines.

Recommended injection moulding applications;

- Core pins, cavity areas, sprue bushings, ejector pins & sleeves, manifold systems.

Advantages include;

- Improved control of post mould shrinkage.
- Better heat dissipation in areas of heavy wall sections or limited water channel access.
- Improved dimensional stability in multi cavity tools or in large flat walled parts.
- Excellent wear life when mated with standard tool steels.

FEATURES OF MIPALLOY 4 & MIPALLOY 100

- Exceptionally high thermal conductivity
- Excellent tensile strength range
- Adequate hardness levels without additional heat treatments
- High toughness
- High compressive, yield strengths
- Easily machinable to good finish
- Superior corrosion resistance
- Excellent resistance to wear, but can be further enhanced when plated
- Nickel or thin dense Chrome adheres well



APPLICATIONS OF MIPALLOY 4 & MIPALLOY 100

- Injection mould cores
- Injection mould core pins
- Injection mould inserts
- Injection mould cavities
- Blow mould cavities
- Injection mould slides
- Injection mould chill plates
- Injection mould runner bars
- Injection mould sprue bushing
- Injection mould sprue puller pins
- Blow mould neck pinch offs
- Blow pins
- Thermo-forming cavities
- Rotational moulding inserts
- Runnerless moulding nozzle tips



BENEFITS USING MIPALLOY 4 & MIPALLOY 100

- Reduced cooling time
- Reduced overall cycle time
- Increased productivity
- More even and consistent mould surface temperatures
- Less stresses in mould parts
- Reduced dimensional variation
- Less incidence of sink marks from hot spots in mould
- Improved control of warpage
- Easier ejection due to cooler surface temperatures
- Greater latitude in coolant channel placement

MOULD DESIGN TIPS

- Use Mipalloy100 when large amounts of heat must be extracted in short periods of time
- Install coolant circulating channels like conventional mould for maximum benefits when possible
- Utilize copper alloys in mould areas where ideal coolant channels installation is not possible
- In small diameter multiple core pin applications, seat core pins on a chill plate
- In high wear applications, such as running Glass filled material, Nickel Chrome plate alloy
- Ensure good contact with mating surfaces to maximize heat transfer
- Insert Mipalloy Material in corners of mould cores to enhance cooling
- Use as mould insert, where heavier wall sections are present on the plastic part
- Use when moulding corrosive plastics



Photo Courtesy - M/s. Sarita Die Works



TUNGSTEN COPPER EDM & ECM ELECTRODES

Tungsten Copper, Mipalloy M75WC are manufactured by the powder metallurgy technique of pressing, sintering and infiltrating Tungsten with Copper as electrode materials for EDM (Electrical Discharge Machining), ECM (Electro Chemical Machining)

Chemical and Physical properties:

Composition : 75% Tungsten & 25% Copper

Density : 14.8 gms/cc

Hardness : 95 HRB

Electrical Conductivity : +40% IACS

Tungsten Copper Electrode retains minute detail and will not break down due to porosity and other structural deficiencies some times found in other Electrodes. While Tungsten Copper alloys are the most expensive electrode materials for EDM and ECM applications, they are superior when fine surface finishes, deep narrow slots or ribs and small precise holes are required. Tungsten alloys are preferred when machining extremely detailed section. They have excellent wear resistance, good material removal rates (MRR) and the ability to retain good detail even during repetitive usage.



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ISO 9001: 2000

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