



**Extreme Resistance  
G5 Tip Range**



Composition

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Application

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Synergy Products

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Case Studies

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# When to Select a G5 Tip

## Engineered for Abrasive Polymers

Mastip has a wide variety of tips available, each with distinct shapes, sizes, flow rates and function. When choosing the right tip for your application consider important factors like gate quality, direct or indirect gating and the type of polymer being processed. Polymer types normally falls into two categories; commodity polymers or engineering polymers, which can be filled.

At Mastip our range of tips are identified by a G for Grade of Tip.

The G1 and G2 grade of tips are manufactured from copper alloy with nickel coating and are best suited for non abrasive polymers with a maximum operating temperature of 300° C.

The G5 tip is ideal for engineering or filled polymers with high temperature requirements.

Engineering polymers typically have a unique combination of properties that improve the end product with aspects like strength, rigidity, stability or their resistance to abrasion or heat.

For example, polycarbonates are highly resistant to impact, while polyamides are highly resistant to abrasion. Examples of Engineering resins include ABS, PA, PBT, PC, PEEK, PET, POM, PPS, PPO, PSU.

G5 tips are available in both Thermal and Valve Gate variations.

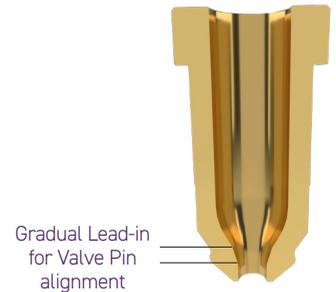
GVG5 is an open valve tip that delivers precise valve pin alignment for cylindrical gates, reducing wear on the shut-off diameter of the valve pin and gate. It features an identifiable groove at the end of the Tip that can accommodate a clip-on insulator cap.



G5 Tip (Thermal Gates)



GVG5 Tip (Guided Valve Gate)



## Composition

### Tungsten Carbide with TiN Coating

The G5 Tip is constructed of Tungsten Carbide with a Titanium Nitride (TiN) coating.

Tungsten Carbide is made from an ultra-fine micro-grain (2.5 microns) fused together with cobalt (during a sintering process known as Powder Metallurgy) to produce a dense, hard metal.

It is well known for its wear resistance (approximately 100 times more resistant than steel in areas including abrasion, erosion and galling) as well as thermal conductivity twice that of tool and carbon steel.

Once the Tungsten Carbide tip is manufactured a Titanium Nitride (TiN) coating is applied to the surface. TiN is an extremely hard ceramic material with highly conductive and corrosion resistant properties that prevent the Tungsten Carbide from oxidising and provides a lower coefficient of friction.

TiN hardens and protects surfaces and is applied as a very thin coating of less than 5 micrometres (0.00020 in) improving the lifetime of the tip.

Tips coated with Titanium Nitride are easily recognisable by their gold appearance (as pictured below).



Tungsten Carbide



Titanium Nitride

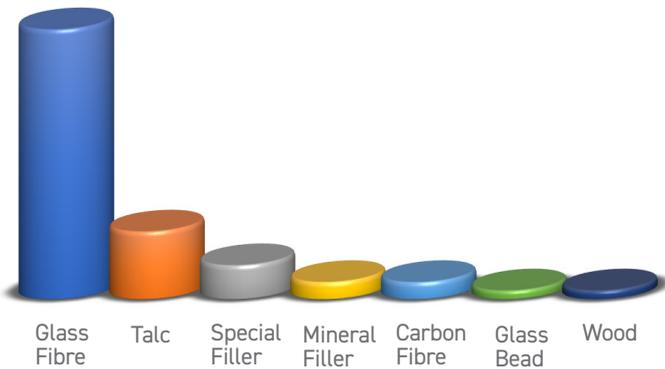
# Application

## Experience with Abrasive Polymers

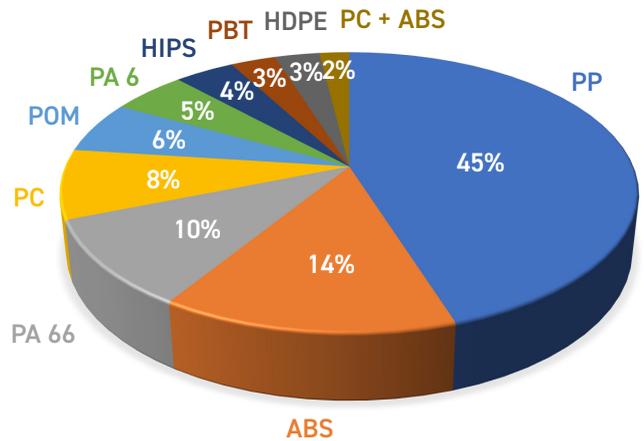
The G5 Tip was developed to process abrasive or filled polymers with fillers like glass, carbon or talc. Mastip has extensive experience providing solutions for difficult to mould polymers with 55% of all projects completed over the last decade including engineering polymers, many of which include fillers.

These projects include applications for industries like electrical, electronic and technical where strength is critical to operation, longevity and performance of the system.

### Most Processed Fillers 2010-2020



### Top 10 Polymers Used



Mastip supplies solutions to process a wide range of filled polymers, the Top 7 are shown to the left with glass fibre the most common filled material.

# Synergy Products

## Powerful Solutions to Compliment G5

### H5 Nut

H5 Nuts are the recommended solution to accompany G5 Tips for filled polymers providing a combination that will perform under the most demanding applications. Consisting of hard, wear resistant powder metallurgy steel, the H5 nut is available in both Bush and Sprue Nut variations for Thermal gate configurations and Bush Nut for Valve Gate configurations.

### Cap Insulators

Insulation caps provide the advantage of isolating the gate well from residence sensitive polymers like PC. This ensures excellent part quality and consistency while providing superior thermal performance by insulating the tip from cooling polymers.

Cap insulators are ideal for applications with frequent colour changes or those processing sensitive materials that require precise cavity-to-cavity conformity and exceptional surface quality.

Insulating caps can be fitted to G5 tips with open nuts.



G5 Tip with H5 Nut



G5 Tips with Cap Insulator

# Proven History

## Industry Case Studies

# mastip™

hot runner solutions

Manufactured for the Automobile Industry this Multi-Material part is made of flame retardant Polyamide PA6.6 with a Glass Fibre reinforcement of 30%. Wall thickness ranges from 2mm to 4mm with an overall part weight of 60g.

Nozzle Selection: SXTSN19145G5

**L&L Products**



This Electrical Component was made with Polyphenylene Sulfide (PPS) known for its strength and heat resistance, containing a Glass Fibre reinforcement of 65%. The finished part weighs 65 grams with a nominal wall thickness of 2mm.

Nozzle Selection: BXIT19055G5



This Multi-material component for the Electrical Industry was made with PA 12 Polyamide known for its hardness, tensile strength and abrasion resistance and included a Glass Fibre reinforcement of 50%.

Nozzle Selection: BXIBE27075G5, BXIT27075G5

**GAUTIER**  
PLASTICS



This power distribution busbar for the Automotive Industry is made with PA66 with a glass fibre reinforcement of 30%. The finished part weighs in at 75g.

Nozzle Selection: BXIT19075G5

**GAUTIER**  
PLASTICS

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