

# METHYLENE MALONATE COMPARISON CHART

Our methylene malonate monomers balance several key physical and mechanical properties, making them the ideal building blocks for new polymer-based coatings and adhesives. In the following table, you can explore the features and benefits of our high-performing chemical platform compared to other chemistries commonly used in coatings and adhesives. You can also compare the number of patents of each of these technologies.

PROPERTY		CHEMISTRY						
FEATURES	BENEFITS	Methylene Malonates	Acrylates	Methacrylates	Cyanoacrylates	Aliphatic Isocyanates	Aromatic Epoxies	Aliphatic Epoxies
Low viscosity monomers	Low to no VOC in formulations	++	++	++	++	++	+	++
Low viscosity multifunctional oligomers	Better flow and processing, higher solids	++	++	++	-	-	-	-
Low odor monomers and oligomers	Better worker comfort	++	-	-	-	+	++	++
Optical clarity of cured films	High gloss coatings, fiberoptics and electronics	++	++	++	++	++	++	++
Symmetric monomers	Multiple	++	-	-	-	-	-	+
Two ester groups for functionalization	Multiple	++	-	-	-	-	-	-
Low shrinkage	3D printing, electronics coatings	++	+	++	++	-	++	++
Anionic and free radical cure	Dual cure, toughness	++	+	-	++	-	-	-
Michael Addition cure	2K formulations with improved cured performance	++	++	-	-	-	-	-
Surface initiation	Better bonding to the substrate, 1K formulations	++	-	-	++	++	-	-
Compatibility with other materials	Versatile and stable formulations with low VOC	-	++	++	-	-	++	++
Lack of blooming, blushing or frosting	Retention of gloss and clarity in cured films and bond lines	++	++	++	-	++	-	+

- Not applicable, not a feature, uncommon

+ Some compounds have this property or benefit

++ Readily available feature

## INNOVATION POTENTIAL—OPENNESS OF PATENT SPACE

PATENTS	Methylene Malonates	Acrylates	Methacrylates	Cyanoacrylates	Aliphatic Isocyanates	Epoxy
WIPO	147	117,855	58,086	3,460	6,990	210,700
USPTO	80	213,405	210,712	15,931	2,849	385,174
ESPACENET	140	1,878,626	621,585	57,943	12,882	1,760,959

