

HD Microsystems™ Product Selection Guide

HD Microsystems offers a broad line of products for microelectronic applications. Selecting the best product for your application needs involves consideration of several critical factors.

First, what patterning technology will be used? Photodefinable materials can be negative tone, solvent processed or positive tone, aqueous processed. Standard, or non-photodefinable, require the use of a photoresist and are either wet etched or dry etched using reactive ion etch (RIE) or laser ablation. If your facility has only tooling for one of these technologies, then the options are limited to products of that processing sequence. If your facility has more processing options, then there are more materials that are available to consider.

Patterning technology can also affect the desired resolution. Wet etch has adequate resolution for large features like bond pads. Photosensitive materials have better resolution, with positive tone materials even better than negative tone products. Dry etch materials have the best resolution with very high aspect ratios.

Next consideration should be cured film properties. Do you need the material to have a low coefficient of thermal expansion (CTE) or must it survive high processing temperature, thus requiring a high glass transition temperature (T_g). You can review the tables below for representative mechanical and electrical properties. Part of this consideration should also be the curing temperature required and how it might affect coated components.

Finally, film thickness should be considered. Within a product series there might be two or three different viscosities that result in different coated film thickness. For limited experimental work, these products can be thinned by the user to test lower film thicknesses.

Photodefinable Materials												
Product Code	Viscosity St	Solids %	Thickness Microns	Cure °C	T _g °C	1% weight loss in air °C	CTE ppm/°C	DC z	Tensile Strength MPa	Elongation %	Modulus GPa	Photo Speed mj
Solvent Negative												
HD-4100	31	33	4 to 12	375	330	430	35	3.4	200	45	3.3	300
HD-4104	17	31	3 to 8	375	330	430	35	3.4	200	45	3.3	300
HD-4110	75	36	8 to 20	375	330	430	35	3.4	200	45	3.3	300
Aqueous Positive												
HD-8820	18	36	4 to 10	300	280	390	60	2.9	140	100	2.1	340
HD-8930	20	35	3 to 10	200	240	-	80	3.1	170	80	1.8	300
Adhesives												
HD-7010	30	37	6 to 14	350	260	370	70	-	175	75	2.6	300

Standard Polyimides											
Product Code	Viscosity St	Solids %	Thickness Microns	Cure °C	Tg °C	1% weight loss in air °C	CTE ppm/°C	DC z	Tensile Strength MPa	Elongation %	Modulus GPa
High Tg											
PI-2545	19	13	1 to 3	375	400	560	30	3.5	260	120	2.3
PI-5878G	68	16	3 to 8	375	400	560	30	3.5	260	120	2.3
Low Stress											
PI-2610	27	11	1 to 3	350	360	620	3	2.9	350	35	8.5
PI-2611	122	14	4 to 8	350	360	620	3	2.9	350	35	8.5
Rapid Curing											
PI-2525	60	25	5 to 12	295	325	560	50	3.3	130	55	2.5
PI-2555	14	19	2 to 3.5	295	325	560	50	3.3	130	55	2.5
Self Priming											
PI-2574	60	25	5 to 12	295	325	560	50	3.3	130	55	2.5
Adhesives											
HD-3007	12	25	3 to 5	250	180	350	50	-	130	10	3.3

What if you can't find a material that meets your needs? HD MicroSystems has several products developed over the years that are not listed here but may have the unique properties you need. Call a Customer Service Representative and they can put you in contact with someone who can assess the possibilities. If a business case can be made, the product could be manufactured as a make-to-order product. In these cases, the entire batch must be purchased and delivered upon completion.

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Caution: Do not use in medical applications involving permanent implantation in the human body.