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PLASTIC MATERIAL REFERENCE GUIDE FOR ULTRASONIC WELDING

Material	Welding	Insertion	Staking	Near Field Welding	Far Field Welding	Ease of Staking	Trade name(s
AMORPHOUS RESINS							
ABS-Acrylonitrile Butadiene Styrene	30-70	20-50	30-80	1	1	1	Cycolac, Lustran
ABS/PC-ABS/Polycarbonate	70-100	50-70	80-120	2	2	2	Cycoloy, Pulse
ASA-Acrylonitrile Styrene Acetate	30-70	20-40	70-90	1	1	3	Centrex, Geloy, Luran
PC-Polycarbonate	50-90	40-70	50-90	1	2	3	Lexan, Calibre, Novarex
PEI-Polyetherimide	70-100	40-70		2	4	5	Ultem
PES-Polyethersulfone	70-100	40-70		2	4	5	Ultrason
PMMA-Acrylic	40-70	30-60	70-90	1	3	3	Acrylite, Plexiglass, Zylar
PPO-Polyphenylene Oxide	50-90	40-60	60-90	2	3	2	Noryl
PS-Polystyrene	20-40	20-40	70-90	1	1	4	Dylark, Styron
PSU-Polysulfone	70-100	40-70	90-120	2	3	3	Udel
PVC-Polyvinyl Chloride	40-80	20-50	70-100	2	4	2	Novablend, Ultrachem
SAN-Styrene Acrylonitrile	30-70	20-40	70-90	1	1	3	Lustran, Styvex
SBC-Styrene Block Polymers	50-90	30-50	80-100	2	3	2	K-Resin
SEMI-CRYSTALLINE RESINS							
PA- Polyamide (Nylon)	70-120	40-80	60-120	2	5	3	Celstran, Ultramid, Zytel
PBT-Polybutylene terephthalate (Polyester)	70-125	40-80	90-120	3	5	4	Celanex, Ultradur, Valox
PE-Polyethylene	70-120	40-80	40-120	2	5	2	Aspun, Clysar, Dowlex
PEEK-polyetheretherketone	60-125	40-80		3	5	5	Arlon
PET-Polyethylene terephthalate (Polyester)	80-120	40-80	90-120	3	5	4	Mylar, Rynite, Cleartuf
PMP-Polymethylpentene	70-120	40-80	90-120	4	5	2	TPX
POM- Polyacetal	75-125	40-80	50-100	2	3	4	Acetal, Celcon, Delrin
PP-Polypropylene	70-120	40-80	40-120	2	5	2	Astryn, Fortilene, Marlex
PPS-Polyphenylene sulfide	80-125	40-80		3	4	5	Fortron, Ryton, Supec

- The table above includes recommended amplitudes for welding, insertion and staking in microns (µm). To convert the values shown to inches, 25.4 microns = .001 of an inch.
- The amplitudes shown in the chart are for 20 KHz. To determine the amplitude requirement for 40 KHz, multiply the amplitude by 0.6, for 30 KHz multiply by 0.8 and for 15 KHz multiply by 1.2.
- Far and near field welding refers to the distance from the ultrasonic horn contact surface to the weld joint. Any distance in excess of 6.35 mm or .250" is considered far field.
- The ease of welding and staking/swaging guide is rated from 1 to 5 with 1 equaling the easiest and 5 equaling the most difficult.
- The ability to weld or stake plastic with ultrasonics is based upon a lot of factors including joint design, material fillers, process variables prior to welding, part geometry, good part design practice, part size, amplitude and properly designed ultrasonic tooling. This table is meant to serve as a guide only.