

PU3500

ADC CABLE MARKERS

Description

ADC Cable Markers are extruded from halogen free and flame retardant PUR (Thermoplastic Polyether-Polyurethane) material which is hydrolysis "No break down in water" and micro organism resistant. Its extremely strong with high tear strength, suitable for a variety of in and outdoor applications where durable mark permanence is de facto standard. The labels are fixed to the cable or wire using cable ties at both ends.

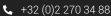
The product is supplied as an all-in-one construction, where the extruded material also functions as the carrier. The markers are partially perforated for easy picking after printing and supplied on rolls for thermal transfer printing. Many colours available.

Material	Polyether TPU	Halogen free	
Finishing	Matt	Flame retardant	
Colors		Temperature	-25°C up to +105°C (-13F to 176°F)

Physical data

Physical

Properties	Test method	Typical value	
Stress at 20% gain	DIN 53504	13 MPa	
Stress at 100% gain	DIN 53504	19 MPa	
Stress at 300% gain	DIN 53504	33 MPa	
Density	DIN 53479	1,27 g/cm ³	
Tensile strength	DIN 53504	30 MPa	
Elongation @ break	DIN 53504	400%	
Charpy notched impact strength, -30°C	DIN EN ISO 179	3 kj/m²	
Charpy notched impact strength, 23°C	DIN EN ISO 179	50 kj/m²	
Tensile strength after storage in water at 80°C for 42 days	DIN 53504	20 MPa	
Compression set at room temperature, 24h	DIN EN ISO 815	30%	
Compression set at 70°C, 24h	DIN EN ISO 815	45%	



ALTEC industrial identification nv



Thermal

Properties	Test method	Typical value
Glass transition temperature, 10°C/min	ISO 11357-1/-2	-70°C
Burning behaviour at 0.75 mm nom thickness	UL94	Class V-2
Burning behaviour at 3.0 mm thickness	UL94	Class V-0
Oxygen Index	ISO 4589-1/-2	24%

Environmental

Properties	Test method	Typical value
UV-A 340 nm 1000 hours Light 60 ° irradiation 0.76 W/m² power duration 8 hours - Spray duration 15 min Condensation 50 ° duration 3,45 hour.	Visual inspectation Mark Adherence	No creasing or cracking Good contrast visibility
TEST with XENON lamp, XENON (340nm) - Light 65 ° c irradiation 0.50 W/m² duration 1,42 hours - Light + Spray duration 0.60 W/m² duration 18 min	Visual inspectation Mark Adherence	No creasing or cracking Good contrast visibility

Chemical resistance

Solvents resistance

No degradation of the CMX TPU products occurs, however, according to the solvent class a variable degree of swelling and consequent reduction in tensile strength (after evaporation of the solvents, the tensile strength recovers approx. its original value).

Methanol should be considered more as a chemical reagent than as a solvent. TPU is soluble in some solvents. As test procedure, 5A test rods (DIN EN ISO 527-2) were immersed in the solvent for three weeks at 23° C, and tested for tensile strength are rounded values.

Code	Test fluid	Swelling	Reduction of tensile strength %	
Aliphatic Hydrocarbons	Pentan Cyclohexan Isooctan	10 22 7.5	20 10 None	
CMX PUR behave similarly in other aliphatic and cyclo-aliphatic hydrocarbons such as methane, ethane, propane, butane, hexane, octane, petroleum ether, paraffin oil, diesel oil and kerosine (although additives can present problems).				
Aromatic Hydrocarbons	Toulene	65	50	
Other aromatic hydrocarbons such as benzene and xylene have a similar affect.				
Aliphatic Esters	Ethyl Acetate	70	75	
Other short-chained esters such as butyl acetate and amyi acetate have a similar affect				
Aliphatic Ketones	Methyl Ethyl Ketone	130	90	
Other short-chained aliphatic ketones such as acetone and methyl isobutyl ketone = MIBK have a similar affect.				
Aliphatic	MethylEthyle Chloride	190	95	

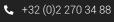




Halogenated Hydrocarbons, 1 C-atom	Chloroform Tetrachloroethylene	75	Practically dissolved 54
1 C-atom and higher	Trichloroethane*		
*Other aliphatic halogenated hydr	ocarbons with 2 C-atoms and higher ha	ave a similar affect.	
Aromatic Halogenated Hydrocarbons	Chlorobenzene	110	60
Other aromatic halogenated hydro	ocarbons have a similar affect.		
ASTM-Oils acc. to ASTM D 471-06**	IRM 901 at 100 °C 500 h IRM 901 at 100 °C 1000 h	1 1	6 14
	IRM 902 at 100 °C 500 h IRM 902 at 100 °C 1000 h	9 10	5
	IRM 903 at 100 °C 500 h IRM 903 at 100 °C 1000 h	18 20	8 30
Agents Dissolving TPU	Tetrahydrofurane Dimethyl Formamide (DMF)	Dissolved Dissolved	Dissolved Dissolved
	Dimethyl Acetamide N-Methyl Pyrrolidone (NMP)	Dissolved Dissolved	Dissolved Dissolved
	Dimethyl Sulphoxide (DMSO) Pyridine	Dissolved Dissolved	Dissolved Dissolved
Alcohols and Fuels	Methanol Ethanol	28 33	6 14
	Iso-Propanol Benzyl Alcohol	30 Not measurable	4 Partly dissolved
	Ethylen Glycol Glycerine	4 None	15 None
FAM Test Fluids acc. to DIN 51 604*	Test Fluid A Test Fluid B Test Fluid C	67 68 43	60 74 70
Diesel Fuel Biodiesel Fuel RME @ 60°C	Diesel Fuel Biodiesel Fuel	11 27	None 21
Fuel Types ASTM D 471	Fuel A = Iso-Octane	7.5	None
	Fuel B = Iso-Octane Touene 70% / 30%	25	36
	Fuel C=Iso-Octane Toluene 50% / 50%	38	44
	Fuel D=Iso-Octane Toluene 60% / 40%	31	44







ALTEC industrial identification nv





* DIN 51 604, 03.1984, is the standard, etablished by FAM to assess the resistance of plastic materials to automotive fuels.

** The IRM reference oils are mineral oils with different paraffin and aromatics contents. The formerly used ASTM oils 1, 2 and 3 were replaced by the IRM oils 1, 2 and 3 owing to health risks, and are no longer available. The IRM oils 1, 2 and 3 are very similar in terms of their characteristics, but not identical.

(FAM = Fachausschuß Mineral- und Brennstoffnormung-Professional committee for standardization of fuel stuffs)

(ASTM = American Society for Testing and Materials)

Test fluid A consists of: 50.0 % by volume toluene 30.0 % by volume iso-octane 15.0 % by volume di-isobutylene 5.0 % by volume ethanol Test fluid B consists of: 42.0 % by volume toluene 25.5 % by volume iso-octane 13.0 % by volume di-isobutylene 15.0 % by volume methanol 4.0 % by volume ethanol 0.5 % by volume water Test fluid C consists of: 20.0 % by volume toluene 12.0 % by volume iso-octane 6.0 % by volume di-isobutylene 58.0 % by volume methanol 2.0 % by volume ethanol 2.0 % by volume water

Storage

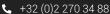
Cool and dry in original packaging. Recommended temperature at +10°C to +25°C and 45-55% relative humidity.

Disclaimer:

Values shown in this document are averages only. For legal reasons, we emphasize that the information on this data is available as is and that Altec gives no guarantees with respect to the accuracy and completeness nor with respect to interpretations made on the basis of this information.







ALTEC industrial identification nv