ALTEC
INDUSTRIAL IDENTIFICATION

Technical datasheet

A395

METAL DETECTABLE CABLE MARKERS

Description

Cable Markers extruded from Polyether based TPU compound. Optimised to the operation of the most usual metal detectors and x-ray detectors. The compounds meets requirements for food contact compliant with EU and FDA requirements.

In food production with open production processes it is advisable to use materials that are easily detectable. Altec offers products that are simple to detect. They make an important contribution to quality management for the food industry, particularly when following the HACCP approach.

The labels are fixed to the cable or wire using detectable 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.

Material	Polyether based TPU
Color	RAL 5012
Temperature	-25 °C up to +105°C
Compliances	Mark permanence external lab Test by Novadan
Flammability standard	Class HB - UL94

Standards

FDA "Food & Drug" 21 CFR
GRAS "Generally accepted as safe"

Regulation (EU) No 10/2011
Plastics intended to come into contact with food.

AP 89 1
European Resolution Pigments used for coloration

Physical data

Physical

Properties	Test method	Typical value
Stress at 20% strain	DIN 53504	12 MPa
Stress at 100% strain	DIN 53504	16 MPa
Stress at 300% strain	DIN 53504	34 MPa
Density	DIN 53479	1,52 g/cm^3
Tensile strength	DIN 53504	6 MPa - Using standardized test specimen
Elongation @ break	DIN 53504	450%
Charpy notched impact strength, -30°C	DIN EN ISO 179	No break
Charpy notched impact strength, 23°C	DIN EN ISO 179	No break
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	50 %
Tear Strength	DIN 53515	110 N/mm
Abrasion resistance	DIN 53516	30 mm^3
Shorehardness	DIN 53505	Shore D 55

Thermal

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Properties	Test method	Typical value
Glass transition temperature, 10°C/min	ISO 11357-1/-2	-30 °C
Burning behaviour at 0.75 mm nom thickness	UL94	Class HB
Melting temperature 10°C/min	ISO 11357-1/-3	137 °C
Short Max working temperature		105 °C

Environmental

Properties	Test method	Typical value
- UV-A 340 nm 1000 hours Light 60 ° irradiation 0.76 W/m² power duration 8 hours	Visual inspection	No creasing or cracking
- Spray duration 15 min.	Mark adherence	Good contrast and visibility
- Condensation 50 ° duration 3,45 hour.		NOT TESTED

SVHC	Test method	Typical value
Substances of very hich concern DEHP (Bis(2-ethyl(hexyl)phtalat).	Article 57(f) of Regulation (EC) No 1907/2006	No content

Chemical resistance

No degradation of the A395 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

A395 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 Kethone	130	90

Other short-chained aliphatic ketones such as acetone and methyl isobutyl ketone = MIBK have a similar affect.

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Aliphatic Halogenated Hydrocarbons, 1 C-atom	MethylEthyle Chloride	190	95
	Chloroform		Practically dissolved
	Tetrachloroethylene	75	54
1 C-atom and higher	Trichloroethane*		

*Other aliphatic halogenated hydrocarbons with 2 C-atoms and higher have a similar affect.

Aromatic Halogenated Hydrocarbons	Chlorobenzene	110	60

Other aromatic halogenated hydrocarbons have a similar affect.

ASTM-Oils acc. to ASTM D 471-06**	IRM 901 at 100 °C 500 h	1	6
	IRM 901 at 100 °C 1000 h	1	14
	IRM 902 at 100 °C 500 h	9	4
	IRM 902 at 100 °C 1000 h	10	5
	IRM 903 at 100 °C 500 h	18	8
	IRM 903 at 100 °C 1000 h	20	30

Agents Dissolving TPU	Tetrahydrofurane	dissolved	dissolved
	Dimethyl Formamide (DMF)	dissolved	dissolved
	Dimethyl Acetamide	dissolved	dissolved
	N-Methyl Pyrrolidone (NMP)	dissolved	dissolved
	Dimethyl Sulphoxide (DMSO)	dissolved	dissolved
	Pyridine	dissolved	dissolved

Alcohols and Fuels	Methanol	28	6
	Ethanol	33	14
	Iso-Propanol	30	4
	Benzyl Alcohol	Not measurable	Party dissolved
	Ethylen Glycol	4	15
	Glycerine	None	None

FAM Test Fluids acc. to DIN 51 604*	Test Fluid A	67	60
	Test Fluid B	68	74
	Test Fluid C	43	70

Diesel Fuel	Diesel Fuel	11	None
Biodiesel Fuel RME @ 60°C	Biodiesel Fuel	27	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

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* 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.

Application

Developed to be used in Food Industry and other Industries requiring detection through metal detectors or X-ray equipment.

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