CMX Hydraulic Cable Marker

Halogen Free, Flame-retardant Polyether based TPU

TECHNICAL DATA SHEET

Revision Number. 1
Last Edited 10. januar 2024

CMX Hydraulic Cable Markers in 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 one end. 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 and kitting after printing and supplied on rolls for thermal transfer printing. Many colours available.
UV STABILITY DATA.
Results of accelerated ageing testing are as a result of artficial lighting/ illumination in a laboratory. Duration test is 500 hours, which equals 10 years of exposure.

Industry

Industry
Marine
Wind power
Commercial
Aerospace
Construction
Railway
Military
Electrical installations
Petrochemical
Telecom

STANDARD COLORS

OTHER COLORS

MATERIAL
halogen free, flame retarded polyether based TPU.

OPERATING TEMPERATURE
-25°C up to +105°C
(-13F to 176°F)

COMPLIANCES
Mark Permanence:
SAE AS-5942.
Ribbon : FTI-Y black

RESISTANCE TO SOLVENTS
MIL-STD-202G
Test method 215
Ribbon : FTI-Y black

RECOMMENDED BLACK RIBBON
FTI-Y
RECOMMENDED WHITE RIBBON
FTI-HLD-CO

FLAMMABILITY STANDARD
Class V-0 - UL94
Not flammable

UV STABILITY TEST

Test with UV lamp 340nm
Light @ 60°C irradiation 0.76 W/m²
Duration 8 hours
Spray duration 15 min.
Condensation 50°C
Duration 3,45 hour.

TEST with XENON (340nm)
Light 65 ° c irradiation 0.50 W/m²
Duration 1,42 hours
Light + Spray duration 0.60 W/m²
Duration 18 min.

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

APPLICATIONS
Developed to be used in normal Industry, Wind Power, Commercial, Construction, Electrical and Telecom installations, wire & cable bundling.

Ordering Info

PART NUMBER EXAMPLES

PART NUMBER	COLOUR	SIZE	TEXT AREA DIMENSION	MATERIAL	QTY	UOM
CMX-040x014.4-2ACR	XX	40x14.4mm	30x14xmm	TPU	1000	Roll
CMX-055x012-1ACR	XX	55x12mm	45x12mm	TPU	1000	Roll

Product code

CMX- - 040 -014.4-2ACR XX

FAMILY
CMX =
All In One Construction Hydraulic Cable Marker

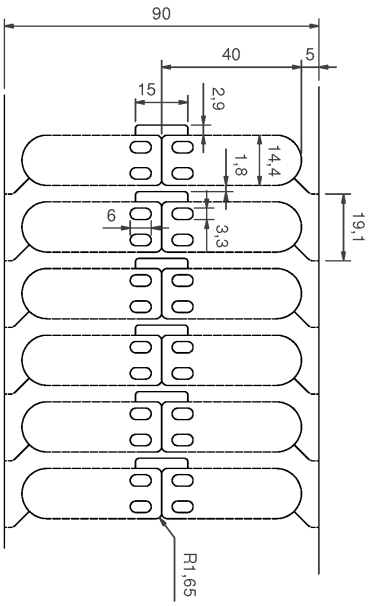
WIDTH
In mm

HEIGHT
In mm

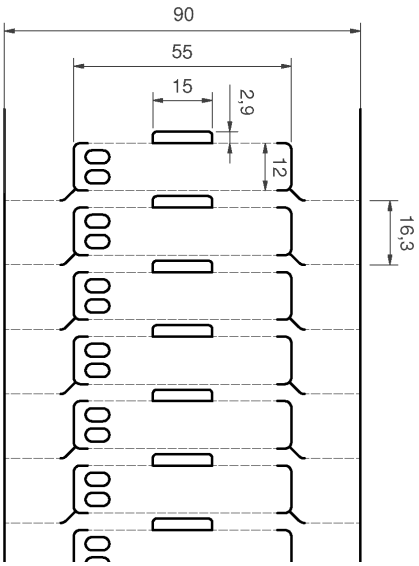
LABELS ACROSS
2ACR= 2 across 1 fixiation

COLOR
Yellow
White
Blue
Black
Red
Lemon Yellow
Ocean Blue
Orange
Signal Red
Signal Green
Blue Sky

40x14.4mm



55x12mm



General Values for PUR Identification Products

PHYSICAL

PROPERTIES	TEST METHOD	TYPICAL VALUE
Stress at 20 % strain	DIN 53504	13 MPa
Stress at 100 % elongation	DIN 53504	19 MPa
Stress at 300% elongation	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	20MPa
Compression set at room temperature, 24h	DIN EN ISO 815	30%
Compression set at 70°C, 24h	DIN EN ISO 815	45 %

THERMAL

PROPERTIES	TEST METHOD	TYPICAL VALUE
Glass transition temperature, 10°C/min	ISO 11357-1/-2	-44°C
Burning behaviour at 0.75 mm nom thickness	UL94	Class V-2
Burning behavior 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 Inspection Mark Adherence	No creasing or cracking Good contrast and visibility

PROPERTIES	TEST METHOD	TYPICAL VALUE
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 Inspection Mark Adherence	No creasing or cracking Good contrast and visibility

CHEMICAL PROPERTIES

CHEMICAL RESISTANCE

SOLVENTS RESISTANCE

No degradation of the CMX-D 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-D 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 Halogenated Hydrocarbons, 1 C-atom 1 C-atom and higher	MethylEthyle Chloride Chloroform Tetrachloroethylene Trichloroethane*	190 75	95 Practically dissolved 54
*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 IRM 901 at 100 °C 1000 h IRM 902 at 100 °C 500 h IRM 902 at 100 °C 1000 h IRM 903 at 100 °C 500 h IRM 903 at 100 °C 1000 h	1 1 9 10 18 20	6 14 4 5 8 30
Agents Dissolving TPU	Tetrahydrofurane Dimethyl Formamide (DMF) Dimethyl Acetamide N-Methyl Pyrrolidone (NMP) Dimethyl Sulphoxide (DMSO) Pyridine	dissolved dissolved dissolved dissolved dissolved dissolved	dissolved dissolved dissolved dissolved dissolved dissolved

CHEMICAL PROPERTIES

CHEMICAL RESISTANCE

SOLVENTS RESISTANCE

CODE	TEST FLUID	SWELLING	REDUCTION OF TENSILE STRENGTH %
Alcohols and Fuels	Methanol Ethanol Iso-Propanol Benzyl Alcohol Ethylen Glycol Glycerine	28 33 30 not measureable 4 none	6 14 4 partly dissolved 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 Fuel B = Iso-Octane Touene 70% / 30% Fuel C=Iso-Octane Toluene 50% / 50% Fuel D=Iso-Octane Toluene 60% / 40%	7.5 25 38 31	none 36 44 44

* 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