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TECHNICAL INFORMATIONS

Irreversible Temperature Indicating **Thermo - Lacquers**

CelsiLack®

Basics

The function of the irreversible (not reversing) temperature indication of the CelsiLack® and CelsiStick® depends entirely on the melting and solidifying (freezing) process of materials (compounds) with a precise defined melting point or melting range.

Partially the melting compounds used in the CelsiLack® and the CelsiStick® are of the same nature, except that the CelsiLack® does present the melting compounds in a dilluted form.

Melting identifies the specific temperature level and not a discoloration of the applied mark.

The temperature indication entirely depends on the principle of the well defined physical melting point of the materials, and not on a chemical reaction between materials.

Chemical reactions always depend on various additional influences, and here especially on the time the chemical is exposed to or held at a certain temperature level. Also eventual chemical interactions between the thermal compound itself and the material of the test surface can play an important role in the quality of the chemical process dependent temperature measurement.

The **melting point** is a very stable physical value. The duration of the thermal exposure has no significant influence. Obviously the ambient pressure on the melting compound influences the melting point. Applications facing reduced or increased atmospheric pressure will have to keep an eye on this fact. Usually for such applications it is advisable to make test indication runs at known temperature levels and known pressure conditions.

The tested object also must be able to supply enough heat energy to melt the mass of indicating material. The phase change (=melting) material consumes heat for the basic temperature increase of its own mass and then also followed by the melting energy needed to be transfered from solid to liquid form.

The following **example** might be excessive but helps to understand and avoiding thermal measurement errors:
A metal strip of 100 mg (= milligramm) has been heated up to 300 °C. It does now not make sense to determine the metal temperature using a 5 gram CelsiStick®. As the much larger thermocompound mass would touch the test specimen, the specimen temperature will drop considerably under this unfavorable mass relation of 100 mg to 5000 mg. Part of the heat energy stored in the specimen will be transfered to the thermocompound to heat up that mass. Depending on mass relation the sensitive compound might heat up only to 40 or 50 °C.

How to use the CelsiLack®?
The thermo lacquer of convenient temperature is applied to the **cold** test surface using a small brush, dispenser needle,a pipette or doing a dip.

The lacquer mark will dry rapidly into a dull, rough and irregular sized mark or spot.

As the melting point of the mark material is exceeded the material will become fluid with a smooth shiny surface and upon cooling will solidify with a smooth and shiny surface. The surface might also be partially translucent or discoloured.

This now glossy and smooth surface clearly indicates that the original dull and rough spot had been molten somtimes in the past and that area was at or above that specified melting point.

When? and how long? can not be extracted.

CelsiLack® is available in 50 , 500, 1000 and 4000 MilliLiter (ml) container.

Please note that we do not produce new CelsiLack® due to the changes to ROHS. So, there are not anymore all temperature levels available.

Available temperature levels in °C for CelsiLac®k and CelsiStick®.												
38	39	41	43	45	48	52	55	59	62	66	69	73
76	79	83	87	90	93	97	101	104	107	111	114	118
121	124	128	132	135	139	142	146	149	152	156	159	163
166	170	173	177	184	191	198	204	212	218	226	232	239
246	253	260	274	286	302	316	329	343	357	371	385	399
427	454	482	500	510	525	538	550	566	593	621	649	677
704	732	760	774	788	804	816	843	871	899	927	954	982
1010	1038	1066	1093	1124	1149	1177	1204	1232	1260	1288	1316	1343
1371	°C		Not all temperature values are avilable from stock.values are available on stock.									