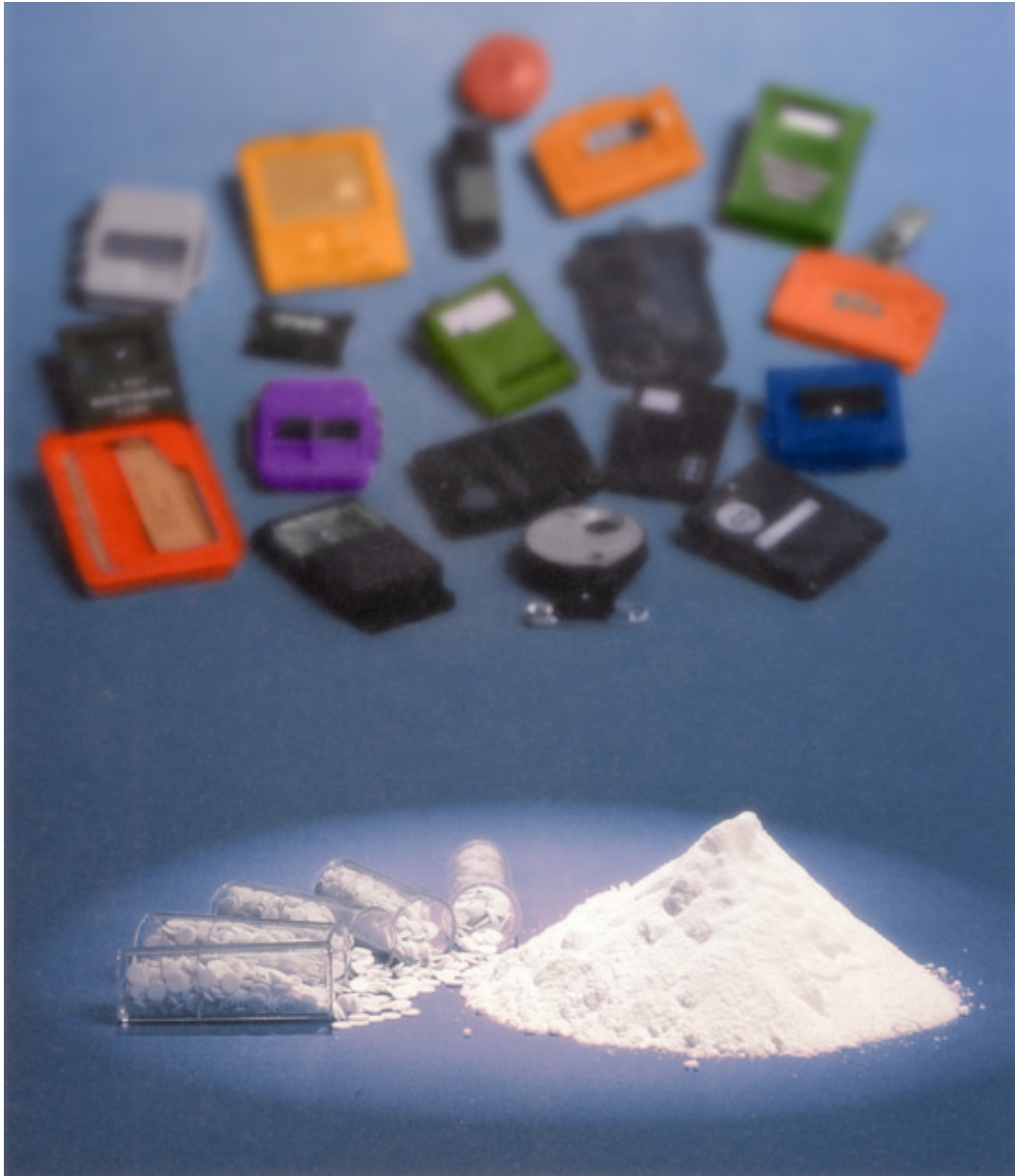


# *TL Materials for Dosimetry Applications*



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**KWD**  
NUCLEAR  
INSTRUMENTS

# TL materials with high sensitivity and reproduction

Wedholm Medical provides all common types of TL materials for dosimetry applications.

Our products include Mg-doped LiF with a natural distribution of lithium and enriched LiF which does not effectively detect neutrons. We can also deliver highly sensitive P-doped LiF detectors.

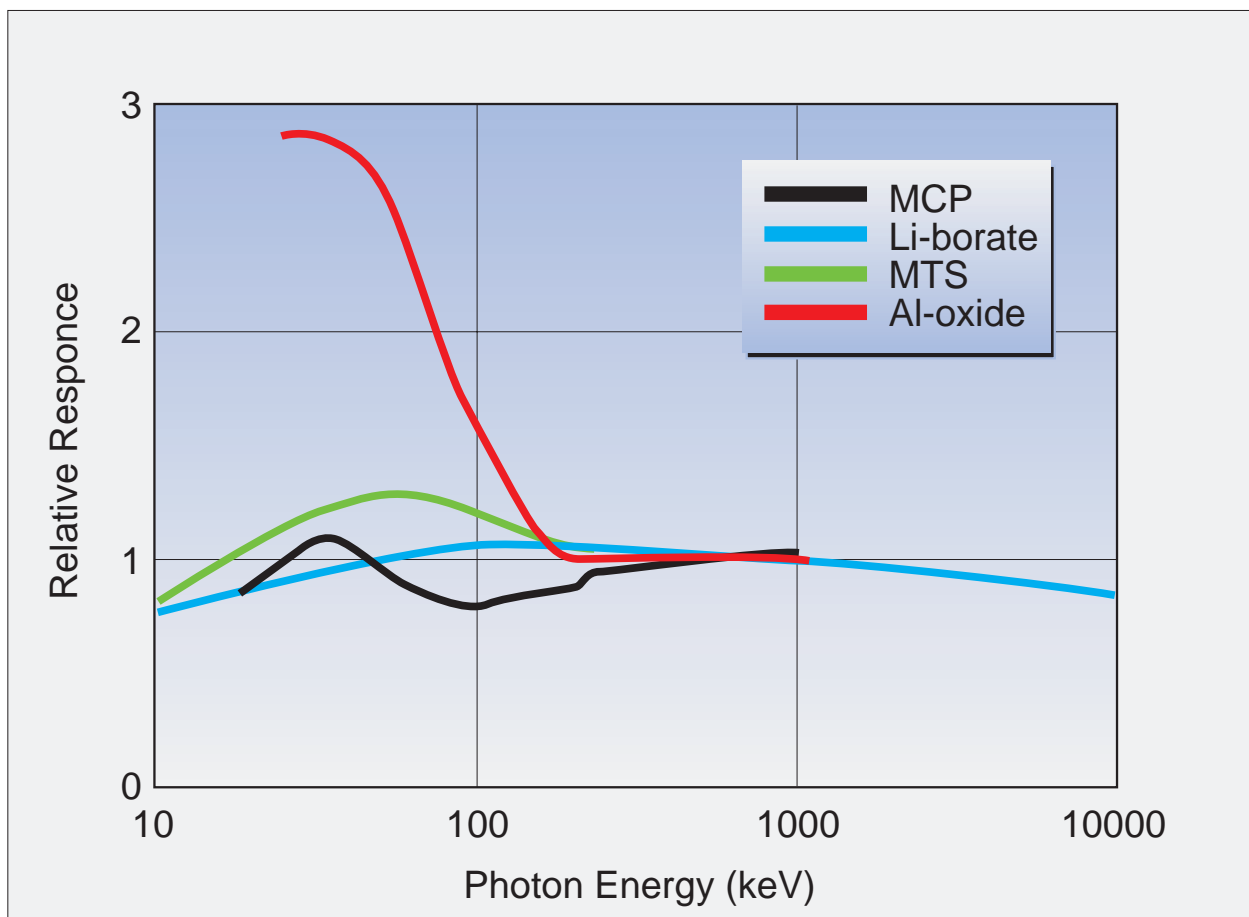
Another standard material is Li-borate doped with Mn and Si, which allows for the detection of beta, gamma and X-ray emission as well as thermal neutrons.

Other detectors of interest are corundum pellets, a very highly sensitive detector of aluminium oxide and graphite-mixed Mg-doped or P-doped LiF detectors.

These materials are supplied in the form of pellets which are pressed and hot sintered from high purity powder. They may also be supplied with alternative sensitive classes. The standard deviation in sensitivity is less than 7% within the batch and less than 15% between batches. Pellets may be used hundreds of times provided that they are protected from contamination.

## General features

- Pellets are compatible with existing standards
- Fits most common manual and automatic readers
- Small energy dependence at low energies
- Wide energy range
- Low fading
- Good reproducibility
- Available from stock - fast delivery
- Precision batches with S. D. - less than 5 % available upon request



## Technical specifications

<i>Material</i>	<b>Li-borate</b> Li <sub>2</sub> B <sub>4</sub> O <sub>7</sub> : Mn, Si natural hot sintered	<b>MTS/Li-fluoride</b> LiF: Mg, Ti - MTS-N natural - MTS-7 enriched hot sintered	<b>MCP/Li-fluoride</b> LiF: Mg, Cu, P - MCP-N natural - MCP-7 enriched hot sintered	<b>Al-oxide</b> Al <sub>2</sub> O <sub>3</sub> Corundum
<i>Dimensions</i>	dia 4.5 mm x 0.8 mm	dia 4.5 mm x 0.9 mm	dia 4.5 mm x 0.9 mm	dia 4.5 mm x 0.9 mm
<i>Radiation detected</i>	beta, gamma, X-rays n <sub>a</sub>	beta, gamma, X-rays n <sub>a</sub> (MTS-N)	beta, gamma, X-rays n <sub>a</sub> (MCP-N)	beta, gamma, X-rays
<i>Energy dependency</i>	see curves	see curves	see curves	see curves
<i>Measurement range</i>	50 µGy – ≥10 Gy	15 µGy – 10 Gy	0.1 µGy – 0.1 Gy	10 µGy – 10 Gy
<i>Main TL peaks</i>	220°C	210°C	210°C	190°C
<i>Efficient atomic no</i>	7.4	8.14	8.14	10.2
<i>Linearity</i>	<5%	3%	3%	Calibration curves must be used
<i>Fading (22°)</i>	<10% per 3 months	3% per 3 months	3% per 3 months	2 % per year
<i>Annealing</i>	300°C, 15 min	400°C, 1 h+100°C, 2 h	240°C, 10 min	400°C, 1 h+100°C, 2 h

## Features

### LiB

Li<sub>2</sub>B<sub>4</sub>O<sub>7</sub>: Mn shows improved air and tissue equivalence and higher stability with respect to air humidity. The detector is very sensitive to thermal neutrons. Application as high dose personal dosimetry.

### MTS

LiF is the most commonly used TL-detector. It exhibits high sensitivity for general applications, low background, ability to withstand environmental conditions and tissue-equivalence. Applications: Personal dosimetry.

### MCP

MCP-type is an ultra-high sensitivity detector, 35 times more sensitive to gamma ray doses compared to MTS. The extremely high sensitivity of MCP detectors opens new possibilities in the study of very low doses. Applications: Monitoring of personal doses during visits to nuclear installations.

### Al-oxide

Al<sub>2</sub>O<sub>3</sub> shows a very high sensitivity which is 5 times, when compared with MTS-7. The fading is very low. Application: Environmental dosimetry.

### Option

For H<sub>1</sub>(d)-dose equivalent ultra thin TL-material can be offered on special request.