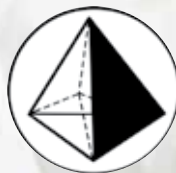


# Phthalate Standards Reference Guide



**Includes  
New  
Phthalate  
Replacements**



**AccuStandard<sup>®</sup>**

## Phthalate Background

Benzene dicarboxylic acid is equivalent to phthalic acid. Reacting phthalic acid with a variety of alcohols results in the synthesis of a group of chemicals designated as phthalic acid esters or phthalates.

Phthalates are used primarily as plasticizers. Plasticizers lower the glass transition temperature of a plastic/polymer and impart flexibility, durability and longevity to these types of products by acting as softening agents.

Due to their low-cost, versatility and effectiveness, phthalates are widely used in plastics manufacturing, in pharmaceutical coatings, in all types of packaging, in inks, in textiles and as gelling agents. They are end-use components of electronics, paints, adhesives, building materials, cleaning products and toys to name just a few.

Phthalates are now separated into two distinct classes according to the length of the precursor alcohol. The lower molecular weight (LMW) phthalates, including di-butyl, benzyl butyl and diethyl hexyl are made from alcohols with three to six carbon backbones.

Unfortunately, the LMW phthalates are easily released into the environment because there is no chemical bond between the phthalates and the plastic/polymer matrix. Leaching and atmospheric release of these compounds increases as the substrate ages and/or weathers; and has resulted in phthalates becoming a major environmental contaminant. This is important because phthalates are considered to be potential endocrine-disrupting agents (1). Human exposure to phthalates may be through direct contact, ingestion or inhalation. Concern over the adverse health effects has prompted regulatory changes and lead to a permanent ban of these plasticizers in baby-care products and toys (2).

Such a large-scale health concern has led to the development of analytical methods for phthalates in a variety of matrices. The majority of these methods focus on the analysis of the LMW phthalates ranging from mono/diethyl to mono/dioctyl and, in particular, dibutyl and bis(2-ethylhexyl)phthalate (3). Bis(2-ethylhexyl)phthalate has been the dominant plasticizer and is the largest volume phthalate in the global market. It is used as a standard for comparison for the performance of other types of plasticizers.

All of the above-mentioned phthalates are single isomer compounds which can be analyzed via straight-forward GC/MS methods yielding a single chromatographic peak for each compound.

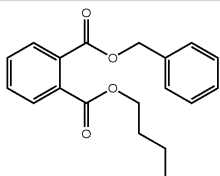


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1. S. Jobling et al., *Environ. Health Perspect.*, **103** (6), 582-587 (1995)
2. *Chemical & Engineering News*, vol. 89, no 22, page 28 (May 30 2011)
3. H. Fromme et al., *Water Research*, **36** (6), 1429-1438 (2002)



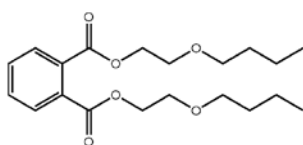
## Benzyl butyl phthalate



CAS 85-68-7 MF C<sub>19</sub>H<sub>20</sub>O<sub>4</sub> MW 312.26 PS L  
SG 1.13 g/cm<sup>3</sup> MP -35 °C BP 370-380 °C  
FP 198 °C

Matrix	Cat. No.	Unit
NEAT	ALR-082N	100 mg
100 µg/mL in MeOH	ALR-082S	1 mL
5 mg/mL in MeOH	AS-E0065	1 mL

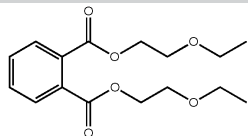
## bis(2-n-Butoxyethyl)phthalate



CAS 117-83-9 MF C<sub>20</sub>H<sub>30</sub>O<sub>6</sub> MW 366.45 PS L  
SG 1.06 g/cm<sup>3</sup> MP N/A BP 270 °C FP 205 °C

Matrix	Cat. No.	Unit
NEAT	J-112	100 mg

## bis(2-Ethoxyethyl)phthalate

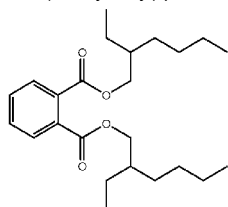


CAS 605-54-9 MF C<sub>16</sub>H<sub>22</sub>O<sub>6</sub> MW 310.34 PS S  
SG 1.12 g/cm<sup>3</sup> MP 34 °C BP 345 °C FP N/A

Matrix	Cat. No.	Unit
NEAT	J-111	100 mg

## bis(2-Ethylhexyl)phthalate (DEHP)

Di(2-Ethylhexyl) phthalate



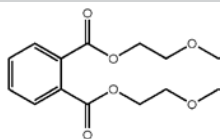
CAS 117-81-7 MF C<sub>24</sub>H<sub>38</sub>O<sub>4</sub> MW 390.56 PS L  
SG 0.98 g/cm<sup>3</sup> MP -50 °C BP 361 °C FP 204 °C

Matrix	Cat. No.	Unit
NEAT	ALR-097N	100 mg
100 µg/mL in MeOH	ALR-097S	1 mL
1 mg/mL in MeOH	APP-9-029-10X	1 mL

### Property Key

CAS	Chemical Abstract Service Number	SG	Specific Gravity (g/cm <sup>3</sup> )
MF	Molecular Formula	MP	Melting Point (°C)
MW	Molecular Weight	BP	Boiling Point (°C)
PS	Physical State (Solid, Liquid)	FP	Flash Point (°C)

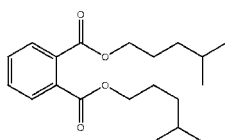
## bis(2-Methoxyethyl)phthalate



CAS 117-82-8 MF C<sub>14</sub>H<sub>18</sub>O<sub>6</sub> MW 282.29 PS L  
SG 1.17 g/cm<sup>3</sup> MP N/A BP 230 °C FP 121 °C

Matrix	Cat. No.	Unit
NEAT	J-106	100 mg

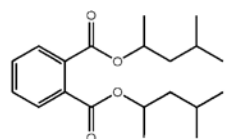
## bis(4-Methylpentyl)phthalate



CAS 71850-09-4 MF C<sub>20</sub>H<sub>30</sub>O<sub>4</sub> MW 334.45 PS S  
SG N/A BP N/A FP N/A

Matrix	Cat. No.	Unit
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100 µg/mL in MeOH	PHTH-022S	1 mL

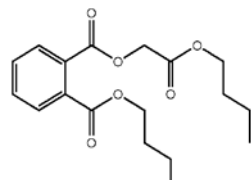
## bis(4-Methyl-2-pentyl)phthalate



CAS 146-50-9 MF C<sub>20</sub>H<sub>30</sub>O<sub>4</sub> MW 334.45 PS L  
SG 1.01 g/cm<sup>3</sup> BP 370-380 °C FP 180 °C

Matrix	Cat. No.	Unit
NEAT	J-109	100 mg

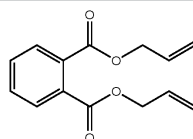
## 2-Butoxy-2-oxoethyl butyl phthalate



CAS 85-70-1 MF C<sub>18</sub>H<sub>24</sub>O<sub>6</sub> MW 336.38 PS L  
SG 1.10 g/cm<sup>3</sup> MP N/A BP 345 °C FP 199 °C

Matrix	Cat. No.	Unit
NEAT	J-115	100 mg

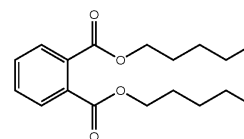
## Diallyl phthalate



CAS 131-17-9 MF C<sub>14</sub>H<sub>14</sub>O<sub>4</sub> MW 246.26 PS L  
SG 1.11 g/cm<sup>3</sup> MP 16 °C BP 165 °C FP 165 °C

Matrix	Cat. No.	Unit
NEAT	J-002	100 mg

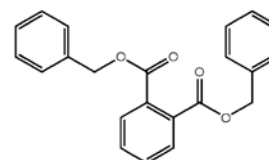
## Diamyl phthalate



CAS 131-18-0 MF C<sub>18</sub>H<sub>26</sub>O<sub>4</sub> MW 306.40 PS L  
SG 1.03 g/cm<sup>3</sup> BP 342 °C FP 190 °C

Matrix	Cat. No.	Unit
NEAT	ALR-098N	100 mg
100 µg/mL in MeOH	ALR-098S	1 mL

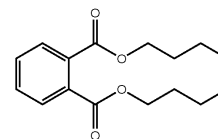
## Dibenzyl phthalate



CAS 523-31-9 MF C<sub>22</sub>H<sub>18</sub>O<sub>4</sub> MW 346.38 PS S  
SG 1.25 g/cm<sup>3</sup> MP 40-42 °C BP >400 °C  
FP >150 °C

Matrix	Cat. No.	Unit
NEAT	J-104	100 mg

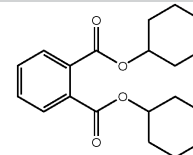
## Dibutyl phthalate



CAS 84-74-2 MF C<sub>16</sub>H<sub>22</sub>O<sub>4</sub> MW 278.34 PS L  
SG 1.05 g/cm<sup>3</sup> MP -35 °C BP 337-340 °C  
FP 177 °C

Matrix	Cat. No.	Unit
NEAT	J-003	100 mg
100 µg/mL in MeOH	APP-9-063	1 mL
1 mg/mL in MeOH	APP-9-063-10X	1 mL
5 mg/mL in MeOH	AS-E0066	1 mL

## Dicyclohexyl phthalate



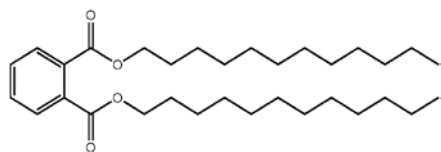
CAS 84-61-7 MF C<sub>20</sub>H<sub>26</sub>O<sub>4</sub> MW 330.42 PS S  
SG 1.14 g/cm<sup>3</sup> MP 61-66 °C BP 235 °C  
FP 207 °C

Matrix	Cat. No.	Unit
NEAT	J-004	100 mg
100 µg/mL in MeOH	ALR-099S	1 mL
1 mg/mL in AcCN	AS-E0318	1 mL

Phthalates continued on next page

# Phthalates (continued)

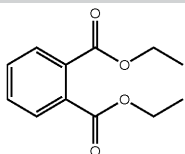
## Didodecyl phthalate



CAS 2432-90-8 MF C<sub>32</sub>H<sub>54</sub>O<sub>4</sub> MW 502.77 PS L or S  
SG 1.05 g/cm<sup>3</sup> MP 21-23 °C BP N/A FP >200 °C

Matrix	Cat. No.	Unit
NEAT	PHTH-018N	100 mg
100 µg/mL in Hexane	PHTH-018S	1 mL

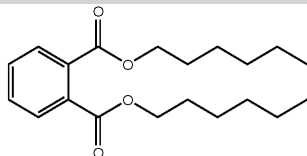
## Diethyl phthalate



CAS 84-66-2 MF C<sub>12</sub>H<sub>14</sub>O<sub>4</sub> MW 222.24 PS L  
SG 1.12 g/cm<sup>3</sup> MP -3 °C BP 172 °C FP 160 °C

Matrix	Cat. No.	Unit
NEAT	J-005	100 mg
100 µg/mL in MeOH	APP-9-081	1 mL
1 mg/mL in MeOH	APP-9-081-10X	1 mL
5 mg/mL in MeOH	AS-E0068	1 mL

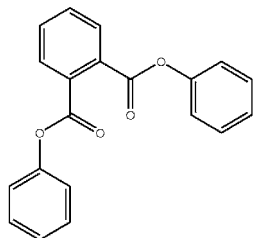
## Dihexyl phthalate



CAS 84-75-3 MF C<sub>20</sub>H<sub>30</sub>O<sub>4</sub> MW 334.45 PS L  
SG 1.01 g/cm<sup>3</sup> BP 185-187 °C FP 200 °C

Matrix	Cat. No.	Unit
NEAT	ALR-100N	100 mg
100 µg/mL in MeOH	ALR-100S	1 mL

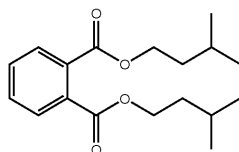
## Diphenyl phthalate



CAS 84-62-8 MF C<sub>20</sub>H<sub>14</sub>O<sub>4</sub> MW 318.32 PS S  
SG 1.24 g/cm<sup>3</sup> MP 74-76 °C BP 255 °C FP 256 °C

Matrix	Cat. No.	Unit
NEAT	J-013	100 mg

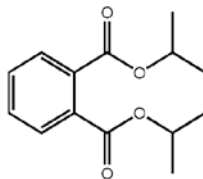
## Diisopentyl phthalate



CAS 605-50-5 MF C<sub>18</sub>H<sub>26</sub>O<sub>4</sub> MW 306.40 PS L  
SG 1.03 g/cm<sup>3</sup> FP 167 °C

Matrix	Cat. No.	Unit
NEAT	J-127	100 mg

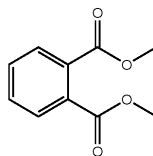
## Diisopropyl phthalate



CAS 605-45-8 MF C<sub>14</sub>H<sub>18</sub>O<sub>4</sub> MW 250.29 PS L

Matrix	Cat. No.	Unit
NEAT	PHTH-019N	100 mg
100 µg/mL in MeOH	PHTH-019S	1 mL

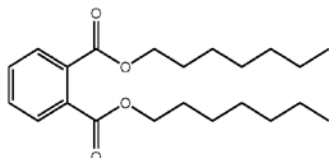
## Dimethyl phthalate



CAS 131-11-3 MF C<sub>10</sub>H<sub>10</sub>O<sub>4</sub> MW 194.18 PS L  
SG 1.19 g/cm<sup>3</sup> MP 2-6 °C BP 282-284 °C  
FP 295 °C

Matrix	Cat. No.	Unit
NEAT	J-010	100 mg
100 µg/mL in MeOH	APP-9-088	1 mL
1 mg/mL in MeOH	APP-9-088-10X	1 mL
5 mg/mL in MeOH	AS-E0069	1 mL
0.1 mg/mL in EtOAc	M-8032-IS	1 mL

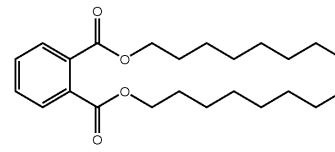
## Di-n-heptyl phthalate



CAS 3648-21-3 MF C<sub>22</sub>H<sub>34</sub>O<sub>4</sub> MW 362.50 PS L  
SG 0.99 g/cm<sup>3</sup> MP N/A BP 195 °C FP 113 °C

Matrix	Cat. No.	Unit
NEAT	PHTH-020N	100 mg
100 µg/mL in MeOH	PHTH-020S	1 mL

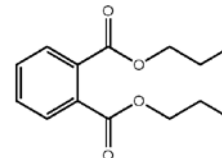
## Di-n-octyl phthalate



CAS 117-84-0 MF C<sub>24</sub>H<sub>38</sub>O<sub>4</sub> MW 390.56 PS L  
SG 0.98 g/cm<sup>3</sup> MP -25 °C FP 109 °C

Matrix	Cat. No.	Unit
NEAT	J-011	100 mg

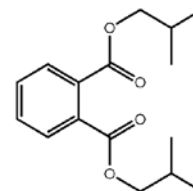
## Di-n-propyl phthalate



CAS 131-16-8 MF C<sub>14</sub>H<sub>18</sub>O<sub>4</sub> MW 250.29 PS L  
SG 1.08 g/cm<sup>3</sup> MP N/A BP 317-318 °C FP 109 °C

Matrix	Cat. No.	Unit
NEAT	J-100	100 mg

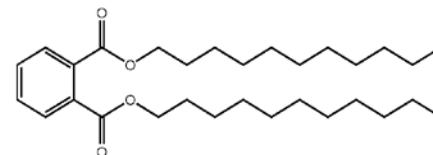
## Diisobutyl phthalate



CAS 84-69-5 MF C<sub>16</sub>H<sub>22</sub>O<sub>4</sub> MW 278.34 PS L or S  
SG 1.04 g/cm<sup>3</sup> MP N/A BP 327 °C FP 109 °C

Matrix	Cat. No.	Unit
NEAT	J-113	100 mg

## Diundecyl phthalate



CAS 3648-20-2 MF C<sub>30</sub>H<sub>50</sub>O<sub>4</sub> MW 474.72 PS L or S  
SG 0.95 g/cm<sup>3</sup> MP 15 °C BP 472 °C FP 239 °C

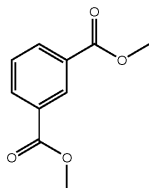
Matrix	Cat. No.	Unit
NEAT	PHTH-021N	100 mg
100 µg/mL in MeOH	PHTH-021S	1 mL

### Property Key

<b>CAS</b>	Chemical Abstract Service Number	<b>SG</b>	Specific Gravity (g/cm <sup>3</sup> )
<b>MF</b>	Molecular Formula	<b>MP</b>	Melting Point (°C)
<b>MW</b>	Molecular Weight	<b>BP</b>	Boiling Point (°C)
<b>PS</b>	Physical State (Solid, Liquid)	<b>FP</b>	Flash Point (°C)

## Isophthalates

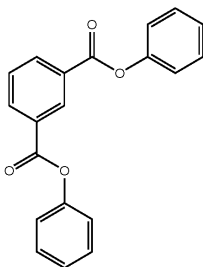
### Dimethyl isophthalate



CAS 1459-93-4 MF C<sub>10</sub>H<sub>10</sub>O<sub>4</sub> MW 194.18 PS S  
SG 1.18 g/cm<sup>3</sup> MP 64-68 °C BP 282-285 °C  
FP 148 °C

Matrix	Cat. No.	Unit
NEAT	J-009	100 mg

### Diphenyl isophthalate

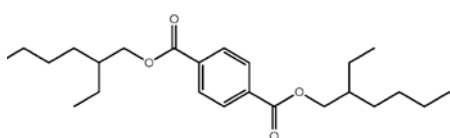


CAS 744-45-6 MF C<sub>20</sub>H<sub>14</sub>O<sub>4</sub> MW 318.32 PS S  
SG 1.24 g/cm<sup>3</sup> MP 136-138 °C FP 256 °C

Matrix	Cat. No.	Unit
NEAT	J-012	100 mg

## Terephthalates

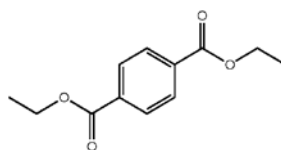
### bis(2-Ethylhexyl)terephthalate



CAS 6422-86-2 MF C<sub>24</sub>H<sub>38</sub>O<sub>4</sub> MW 390.56 PS L  
SG 0.99 g/cm<sup>3</sup> MP N/A BP 400 °C FP 212 °C

Matrix	Cat. No.	Unit
NEAT	J-121	100 mg

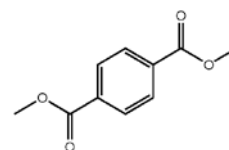
### Diethyl terephthalate



CAS 636-09-9 MF C<sub>12</sub>H<sub>14</sub>O<sub>4</sub> MW 222.24 PS S  
SG 1.15 g/cm<sup>3</sup> MP 43-47 °C BP 142 °C  
FP >150 °C

Matrix	Cat. No.	Unit
NEAT	J-123	100 mg

### Dimethyl terephthalate



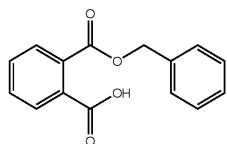
CAS 120-61-6 MF C<sub>10</sub>H<sub>10</sub>O<sub>4</sub> MW 194.18 PS S  
SG 1.36 g/cm<sup>3</sup> MP 139-141 °C BP 288 °C  
FP 151 °C

Matrix	Cat. No.	Unit
NEAT	J-101	100 mg

## Monophthalates

Mono-phthalate esters are the primary phthalate metabolites formed via hydrolysis of one ester bond. It is these compounds that are thought to be toxic agents; and are receiving interest as a possible human health issue. Studies have shown that they can produce estrogenic and immune-suppressive effects in humans.

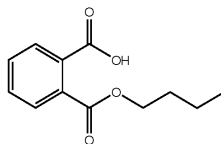
### Monobenzyl phthalate (mBzP)



CAS 2528-16-7 MF C<sub>15</sub>H<sub>12</sub>O<sub>4</sub> MW 256.25 PS S  
SG 1.28 g/cm<sup>3</sup> MP 106 °C BP 441 °C FP 168 °C

Matrix	Cat. No.	Unit
NEAT	ALR-134N	100 mg
100 µg/mL in AcCN	ALR-134S-CN	1 mL

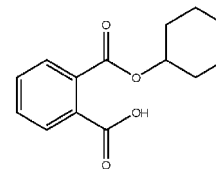
### Monobutyl phthalate (mBP)



CAS 131-70-4 MF C<sub>12</sub>H<sub>14</sub>O<sub>4</sub> MW 222.24 PS S  
SG 1.17 g/cm<sup>3</sup> MP 73 °C BP 350-354 °C FP 138 °C

Matrix	Cat. No.	Unit
NEAT	ALR-135N	100 mg
100 µg/mL in AcCN	ALR-135S-CN	1 mL

### Monocyclohexyl phthalate (mBP) **NEW**



CAS 7517-36-4 MF C<sub>14</sub>H<sub>16</sub>O<sub>4</sub> MW 248.27 PS S  
SG 1.24 g/cm<sup>3</sup> MP 89-91 °C BP 410 °C FP 154 °C

Matrix	Cat. No.	Unit
NEAT	ALR-178N	100 mg
100 µg/mL in AcCN	ALR-178S-CN	1 mL

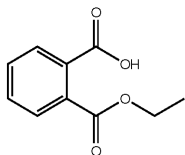
### Technical Note

AccuStandard offers eight mono-phthalates including the mono-ethylhexyl (mEHP) which is the metabolite of the plasticizer with the greatest yearly production and use on a global basis.

Monophthalates continued on  
next page

# Monophthalates (continued)

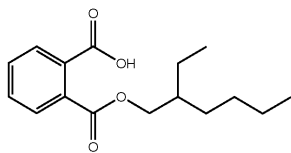
## Monoethyl phthalate (mEP)



CAS 2306-33-4 MF C<sub>10</sub>H<sub>10</sub>O<sub>4</sub> MW 194.18 PS S  
SG 1.24 g/cm<sup>3</sup> MP 101 °C BP 329 °C FP 135 °C

Matrix	Cat. No.	Unit
NEAT	ALR-137N	100 mg
100 µg/mL in AcCN	ALR-137S-CN	1 mL

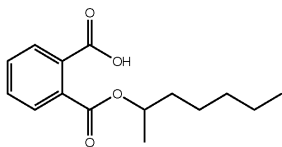
## Monoethylhexyl phthalate (mEHP)



CAS 4376-20-9 MF C<sub>16</sub>H<sub>22</sub>O<sub>4</sub> MW 278.34 PS S  
SG 1.09 g/cm<sup>3</sup> MP 142 °C BP 390-395 °C  
FP 144 °C

Matrix	Cat. No.	Unit
NEAT	ALR-138N	100 mg
100 µg/mL in AcCN	ALR-138S-CN	1 mL

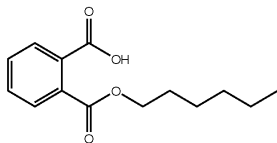
## Mono-2-heptyl phthalate



CAS N/A MF C<sub>15</sub>H<sub>20</sub>O<sub>4</sub> MW 264.32 PS S

Matrix	Cat. No.	Unit
NEAT	ALR-143N	100 mg
100 µg/mL in AcCN	ALR-143S-CN	1 mL

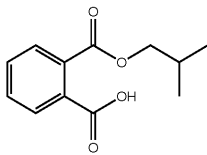
## Monoethyl phthalate NEW



CAS 24539-57-9 MF C<sub>14</sub>H<sub>16</sub>O<sub>4</sub> MW 250.29 PS S  
SG 1.12 g/cm<sup>3</sup> MP 133 °C BP 375-380 °C  
FP 142 °C

Matrix	Cat. No.	Unit
NEAT	ALR-175N	100 mg
100 µg/mL in AcCN	ALR-175S-CN	1 mL

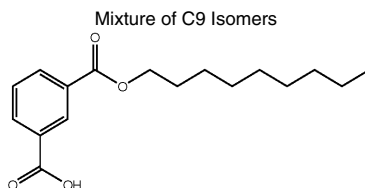
## Monoisobutyl phthalate



CAS 30833-53-5 MF C<sub>12</sub>H<sub>14</sub>O<sub>4</sub> MW 222.24 PS S  
SG 1.17 g/cm<sup>3</sup> MP 78-80 °C BP 356-357 °C  
FP 135 °C

Matrix	Cat. No.	Unit
NEAT	ALR-176N	100 mg
100 µg/mL in AcCN	ALR-176S-CN	1 mL

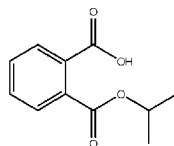
## Monoisononyl phthalate



CAS N/A MF C<sub>17</sub>H<sub>24</sub>O<sub>4</sub> MW 292.37 PS S

Matrix	Cat. No.	Unit
NEAT	ALR-142N	100 mg
100 µg/mL in AcCN	ALR-142S-CN	1 mL

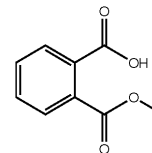
## Monoisopropyl phthalate



CAS 35118-50-4 MF C<sub>11</sub>H<sub>12</sub>O<sub>4</sub> MW 208.21 PS S  
SG 1.20 g/cm<sup>3</sup> MP 100-104 °C BP 343-344 °C  
FP 133 °C

Matrix	Cat. No.	Unit
NEAT	ALR-179N	100 mg
100 µg/mL in AcCN	ALR-179S-CN	1 mL

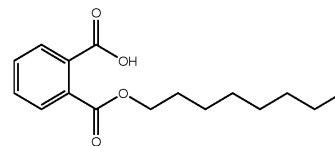
## Monomethyl phthalate



CAS 4376-18-5 MF C<sub>9</sub>H<sub>8</sub>O<sub>4</sub> MW 180.16 PS S  
SG 1.29 g/cm<sup>3</sup> MP 81-84 °C BP 315-316 °C  
FP 135 °C

Matrix	Cat. No.	Unit
NEAT	ALR-139N	100 mg
100 µg/mL in AcCN	ALR-139S-CN	1 mL

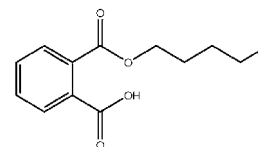
## Monooctyl phthalate



CAS 5393-19-1 MF C<sub>16</sub>H<sub>22</sub>O<sub>4</sub> MW 278.34 PS S  
SG 1.09 g/cm<sup>3</sup> MP 149 °C BP 400 °C FP 146 °C

Matrix	Cat. No.	Unit
NEAT	ALR-141N	100 mg
100 µg/mL in AcCN	ALR-141S-CN	1 mL

## Mono-n-pentyl phthalate NEW



CAS 24539-56-8 MF C<sub>13</sub>H<sub>16</sub>O<sub>4</sub> MW 236.26 PS S  
SG 1.48 g/cm<sup>3</sup> MP 125-126 °C BP 376-377 °C  
FP 140 °C

Matrix	Cat. No.	Unit
NEAT	ALR-177N	100 mg
100 µg/mL in AcCN	ALR-177S-CN	1 mL

### Property Key

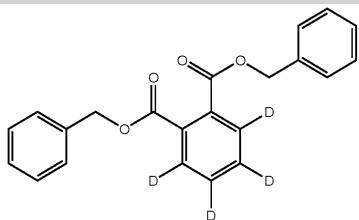
<b>CAS</b>	Chemical Abstract Service Number	<b>SG</b>	Specific Gravity (g/cm <sup>3</sup> )
<b>MF</b>	Molecular Formula	<b>MP</b>	Melting Point (°C)
<b>MW</b>	Molecular Weight	<b>BP</b>	Boiling Point (°C)
<b>PS</b>	Physical State (Solid, Liquid)	<b>FP</b>	Flash Point (°C)



# Deuterated Phthalates

AccuStandard offers eleven deuterated phthalates which can be used as internal standards. To simplify the ordering process, the native and the corresponding deuterated compound are packaged as sets at a reduced price

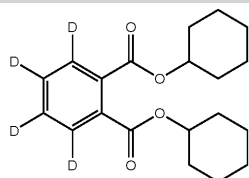
## Dibenzylphthalate-d<sub>4</sub>



CAS 1015854-62-2 MF C<sub>20</sub>H<sub>14</sub>D<sub>4</sub>O<sub>4</sub> MW 350.40  
PS S MP 40-42 °C BP 276-278 °C

Matrix	Cat. No.	Unit
NEAT	PHTH-D4-001N	5 mg
100 µg/mL in MeOH	PHTH-D4-001S	1 mL

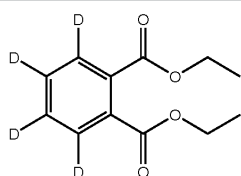
## Dicyclohexyl phthalate-3,4,5,6-d<sub>4</sub>



CAS 358731-25-6 MF C<sub>20</sub>H<sub>22</sub>D<sub>4</sub>O<sub>4</sub> MW 334.44 PS S  
SG 1.16 g/cm<sup>3</sup> MP 65-67 °C FP 207 °C

Matrix	Cat. No.	Unit
NEAT	PHTH-D4-004N	5 mg
100 µg/mL in MeOH	PHTH-D4-004S	1 mL

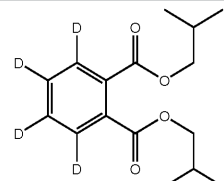
## Diethyl phthalate-3,4,5,6-d<sub>4</sub>



CAS 93952-12-6 MF C<sub>10</sub>H<sub>10</sub>D<sub>4</sub>O<sub>4</sub> MW 226.26 PS L  
SG 1.14 g/cm<sup>3</sup> MP -3 °C FP 160 °C

Matrix	Cat. No.	Unit
NEAT	PHTH-D4-005N	5 mg
100 µg/mL in MeOH	PHTH-D4-005S	1 mL

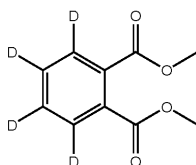
## Di-iso-butyl phthalate-3,4,5,6-d<sub>4</sub>



CAS 358730-88-8 MF C<sub>16</sub>H<sub>18</sub>D<sub>4</sub>O<sub>4</sub> MW 282.37 PS L  
MP N/A BP 327 °C FP 109 °C

Matrix	Cat. No.	Unit
NEAT	PHTH-D4-003N	5 mg
100 µg/mL in MeOH	PHTH-D4-003S	1 mL

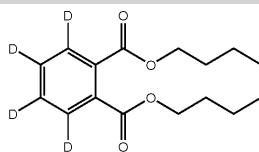
## Dimethyl phthalate-3,4,5,6-d<sub>4</sub>



CAS 93951-89-4 MF C<sub>10</sub>H<sub>8</sub>D<sub>4</sub>O<sub>4</sub> MW 198.21 PS L  
SG 1.20 g/cm<sup>3</sup> MP 2 °C BP 282 °C FP 147 °C

Matrix	Cat. No.	Unit
NEAT	PHTH-D4-007N	5 mg
100 µg/mL in MeOH	PHTH-D4-007S	1 mL

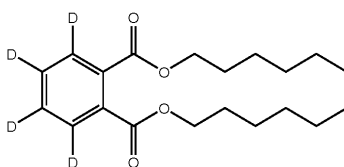
## Di-n-butyl phthalate-d<sub>4</sub>



CAS 93952-11-5 MF D<sub>16</sub>H<sub>18</sub>D<sub>4</sub>O<sub>4</sub> MW 282.37 PS L  
SG 1.07 g/cm<sup>3</sup> MP < 25 °C BP 336 °C FP 171 °C

Matrix	Cat. No.	Unit
NEAT	PHTH-D4-002N	5 mg
100 µg/mL in MeOH	PHTH-D4-002S	1 mL

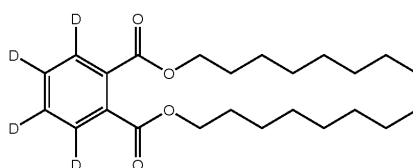
## Di-n-hexyl phthalate-3,4,5,6-d<sub>4</sub>



CAS 1015854-55-3 MF C<sub>20</sub>H<sub>26</sub>D<sub>4</sub>O<sub>4</sub> MW 338.47  
PS L SG 1.01 g/cm<sup>3</sup> MP N/A BP 185-187 °C

Matrix	Cat. No.	Unit
NEAT	PHTH-D4-006N	5 mg
100 µg/mL in MeOH	PHTH-D4-006S	1 mL

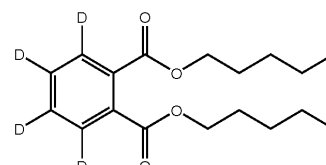
## Di-n-octyl phthalate-3,4,5,6-d<sub>4</sub>



CAS 93952-13-7 MF C<sub>26</sub>H<sub>34</sub>D<sub>4</sub>O<sub>4</sub> MW 394.58 PS L  
SG 0.96 g/cm<sup>3</sup> MP -50 °C BP 390 °C FP 205 °C

Matrix	Cat. No.	Unit
NEAT	PHTH-D4-008N	5 mg
100 µg/mL in MeOH	PHTH-D4-008S	1 mL

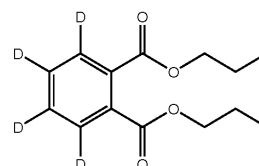
## Di-n-pentyl phthalate-3,4,5,6-d<sub>4</sub>



CAS 358730-89-9 MF C<sub>18</sub>H<sub>22</sub>D<sub>4</sub>O<sub>4</sub> MW 310.42 PS L  
MP N/A BP 360 °C FP >110 °C

Matrix	Cat. No.	Unit
NEAT	PHTH-D4-009N	5 mg
100 µg/mL in MeOH	PHTH-D4-009S	1 mL

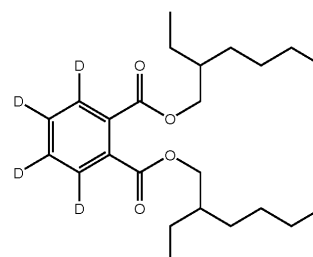
## Di-n-propyl phthalate-3,4,5,6-d<sub>4</sub>



CAS 358731-29-0 MF C<sub>14</sub>H<sub>14</sub>D<sub>4</sub>O<sub>4</sub> MW 254.31 PS L  
SG 1.08 g/cm<sup>3</sup> MW N/A BP 317-318 °C FP >110 °C

Matrix	Cat. No.	Unit
NEAT	PHTH-D4-010N	5 mg
100 µg/mL in MeOH	PHTH-D4-010S	1 mL

## bis(2-Ethylhexyl) phthalate-3,4,5,6-d<sub>4</sub>



CAS 93951-87-2 MF C<sub>24</sub>H<sub>34</sub>D<sub>4</sub>O<sub>4</sub> MW 394.58 PS L  
SG 0.98 g/cm<sup>3</sup> MP -50 °C BP 384 °C FP 207 °C

Matrix	Cat. No.	Unit
NEAT	PHTH-D4-011N	5 mg
100 µg/mL in MeOH	PHTH-D4-011S	1 mL

## Set includes 11 Deuterated Phthalates

Neat Set	PHTH-D4N-SET	11 x 5 mg
Solution Set	PHTH-D4S-SET	11 x 1 mL

Other compounds are available.  
contact our Technical Service if you  
require additional deuterated or other  
labeled compounds.

# Phthalates - Technical Mixtures

The high molecular weight (HMW) phthalates have more than six carbons in the backbone; and are synthesized from phthalic acid and mixtures of C9 and C10 alcohols. The two major HMW products are diisononyl phthalate (DINP) and diisodecyl phthalate (DIDP).

Attention has now turned to the analysis of these compounds as they are becoming major players in the plasticizer marketplace. However, due to the synthesis process, GC separation of DINP and DIDP results in a cluster of peaks corresponding to different isomers. Consequently, different analytical approaches based on soft ionization techniques and MS detection have been documented in the literature (1). These new approaches can provide another tool to scrutinize the amounts, environmental fate and potential health effects of these HMW plasticizers.

1. David, F., Sandra, P. and Hancock, P., *Current Trends in Mass Spectrometry*, May 2011)

Solutions in 1 mL

Compound	CAS No.	Conc.	Matrix	Cat. No.
Benzyl 2-ethylhexyl phthalate	27215-22-1	100 mg	NEAT	ALR-165N
		100 µg/mL	MeOH	ALR-165S
n-Butyl benzyl phthalate	85-68-7	10 mg	NEAT	PHTH-014N
		100 µg/mL	MeOH	PHTH-014S
Butyl cyclohexyl phthalate	84-64-0	100 mg	NEAT	J-122
n-Butyl isobutyl phthalate	17851-53-5	10 mg	NEAT	PHTH-013N
		100 µg/mL	MeOH	PHTH-013S
Butyl octyl phthalate	84-78-6	100 mg	NEAT	J-001
Decyl octyl phthalate	119-07-3	10 mg	NEAT	PHTH-012N
		100 µg/mL	MeOH	PHTH-012S
Didecyl phthalate	84-77-5	100 mg	NEAT	J-120
Diisodecyl phthalate	26761-40-0	100 mg	NEAT	ALR-101N
		100 µg/mL	MeOH	ALR-101S
Diisooheptyl phthalate	71888-89-6	50 mg	NEAT	PHTH-017N
		100 µg/mL	MeOH	PHTH-017S
Diisohexyl phthalate	68515-50-4	100 mg	NEAT	J-007
Diisononyl phthalate (C8 to C10 Isomers)	68515-48-0	100 mg	NEAT	ALR-102N
		100 µg/mL	MeOH	ALR-102S
Diisooctyl phthalate (C8 Isomers)	27554-26-3	100 mg	NEAT	ALR-103N
		100 µg/mL	MeOH	ALR-103S
Dinonyl phthalate	84-76-4	100 mg	NEAT	J-105
Hexyl 2-ethylhexyl phthalate	75673-16-4	100 mg	NEAT	J-016
Isobutyl benzyl phthalate	72170-45-7	10 mg	NEAT	PHTH-015N
		100 µg/mL	MeOH	PHTH-015S
Isobutyl cyclohexyl phthalate	5334-09-8	100 mg	NEAT	J-014
Pentyl isopentyl phthalate	776297-69-9	10 mg	NEAT	PHTH-016N
		100 µg/mL	MeOH	PHTH-016S
n-Octyl n-decyl phthalate	119-07-3	100 mg	NEAT	J-015





# Phthalate Replacements

World-wide concern over environmental and health-related factors associated with phthalates has led to restrictions of use in a wide array of products. This has resulted in the plastics industry generating a variety of alternatives.

In response, AccuStandard has developed a phthalate replacement product line comprised of 42 compounds representing 18 chemical classes.

**NEW**  
Product Line

Compound	CAS No.	Concentration	Cat. No.	Unit
<b>Azelaic Acid Derivatives</b>				
Diisodecyl azelate	28472-97-1	1000 µg/mL in Acetone	PLAS-PL-075S-A	1 mL
Diisooctyl azelate	26544-17-2	1000 µg/mL in Acetone	PLAS-PL-076S-A	1 mL
Dimethyl azelate	1732-10-1	1000 µg/mL in Acetone	PLAS-PL-077S-A	1 mL
Di-n-hexyl azelate	109-31-9	1000 µg/mL in Acetone	PLAS-PL-078S-A	1 mL
Di(2-ethyl hexyl) azelate	103-24-2	1000 µg/mL in Acetone	PLAS-PL-081S-A	1 mL
<b>Adipic Acid Derivatives</b>				
Di(tridecyl) adipate	16958-92-2	1000 µg/mL in Acetone	PLAS-PL-079S-A	1 mL
Di(n-heptyl, n-nonyl) adipate	68515-75-3	1000 µg/mL in Acetone	PLAS-PL-080S-A	1 mL
Diisobutyl adipate	84-69-5	1000 µg/mL in Hexane	PLAS-PL-082S	1 mL
Diisodecyl adipate	27178-16-1	1000 µg/mL in Hexane	PLAS-PL-083S	1 mL
<b>Dimer Acid Derivatives</b>				
Bis(2-hydroxyethyl) dimerate	68855-78-7	1000 µg/mL in Hexane	PLAS-PL-084S	1 mL
<b>Epoxy Derivatives</b>				
Epoxidized linseed oil	8016-11-3	1000 µg/mL in Toluene	PLAS-PL-085S-T	1 mL
2-Ethylhexyl epoxy tallate	61789-01-3	1000 µg/mL in Hexane	PLAS-PL-086S	1 mL
<b>Fumaric Acid Derivative</b>				
Dibutyl fumarate	105-75-9	1000 µg/mL in Hexane	PLAS-PL-087S	1 mL
<b>Glycerol Derivative</b>				
Glycerol triacetate	102-76-1	1000 µg/mL in Hexane	PLAS-PL-088S	1 mL
<b>Isobutyrate Derivative</b>				
2,2,4-Trimethyl-1,3-pentanediol-diisobutyrate	6846-50-0	1000 µg/mL in Hexane	PLAS-PL-089S	1 mL
<b>Maleic Acid Derivatives</b>				
di(2-Ethylhexyl)maleate [Dioctyl maleate]	142-16-5	1000 µg/mL in Hexane	PLAS-PL-090S	1 mL
Di n-butyl maleate	105-76-0	1000 µg/mL in Hexane	PLAS-PL-091S	1 mL
<b>Mellitates</b>				
Tricapryl trimellitate	27251-75-8	1000 µg/mL in Hexane	PLAS-PL-092S	1 mL
Triisodecyl trimellitate	36631-30-8	1000 µg/mL in Hexane	PLAS-PL-093S	1 mL
Tri-(n-octyl, n-decyl) trimellitate	53894-23-5	1000 µg/mL in Hexane	PLAS-PL-094S	1 mL
<b>Myristate</b>				
Isopropyl myristate	110-27-0	1000 µg/mL in Hexane	PLAS-PL-095S	1 mL
<b>Oleic Acid Derivatives</b>				
Glycerol monooleate	25496-72-4	1000 µg/mL in Hexane	PLAS-PL-096S	1 mL
Methyl oleate	112-69-2	1000 µg/mL in Hexane	PLAS-PL-097S	1 mL
n-Propyl oleate	111-59-1	1000 µg/mL in Hexane	PLAS-PL-098S	1 mL
Tetrahydrofurfuryl oleate	150-81-2	1000 µg/mL in Hexane	PLAS-PL-099S	1 mL
<b>Palmitic Acid derivative</b>				
Isopropyl palmitate	142-91-6	1000 µg/mL in Hexane	PLAS-PL-100S	1 mL
<b>Benzoic Acid Derivatives</b>				
Di(propylene glycol) dibenzoate	20109-39-1	1000 µg/mL in Hexane	PLAS-PL-101S	1 mL
Polyethylene glycol 200 dibenzoate	9004-86-6	1000 µg/mL in Hexane	PLAS-PL-102S	1 mL
<b>Phosphoric Acid Derivatives</b>				
t-Butylphenyl diphenyl phosphate	56803-37-3	1000 µg/mL in Hexane	PLAS-PL-103S	1 mL
Tri-butoxyethyl phosphate	78-51-3	1000 µg/mL in Hexane	PLAS-PL-104S	1 mL
<b>Ricinoleic Acid Derivatives</b>				
Butyl ricinoleate	151-13-3	1000 µg/mL in Hexane	PLAS-PL-105S	1 mL
Glyceryl (triacetyl)ricinoleate	101-34-8	1000 µg/mL in Hexane	PLAS-PL-106S	1 mL
n-Butyl acetyl ricinoleate	140-04-5	1000 µg/mL in Hexane	PLAS-PL-107S	1 mL
Propylene glycol ricinoleate	142-56-3	1000 µg/mL in Hexane	PLAS-PL-108S	1 mL
<b>Succinic acid Derivatives</b>				
Diethyl succinate	123-25-1	1000 µg/mL in Hexane	PLAS-PL-109S	1 mL
<b>Sulfonic acid Derivatives</b>				
o,p-Toluenesulfonamide	8013-74-9	1000 µg/mL in Hexane	PLAS-PL-110S	1 mL
n-Ethyl o,p-toluenesulfonamide	8047-99-2	1000 µg/mL in Hexane	PLAS-PL-111S	1 mL
<b>Stearic acid Derivatives</b>				
Ethylene glycol monostearate	111-60-4	1000 µg/mL in Hexane	PLAS-PL-112S	1 mL
Isopropyl isostearate	68171-33-5	1000 µg/mL in Hexane	PLAS-PL-113S	1 mL
n-Butyl stearate	123-95-5	1000 µg/mL in Hexane	PLAS-PL-114S	1 mL
Glycerol monostearate	31566-31-1	1000 µg/mL in Hexane	PLAS-PL-115S	1 mL
Propylene glycol monostearate	1323-39-3	1000 µg/mL in Hexane	PLAS-PL-116S	1 mL



# EPA Methods - Phthalate Standards

## Method 506 Phthalate Esters by PID

### Phthalate Esters

<b>M-506</b>		<b>1 x 1 mL</b>
<b>M-506-PAK</b>	<b>SAVE</b>	<b>5 x 1 mL</b>
1.0 mg/mL each in Isooctane		
Benzyl butyl phthalate	bis(2-Ethylhexyl)adipate	
Dimethyl phthalate	bis(2-Ethylhexyl)phthalate	
Diethyl phthalate	Di- <i>n</i> -octyl phthalate	
Di- <i>n</i> -butyl phthalate		

<b>M-506-QC</b>		<b>1 x 1 mL</b>
<b>M-506-QC-PAK</b>	<b>SAVE</b>	<b>5 x 1 mL</b>
At stated conc. in MeOH		

Benzyl butyl phthalate (0.25 mg/mL)	bis(2-Ethylhexyl)adipate (1.2 mg/mL)
Dimethyl phthalate (0.1 mg/mL)	bis(2-Ethylhexyl)phthalate (0.25 mg/mL)
Diethyl phthalate (0.1 mg/mL)	Di- <i>n</i> -octyl phthalate (0.65 mg/mL)
Di- <i>n</i> -butyl phthalate (0.1 mg/mL)	

## Method 606 Phthalate Esters by GC/ECD

<b>M-606</b>		<b>1 x 1 mL</b>
<b>M-606-PAK</b>	<b>SAVE</b>	<b>5 x 1 mL</b>
0.2 mg/mL each in MeOH		
Benzyl butyl phthalate	Di- <i>n</i> -butyl phthalate	
Dimethyl phthalate	Di- <i>n</i> -octyl phthalate	
Diethyl phthalate	bis(2-Ethylhexyl)phthalate	

## Method 8060 Phthalate Esters by GC/ECD

### Phthalate Esters

<b>M-8060</b>		<b>1 x 1 mL</b>
<b>M-8060-PAK</b>	<b>SAVE</b>	<b>5 x 1 mL</b>
2.0 mg/mL each in Isooctane		
Benzyl butyl phthalate	Di- <i>n</i> -butyl phthalate	
Diethyl phthalate	Di- <i>n</i> -octyl phthalate	
Dimethyl phthalate	bis(2-Ethylhexyl)phthalate	

<b>M-8060-QC</b>		<b>1 x 1 mL</b>
<b>M-8060-QC-PAK</b>	<b>SAVE</b>	<b>5 x 1 mL</b>
At stated conc. in MeOH		

Benzyl butyl phthalate (0.1 mg/mL)	Di- <i>n</i> -butyl phthalate (0.25 mg/mL)
Diethyl phthalate (0.25 mg/mL)	Di- <i>n</i> -octyl phthalate (0.5 mg/mL)
Dimethyl phthalate (0.25 mg/mL)	bis(2-Ethylhexyl)phthalate (0.5 mg/mL)

## Method 8061A Phthalate Esters by GC/ECD

### Phthalate Esters

<b>M-8061-R1</b>		<b>1 x 1 mL</b>
<b>M-8061-R1-PAK</b>	<b>SAVE</b>	<b>5 x 1 mL</b>
1.0 mg/mL each in Hexane		
bis(2- <i>n</i> -Butoxyethyl)phthalate	Dimethyl phthalate	
Butyl benzyl phthalate	Dinonyl phthalate	
Diamyl phthalate	Di- <i>n</i> -octyl phthalate	
Di- <i>n</i> -butyl phthalate	bis(2-Ethoxyethyl)phthalate	
Dicyclohexyl phthalate	bis(2-Ethylhexyl)phthalate	
Diethyl phthalate	bis(2-Methoxyethyl)phthalate	
Dihexyl phthalate	bis(4-Methyl-2-pentyl)phthalate	
Diisobutyl phthalate		

<b>M-8061A</b>		<b>1 x 1 mL</b>
<b>M-8061A-PAK</b>	<b>SAVE</b>	<b>5 x 1 mL</b>
1.0 mg/mL each in Hexane		

Butyl benzyl phthalate	Diethyl phthalate
bis(2-Ethylhexyl)phthalate	Dimethyl phthalate
Di- <i>n</i> -butyl phthalate	Di- <i>n</i> -octyl phthalate

### Matrix Spike Solution

<b>M-8061A-MS</b>		<b>1 x 1 mL</b>
<b>M-8061A-MS-PAK</b>	<b>SAVE</b>	<b>5 x 1 mL</b>
2.0 mg/mL each in Acetone		
Butyl benzyl phthalate	bis(2-Ethylhexyl)phthalate	

### Internal Standard

<b>M-8061-IS</b>		<b>1 x 1 mL</b>
<b>M-8061-IS-PAK</b>	<b>SAVE</b>	<b>5 x 1 mL</b>
5.0 mg/mL in Hexane		
Benzyl benzoate		

### Surrogate Standards

<b>M-8061-SS</b>		<b>1 x 1 mL</b>
<b>M-8061-SS-PAK</b>	<b>SAVE</b>	<b>5 x 1 mL</b>
50 µg/mL each in Acetone		
<b>M-8061-SS-10X</b>		<b>1 x 1 mL</b>
<b>M-8061-SS-10X-PAK</b>	<b>SAVE</b>	<b>5 x 1 mL</b>
500 µg/mL each in Acetone		
Dibenzyl phthalate	Diphenyl phthalate	
Diphenyl isophthalate		

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With 50 additional compounds, this second edition nearly doubles the number of additives in several categories, including processing aids, antistatic compounds, mould release products, and blowing agents. It includes a listing that can be cross-referenced by trade name, chemical name, CAS number, and even key mass unit ions from the GC/MS run.

Addressing additives from an analytical viewpoint, this comprehensive handbook helps readers identify the additives in plastics. This information can be used to assess compliance with regulations issued by the FDA, US EPA, EU, and other agencies.

# Phthalate Set, Kit and Mixtures

## Phthalates Solution Set

**Set of 17 Phthalate Solutions**      **ALR-PHT-SET**      **17 x 1 mL**  
*Each at 100 µg/mL Concentration*      S in MeOH, S-CN in AcCN

Compound	CAS No.	Cat. No.	Unit
Benzyl butyl phthalate	85-68-7	ALR-082S	1 mL
Diamyl phthalate	131-18-0	ALR-098S	1 mL
Dicyclohexyl phthalate	84-61-7	ALR-099S	1 mL
Di(2-ethyl hexyl) phthalate (DEHP)	117-81-7	ALR-097S	1 mL
Diethyl phthalate	84-66-2	ALR-110S	1 mL
Di-hexyl phthalate	84-75-3	ALR-100S	1 mL
Diisodecyl phthalate	26761-40-0	ALR-101S	1 mL
Diisononyl phthalate	68515-48-0	ALR-102S	1 mL
Diisooctyl phthalate	27554-26-3	ALR-103S	1 mL
Dimethyl phthalate (DMP)	131-11-3	ALR-111S	1 mL
Di-n-butyl phthalate (DBP)	84-74-2	ALR-104S	1 mL
Di-n-octyl phthalate	117-84-0	ALR-105S	1 mL
Monobenzyl phthalate (mBzP)	2528-16-7	ALR-134S-CN	1 mL
Monobutyl phthalate (mBP)	131-70-4	ALR-135S-CN	1 mL
Monoethyl phthalate (mEP)	2306-33-4	ALR-137S-CN	1 mL
Monoethylhexyl phthalate (mEHP)	4376-20-9	ALR-138S-CN	1 mL
Monomethyl phthalate	4376-18-5	ALR-139S-CN	1 mL

## Phthalate Esters Kit

**PS-840C-R1-SET**      **15 vials**  
 Neats at 1 mL each.

- (01) Dimethyl phthalate
- (02) Diethyl phthalate
- (03) Di-n-propyl phthalate
- (04) Di-iso-propyl phthalate
- (05) Di-n-butyl phthalate
- (06) Di-iso-butyl phthalate
- (07) Dipentyl phthalate
- (08) Dihexyl phthalate
- (09) Diheptyl phthalate
- (10) Dioctyl phthalate
- (11) Dinonyl phthalate
- (12) Didecyl phthalate
- (13) Diundecyl phthalate
- (14) Didodecyl phthalate

### Calibration Mixture

**PS-84C-1ML**      **1 mL vial**

- Neat at the stated weight %  
 Neat at stated weight %
- |                       |       |
|-----------------------|-------|
| Dimethyl phthalate    | 16.7% |
| Diethyl phthalate     | 16.7% |
| Di-n-propyl phthalate | 33.3% |
| Di-n-butyl phthalate  | 33.3% |
- (15) Phthalate Mixture PS-84C-1ML  
 Neat at stated weight %
- |                       |       |
|-----------------------|-------|
| Dimethyl phthalate    | 16.7% |
| Diethyl phthalate     | 16.7% |
| Di-n-propyl phthalate | 33.3% |
| Di-n-butyl phthalate  | 33.3% |

## Miscellaneous Phthalate Mixes

### Appendix IX Phthalate Mix

**APP-9-PHTH-MIX**

1000 µg/mL each in Cyclohexane

**1 x 1 mL**  
6 comps.

bis(2-Ethylhexyl)phthalate	Diisodecyl phthalate
Dibutyl phthalate	Diisononyl phthalate
Di-n-octyl phthalate	Benzyl butyl phthalate

### Phthalate Mix

**ASM-146**

1.0 mg/mL each in MeOH

**1 x 1 mL**  
6 comps.

Benzyl butyl phthalate	Di-n-butyl phthalate
Dimethyl phthalate	Di-n-octyl phthalate
Diethyl phthalate	bis(2-Ethylhexyl)phthalate

### Phthalate Esters Mix

**M-PHE**

**M-PHE-PAK**

At stated conc. (µg/mL) in Acetone

**1 x 1 mL**  
**SAVE 5 x 1 mL**  
6 comps.

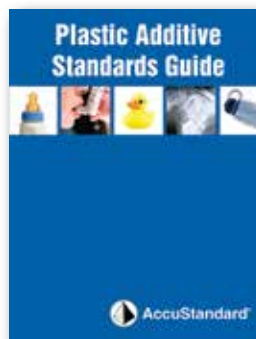
Benzyl butyl phthalate	10	Dimethyl phthalate	25
bis(2-Ethylhexyl)phthalate	50	Di-n-butyl phthalate	25
Diethyl phthalate	25	Di-n-octyl phthalate	50



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### Plastic Additive Standards Guide Includes phthalates and other plasticizers



Both the Handbook and Guide are organized into classes by additive type. Manufacturers can easily find Standards that match their particular application and product formulation for the following product categories:

- Medical Devices
- Food Packaging
- Pharmaceutical Packaging
- Toys
- Wire and Cable
- etc.

#### Product Group including:

Accelerants, Antidegradants, Antifoams, Antioxidants, Antiozonants, Blowing Agents, Coupling Agents, Crosslinking Agents, Flame Retardants, Plasticizers, Processing Aids, Retarders, Stearates, UV Stabilizers, Vegetable Oils, Deuterated Phthalates



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