MIE - Minimum Ignition Energy

Definition: the minimum energy that can ignite a mixture of a specified flammable material with air or oxygen, measured by a standard procedure.

Depending on the specific application, there are several standard procedures for determining MIE of dust clouds, solvent vapours and gases.

The common element in all procedures is that the energy is generated by an electrostatic spark discharge released from a capacitive electrical circuit. The exact circuit components and the arrangement of electrodes between which sparks are generated are the principle differences between the methods.

In the following table MIE is quoted for flammable substances mixed with air. A reference is provided to indicate the source of the data. MIE values are provided for guidance only. Please check references for specific measurement conditions. Linq Industrial Fabrics, Inc. makes no claims for the accuracy of the data and accepts no liability for any use of the data.

Substance	MIE (mJ)	Ref.
ABS	30	3
acetaldehyde	0.37	1
acetaldehyde	0.36	3
acetone	1.15	1
acetyl cellulose	15	1
acetylene	0.017	1
acrolein	0.13	1
acrylonitrile	0.16	1
adipic acid	60	1
alfalfa meal	320-5100	3
allyl chloride	0.78	3
aluminium	50	1
aluminium stearate	15	1
ammonia	680	2
antimony	1920	3
aspirin	25-30	3

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Substance	MIE (mJ)	Ref.
aziridine	0.48	2
benzene	0.20	1
benzene	0.22	3
bisphenol-A	1.8	4
black powder	320	3
boron	60	3
1,3-butadiene	0.13	1
butane	0.25	1
butane	0.26	3
n-butyl chloride	0.33	3
cadmium	4000	3
carbon monoxide	<0.3	2
carbon disulphide	0.009	1
carbon disulphide	0.015	3
casein	60	1
cellulose	35	1
cellulose acetate	20-50	3
charcoal	20	3
chromium	140	3
cinnamon	30	1
coal	40	1
coal, pittsburg	250	3
cocoa	100	1
cocoa	100-180	3
coffee	160	3
copal	30	1
cork powder	35-100	3

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Substance	MIE (mJ)	Ref.
corn meal	40	1
corn flour	20	1
corn starch	30-60	3
cotton (filler)	25	1
cotton linters	1920	3
cyclohexane	0.22	1
cyclopentane	0.54	1
cyclopentane	0.24	3
1,3-cyclopentadiene	0.67	1
cyclopropane	0.17	1
cyclopropane	0.18	3
dextrine	40	1
dichlorosilane	0.015	3
diethyl ether	0.19	1
diethyl ether	0.2	3
2,3-dihydopyran	0.36	1
diisobutylene	0.96	1
diisopropyl ether	1.14	1
dimethoxymethane	0.42	3
dimethyl amine	<0.3	2
2,2-dimethyl butane	0.25	1
dimethyl ether	0.29	1
2,2-dimethyl propane	1.57	1
dimethyl sulphide	0.5	2
dimethyl sulphide	0.48	3
dinitrobenzamide	45	3
dinitrobenzoic acid	45	3

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Substance	MIE (mJ)	Ref.
dinitro-sym-diphenylurea	60	3
dinitrotoluamide	15	3
dioxane	<0.3	2
di-(tert)-butylperoxide	0.5	2
di-(tert)-butylperoxide	0.41	3
epoxy resin	15	1
ethane	0.24	1
ethane	0.26	3
ethene	0.07	2
ether	0.19	2
ethyl acetate	1.42	1
ethyl amine	2.4	1
ethyl cellulose	10	1
ethyl chloride	<0.3	2
ethylene	0.07	3
ethylene oxide	0.06	1
ethylene oxide	0.065	2
ethylene oxide	0.062	3
flour, cake	25-80	3
furan	0.22	1
gasoline	0.8	3
grain dust	30	3
grass seed	60-260	3
hemp	30	1
heptane	0.24	1

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Substance	MIE (mJ)	Ref.
dinitro-sym-diphenylurea	60	3
dinitrotoluamide	15	3
dioxane	<0.3	2
di-(tert)-butylperoxide	0.5	2
di-(tert)-butylperoxide	0.41	3
epoxy resin	15	1
ethane	0.24	1
ethane	0.26	3
ethene	0.07	2
ether	0.19	2
ethyl acetate	1.42	1
ethyl amine	2.4	1
ethyl cellulose	10	1
ethyl chloride	<0.3	2
ethylene	0.07	3
ethylene oxide	0.06	1
ethylene oxide	0.065	2
ethylene oxide	0.062	3
flour, cake	25-80	3
furan	0.22	1
gasoline	0.8	3
grain dust	30	3
grass seed	60-260	3
hemp	30	1
heptane	0.24	1

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Substance	MIE (mJ)	Ref.
hexamethylenetetramine	10	1
hexane	0.24	1
hexane	0.29	3
hydrogen	0.011	1
hydrogen	0.017	3
hydrogen sulphide	0.068	1
hydrogen sulphide	0.077	3
isooctane	1.35	1
isopentane	0.21	1
isopentane	0.25	3
isopropyl alcohol	0.65	1
isopropyl amine	2.0	1
isopropyl chloride	1.55	1
isopropyl chloride	1.08	3
isopropyl ether	1.14	2
isopropyl mercaptan	0.53	1
lignin	20	1
lycopodium	50	3
magnesium	80	1
magnesium	40	3
manganese	305	3
melamine formaldehyde	50-320	3
methane	0.28	1
methane	0.3	3
methanol	0.14	1
methyl acetylene	0.11	1

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Substance	MIE (mJ)	Ref.
methyl acetylene	0.115	3
methylal	0.5	2
methyl cyclohexane	0.27	1
methylene chloride	10000	1
methyl ethyl ketone	0.53	1
methylformate	0.5	2
methylmethacrylate	15	1
nitrostarch	40	3
nylon	20	1
nylon	20-30	3
paper dust	20-60	3
paraformaldehyde	20	1
pentaerythritol	10	1
pentane	0.22	1
2-pentene	0.18	1
petroleum ether (benzine)	0.25	3
phenol formaldehyde	Oct/00	3
phosphorus (red)	0.2	1
phthalic anhydride	15	1
PMMA	15-20	3
polyacrylonitrile	20	3
polycarbonate	25	1
polyethylene	10	1
polyethylene	70	3
polyethylene teraphthalate	35	3
polypropylene	25-400	3

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Substance	MIE (mJ)	Ref.
polystyrene	40-120	3
polyvinyl acetate	160	3
polyvinyl acetate alcohol	120	3
polyvinyl butyral	10	3
potato starch	20	1
potato starch	25	3
propane	0.25	1
propane	0.26	3
propene	0.28	2
propionaldehyde	0.4	2
propylchloride	1.08	1
propylene	0.28	1
propylene oxide	0.13	1
propylene oxide	0.14	3
pyrethrum	80	3
rayon	240	3
rice	40	1
rice	40-120	3
rubber (hard)	30	1
SAN	30	3
shellac	10	1
silicon	100	3
soap	60	1
soap	60-120	3
soy flour	100-460	3
sugar	30	1

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Substance	MIE (mJ)	Ref.
sulphur	15	1
tantalum	120	3
tetrafluoroethylene	3.5	3
tetrahydrofuran	0.54	1
tetrahydropyran	0.22	1
thiophene	0.39	1
thorium	5	1
tin	80	3
titanium	40	1
titanium	25	3
TNT	75	3
toluene	0.24	3
trichloroethylene	295	3
triethyl amine	0.75	1
triethyl amine	1.15	3
2,2,3-trimethyl butane	1.0	1
uranium	45	1
urea formaldehyde	80-1280	3
vanadium	60	3
vinyl acetate	0.7	1
vinyl acetylene	0.082	1
vinyl chloride	<0.3	2
wheat flour	50	1
wheat starch	20	1
wheat starch	25-60	3
wood bark	40-60	3

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Substance	MIE (mJ)	Ref.
wood (filler)	20	1
wood flour	30-40	3
m-, o- & p-xylene	0.2	3
yeast	50	3
zinc	960	3
zirconium	5	1
zirconium	15	3

References

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