



SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006 (REACH) and Regulation (EU) No. 2015/830

Solvent DEK/DEM 1:1 (Vol.-%) & Developer AR 600-548

Material number DEK/DEM 1:1 (Vol.-%) & AR 600-548

Revision date: 23/1/2019

Version: 9

Language: en-GB,IE

Date of print: 27/8/2020

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SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name: Solvent DEK/DEM 1:1 (Vol.-%) & Developer AR 600-548

1.2 Relevant identified uses of the substance or mixture and uses advised against

General use: Solvents
Intermediate for electronic industry
For industrial purposes only

1.3 Details of the supplier of the safety data sheet

Company name: Allresist
Gesellschaft für chemische Produkte zur Mikrostrukturierung mbH
Street/POB-No.: Am Biotop 14
Postal Code, city: 15344 Strausberg
WWW: www.allresist.de
E-mail: info@allresist.de
Telephone: +49 (0)33 41-35 93-0
Telefax: +49 (0)33 41-35 93-29
Department responsible for information:
Frau Dr. Zimmermann, Email: produktion@allresist.de

1.4 Emergency telephone number

Telephone: +49 (0)33 41-35 93-0
Only available during office hours.

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to EC regulation 1272/2008 (CLP)

Flam. Liq. 2; H225 Highly flammable liquid and vapour.
Eye Irrit. 2; H319 Causes serious eye irritation.
STOT SE 3; H335, H336 May cause respiratory irritation. May cause drowsiness or dizziness.
(EUH066) Repeated exposure may cause skin dryness or cracking.

2.2 Label elements

Labelling (CLP)



Signal word:

Danger

Hazard statements: H225 Highly flammable liquid and vapour.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
H336 May cause drowsiness or dizziness.
EUH066 Repeated exposure may cause skin dryness or cracking.



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Precautionary Statements:

- P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P261 Avoid breathing vapours/spray.
- P280 Wear protective gloves/protective clothing/eye protection.
- P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
- P312 Call a POISON CENTER/doctor if you feel unwell.
- P403+P235 Store in a well-ventilated place. Keep cool.

Special labelling

Text for labelling: Contains Pentan-3-one.

2.3 Other hazards

Potentially explosive mixtures may form if adequate ventilation is not provided.
Higher doses may lead to a narcotic effect.
Special danger of slipping by leaking/spilling product.

Results of PBT and vPvB assessment:

No data available

SECTION 3: Composition / information on ingredients

3.1 Substances: not applicable

3.2 Mixtures

Chemical characterisation: Mixture of solvents

Hazardous ingredients:

Ingredient	Designation	Content	Classification
REACH 01-2119531111-60-xxxx EC No. 202-490-3 CAS 96-22-0	Pentan-3-one	50 - 70 %	Flam. Liq. 2; H225. Eye Irrit. 2; H319. STOT SE 3; H335, H336. (EUH066).
EC No. 203-305-9 CAS 105-53-3	Diethyl malonate	40 - 60 %	Eye Irrit. 2; H319.

Full text of H- and EUH-statements: see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

- General information: If medical advice is needed, have product container or label at hand. First aider: Pay attention to self-protection!
- In case of inhalation: Remove person to fresh air and keep comfortable for breathing. If victim is at risk of losing consciousness, position and transport on their side. Seek medical attention.
- Following skin contact: Remove residues with soap and water. Take off immediately all contaminated clothing and wash it before reuse. In case of skin reactions, consult a physician.
- After eye contact: With eyelids open, wash out eyes for several minutes under flowing water. Remove contact lenses, if present and easy to do. Continue rinsing. Subsequently consult an ophthalmologist.



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After swallowing: Rinse mouth immediately and drink plenty of water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Call a POISON CENTER/doctor if you feel unwell.

4.2 Most important symptoms and effects, both acute and delayed

Causes serious eye irritation. May cause respiratory irritation. May cause drowsiness or dizziness.

4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically. Decontamination.

In the event of pulmonary irritation treat initially with dexamethasone - dosing aerosol. Subsequent observance for pneumonia and lung oedema.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media:

Extinguishing powder, water spray jet or carbon dioxide.

In case of large fires: alcohol resistant foam or water spray jet.

Extinguishing media which must not be used for safety reasons:

Full water jet

5.2 Special hazards arising from the substance or mixture

Highly flammable liquid and vapour.

With air, vapours form potentially explosive mixtures, which are heavier than air. Vapours may proceed on the ground over great distances and cause fire and backflashes.

In case of fire may be liberated: nitrogen oxides (NO_x), carbon monoxide and carbon dioxide.

5.3 Advice for firefighters

Special protective equipment for firefighters:

Wear self-contained positive pressure breathing apparatus and full firefighting protective clothing.

Additional information: Hazchem-Code: •3YE

Heating will lead to pressure increase: Danger of bursting and explosion. Keep containers cool with water spray.

In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Do not allow fire water to penetrate into surface or ground water.

Fire residuals and contaminated extinguishing water must be disposed of in accordance with the regulations of the local authorities.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Eliminate all ignition sources if safe to do so. If possible, eliminate leakage. Provide adequate ventilation.

Avoid contact with the substance. Wear appropriate protective equipment. Keep unprotected people away. Do not breathe vapour/aerosol.

Cordon off downwind area at risk and warn inhabitants.



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6.2 Environmental precautions

Do not allow to enter into ground-water, surface water or drains. Danger of explosion!

If necessary notify appropriate authorities.

6.3 Methods and material for containment and cleaning up

Isolate leaked material using non-flammable absorption agent (e.g. sand, earth, vermiculit, diatomaceous earth) and collect it for disposal in appropriate containers in accordance with the local regulations (see section 13).

Beware of re-ignition. Thoroughly clean surrounding area.

In case of greater quantities: Collect mechanically (use only explosion-proof equipment when pumping out).

Additional information: Use explosion-proof equipment and non-sparking tools/utensils.

Special danger of slipping by leaking/spilling product.

6.4 Reference to other sections

Refer additionally to section 8 and 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advices on safe handling: Provide adequate ventilation, and local exhaust as needed. Do not breathe vapour/aerosol. Avoid contact with skin, eyes, and clothing.

Wear appropriate protective equipment. Take off immediately all contaminated clothing and wash it before reuse.

Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling.

Guarantee sufficient ventilation during and after use, in order to prevent vapour accumulation.

When handling large quantities, supply emergency spray. Avoid the formation of aerosol.

Precautions against fire and explosion:

Keep away from sources of ignition - No smoking.

Take precautionary measures against static discharge.

Use only explosion-protected equipment/instruments. Do not weld.

In partially filled containers explosive mixtures may form.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storerooms and containers:

Keep container tightly closed in a cool, well-ventilated place.

Keep away from sources of ignition and heat.

Keep container dry. Keep only in the original container. Store containers in upright position.

Protect from heat and direct sunlight. Protect from humidity and water. Avoid admission of air/oxygen (formation of peroxide).

Storage temperature: 10 - 18 °C.

Hints on joint storage:

Do not store together with oxidizing agents, acids, reducing agents or alkalis.

Do not store together with halogens, Sodium, hydrogen peroxide or alkali and alkaline earth metals.

Keep away from food, drink and animal feedingstuffs.

7.3 Specific end use(s)

No information available.



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SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limit values:

CAS No.	Designation	Type	Limit value
96-22-0	Pentan-3-one	Great Britain: WEL-STEL	895 mg/m ³ ; 250 ppm
		Great Britain: WEL-TWA	716 mg/m ³ ; 200 ppm
		Ireland: 15 minutes	875 mg/m ³ ; 250 ppm
		Ireland: 8 hours	700 mg/m ³ ; 200 ppm

DNEL/DMEL: Information about Pentan-3-one:
Systemic effects:
DNEL workers, long-term, inhalative: 708 mg/m³
DNEL workers, long-term, dermal: 101 mg/kg bw/d
Local effects:
DNEL workers, long-term, inhalative: 705 mg/m³
DNEL workers, short-term, inhalative: 1057 mg/m³

PNEC: Information about Pentan-3-one:
PNEC water (freshwater): 0.5 mg/L
PNEC water (marine water): 0.05 mg/L
PNEC water (intermittent release): 5 mg/L
PNEC sewage treatment plant: 6287 mg/L
PNEC sediment (freshwater): 2.17 mg/kg dw
PNEC floor: 0.207 mg/kg dw

8.2 Exposure controls

Provide for good ventilation or exhaust system or work with completely self-contained equipment. Explosion protection required.

Personal protection equipment

Occupational exposure controls

Respiratory protection: If vapours form, use respiratory protection.
Use filter type A (= against vapours of organic substances) according to EN 14387. The filter class must be suitable for the maximum contaminant concentration (gas/vapour/aerosol/particulates) that may arise when handling the product.

Hand protection: Protective gloves according to EN 374
Glove material: butyl caoutchouc (butyl rubber) - Layer thickness: 0,7 mm.
Breakthrough time: >= 480 min.
Observe glove manufacturer's instructions concerning penetrability and breakthrough time.

Eye protection: Tightly sealed goggles according to EN 166.

Body protection: Flame retardant, antistatic and chemical resistant protective clothing.

General protection and hygiene measures:
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Do not breathe vapour/aerosol. Do not get in eyes, on skin, or on clothing.
Take off immediately all contaminated clothing and wash it before reuse. Contaminated work clothing should not be allowed out of the workplace.
When using do not eat or drink. Wash hands thoroughly after handling.
When handling large quantities, supply emergency spray.



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Environmental exposure controls

Do not allow to enter into ground-water, surface water or drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	Physical state at 20 °C and 101.3 kPa: liquid Colour: colourless
Odour:	like ketone
Odour threshold:	No data available
pH value:	No data available
Melting point/freezing point:	No data available
Initial boiling point and boiling range:	101 - 199 °C
Flash point/flash point range:	18 °C (c.c.)
Evaporation rate:	No data available
Flammability:	Highly flammable liquid and vapour.
Explosion limits:	LEL (Lower Explosion Limit): 0.80 Vol-% (Diethyl malonate) UEL (Upper Explosive Limit): 12.80 Vol-% (Diethyl malonate)
Vapour pressure:	at 20 °C: 37.6 hPa (Pentan-3-one) at 40 °C: 1.3 hPa (Diethyl malonate)
Vapour density:	No data available
Density:	at 20 °C: 0.932 g/mL
Water solubility:	partially soluble
Partition coefficient: n-octanol/water:	0.85 log P(o/w) (Pentan-3-one) Based on the n-octanol/water partition coefficient accumulation in organisms is not expected.
Auto-ignition temperature:	No data available
Decomposition temperature:	Information about Diethyl malonate: 435 °C
Viscosity, kinematic:	No data available
Explosive properties:	Product is not explosive. Potentially explosive vapour/air mixtures may form.
Oxidizing characteristics:	Product has no oxidizing effect.

9.2 Other information

Ignition temperature: > 400 °C

SECTION 10: Stability and reactivity

10.1 Reactivity

Highly flammable liquid and vapour.
Vapours can form explosive mixtures with air.

10.2 Chemical stability

Stable under recommended storage conditions.



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10.3 Possibility of hazardous reactions

Heating will lead to pressure increase: Danger of bursting and explosion.

Reacts with strong oxidizing agents, acids, and alkalis.

10.4 Conditions to avoid

Keep away from heat sources, sparks and open flames.

Protect from direct sunlight.

Protect from humidity and water.

Avoid admission of air/oxygen (formation of peroxide).

10.5 Incompatible materials

Sodium, strong oxidizing agents, water, alkalis, acids, reducing agent, halogens, alkali and alkaline earth metals, hydrogen peroxide.

10.6 Hazardous decomposition products

No hazardous decomposition products when regulations for storage and handling are observed.

Thermal decomposition: Information about Diethyl malonate: 435 °C

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Toxicological effects: The statements are derived from the properties of the single components. No toxicological data is available for the product as such.

Acute toxicity (oral): Based on available data, the classification criteria are not met.

ATEmix (calculated): $2000 < ATE \leq 5000$ mg/kg.

Acute toxicity (dermal): Based on available data, the classification criteria are not met.

ATEmix calculated: > 5000 mg/kg

Acute toxicity (inhalative): Lack of data.

Skin corrosion/irritation: Lack of data.

Serious eye damage/irritation: Eye Irrit. 2; H319 = Causes serious eye irritation.

Sensitisation to the respiratory tract: Lack of data.

Skin sensitisation: Lack of data.

Germ cell mutagenicity/Genotoxicity: Lack of data.

Carcinogenicity: Lack of data.

Reproductive toxicity: Lack of data.

Effects on or via lactation: Lack of data.

Specific target organ toxicity (single exposure): STOT SE 3; H335, H336 = May cause respiratory irritation. May cause drowsiness or dizziness.

Specific target organ toxicity (repeated exposure): Lack of data.

Aspiration hazard: Lack of data.



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Other information: Information about Pentan-3-one:
LD50 Rat, oral: approx. 2900 mg/kg (OECD 401)
LD50 Rabbit, dermal: 16200 mg/kg bw (OECD 402)
Information about Diethyl malonate:
LD50 Rat, oral: 15794 mg/kg
LD50 Rabbit, dermal: > 5000 mg/kg

Symptoms

In case of inhalation:
Mucous membrane irritation, cough, shortage of breath, Nausea, vomiting, headache, narcosis.
In case of ingestion: May be harmful if swallowed.
After contact with skin: Repeated exposure may cause skin dryness or cracking.
After eye contact: Upon direct contact with eyes may cause burning, tearing, redness.

SECTION 12: Ecological information

12.1 Toxicity

Aquatic toxicity: Information about Pentan-3-one:
Algae toxicity:
EC50 *Scenedesmus subspicatus*: > 500 mg/L/72h
Daphnia toxicity:
EC50 *Daphnia magna* (Big water flea): > 500 mg/L/48h
Fish toxicity:
LC50 *Pimephales promelas* (fathead minnow): 1540 mg/L/96h
Bacterial toxicity:
EC50 *Pseudomonas putida*: approx. 10000 mg/L/17h
Information about Diethyl malonate:
Daphnia toxicity:
EC50 *Daphnia magna* (Big water flea): 179 mg/L/48h
Algae toxicity:
EC50 *Scenedesmus subspicatus*: 508.2 mg/L/72h
According to experience to date, toxicity to fish is not expected.
LC50 *Pimephales promelas* (fathead minnow): 11.8 mg/L/96h

12.2 Persistence and degradability

Further details: Biodegradability:
Information about Pentan-3-one:
90-100%/13d
Easily bio-degradable
Information about Diethyl malonate:
99%/28d
Easily bio-degradable
Oxygen demand: BSB: (Pentan-3-one) 1310 mg/g/5d
CSB: (Pentan-3-one) 2246 mg/g



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12.3 Bioaccumulative potential

Partition coefficient: n-octanol/water:

0.85 log P(o/w) (Pentan-3-one)

Based on the n-octanol/water partition coefficient accumulation in organisms is not expected.

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

No data available

12.6 Other adverse effects

General information: Do not allow to enter into ground-water, surface water or drains.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste key number: 16 03 05* = Organic wastes containing hazardous substances
* = Evidence for disposal must be provided.

Recommendation: Dispose of waste according to applicable legislation.
Do not dispose of with household waste.

Contaminated packaging

Recommendation: Dispose of waste according to applicable legislation.
Handle contaminated packages in the same way as the substance itself.
Handle empty containers with care. Incineration may cause explosion.
Non-contaminated packages may be recycled.

SECTION 14: Transport information

14.1 UN number

ADR/RID, IMDG, IATA-DGR:

UN 1993

14.2 UN proper shipping name

ADR/RID, IMDG, IATA-DGR:

UN 1993, FLAMMABLE LIQUID, N.O.S. (Pentan-3-one)

14.3 Transport hazard class(es)

ADR/RID: Class 3, Code: F1

IMDG: Class 3, Subrisk -

IATA-DGR: Class 3

14.4 Packing group

ADR/RID, IMDG, IATA-DGR:

II





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14.5 Environmental hazards

Marine pollutant: no

14.6 Special precautions for user

Land transport (ADR/RID)

Warning board: ADR/RID: Kemmler-number 33, UN number UN 1993
Hazard label: 3
Special provisions: 274 601 640D
Limited quantities: 1 L
EQ: E2
Contaminated packaging - Instructions: P001 IBC02 R001
Special provisions for packing together: MP19
Portable tanks - Instructions: T7
Portable tanks - Special provisions: TP1 TP8 TP28
Tank coding: LGBF
Tunnel restriction code: D/E

Sea transport (IMDG)

EmS: F-E, S-E
Special provisions: 274
Limited quantities: 1 L
Excepted quantities: E2
Contaminated packaging - Instructions: P001
Contaminated packaging - Provisions: -
IBC - Instructions: IBC02
IBC - Provisions: -
Tank instructions - IMO: -
Tank instructions - UN: T7
Tank instructions - Provisions: TP1, TP8, TP28
Stowage and handling: Category B.
Properties and observations: -
Segregation group: none

Air transport (IATA)

Hazard label: Flamm. liquid
Excepted Quantity Code: E2
Passenger and Cargo Aircraft: Ltd.Qty.: Pack.Instr. Y341 - Max. Net Qty/Pkg. 1 L
Passenger and Cargo Aircraft: Pack.Instr. 353 - Max. Net Qty/Pkg. 5 L
Cargo Aircraft only: Pack.Instr. 364 - Max. Net Qty/Pkg. 60 L
Special provisions: A3
Emergency Response Guide-Code (ERG): 3H

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

No data available



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SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

National regulations - Great Britain

Hazchem-Code: •3YE
No data available

National regulations - EC member states

Volatile organic compounds (VOC):
100 % by weight

Labelling of packaging with <= 125mL content



Signal word: **Danger**

Hazard statements: EUH066 Repeated exposure may cause skin dryness or cracking.

Precautionary Statements:
not applicable

Further regulations, limitations and legal requirements:
Use restriction according to REACH annex XVII, no.: 3

15.2 Chemical Safety Assessment

For this mixture a chemical safety assessment is not required.

SECTION 16: Other information

Further information

Wording of the H-phrases under paragraph 2 and 3:

H225 = Highly flammable liquid and vapour.

H319 = Causes serious eye irritation.

H335 = May cause respiratory irritation.

H336 = May cause drowsiness or dizziness.

EUH066 = Repeated exposure may cause skin dryness or cracking.



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Abbreviations and acronyms:

ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
AS/NZS: Australian Standards/New Zealand Standards
ATEmix: Acute Toxicity Estimate of mixture
CAS: Chemical Abstracts Service
CFR: Code of Federal Regulations
CLP: Classification, Labelling and Packaging
DMEL: Derived minimal effect level
DNEL: Derived no-effect level
EC50: Effective Concentration 50%
EC: European Community
EN: European Standard
EU: European Union
IATA: International Air Transport Association
IBC Code: International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk
IMDG Code: International Maritime Dangerous Goods Code
LC50: Median lethal concentration
LD50: Lethal dose 50%
LEL: Lower Explosion Limit
log P(o/w): Partition coefficient: octanol/water
MARPOL: Maritime Pollution: The International Convention for the Prevention of Pollution from Ships
OSHA: Occupational Safety and Health Administration
PBT: Persistent, bioaccumulative and toxic
PNEC: Predicted no-effect concentration
REACH: Registration, Evaluation, Authorisation and Restriction of Chemicals
RID: Regulations Concerning the International Carriage of Dangerous Goods by Rail
STOT SE: Specific target organ toxicity - single exposure
UN: United Nations
vPvB: Very persistent and very bioaccumulative

Reason of change: Changes in section 1.3: Department responsible for information

Date of first version: 16/6/2011

Department issuing data sheet

Contact person: see section 1: Department responsible for information

The information in this data sheet has been established to our best knowledge and was up-to-date at time of revision. It does not represent a guarantee for the properties of the product described in terms of the legal warranty regulations.