

**Trade name: Avantama Q-740**

## Safety data sheet

### 1 Identification of the substance/mixture and of the company

#### 1.1 Product identifiers

Trade name: Avantama Q-740  
Product number: 14029

REACH No.: A registration number is not available for this substance as the substance or its uses are exempted from registration, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

#### 1.2 Relevant identified uses of the substance or mixture

Identified uses: Laboratory chemicals, Manufacture of thin films

#### 1.3 Details of the supplier of the safety data sheet

##### Distributing company:

Avantama AG  
Laubisrütistrasse 50  
8712 Stäfa  
Switzerland  
Tel.-Nr.: +41 44 244 51 00

**Informational:** info@avantama.com

#### 1.4 Emergency telephone number:

Schweizerisches Toxikologisches Informationszentrum (STIZ), Switzerland  
Tel.-Nr.: +41 (0)44 251 5151

### 2 Hazards identification

#### 2.1 Classification of the substance or mixture

For the full text of the H-statements and P-phrases mentioned in this section, see Section 16

##### Classification according to Regulation (EC) No 1272/2008 [EU-GHS/CLP]

Flammable liquids (cat. 2)	H225
Acute tox., oral (cat. 4)	H302
Aspiration hazard (cat. 1)	H304
Skin irritation (cat. 1B)	H314
Eye irritation (cat. 2)	H319
Spec. target organ tox. singl. exp. (cat 3) – Central nervous system	H336
Reproductive toxicity (cat. 1A)	H360Df
Spec. target organ tox. rep. exp. (cat. 2) – Liver, Gastrointestinal tract, immune system	H373
Acute aquatic toxicity (cat. 1)	H400
Chronic aquatic toxicity (cat.1)	H410

Classification systems:

The classification corresponds to the current EC-Lists and is complemented with literature and the company knowledge.

#### 2.2 Label elements

Labeling according to Regulation (EC) Nr. 1272/2008  
The product is classified and labeled according to the CLP regulation.

##### Pictogram



**Signal word:** Danger

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**Hazard statement(s)**

H225	Highly flammable liquid and vapor.
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways.
H314	Causes severe skin burns and eye damage
H319	Causes serious eye irritation
H336	May cause drowsiness and dizziness.
H360Df	May damage the unborn child. Suspected of damaging fertility
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long lasting effects.

**Precautionary statement(s)**

P201	Obtain special instructions before use.
P210	Keep away from heat/ sparks/ open flames/ hot surfaces. – No smoking.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
P273	Avoid release to the environment.
P280	Wear protective gloves protective clothing eye protection face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340+P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention
P331	Do not induce vomiting.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P370 + P378	In case of fire: Use dry powder or dry sand to extinguish.
P403 + P235	Store in a well-ventilated place. Keep cool.
P501	Dispose of contents/ container to an approved waste disposal plant.

**2.3 Supplemental Hazard**

The applied nanoparticles may be enriched in human body and/ or in organisms.

<b>3 Composition / information on ingredients</b>
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**Chemical characterization:** Mixtures

**Description:** Mixture made of following ingredients including non-hazardous admixtures.

<b>Hazardous ingredients:</b>		
CAS: 108-88-3 EC: 203-625-9	Toluene Flam. Liq. 2; H225; Skin Irrit. 2; H315; Repr. 2; H361d; STOT SE 3; H336; STOT RE 2; H373; Asp. Tox. 1; H304	<90%
CAS: 1008105-17-6 EC: N/A	Formamidinium Lead trihalide Acute Tox. 4; H302; Repr. 1A; H360Df; STOT RE 2; H373; Aquatic Acute 1; H400; Aquatic Chronic 1; H410;	≤8%

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CAS: proprietary EC: proprietary	Proprietary dispersion additive Acute Tox. 4; H302; Asp. Tox. 1; H304; Skin irrit. 2; H315; Eye Irrit. 2; H319; Aquatic Acute 1; H400; STOT SE 3; H336; STOT RE 2; H373	≤2%
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**Additional indication:**

Comprised inorganic material is present as nanoparticles.

For the full text of the H-statements and P-phrases mentioned in this section, see Section 16

## 4 First aid measures

### 4.1 Description of first aid measures

General advice: Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact: Wash off with soap and plenty of water.

In case of eye contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Remove contact lenses if present and easy to do.

If swallowed: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

### 4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labeling (see section 2.2) and/or in section 11.

### 4.3 Indication of any immediate medical attention and special treatment needed.

No data available.

## 5 Firefighting measures

### 5.1 Extinguishing media

**Suitable media:**

Water spray, CO<sub>2</sub>, alcohol-resistant foam, dry chemical or carbon dioxide.

### 5.2 Special hazards arising from the substance or mixtures

Hydrogen bromide gas, lead oxides, carbon oxide, nitrogen oxides (NO<sub>x</sub>)  
Flash back possible over considerable distance.

### 5.3 Advice for firefighters

Specific protective equipment: Wear self-contained breathing apparatus for fire fighting if necessary.

Further information: Use water spray to cool unopened containers. Prevent further leakage or spillage if safe to do so. Prevent fire-extinguishing water from contaminating surface water or the ground water system.

## 6 Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

### 6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

### 6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal with liquid binding material (chemical binders, sand, diatomite, acid binders, universal binders, sawdust). Then collect by wet-brushing and place in container for disposal according to local regulations.

Provide adequate ventilation.

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#### 6.4 Reference to other sections

For handling see section 7  
For disposal see section 13

## 7 Handling and storage

### 7.1 Handling

#### Precaution for safe handling

Ensure adequate ventilation. Use personal protective equipment. Avoid breathing vapors, mist or gas. Avoid contact with skin and eyes. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas. Usual measures of the preventing fire protection. Avoid formation of aerosols, do not inhale.

### 7.2 Conditions for safe storage, including any incompatibilities

#### Storage

Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Containers, which are opened, must be carefully resealed and kept upright to prevent leakage.  
Storage class (TGRS 510): Flammable liquids containing non-combustible, acute toxic Cat.3/ toxic hazardous materials or hazardous materials causing chronic effects

### 7.3 Specific end use(s)

Apart from the uses mentioned in section 1 no other specific uses are stipulated.

## 8 Exposure controls/personal protections

Additional indication for technical installation: No data available, see section 7.

### 8.1 Control parameters

<b>Components requiring monitoring of workplace exposure limit values:</b>	
<b>Toluene (≤90%)</b>	
MAK (Switzerland)	190 mg/m <sup>3</sup> 50 ppm
KZGW (Switzerland)	760 mg/m <sup>3</sup> 200 ppm
<b>Formamidinium lead trihalide (≤8%)</b>	
MAK (Switzerland)	No limitations present
<b>Proprietary dispersion additive (≤2%)</b>	
MAK (Switzerland)	No limitations present

### 8.2 Exposure controls

#### Personal protective equipment

##### General protective and hygienic measures

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of the day. Keep away from food, beverage and feeding stuff. Take off contaminated clothing immediately.

##### Eye/face protection



Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards.

##### Respiratory protection

For mist /aerosol exposures use respiratory protection.  
Recommended filter type: ABEK P3

##### Skin protection

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Handle with gloves. Use proper glove removal technique to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

**Glove material**

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Recommended material: Nitrile rubber

**Full contact:**

Minimum layer thickness: 0.4 mm

Break through time: 480 min

**Splash contact**

Minimum layer thickness: 0.4 mm

Break through time: 60min

**Body protection**

Type of protective equipment according to risk evaluation.

**Control of environmental exposure**

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

**9 Physical and chemical properties**

<b>9.1 Information on basic physical and chemical properties</b>	
General properties	
Appearance:	
Form:	Liquid
Color:	Translucent, deep red emissive
Odor:	No data available
Odor threshold:	No data available
pH:	No data available
Phase transition	
Melting point/melting range:	No data available
Initial boiling point/boiling range:	No data available
Flash point:	No data available
Flammability (solid, gas):	No data available
Ignition temperature:	No data available
Decomposition temperature:	No data available
Auto-ignition temperature:	No data available
Explosive properties:	No data available
Explosion limit:	
Lower:	No data available
Upper:	No data available
Oxidizing properties	No data available
Vapor pressure at 20°C:	No data available
Density at 20°C	No data available
Relative density	No data available
Vapor density	No data available
Evaporation rate	No data available
Solubility in / Miscibility with	
Water:	bad
Partition coefficient:	No data available
Viscosity:	
Dynamic:	No data available
Kinematic:	No data available
Solvent content:	

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Organic solvents:	≥90%
VOC (EU):	≥90%
VOCV (CH):	≥90%
Solid load:	≤10%

**9.2 Additional safety information:**

Primary particle size (dried appearance): 5-50 nm  
Particle size (agglomerate size) in Dispersion: <100 nm  
Zeta-Potential of nanoparticles is unknown.  
Nanoparticle solubility: no data available  
Nanoparticles are functionalized.

**10 Stability and Reactivity****10.1 Reactivity**

No data available

**10.2 Chemical stability**

Stable under recommended storage conditions

**10.3 Thermic decomposition / conditions to avoid:**

No decomposition under recommended application.

**10.4 Possibility of hazardous reactions**

No data available.

**10.5 Conditions to avoid**

Heat, flames and sparks. Extreme temperatures and direct sunlight

**10.6 Incompatible materials**

Strong bases, strong oxidizing agents, strong acids, halogenated compounds.

**10.7 Hazardous decomposition products**

Other decomposition products – no data available.

In the event of fire: See section 5

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## 11 Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity

Classification-relevant LD/LC50 values:		
<b>Toluene</b>		
Oral	LD50	> 5'580 mg/kg (rat)
Inhalation	LC50	12'500 – 28'800 mg/m <sup>3</sup> (rat – 4h)
Dermal	LD50	12'196 mg/kg (rabbit)
<b>Formamidinium Lead trihalide</b>		
No data available		
<b>Proprietary dispersion additive</b>		
No data available		

#### Primary corrosion/irritation:

Respiratory: May be harmful, may cause irritation of respiratory system by inhalation of aerosol or dust.

Skin: Rabbit – Skin irritation – 24h

Eye: No data available

Sensitizations: No data available

Carcinogenicity: Formamidinium Lead trihalide; probably cancerogenic to humans.

IARC: 2A – Group 2A; probably cancerogenic to humans (lead compounds)

Reproductive toxicity:

Mouse – Oral: Effects on Fertility: Post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants)

May cause congenital malformation in the fetus. Known human reproductive toxicant.

Lead salts have been reported to cross the placenta and to induce embryo- and feto- mortality. They also have teratogenic effect in some animal species. No teratogenic effects have been reported with exposure to organometallic lead compounds. Adverse effects of lead on human reproduction, embryonic and fetal development, and postnatal (e.g., mental) development have been reported. Excessive exposure can affect blood, nervous, and digestive systems. The synthesis of hemoglobin is inhibited and results in anemia. If left untreated, neuromuscular dysfunction, possible paralysis, and encephalopathy can result.

Additional symptoms of overexposure include: joint and muscle pain, weakness of the extensor muscles (frequently the hand and wrist), headache, dizziness, abdominal pain, diarrhea, constipation, nausea, vomiting, blue line on the gums, insomnia, and metallic taste. High body levels produce increased cerebrospinal pressure, brain damage, and stupor leading to coma and often death.

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

## 12 Ecological information

### 12.1 Toxicity

Aquatic Toxicity:

Toluene	LC50 – Oncorhynchus mykiss – 7.63 mg/l–96h EC50 – Daphnia magna – 8.00 mg/l – 24h EC50 – Chlorella vulgaris – 245.00 mg/l – 24h
Formamidinium Lead trihalide:	No data available
Proprietary dispersion additive:	No data available

**Trade name: Avantama Q-740****12.2 Persistence and degradability**

Toluene	Readily biodegradable
Formamidine Lead trihalide:	No data available
Proprietary dispersion additive:	No data available

**12.3 Behavior in environmental compartments:**

Bio-accumulative potential: No data available.  
Mobility in soil: No data available.

**12.4 Additional ecological indication:**

General indication: Do not let product enter drains, surface water or the ground water system. Discharge into the environment must be avoided.

**12.5 Results of PBT- and vPvB assessment**

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

**12.6 Other adverse effects**

Very toxic to aquatic life with long lasting effects.

**13 Disposal considerations****13.1 Waste treatment methods**

**Recommendation:** Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting, as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company.

**13.2 Contaminated packaging**

**Recommendation:** Dispose of as unused product

**Recommended detergent:** Heptane/toluene



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## 14 Transport information

### Land transport ADR/RID and GGVSEB (cross-border/interior):



ADR/RID-GGVSEB class:	3 flammable liquid, toxic
<b>UN number:</b>	<b>1992</b>
Packing group:	II
Hazard label:	3+6.1
UN proper shipping name:	Flammable liquid, toxic, N.O.S. (soluble lead compound)
Tunnel restriction code	D/E
Limited quantities (LQ)	1L
Transport hazard class(es)	3

### Sea shipment IMDG/GGVSee



IMDG/GGVSee class:	3 flammable liquid, toxic
<b>UN number:</b>	<b>1992</b>
Hazard label:	3+6.1
Packing group:	II
EMS code:	F-E, S-D
Marine pollutant:	Yes
UN proper shipping name:	Flammable liquid, toxic, N.O.S. (soluble lead compound)

### Air transport ICAO-TI und IATA-DGR



ICAO/IATA class:	3
<b>UN/ID number:</b>	<b>1992</b>
Hazard label:	3
Subsidiary risk:	6.1
Packing group:	II
UN proper shipping name:	Flammable liquid, toxic, N.O.S. (soluble lead compound)

## 15 Regulatory information

Chemical Safety Assessment: For this product a chemical safety assessment was not carried out.

## 16 Other information

The above information is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Avantama Ltd shall not be held liable for any damage resulting from handling or from contact with the above product.

This safety data sheet contains nano-specific information.

**Trade name: Avantama Q-740****16.1 H-statements**

- H225 Highly flammable liquid and vapor.  
H302 Harmful if swallowed.  
H304 May be fatal if swallowed and enters airways.  
H314 Causes severe skin burns and eye damage  
H319 Causes serious eye irritation  
H336 May cause drowsiness and dizziness.  
H360Df May damage the unborn child. Suspected of damaging fertility  
H373 May cause damage to organs through prolonged or repeated exposure.  
H400 Very toxic to aquatic life  
H410 Very toxic to aquatic life with long lasting effects.

**16.2 Precautionary statement(s)**

- P201 Obtain special instructions before use.  
P210 Keep away from heat/ sparks/ open flames/ hot surfaces. – No smoking.  
P261 Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.  
P273 Avoid release to the environment.  
P280 Wear protective gloves protective clothing eye protection face protection.  
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.  
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.  
P304+P340+P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.  
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P308 + P313 IF exposed or concerned: Get medical advice/ attention  
P331 Do not induce vomiting.  
P337 + P313 If eye irritation persists: Get medical advice/ attention.  
P370 + P378 In case of fire: Use dry powder or dry sand to extinguish.  
P403 + P235 Store in a well-ventilated place. Keep cool.  
P501 Dispose of contents/ container to an approved waste disposal plant.