

**Safety data sheet**  
**According to Regulation n. 1907/2006 and Regulation 878/2020**  
**PD ACETYLACETONATE**



Revision 1 – 14.05.2025

**1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING**

**1.1 Product identifier**

Chemical name	Palladium (II) di(4-oxopent-2-en-2-oate)
Product code	353
C.A.S. Registry Number	14024-61-4
EINECS number	237-859-8
Molecular weight	304.6 g/mol
Chemical formula	Pd(C <sub>5</sub> H <sub>7</sub> O <sub>2</sub> ) <sub>2</sub>

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

Recommended uses: Industrial use. Synthesis catalyst.

Uses advised against: none in particular

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

Name	FAGGI ENRICO S.P.A.
Address	Via Majorana, 101/103 50019 Sesto Fiorentino FI
Telephone number	055311861
Fax number	055311791
Competent person	lorenzo.magaldi@faggi.it

responsible for the safety data sheet

<b>1.4 Emergency telephone number</b>	111 - Medical helpline operating in England, in Scotland (NHS 24) and in Wales (NHS Direct Wales).
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<b>1.5 Registration number</b>	Exempt under Article 6(1)
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**2. HAZARDS IDENTIFICATION**

**2.1 Classification of the mixture according to Regulation (EC) n. 1272/2008**

<b>Hazard class</b>	<b>Category codes</b>	<b>Hazards indications</b>
Flam. solid	1	H228
Self-heating substances/mixtures	1	H251
Acut. Tox. (oral)	4	H302
Skin sens.	1	H317
Eye Dam.	1	H318
Aquatic acute	1	H400
Aquatic chronic	1	H410

**2.2 Label elements:**

**Pictograms**



**Signal word**

**DANGER**

**Hazard statement**

H228	Flammable solid
H252	Self-heating: may catch fire
H302	Harmful if swallowed
H317	May cause an allergic skin reaction
H318	Causes serious eye damage
H400	Very toxic to aquatic organisms

**Safety data sheet**  
**According to Regulation n. 1907/2006 and Regulation 878/2020**  
**PD ACETYLACETONATE**



Revision 1 – 14.05.2025

<b>Precautionary advise</b>	H410	Very toxic to aquatic life with long lasting effects
	P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
	P280	Wear protective gloves/protective clothing/eye protection/face protection
	P301+P330+P331	IF SWALLOWED: rinse mouth. Do NOT induce vomiting
	P302+P352	IF ON SKIN: Wash with plenty of soap and water
	P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
	P310	Immediately call a POISON CENTER or doctor/physician
	P370+P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction
<b>2.3 Other hazards</b>		<p>It does NOT contain PBT / vPvB substances according to Regulation (EC) 1907/2006, annex XIII</p> <p>It does NOT contain substances that interfere with the endocrine system in accordance with Regulation (EC) 1907/2006 art.59 paragraph 1 and in accordance with the criteria established in Regulation (EU) 2017/2100 and Regulation (EU) 2018/605.</p>

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

**3.1 Substance : PD ACETYLACETONATE ≤ 100%**

CAS number : 14024-61-4

EINECS number : 237-859-8

Index Number : Not available

ATE: Oral LD50:2000 mg/kg bw (rat)

Acute M factor : 10

Cronic M factor: 10

**4. FIRST AID MEASURES**

**4.1 Description of first aid measures**

Inhalation Remove to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms occur.

Ingestion Clean mouth with water and drink afterwards plenty of water. Get medical attention if symptoms occur.

Contact with skin Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician.

Contact with eyes Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

**Recommendations:**

- **Need to see a doctor immediately**

YES

**Safety data sheet**  
**According to Regulation n. 1907/2006 and Regulation 878/2020**  
**PD ACETYLACETONATE**



Revision 1 – 14.05.2025

	<ul style="list-style-type: none"><li>• Possibility of delayed effects following exposure</li><li>• Move the exposed individual from the place of exposure to the open air</li><li>• Remove the clothing and shoes of the exposed individual</li><li>• How to handle contaminated clothing</li><li>• For those providing first aid, wear PPE</li></ul>	YES YES YES Use gloves YES
<b>4.2</b>	<b>Most important symptoms and effects, both acute and delayed</b> Causes severe eye damage. May cause allergic skin reaction. Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing	
<b>4.3</b>	<b>Indication of any immediate medical attention and special treatment needed</b> Consult a doctor immediately	
<b>5.</b>	<b>FIREFIGHTING MEASURES</b>	
<b>5.1</b>	<b>Extinguishing media</b> Suitable extinguishing media	Suitable extinguishing media: CO <sub>2</sub> , powder or water spray. Extinguish large fires with water spray or alcohol-resistant foam.
	Unsuitable extinguishing media	No one in particular
<b>5.2</b>	<b>Special hazards arising from the substance or mixture</b> In case of fire, toxic fumes may be produced: carbon monoxide (CO), carbon dioxide (CO <sub>2</sub> ), 2,4-pentanedione, palladium oxide	
<b>5.3</b>	<b>Advice for firefighters</b> General informations	Prevent the water used to extinguish the fire from flowing into the sewer, groundwater or surface water.
	Equipment	Protective helmet with visor, fireproof clothing, fireproof gloves, an overpressure mask with a facepiece that covers the entire face of the operator or self-contained breathing apparatus in the event of large quantities of smoke.
<b>6.</b>	<b>ACCIDENTAL RELEASE MEASURES</b>	
<b>6.1</b>	<b>Personal precautions, protective equipment and emergency procedures</b>	
	<b>6.1.1. For non-emergency personnel</b>	Move away from the contaminated area immediately and keep upwind.
	<b>6.1.2. For emergency responders</b>	Wear : Gloves for chemical risks compliant with EN420 EN374 Standards Complete clothing compliant with the UNI EN 13034: 2006 standard Semi-face masks with ABEK2P3 R filters conforming to EN14387: 2004 + A1: 2008
<b>6.2</b>	<b>Environmental precautions</b>	Prevent infiltration into the sewer, groundwater and surface water
<b>6.3</b>	<b>Methods and material for containment and cleaning up</b>	
	<b>6.3.1. Advice in order to contain a spill</b>	Avoid formation of dust
	<b>6.3.2. Advice in order to clean-up a spill</b>	Wash contaminated area with water
	<b>6.3.3. Other information</b>	None
<b>6.4</b>	<b>Reference to other sections</b>	None
<b>7.</b>	<b>HANDLING AND STORAGE</b>	

**Safety data sheet**  
**According to Regulation n. 1907/2006 and Regulation 878/2020**  
**PD ACETYLACETONATE**



Revision 1 – 14.05.2025

**7.1. Precautions for safe handling**

**7.1.1. *Raccomandations in order to manipulate the substance or the mixture in a safe manner, such as containment measures and prevention of fire and aerosol and powders formation***

Store in the original labeled packaging. Close immediately after use

**7.1.2. *General recommendation on work hygiene***

Do not eat, drink and smoke in work areas. Wash your hands after use. Remove contaminated clothing and protective equipment before entering eating areas

**7.2. Conditions Safe storage, including any incompatibilities**

**7.2.1. *Risk management associated with explosive atmospheres, corrosive conditions, flammability hazards, incompatible substances or mixtures, evaporative conditions, potential ignition sources***

Store in an area without drains or access to sewers and away from humidity and direct light.

**7.2.2. *Containment of the effects of weather conditions, pressure, temperature, sunlight, humidity and vibrations***

Store in closed and labeled containers

**7.2.3. *Conditions for keeping substances / mixtures intact***

Keep in a cool and dry place in tightly closed containers

**7.2.4. *Provisions relating to ventilation, specific design of storage rooms or containers, quantitative limits in storage conditions, compatibility of packaging***

Use approved ADR packaging

**7.3. Specific end use(s)**

Industrial use. Catalyst for synthesis

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**8.1. Control parameters**

**DNEL**

**Workers**

Systemic effects for long-term exposure – inhalation: 35.3 µg/m<sup>3</sup>

Systemic effects for short-term exposure – inhalation: no hazard identified

Local effects for long-term exposure – inhalation: medium hazard (no threshold derived)

Local effects for short-term exposure – inhalation: medium hazard (no threshold derived)

Systemic effects for long-term exposure – dermal: 50 µg/kg body weight per day

Systemic effects for short-term exposure – dermal: no hazard identified

Local effects for long-term exposure – dermal: high hazard (no threshold derived)

Local effects for short-term exposure – dermal: high hazard (no threshold derived)

Eye hazards: medium hazard (no threshold derived)

**General population**

hazard unknown but no further hazard information necessary as no exposure expected

**PNEC**

Freshwater: 0.186 µg/L

Marine water: 0.019 µg/L

Sewer treatment plant: 668 µg/L

Sediment (freshwater): 6 µg/kg sediment dry weight

Sediment (marine water): 1 µg/kg sediment dry weight

Soil: 22 µg/kg soil dry weight

**8.2. Exposure controls**

**8.2.1. *Appropriate engineering controls***

Periodically check the range of the extractor hood.

**Safety data sheet**  
**According to Regulation n. 1907/2006 and Regulation 878/2020**  
**PD ACETYLACETONATE**



Revision 1 – 14.05.2025

**8.2.2. Individual protection measures, such as personal protective equipment**

<b>Eye/face protection</b>	Splash goggles compliant with Directive 89/686 / EEC and standard EN166: 2001
<b>Skin protection (hands)</b>	Chemical gloves according to EN 420 EN 374 Glove material: Fluorocarbon rubber (Viton) Material thickness: 0.5 mm Penetration time: ≥ 480 min DIN EN374 method
<b>Skin protection (body)</b>	Complete clothing compliant with the UNI EN 13034: 2006 standard
<b>Respiratory protection</b>	semifacial mask with A/P3 filters
<b>Thermal hazards</b>	none

**8.2.3. Environmental exposure controls**

Maintain suction in all environments using localized collection systems and ambient air exchange. Convey the aspirated volumes to an abatement system and then into the atmosphere. Do not use recirculating air suction systems. Avoid any spillage into the environment.

**9.**

**9.1**

**PHYSICAL AND CHEMICAL PROPERTIES**

**Information on basic physical and chemical properties**

Physical state	Dust
Color	Yellow
Odor	Undefined
Melting point / freezing point	> 450 ° C
Boiling point or initial boiling point and boiling range	Not applicable
Flammability	Flammable
Lower and upper explosive limits	Explosive if dust concentration exceeds 100 g/m <sup>3</sup>
Flash point	Study technically not feasible because decomposition occurred during the melting point study
Self-ignition temperature	Palladium acetylacetone temperature was determined to exceed the oven temperature by 60 ° C during the initial 24 hours testing period at 140 ° C. The test item has been classified as Category 1 of the Self Heating Substances Criteria of Regulation(EC) No 1272/2008
Decomposition temperature	180 ° C
pH	Not applicable
Kinematic viscosity	Not applicable
Solubility	Insoluble
Partition coefficient n-octanol / water (logarithmic value)	Log Kow 26.6 at 25 ° C
Vapor pressure	0 Pa at 25 ° C
Density and / or relative density	1.77 g/cm <sup>3</sup> at 25 ° C
Relative vapor density	No data available

**Safety data sheet**  
**According to Regulation n. 1907/2006 and Regulation 878/2020**  
**PD ACETYLACETONATE**



Revision 1 – 14.05.2025

	Characteristics of the particles	The average 10th, 50th and 90th percentile particle sizes for bis(acetylacetonato) palladium (II) were 0.66, 2.1 and 5.4 $\mu\text{m}$ , respectively. The average specific surface area was determined as $2.63 \pm 0.03 \text{ m}^2/\text{g}$ .
<b>9.2.</b>	<b>Other information</b>	None
<b>10.</b>	<b>STABILITY AND REACTIVITY</b>	
<b>10.1</b>	<b>Reactivity</b>	No relevant information
<b>10.2</b>	<b>Chemical stability</b>	The product is stable under normal working conditions
<b>10.3</b>	<b>Possibility of hazardous reactions</b>	No relevant information
<b>10.4</b>	<b>Conditions to avoid</b>	strong heating
<b>10.5</b>	<b>Incompatible materials</b>	Strong oxidizing agents
<b>10.6</b>	<b>Hazardous decomposition products</b>	carbon monoxide, carbon dioxide, acetylacetone, palladium oxide
<b>11.</b>	<b>TOXICOLOGICAL INFORMATION</b>	
<b>11.1</b>	<b>Information on hazard classes as defined in Regulation (EC) No 1272/2008</b>	
	<b>Acute toxicity</b>	LD50 (oral): 2000 mg/kg bw (rat) Skin toxicity: based on available data, the classification criteria are not met Inhalation toxicity: based on available data, the classification criteria are not met
	<b>Skin corrosion / irritation</b>	Based on available data, the classification criteria are not met
	<b>Serious eye damage/irritation</b>	Corrosive to eyes (Category 1), according to EU CLP criteria (EC 1272/2008).
	<b>Respiratory or skin sensitization</b>	Skin sensitisier category 1
	<b>Germ cell mutagenicity</b>	Based on available data, the classification criteria are not met
	<b>Carcinogenicity</b>	No data available
	<b>Reproductive toxicity</b>	Based on available data, the classification criteria are not met
	<b>STOT – single exposure</b>	Based on available data, the classification criteria are not met
	<b>STOT – repeated exposure</b>	No adverse effect observed.
		NOAEL 3 mg/kg bw/day (subacute, rat)
<b>11.2</b>	<b>Information on other hazards</b>	
	None	
<b>12.</b>	<b>ECOLOGICAL INFORMATION</b>	
<b>12.1</b>	<b>Toxicity</b>	LC50 (4 days) (fish) 5.48 - 530 $\mu\text{g}/\text{L}$ NOEC (4 days) (fish) 320 $\mu\text{g}/\text{L}$ EC50 (48 h) (invertebrates) 35.19 - 220 $\mu\text{g}/\text{L}$

**Safety data sheet**  
**According to Regulation n. 1907/2006 and Regulation 878/2020**  
**PD ACETYLACETONATE**



Revision 1 – 14.05.2025

		NOEC (48 h) (invertebrates) 20.52 - 105 µg/L NOEC (21 days) (invertebrates) 4.3 - 28.4 µg/L EC50 (72 h) (algae) 2.03 - 81 µg/L EC50 (24 h) (algae) 78 µg/L NOEC (72 h) (algae) 1.33 - 40 µg/L
<b>12.2</b>	<b>Persistence and degradability</b>	Persistence and degradability are unlikely.
<b>12.3</b>	<b>Bioaccumulative potential</b>	Koc: 568.1 L/kg @ 25 °C
<b>12.4</b>	<b>Mobility in soil</b>	Spillage unlikely to penetrate soil Is not likely mobile in the environment due its low water solubility.
<b>12.5</b>	<b>Results of PBT and vPvB assessment</b>	Not PBT or vPvB
<b>12.6</b>	<b>Endocrine disrupting properties</b>	No known effects
<b>12.7</b>	<b>Other adverse effects</b>	No known effects
<b>13.</b>	<b>DISPOSAL CONSIDERATIONS</b>	
<b>13.1.</b>	<b>Waste treatment methods</b>	The substance and its packaging must be disposed of as hazardous waste by authorized companies.
<b>14.</b>	<b>TRANSPORT INFORMATION</b>	
<b>14.1</b>	<b>UN number or ID number</b>	UN3181
<b>14.2</b>	<b>Official UN shipping name</b>	Metal salts of organic compounds, flammable, n.o.s. (Palladium (II) di(4-oxopent-2-en-2-oate)
<b>14.3</b>	<b>Transport hazard class(es)</b>	
	ADR/RID/ADN/IMDG/ICAO-IATA: Class:	4.1
	ADR/RID/ADN/IMDG/ICAO-IATA: Label:	4.1 + mark dangerous for environment
	ADR: Tunnel restriction code	(E)
<b>14.4</b>	<b>Packing group</b>	II
<b>14.5</b>	<b>Dangers for the environment</b>	
	ADR/RID/ADN/ICAO-IATA:	yes
	IMDG: Marine Contaminant:	yes
	IMDG - EmS:	F-A, S-I
<b>14.6</b>	<b>Special precautions for user</b>	Transport must be carried out by vehicles authorized for the transport of dangerous goods according to the provisions of the current edition of the A.D.R. Agreement. and the applicable national provisions. Transport must be carried out in the original packaging and, in any case, in packaging which is made of materials which cannot be attacked by the contents, and which are not likely to generate dangerous reactions. Those responsible for loading and unloading dangerous goods must have received appropriate training on the risks presented by the preparation and on any procedures to be adopted in the event of emergency situations.
<b>14.7</b>	<b>Maritime transport in bulk according to IMO instruments</b>	
	Bulk transport is not foreseen	
<b>15.</b>	<b>REGULATORY INFORMATION</b>	
<b>15.1</b>	<b>Safety, health and environmental regulations/legislation specific for the substance or mixture</b>	<b>Applicability</b>
	Reg. (EC) 1907/2006 / EC Reach	YES
	Reg. (EC) 1272/2008 CLP and subsequent changes and additions	YES
	Reg. (CE) 2037/2000 "Substances that deplete the ozone layer"	NO
	Reg. (EC) 850/2004 "Persistent organic pollutants"	NO

**Safety data sheet**  
**According to Regulation n. 1907/2006 and Regulation 878/2020**  
**PD ACETYLACETONATE**



Revision 1 – 14.05.2025

Reg. (EC) 689/2008 "export and import of dangerous chemicals"	NO
Substance listed in Annex I of Dir. 2012/18 / EU so-called Seveso	YES
Legislative Decree 81/2008 Consolidated Law on health and safety at work	YES
Directive 2014/103 / EU "Adr"	YES
<b>Reg. (CE) 1907/2006/CE Reach art. 59 – Candidate List of Substances of Very High Concern (SVHC)</b>	NO
<b>Reg. (CE) 1907/2006/CE Reach - Annex XIV – Authorisation List</b>	NO
<b>Reg. (CE) 1907/2006/CE Reach - Annex XVII – Restriction List</b> <a href="https://echa.europa.eu/it/substances-restricted-under-reach">https://echa.europa.eu/it/substances-restricted-under-reach</a>	Limited use Item 40-75 (check link)

**15.2 Chemical safety assessment**

A chemical safety assessment was not carried out

**16. OTHER INFORMATION**

**Changes compared to the previous edition**

First edition

**Acronym and abbreviation legend**

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

GHS: Globally Harmonized System of Classification and Labeling of Substances

EINECS: European Inventory of Chemical Substances

CAS: Chemical Abstract Service

STA: Acute Toxicity Estimate

PBT: Persistent, Bioaccumulative and Toxic.

vPvB: (very persistent and very bioaccumulative). Very persistent and very bioaccumulative

LD: lethal dose

PNEC: predicted no effect concentration

DNEL: derived no effect level

TLV (ceiling value): threshold limit value

STEL: short-term exposure limit

EU-OEL: European occupational exposure limit

TWA: time-weighted average

EC: effective concentration

NOAEL: no observed adverse effect level

LC: lethal concentration

NOEC: no observed effect concentration

LOEC: lowest observed effect concentration

Bw: body weight

Koc: organic carbon-water partition coefficient

**Main references and data sources**

ECHA's data bank on registered substances and soon to be registered substances:

<https://chem.echa.europa.eu/>

**Adequate training for workers in order to ensure the protection of human health and the environment**

Training on Chemical Risk pursuant to Legislative Decree 81/08 Title IX dangerous substances

PPE training