



L. CORNELISSEN & SON

Artists' Colourmen

Suppliers of Materials for Painters, Gilders & Printmakers

Safety Data Sheet according to Directive 91/155/EC

Revision Date: October 2013

1) Identification of the substance/preparation and the company

Trade Name: Cornelissen Lemon Yellow

Application: Artists' Pigment

Manufacturer/Supplier:

L Cornelissen & Son Ltd
105 Great Russell Street
London WC1B 3RY

Tel: 020 7636 1045

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www.cornelissen.com

Composition/Information on ingredients

Chemical composition: Barium chromate, Substance mono-constituent BaCrO₄.

CAS N°: 10294-40-3

EINECS N°: 233-660-5

Pigment: Yellow 31

Colour Index: 77103

Impurity, hazardous components (1) regulation 1272/2008

CAS N°	Annex VI Index N°	EINECS N°	Name	%	Symbol	Phrase
Substance						
10294-40-3	056-002-00-7	233-660-5	BaCrO ₄	95	GHS07	H332
			Barium chromate		Warning	H302
Impurities:						
7789-06-2	024-009-00-4	232-142-6	SrCrO ₄	0.5	GHS08	H350
			Strontium chromate		GHS07	H302
					GHS09	H400
					Danger	H410
11103-86-9	024-007-00-3	234-329-8	Zinc	0.5	GHS08	H350 H302
			Potassium Chromate		GHS07	H317 H400
			3ZnCrO ₄ , K ₂ CrO ₄		GHS09	H410
			Zn(OH) ₂ , 2H ₂ O		Danger	

3) Hazards Identification

Classification

Classification according to Regulation (EC) No 1272/2008

Hazard pictogram:



Signal word: DANGER

Hazard statements:

H350	May cause cancer.
H302	Harmful if swallowed.
H332	Harmful if inhaled.
H412	Harmful to aquatic life with long lasting effects.

Precautionary statements:

Prevention:	P202	Do not handle until all safety precautions have been read and understood.
Response:	P264	Wash thoroughly after handling.
	P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
	P308 P313	If exposed or concerned: get medical advice/attention.
	P405	Store locked up.
Disposal:	P501	Dispose of contents/ containers to be collected by a licensed contractor in accordance with national and local regulations.

4) First Aid Measures

Description of first aid measures: Get immediate medical attention.

After inhaling: Immediately remove from exposure area to fresh air. If respiration has stopped, perform artificial respiration. Keep person warm and at rest. Treat symptomatically and supportively.

After skin contact: Immediately remove contaminated clothing and shoes. Wash contaminated area with soap or mild detergent and large amount of water until no evidence of chemicals remains. Lesions can be scrubbed with a 20 % solution of sodium hyposulfite or treated

with calcium-disodium EDTA ointments. Freshly prepared and promptly applied 10 % ascorbic acid solution may speed healing of ulcers (Gosselin Clinical Toxicology of Commercial Products, 5th Ed). As will 1 % solution of aluminium acetate (Arena, Poisoning 4th Ed.)

After eye contact: Wash eyes immediately with large amounts of water, occasionally lifting upper and lower lids, until no evidence of chemical remains (at least 15-20 minutes). Continue irrigating with normal saline until pH has returned to normal (30-60 minutes) cover with sterile bandages. Get immediately ophthalmologist attention.

After ingestion: If the person is conscious and not convulsing, induce vomiting by giving syrup of ipecac (keeping the head below the hips to prevent aspiration), followed by water. Repeat in 20 minutes if not effective initially. For patients with depressed respiration or if vomiting has not worked out, perform gastric lavage cautiously (Dreisbach, Handbook of Poisoning, 12th Ed.). Treat symptomatically and supportively. Gastric lavage should be performed by qualified medical personnel. Get immediately medical attention.

Indication of any immediate medical attention and special treatment needed: NOTE TO PHYSICIAN

ANTIDOTE: The following antidote has been recommended. However, the decision as to whether the severity of poisoning requires administration of any antidote and actual dose required should be made by qualified medical personnel.

BARIUM POISONING: Give orally 30 gr of Sodium Sulphate in 250 ml of water and repeat one hour later (with the help of a pipe if necessary). The administration of sulphate salts intravenously is hazardous, since they induce the precipitation of barium sulphate in the kidney, with subsequent renal failure. Administration of potassium is critical (Dreisbach, Handbook of Poisoning, 12th Ed.). Antidote should be administered by qualified medical personnel.

CHROMIUM POISONING: use of dimercaprol has been suggested on the basis of findings on animals. Give 3 mg/kg (or 0.3 ml/10 kg) every 4 hours, intramuscularly for the first 2 days and then 2 mg/kg every 12 hours for a total of 10 days (Dreisbach Handbook of Poisoning, 12th Ed.). Antidote should be administered by qualified medical personnel.

5) Fire Fighting Measures

Suitable extinguishing media: CO₂, dry chemical, regular foam.

Not recommended: Water spray (chromate slightly soluble in water).
Do not let this material and its solution contaminate the Environment.

Special hazards arising from the substance: Negligible hazard when exposed to flames. When heated this substance decomposes and can release oxygen (temperature range 200-600 ° C Depends on reducing conditions).

When there is excess heat, after reduction of barium chromate salts of trivalent chromium, there is conversion to CrO₃ under oxidizing conditions. In large fires, the

decomposition of substances may release oxides of chromium. Keep away from reducing agents (e.g. hydrazine, wood, sulphur, paper, aluminium). Avoid breathing dust.

Advice for fire-fighters

Special personal protection equipment: Wear an air respirator beyond dust limits, gloves and appropriate clothing and equipment to prevent a prolonged skin contact with substance.

Conduct of fire fighting: Avoid dusting. Keep away unprotected people. Move container from fire area; if possible you can do it without risk. Do not scatter spilled material with high-pressure water streams. Dike and contain fire-control water for later disposal. (chromate practically insoluble in water). Eliminate waste waters according to local regulations: see chapter 6. Contaminated wastes have to be collected by a licensed contractor. Do not let contaminated water contaminate the environment.

Additional information: The fire water, waste contaminated containers and fire residues containing barium chromate must be removed by licensed contractor for garbage.

6 Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Avoid dusting. Wear appropriate mask (minimum type FFP2 (EN 149)), glasses and gloves and appropriate clothing equipment to prevent from a prolonged skin contact with this substance. Keep unnecessary people away.

Environmental precautions: Prevent the formation of a cloud of dust and atmospheric emission of barium chromate may fall to the ground and pollute it. Do not get rid of waste waters, neither in discharge, nor in sewers, but according to local regulations. To prevent dispersion on the floor and later in the environment, it is highly recommended to forbid walking on the product spillage. Avoid/minimise residues and waste production as possible.

Methods and material for containment and cleaning up:

Occupational spill: Avoid dusting. Sweep up in suitable clean, dry container or absorb material avoiding dusting.

Do not flush spilled materials into sewer. Keep unnecessary people away.

Soil spill: Dig a holding area such as pit, pond or lagoon to contain spilled material. Use protective cover such as plastic sheet to prevent dissolving in fire-fighting water or rain. Dusting is prohibited.

Water spill: For total elimination. Detoxication of Cr⁶⁺ is recommended (Cr⁶⁺ in waste water is prohibited according to local regulations). For this purpose add FeSO₄ for the chromium reduction and then proceed to Cr³⁺ flocculation by neutralisation (pH 8-9) with sodium carbonate, lime. Use mechanical dredges or lifts to extract immobilised masses of pollution and precipitates.

Air spill: A hazardous concentration of particles in suspension in the air can quickly be reached by dispersion. Keep unnecessary and unprotected people away. Let the particles suspension fall down and go into the place with appropriate individual protection equipment: respirator (or dust mask) and protective (impervious) clothing. Prevent any contact with food and animal feeding stuff.

7) Handling and Storage

Precautions for safe handling:

EC: The directive 90/394/EC dealing with the prevention of exposition risks to carcinogenic agents in workhouses applies to this substance (see Chapter 15). The directives 98/24/EC deals with the workers' health and security protection against chemical risks in workhouses.

Handling: Avoid dust breathing and use adequate ventilation. Protection is required to keep exposure below permissible limit (see Chapter 8 and 15). Refer to Chapter 8 to know the protection means you have to wear.

Protection against fire and explosion: The product is non-flammable. It may reduce the ignition temperature of flammable substances. Prevent static electric sparks.

Conditions for safe storage, including any incompatibilities:

Storage: Store in roofed place at room temperature. Keep containers tightly sealed. Do not store with or close to food and animals feeding stuff (see Chapter 15).

Material/chemical incompatibility: Do not store close to reducers (ex-hydrazine, aluminium powder).

8) Exposure/Personal Protection

Additional notes for design of plant equipment: no further detail. See chapter 7.

Substance with workplace related limits to be monitored:

BaCrO₄, Barium Chromate (95%) CAS: 10294-40-3

SrCrO₄, Strontium Chromate (0.5%) CAS: 7789-06-2

3ZnCrO₄, K₂CrO₄, Zn(OH)₂, 2H₂O, zinc potassium chromate (0.5%) CAS: 11103-86-9

EXPOSITION LIMIT VALUE (Occupational Exposure Limits):

European Union Chromium VI compounds 0.05 mg Cr/m³

Denmark Chromates 0.005 mg Cr/m³

France Chromium VI compounds 0.05 mg Cr/m³

Germany Chromium VI compounds 0.05 mg Cr/m³

Barium chromate is insoluble.

Due to the possible impurities it contains, we classify it as: Carc. Cat.1A.

Japan Chromium VI compounds 0.05 mg Cr/m³

South Africa Chromium VI compounds 0.05 mg Cr/m³

Sweden Chromates VI 0.02 mg Cr/m³

UK Chromium VI compounds (MEL) 0.05 mg Cr/m³ (Maximum Exposure Limit)

USA Threshold Limit Value (TLV - ACGIH) 0.01 mg Cr /m³ (TWA) (TWA: 8 hours Time Weighted Average). (Note: this value is considered as a ceiling value: peaks should not be exceeded for any period of time).

Cancer Class: Given the fact barium chromate is insoluble and that it may contain soluble hexavalent chromium compounds from zinc potassium chromate or strontium we classify it: Category 1A (CLP-GHS proved human carcinogen).

Professional exposure.

This substance can be associated with the alkaline chromate's family for which biological exposure indices exist. These indices are a mean to assess the workers' exposure to chemical substances and can be complementary to the measurements of exposition threshold values in the air (table below).

CrO ₃ concentration in the air without protection (µg/m ³)	Chromium content in erythrocytes (µl/l blood)	Chromium in urine (µg/l)
0.03	9	12
0.05	17	20
0.08	25	30
0.1	35	40

A direct relationship exists between the exposure on a workhouse of compounds belonging to the alkaline chromate's family and the chromium concentration in blood and urine. Results of such analyses allow assessing workers' health (table above).

OCCUPATIONAL EXPOSURE MANAGEMENT:

CrVI+ Risk management minimizing needs an 8 hours time weighted average exposure below the Threshold Limit Value in occupational workplaces. In order to perform a real exposure on workplace, it is recommended to:

- Keep under control CrVI+ nuisance dust exposure
- Determine the accurate working time per shift
- Choose appropriate Personal protective equipment (Respiratory Protective device...) with accurate safety factor

After calculation, risk characterisation ratio must be below than 1 for safe operating conditions. For more information see extended safety data sheet.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory protection: Wear a specific respirator or dust mask (at least a type FFP3) adapted to contamination level found on site.

Hand protection: Employee must wear appropriate protective gloves to prevent from contact with this substance.

Eye protection: Employee must wear splash-proof or dust-resistant safety goggles and a face shield to prevent from contact with this substance (EN166).

Clothing: Employee must wear appropriate protective (impervious) clothing and equipment to prevent from any possibility of skin contact with this substance.

Skin protection: Wear appropriate clothing to avoid any contact with skin.

Other recommendations: Showering is recommended after work according to local regulations. Do not drink and eat on site.

Avoid any dust generation. No data are available as to the environment exposure. However, emissions have to conform to the authorised limits (see Chapter 15).

Given the lack of data, this compound is considered as trivalent chromium in soils. Little quantities of hexavalent chromium are quickly converted into trivalent chromium in the soil.

Atmospheric emissions: Ventilation systems must be appropriated to get the performance level to control air emissions as required by national regulations. If necessary an appropriate treatment device must be installed according to regulations (Cr6+ compound)

Water emissions: Must be keep under control so they do not contaminated water drainage systems, sewers, streams surface water and groundwater as required by national regulations

Soil emissions: Do not let this material to contaminate soils or ground.

9) Physical and chemical Properties

Physical state:	solid
Odour and appearance:	odourless yellow powder
Change in physical state	
Decomposition Melting	500° C - 600° C * (air) > 1900° C
* Temperature may be reduced by reducers	
Flash-point:	NA
Flammable properties:	not flammable, may enhance flammability of other materials
Explosion risks:	NA
Vapour pressure:	NA
Specific gravity:	4.5 ISO 787/10
Solubility (water 20° C):	3-10 mg/l ISO 2068
pH:	6 - 9 ISO 787/9
Other information:	Practically insoluble in water. Soluble in mineral acids, insoluble in dilute acetic acid. Slightly soluble in ammonia salts.
Coef. n Octanol/water:	not available

10) Stability and Reactivity

Reactivity: Barium Chromates are very slightly soluble in water (0.1g/l). When heated this substance is decomposed and may release oxygen (temperature range 200-600°C depending of reducing condition). However, in similarity with strontium chromate, according GHS/CLP 1272/2008/EC regulation, the barium chromate should not be considered to be an oxidising solid (oxidizer not strong enough to be classified).

Chemical stability: Stable under normal temperatures and pressures. When mixed with acid this substance may generate dichromate (pH: 5.5-3.5)/ chromic acid (pH <3) in mixture.

Possibility of hazardous reactions: Stable under normal condition of uses. When excess of heating, after reduction of the Barium chromate in trivalent chromium salts, these are converted in CrO₃ in oxidising conditions. In case of large fire, substance decomposition may release some oxides of chromium.

Conditions to avoid: Flammability. This product may burn, but does not ignite readily. Prevent static electric sparks.

Incompatible materials: Avoid contact with strong reducers (Al, hydrazine, combustible materials), excessive heat, sparks or open flame.

Hazardous decomposition products: Stable under normal temperatures and pressures. At high temperature, may release Cr⁶⁺. After reduction of the barium chromate in trivalent chromium salts, these are converted in CrO₃ in oxidising conditions.

11) Toxicological Information

Toxicity data: LD/LC50 oral (rat): not available.

Chronical toxicity: Barium Chromate pigments are practically insoluble. However, gastric fluid dissolves small quantities of Barium Chromate which is harmful (soluble Ba HCl 0.07 N: 2.2 % maximum) if swallowed. Absorption of barium may result in potassium deficiency.

Carcinogenicity: The barium chromate is recognized without effect on the animal: however, we classify under 2 GHS Carcinogen IARC Group 1A as hexavalent chromium compound contained in potential impurities (zinc chromate or strontium potassium).
Substance listed as "known human carcinogen" or "anticipated human carcinogen" by the National Toxicology Program (NTP) annual report on Carcinogen (USA).

Mutagenicity, Reproductive toxicity:

Mutagenicity: No data available

Reproductive toxicity: No data available

Irritation: Contact with skin: may cause irritation by mechanical contact. By similarity to strontium chromate, this substance should not present the characters enough to be classified according to the CLP Regulation 1272/2008/EC.

Contact with eyes may cause irritation by mechanical contact. By similarity to strontium chromate, this substance should not present the characters enough to be classified according to the CLP Regulation 1272/2008/EC.

Sensitization: No sensitizing effects known for barium chromate

Repeated dose toxicity:

Toxicity specific target organ (single exposure): No information available.

Toxicity specific target organ (repeated exposure): No information available.

Aspiration hazard: No information available.

12) Ecological Information

Aquatic toxicity, Chronic aquatic toxicity: Harmful for the aquatic organisms and may cause long term adverse effects in the aquatic environment, due to traces of strontium chromate or zinc potassium.

Sediment toxicity: No data available

Mobility: Substance slightly soluble in water (Cr6+) See chapter 6. No specific data available for barium chromate. This substance may be separated from water by sedimentation or filtration.

Disposal: It is recommended to proceed to a chemical flocculation by neutralisation at pH = 8.

Persistence/Degradability: This product containing CrVI while dumping is avoided. Hexavalent chromium may remain unchanged or change slowly in many natural waters at low concentrations of organic compounds / reducer. The oxidizing capacity of hexavalent chromium in water increases with decreasing pH (lower). Most chromium released into the water is finally deposited in sediments in hydrated form after being reduced to Cr (III). Cr6 + must be reduced for disposal. Chapters 6 and 9. Preventing it from entering the drainage of waste water or soil.

Behaviour in environmental compartments:

Bio accumulative potential: The passage and bioaccumulation of chromium from the earth to the upper parts of plants above the ground is unlikely. Chromium is commonly found in freshwater organisms and accumulates in moderation.

Mobility in soil: This product is very poorly soluble (but slightly stronger than that of barium sulphate) and consequently mobility is very low. However in the presence of sulphate-rich soils Barium chromate is likely to decompose to form insoluble barium sulphate and release CrVI+ in the environment. Chromium VI is extensively converted to trivalent chromium in soils and sediments (favoured by anaerobic conditions and low pH). In sediment and soil, chromium III is adsorbed more than the chromium VI.

Results of PBT and vPvB assessment: The Annex XIII of the REACH Regulation No. 1907/2006 is not applicable to inorganic substances.

13) Disposal Information

Waste treatment methods

Product: Do not let contaminate the environment with this substance. Waste and spillage must be collected by a licensed contractor for treatment. Dispose in accordance with state or local regulations.

Contaminated package and containers: Empty bags can be either destroyed, or recycled according to the international norms that apply. Spoiled and unclean packagings are regulated by the ADR/IMDG/IATA.

This substance meets the definition of the hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA).

14) Transport Information

ADR : UN 1564, BARIUM COMPOUND, N.O.S. (BARIUM CHROMATE), 6.1, III

IMDG : UN 1564, BARIUM COMPOUND, N.O.S. (BARIUM CHROMATE), 6.1, III

IATA: UN 1564, Barium compound, n.o.s. (Barium chromate), 6.1, III

Limited Quantities: Y645 net weight of the package: 10 kg max; 670; passenger aircraft
100 kg max; 677CAO 200 kg maximum.

15) Regulatory Information

Labelling according to Regulation 1272/2008/EC [CLP/GHS]

Hazard pictogram:

Signal word: DANGER

Hazard statements:

	H350	May cause cancer
	H302	Harmful if swallowed
	H332	Harmful if inhaled.
□	H412	Harmful to aquatic life with long lasting effects

Precautionary statements:

Prevention:

P202	Do not handle until all safety precautions have been read and understood.
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Response:

P264	Wash thoroughly after handling.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P308 P313	If exposed or concerned: get medical advice/attention.
P405	Store locked up.

Disposal:

P501	Dispose of contents/ containers to be collected by a licensed contractor in accordance with national and local regulations.
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Chemical safety assessment: Chemical safety report were performed for all impurities included in Barium chromate

(see chapter 16) but not for the substance barium chromate.

16) Other information

EC PREPARATION LABELLING: (Directive 1999/45/EC)

If the concentration of this substance exceeds 10%, the preparation is labelled «carcinogen» and sentences R45 and/or R49 are mandatory depending on the case.

For industrial use only (97/10/EC).

GERMANY : Wassergefährdungsklasse WGK (VwVwS): WGK 3

USA:

- Substance included in the EPA TSCA inventory.
- RTECS number: CQ 8760000 (Register of Toxical Effects of Chemical Substances).
- Cercla Rating (scale 0-3): Health 3 - Fire 0 - Reactivity 0 - Persistence 3.
- NFPA Rating (scale 0-4): Health 4 - Fire 0 - Reactivity 0.
- Substance labelled and classified HMIS third edition: H = 3* - F = 0 - PH = 1.
- Proposition 65 Warning: This product contains chemicals known to the State of California to cause cancer.
- Pennsylvania Department of Labour and Industry: Hexavalent chromium compounds are on the Right to Know

List as E (Environmental Hazard) and S (Special Hazardous Substance).

- HMIS III : The HMIS III ratings are from the HMIS Third Edition. There have been significant changes made to the system. "PH" stands for "Physical Hazard" as defined in the OSHA Haz Com Standard and replaces the former code "R" for "Reactivity". For a more detailed explanation of the system and the ratings, please contact our Offices at INT = 33 (0)1 30 40 57 57.

INTERNATIONAL STATUS OF THE PRODUCT:

- Europ (EC):

a) REACH status: The substance is preregistered according regulation REACH 1907/2006/EC,

b) EINECS registered substance

c) The substance contains impurities such as zinc potassium chromate and strontium chromate listed in the Candidate list of Substances of Very High Concern for authorisation (06/2011).

d) Starting from 20 June 2011, producers and importers of articles shall notify ECHA within six months, after a substance has been included in the Candidate List, if the substance is present in those articles in quantities totalling over one tonne, per producer or importer per year, and if the substance is present in those articles above a concentration of 0.1 % weight by weight. This is required for producers and importers of articles when all conditions of Article 7(2) are met according REACH regulation 1907/2006/EC. Exemption from obligation possible on the basis of: A notification is not required when:

The substance has already been registered for that use (Zinc potassium chromate and strontium chromate are registered for the following uses: anticorrosive

pigment for paints (solid corrosion inhibitor). Pigment reserved for industrial use (OEM): aerospace and car refinishing and Coil coating, [strontium chromate only]),

Exposure of humans and the environment can be excluded during the use and disposal of the article.

In such cases, the producer or importer shall however supply appropriate instructions to the recipient of the article.

Upon request of a consumer, the article supplier has to provide relevant safety information about SVHC (Article 33(2) 1907/2006/EC) when the concentration in article exceeds the 0.1% threshold.

d) This product does not meet with: Rosh directive ((Restriction of the use of certain Hazardous Substances in electrical and electronic equipment) 2002/95/CE) for Lead, Cadmium, hexavalent Chromium, Mercury, Diphenylethers Polybrominated and Polybromated Biphenyls and ELV (End Life of Vehicles) directive 2000/53/EC.

USA: Substance TSCA registered.

Canada: Listed on the Domestic Substance List (DSL).

Japan: Listed on the MITI.

Australia: Listed in the AICS.

To best of our knowledge the information contain herein is accurate. However, neither the above supplier assumes any liability whatsoever for the accuracy or completeness of the information herein

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist