

Rotation Ligature Ties (Pletcher Springs, Tie Hooks, Power Pins, Teflon®* Coated Ligature Wires, Preformed Ligature Wires, Mini-Twisted Kobayashi Ligatures)

Section 1. Identification

- GHS product identifier** : Rotation Ligature Ties (Pletcher Springs, Tie Hooks, Power Pins, Teflon®* Coated Ligature Wires, Preformed Ligature Wires, Mini-Twisted Kobayashi Ligatures)
- Product code** : Not available.
- Other means of identification** : Not available.
- Product type** : Solid.

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

- Product use** : Dental product: Orthodontic Appliance
This product, under the normal conditions of use, meets the definition of an "ARTICLE".
- Area of application** : Professional applications.

Manufacturer : **Ormco Corporation**
1332 S. Lone Hill Avenue
Glendora, CA 91740-5339
Telephone no.: 1-800-854-1741

e-mail address of person responsible for this SDS : OrmcoCustCare@sybrondental.com

Emergency telephone number (with hours of operation) : CHEMTREC® (24 hours) U.S. : 1-800-424-9300 International: +1-703-527-3887

Section 2. Hazards identification

OSHA/HCS status : While this material is an article and exempted by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

Classification of the substance or mixture : Not classified.

Percentage of the mixture consisting of ingredient(s) of unknown toxicity: 69.8%

GHS label elements

- Signal word** : No signal word.
- Hazard statements** : No known significant effects or critical hazards.
- Precautionary statements**
- Prevention** : Not applicable.
- Response** : Not applicable.
- Storage** : Not applicable.
- Disposal** : Not applicable.

Date of issue/Date of revision : 12/16/2016 **Date of previous issue** : No previous validation **Version** : 1 1/13

Section 2. Hazards identification

Hazards not otherwise classified : If dust or fumes are generated during processing (e.g., brazing, cutting, grinding, sawing, and welding) hazardous chemicals could be released.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture
Other means of identification : Not available.

Ingredient name	Other names	%	CAS number
Nickel	-	≥25 - ≤50	7440-02-0
cobalt	-	≥25 - ≤50	7440-48-4
molybdenum	-	≥10 - ≤25	7439-98-7
manganese	-	≥10 - ≤25	7439-96-5
tungsten	-	≤10	7440-33-7
silicon	-	≤5	7440-21-3
Aluminium powder (stabilized)	-	≤5	7429-90-5

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health and hence require reporting in this section.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : No special measures are required. Get medical attention if symptoms occur.
Inhalation : No special measures required. Get medical attention if symptoms occur.
Skin contact : No special measures required. Get medical attention if symptoms occur.
Ingestion : If swallowed then seek immediate medical assistance.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.
Inhalation : No known significant effects or critical hazards.
Skin contact : No known significant effects or critical hazards.
Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : No specific data.
Inhalation : No specific data.
Skin contact : No specific data.
Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments : No specific treatment.
Protection of first-aiders : In case of major fire and large quantities: No action shall be taken involving any personal risk or without suitable training.

Section 4. First aid measures

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : Do not use water jet.

Specific hazards arising from the chemical : Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
metal oxide/oxides
Fluoride compounds
Hydrogen fluoride (HF).

Special protective actions for fire-fighters : In case of major fire and large quantities: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : Low release. For professional use only. Handling of product in very small amounts or in situations where release is highly unlikely

For emergency responders : Low release. See also the information in "For non-emergency personnel".

Environmental precautions : No special measures are required.

Methods and materials for containment and cleaning up

Small spill : No special measures required.

Large spill : No special measures required.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : No special measures are required.

Advice on general occupational hygiene : No special measures are required.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Nickel	<p>ACGIH TLV (United States, 3/2016). TWA: 1.5 mg/m³ 8 hours. Form: Inhalable fraction</p>
cobalt	<p>NIOSH REL (United States, 10/2013). TWA: 0.015 mg/m³, (as Ni) 10 hours.</p> <p>OSHA PEL (United States, 6/2016). TWA: 1 mg/m³, (as Ni) 8 hours.</p> <p>NIOSH REL (United States, 10/2013). TWA: 0.05 mg/m³, (as Co) 10 hours. Form: Dust and fumes</p> <p>OSHA PEL (United States, 6/2016). TWA: 0.1 mg/m³, (as Co) 8 hours.</p> <p>ACGIH TLV (United States, 3/2016). TWA: 0.02 mg/m³, (as Co) 8 hours. Form: Inorganic</p> <p>TWA: 0.005 mg/m³ 8 hours. Form: Thoracic fraction</p>
molybdenum	<p>ACGIH TLV (United States, 3/2016). TWA: 10 mg/m³, (as Mo) 8 hours. Form: Inhalable fraction</p> <p>TWA: 3 mg/m³, (as Mo) 8 hours. Form: Respirable fraction</p>
manganese	<p>OSHA PEL (United States, 6/2016). CEIL: 5 mg/m³, (as Mn) Form: Fume</p> <p>NIOSH REL (United States, 10/2013). TWA: 1 mg/m³, (as Mn) 10 hours. Form: Fume</p> <p>STEL: 3 mg/m³, (as Mn) 15 minutes. Form: Fume</p> <p>ACGIH TLV (United States, 3/2016). TWA: 0.1 mg/m³, (as Mn) 8 hours. Form: Inhalable fraction</p> <p>TWA: 0.02 mg/m³, (as Mn) 8 hours. Form: Respirable fraction</p>
tungsten	<p>NIOSH REL (United States, 10/2013). TWA: 5 mg/m³, (as W) 10 hours. STEL: 10 mg/m³, (as W) 15 minutes.</p> <p>ACGIH TLV (United States, 3/2016). TWA: 5 mg/m³, (as W) 8 hours. Form: Insoluble</p> <p>STEL: 10 mg/m³, (as W) 15 minutes. Form: Insoluble</p>
silicon	<p>OSHA PEL (United States, 6/2016). TWA: 5 mg/m³ 8 hours. Form: Respirable fraction</p> <p>TWA: 15 mg/m³ 8 hours. Form: Total dust</p> <p>NIOSH REL (United States, 10/2013). TWA: 5 mg/m³ 10 hours. Form: Respirable fraction</p> <p>TWA: 10 mg/m³ 10 hours. Form: Total</p>

Section 8. Exposure controls/personal protection

Aluminium powder (stabilized)	<p>NIOSH REL (United States, 10/2013). TWA: 5 mg/m³ 10 hours. Form: Respirable fraction TWA: 10 mg/m³ 10 hours. Form: Total</p> <p>ACGIH TLV (United States, 3/2016). TWA: 1 mg/m³ 8 hours. Form: Respirable fraction</p> <p>OSHA PEL (United States, 6/2016). TWA: 5 mg/m³, (as Al) 8 hours. Form: Respirable fraction TWA: 15 mg/m³, (as Al) 8 hours. Form: Total dust</p>
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Appropriate engineering controls : No special measures are required for small quantities under normal and intended conditions of product use.

Environmental exposure controls : No special measures are required for small quantities under normal and intended conditions of product use.

Individual protection measures

Hygiene measures : No special measures are required for small quantities under normal and intended conditions of product use.

Eye/face protection : No special measures are required for small quantities under normal and intended conditions of product use.

Skin protection

Hand protection : No special protection is required.

Body protection : No special measures are required for small quantities under normal and intended conditions of product use.

Other skin protection : No special measures are required for small quantities under normal and intended conditions of product use.

Respiratory protection : No special measures are required for small quantities under normal and intended conditions of product use.

Section 9. Physical and chemical properties

Appearance

Physical state : Solid. [Formed wire]

Color : Metallic. Gray.

Odor : Odorless.

Odor threshold : Not applicable.

pH : Not applicable.

Melting point : 1371.1°C (2500°F)

Boiling point : 1466.7°C (2672.1°F)

Flash point : Not applicable.

Evaporation rate : Not applicable.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not applicable.

Vapor pressure : Not applicable.

Section 9. Physical and chemical properties

Vapor density	: Not applicable.
Relative density	: Not applicable.
Density	: Not available.
Solubility	: Insoluble in the following materials: cold water and hot water.
Solubility in water	: Not available.
Partition coefficient: n-octanol/water	: Not applicable.
Auto-ignition temperature	: Not applicable.
Decomposition temperature	: Not applicable.
SADT	: Not available.
Viscosity	: Not applicable.
Flow time (ISO 2431)	: Not applicable.

Section 10. Stability and reactivity

Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	: The product is stable.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous polymerization will not occur.
Conditions to avoid	: No specific data.
Incompatible materials	: No specific data.
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
cobalt	LC50 Inhalation Dusts and mists	Rat - Male, Female	<0.05 mg/l	4 hours
	LD50 Oral	Rat	550 mg/kg	-
molybdenum	LC50 Inhalation Dusts and mists	Rat	>5.84 mg/l	4 hours
	LD50 Dermal	Rat	>2000 mg/kg	-
	LD50 Oral	Rat	>5000 mg/kg	-
manganese	LC50 Inhalation Dusts and mists	Rat	5.14 mg/l	4 hours
	LD50 Oral	Rat	9 g/kg	-
silicon	LD50 Oral	Rat	3160 mg/kg	-

Irritation/Corrosion

Section 11. Toxicological information

Product/ingredient name	Result	Species	Score	Exposure	Observation
manganese	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
tungsten	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
silicon	Eyes - Mild irritant	Rabbit	-	3 milligrams	-

Sensitization

Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Classification

Product/ingredient name	OSHA	IARC	NTP
Nickel	-	2B	Reasonably anticipated to be a human carcinogen.
cobalt	-	2B	

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
molybdenum	Category 3	Not applicable.	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
Nickel	Category 1	Inhalation	respiratory tract central nervous system (CNS) and lungs
manganese	Category 2	Not determined	
Aluminium powder (stabilized)	Category 2	Not determined	lungs

Aspiration hazard

Not available.

Information on the likely routes of exposure : Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential acute health effects

Section 11. Toxicological information

Eye contact	: No known significant effects or critical hazards.
Inhalation	: No known significant effects or critical hazards.
Skin contact	: No known significant effects or critical hazards.
Ingestion	: No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact	: No specific data.
Inhalation	: No specific data.
Skin contact	: No specific data.
Ingestion	: No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects	: Not available.
Potential delayed effects	: Not available.

Long term exposure

Potential immediate effects	: Not available.
Potential delayed effects	: Not available.

Potential chronic health effects

Not available.

General	: No known significant effects or critical hazards.
Carcinogenicity	: No known significant effects or critical hazards.
Mutagenicity	: No known significant effects or critical hazards.
Teratogenicity	: No known significant effects or critical hazards.
Developmental effects	: No known significant effects or critical hazards.
Fertility effects	: No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Section 12. Ecological information

Product/ingredient name	Result	Species	Exposure
Nickel	Acute EC50 2 ppm Marine water	Algae - Macrocystis pyrifera - Young	4 days
	Acute EC50 450 µg/l Fresh water	Aquatic plants - Lemna minor	4 days
	Acute EC50 1000 µg/l Marine water	Daphnia - Daphnia magna	48 hours
	Acute IC50 0.31 mg/l Marine water	Crustaceans - Americamysis bahia - Juvenile (Fledgling, Hatchling, Weanling)	48 hours
cobalt	Acute LC50 47.5 ng/L Fresh water	Fish - Heteropneustes fossilis	96 hours
	Chronic NOEC 100 mg/l Marine water	Algae - Glenodinium halli	72 hours
	Chronic NOEC 3.5 µg/l Fresh water	Fish - Cyprinus carpio	4 weeks
molybdenum	Acute LC50 4400 µg/l	Daphnia - Daphnia magna	48 hours
	Acute LC50 3.4 mg/l Fresh water	Fish - Pimephales promelas	96 hours
manganese	Acute LC50 >200000 µg/l	Daphnia - Daphnia magna	48 hours
	Acute LC50 800 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
	Chronic NOEC 500 mg/l Marine water	Algae - Glenodinium halli	72 hours
	Acute EC50 31000 µg/l Fresh water	Aquatic plants - Lemna minor	4 days
	Acute LC50 29000 µg/l	Daphnia - Daphnia magna	48 hours
Aluminium powder (stabilized)	Acute LC50 28 mg/l Fresh water	Fish - Pimephales promelas	96 hours
	Chronic NOEC 1.7 mg/l Fresh water	Daphnia - Water Flea- Ceriodaphnia dubia	8 days
	Acute LC50 38000 µg/l	Daphnia - Daphnia magna	48 hours
	Acute LC50 120 µg/l Fresh water	Fish - Oncorhynchus mykiss - Embryo	96 hours
	Chronic NOEC 9 mg/l Fresh water	Aquatic plants - Ceratophyllum demersum	3 days

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
cobalt	-	15600	high
silicon	57 to 77	-	high

Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Section 14. Transport information

	DOT Classification	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-
Transport hazard class (es)	-	-	-
Packing group	-	-	-
Environmental hazards	No.	No.	No.
Additional information	-	-	-

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : TSCA 8(a) PAIR: tungsten
 United States inventory (TSCA 8b): Not determined.
 Clean Water Act (CWA) 307: Nickel; copper; chromium
 Clean Water Act (CWA) 311: red phosphorus

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

[Composition/information on ingredients](#)

Section 15. Regulatory information

Name	%	EHS	SARA 302 TPQ		SARA 304 RQ	
			(lbs)	(gallons)	(lbs)	(gallons)
red phosphorus	≤0.1	Yes.	100	-	1	-

SARA 304 RQ : 1111.1 lbs / 504.4 kg

SARA 311/312

Classification : Not applicable.

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Nickel	≥25 - ≤50	No.	No.	No.	Yes.	Yes.
cobalt	≥25 - ≤50	No.	No.	No.	Yes.	Yes.
molybdenum	≥10 - ≤25	No.	No.	No.	Yes.	No.
manganese	≥10 - ≤25	Yes.	No.	No.	Yes.	Yes.
tungsten	≤10	Yes.	No.	Yes.	Yes.	No.
silicon	≤5	Yes.	No.	No.	Yes.	No.
Aluminium powder (stabilized)	≤5	Yes.	No.	No.	No.	Yes.

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	chromium	7440-47-3	≥50 - ≤75
	Nickel	7440-02-0	≥25 - ≤50
	copper	7440-50-8	≥25 - ≤50
	cobalt	7440-48-4	≥25 - ≤50
	manganese	7439-96-5	≥10 - ≤25
	Aluminium powder (stabilized)	7429-90-5	≤5
Supplier notification	chromium	7440-47-3	≥50 - ≤75
	Nickel	7440-02-0	≥25 - ≤50
	copper	7440-50-8	≥25 - ≤50
	cobalt	7440-48-4	≥25 - ≤50
	manganese	7439-96-5	≥10 - ≤25
	Aluminium powder (stabilized)	7429-90-5	≤5

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts

: The following components are listed: TUNGSTEN; TANTALUM; SILICON DUST; NICKEL; NICKEL CATALYST; MOLYBDENUM; MANGANESE; COPPER; COBALT; CHROMIUM; ALUMINUM

New York

: The following components are listed: Nickel; Copper; Chromium

New Jersey

: The following components are listed: TUNGSTEN; TANTALUM; SILICON; NICKEL; MOLYBDENUM; MANGANESE; COPPER; COBALT; CHROMIUM; ALUMINUM

Pennsylvania

: The following components are listed: TUNGSTEN; TANTALUM; SILICON; NICKEL CATALYST; MOLYBDENUM; MANGANESE COMPOUNDS; COPPER FUME; COBALT FUME; CHROMIUM COMPOUNDS; ALUMINUM

California Prop. 65

WARNING: This product contains a chemical known to the State of California to cause cancer.

Section 15. Regulatory information

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Nickel cobalt	Yes. Yes.	No. No.	No. No.	No. No.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

Health	0
Flammability	0
Physical hazards	0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Section 16. Other information

Procedure used to derive the classification

Classification	Justification
Not classified.	

History

- Date of issue/Date of revision** : 12/16/2016
- Date of previous issue** : No previous validation
- Version** : 1
- Key to abbreviations** :
- ATE = Acute Toxicity Estimate
 - BCF = Bioconcentration Factor
 - GHS = Globally Harmonized System of Classification and Labelling of Chemicals
 - IATA = International Air Transport Association
 - IBC = Intermediate Bulk Container
 - IMDG = International Maritime Dangerous Goods
 - LogPow = logarithm of the octanol/water partition coefficient
 - MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
 - UN = United Nations
- References** : HCS (U.S.A.)- Hazard Communication Standard
International transport regulations

☑ Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained 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.