TOOLS CUT BETTER WITH TIGRA

Product Data Sheet - Hardmetal Articles

Version 3.0 dated 2014-07-28

1. Identification of the article/product and of the company / undertaking

1.1. Product identifier

Article/Product Name	Carbide / Hartmetall / Carbure / Metallo duro / Metal duro
Chemical Name	Tungsten Carbide article with Cobalt and/or Nickel binder
CAS No.	Not applicable for articles
EINECS No.	Not applicable for articles
Molecular weight	Not applicable for articles
REACH Registration number	Not applicable for articles

1.2. Relevant identified uses of the article and uses advised against

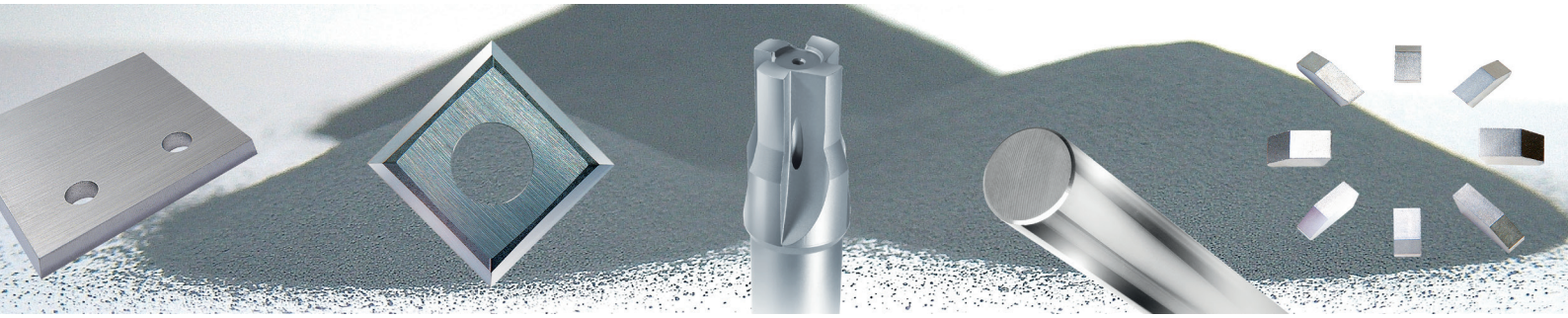
Identified Uses	Mining Tools, Construction Tools, Round Tools, Woodworking Tools, Metalworking Tools, Metallurgical Products, and Inserts.
Uses advised against	Avoid re-shaping or re-grinding finished hardmetal articles without appropriate exposure controls (eg ventilation, personal protection equipment). Cutting, sharpening, or grinding hardmetal tools may produce dusts of hazardous substances, which may be inhaled, ingested or come in contact with eyes and skin. Return tools to appropriate locations for reconditioning or recycling services.

1.3. Details of the supplier of the article information data sheet

Name	TIGRA GmbH
Address	Gewerbering 2, D-86698 Oberndorf am Lech, Germany
Phone	+49 9090 9680 01
Fax	+49 9090 9680 50
E-mail of competent person responsible for the Article Information Data Sheet in the Member State or in the EU	labor@tigra.de

1.4. Emergency telephone number

European Emergency No.	+49 (0)89 19240
Available outside office hours	24 h per day / 7 days per week



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2. Hazards Identification

 WARNING	Fragmentation hazard:	Cutting tools and holders may fragment in use. Always wear safety equipment and keep machine guards in place.
	Breathing hazard:	Wet or dry grinding of cutting tools may produce hazardous dust or mist. Use ventilation control and respiratory protection.

2.1. Classification of the article

Classification according to EC 1272/2008:	Not applicable for articles
Classification according to 67/548/EEC:	24 h per day / 7 days per week

2.2. Label elements (according to EC 1272/2008)

Hazard pictogram(s):	Not applicable for articles
Signal word:	Not applicable for articles
Hazard Statement(s):	Not applicable for articles
Precautionary statement(s):	Not applicable for articles

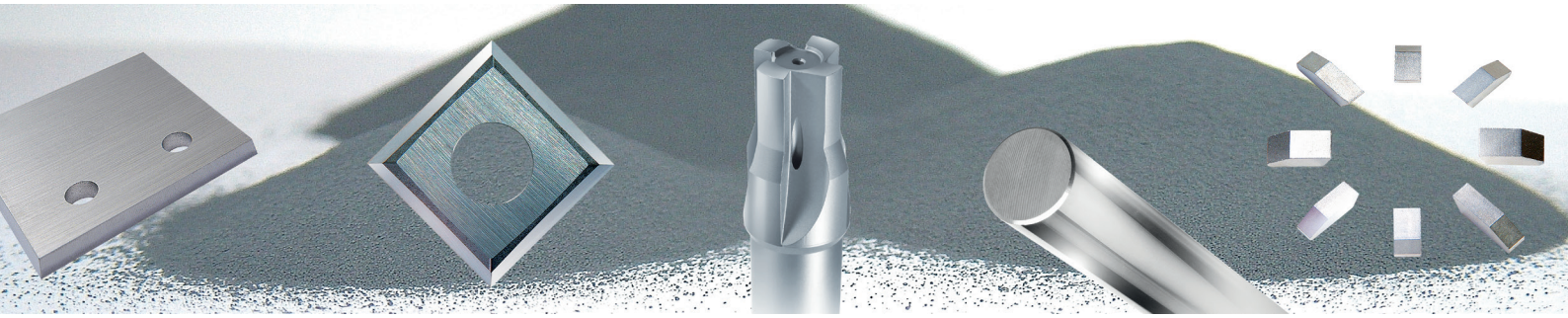
2.3. Other Hazards

PBT or vPvB	Not applicable for articles

3. Article Composition

3.1. Information on article constituents

Identification Name	EINECS No.	CAS No.	Weight % Content	Classification CLP/DSD
Tungsten Carbide	235-123-0	12070-12-1	>60%	Tungsten carbide is not classified under DSD/CLP
Cobalt	231-158-0	7440-48-4	<= 25%	CLP: CLP: Acute Tox. (oral) 4; H302; Acute Tox. (inhalation) 1; H330; Eye Irrit. 2; H319, Resp. Sens. 1B; H334, Skin Sens. 1; H317, Carc. 1B, H350i; Repr. 2; H361f, Aquatic Acute 1; H400 (M-factor of 10), Aquatic Chronic 1; H410 (M-factor of 1) DSD: Xn;R22, T+; R26, Xi;R36, R42/43, Carc Cat 2;R49, Repr. Cat. 3;R62, N;R50-53
Nickel	231-111-4	7440-02-0	<= 15%	CLP: Carc. 2; H351, STOT RE 1; H372, Skin Sens. 1; H317, Aquatic Chronic 3; H412 DSD: R40, T;R48/23, R43, R52-53



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4. First aid measures

4.1. Description of first aid measures

As sintered hardmetal articles, exposure to high volumes of powder/dust is not anticipated under normal conditions and use. If tool chips, breaks, fragments or is reground/re-sharpen may produce exposure to dusts of hazardous substances, which may be inhaled, ingested or come in contact with eyes and skin.

Eyes	Rinse opened eye for at least ten minutes under running water. Consult a doctor if required.
Inhalation	Remove to fresh air. Seek medical attention if required.
Ingestion	Rinse mouth with water and drink plenty of water afterwards. Seek medical advice if required.
Skin	Remove contaminated clothing. Immediately wash with soap and water and rinse thoroughly. Seek medical attention if required.
General advise	After first aid, get appropriate medical attention.

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

In the case of generation of dust, metal powders or dust may cause mechanical eye and skin irritation. Inhalation of powder or dust may cause mild respiratory tract irritation.

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

None known

5. Firefighting measures

5.1: Extinguishing media

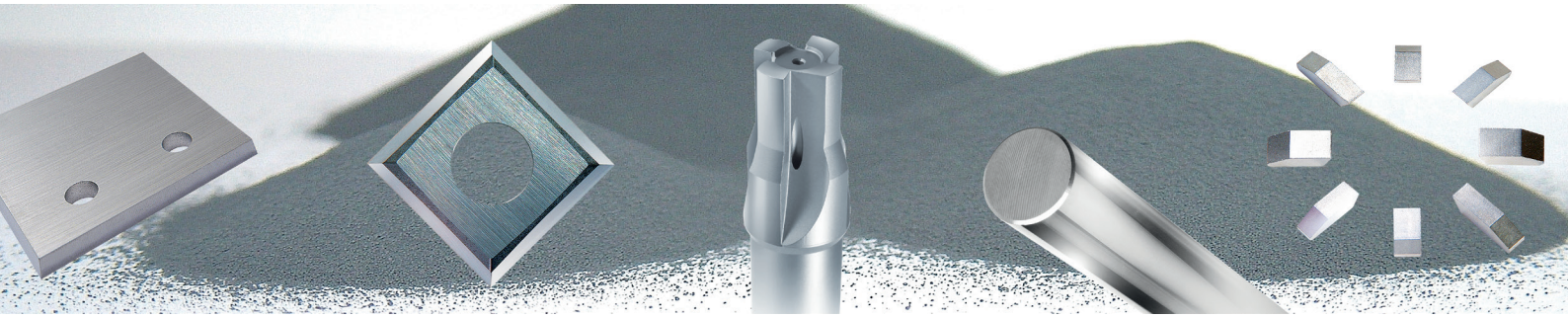
Hardmetal sintered articles as provided are not a fire hazard.

5.2. Special hazards arising from the article use

During normal operation and usage, hardmetal articles are not a fire hazards.

5.3. Advice for firefighters

Not Applicable



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6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Hardmetal sintered articles as provided do not present hazards that require accidental release measures. However, wet or dry grinding of cutting hardmetal articles may produce hazardous dust or mists. Avoid inhalation and contact with skin and eyes. Re-sharpen tools using appropriate safety and extraction systems to avoid dust exposure. Use personal protective equipment (i.e. gloves, safety goggles, dust respirator) as specified in Section 8 of this article information data sheet. Ventilate area if necessary.

6.2. Environmental precautions

In the case of generation of dust/mist, avoid release into the environment.

6.3. Methods and material for containment and cleaning up

Broken hardmetal tools and articles should be recycled.

6.4. Reference to other sections

See sections 8 and 13 for exposure controls and disposal considerations.

7. Handling and storage

Hardmetal articles as provided do not present hazards requiring precautions for safe handling and storage. However, operations such as grinding, cutting, re-sharpening of hardmetal articles may generate dusts or fumes which may require special handling procedures. The procedures described below relate to these operations.

7.1. Precautions for safe handling

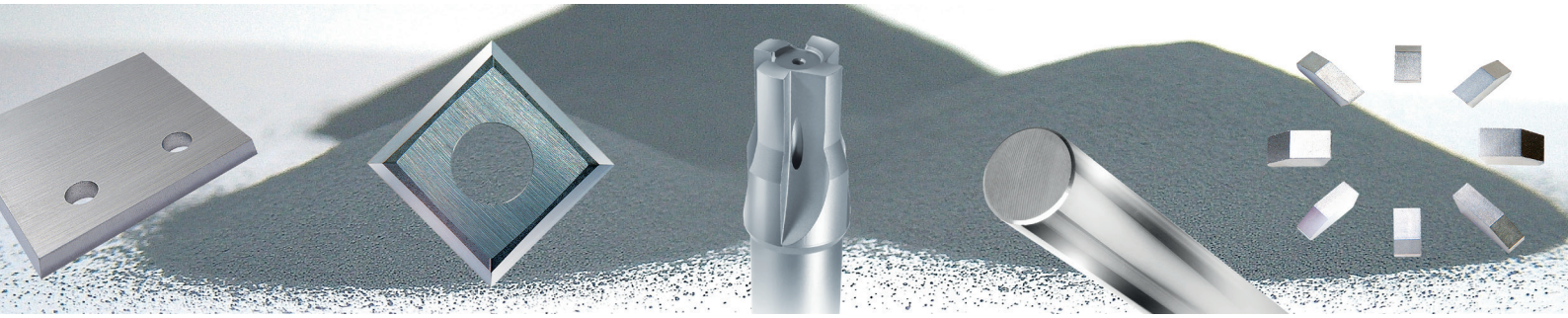
Under normal operating conditions, the use of hardmetal articles do not require special safety precautions beyond normal safety procedures for handling and using cutting tools, such as safety glasses and gloves. No smoking, eating, or drinking while using hardmetal articles. Wash hands thoroughly after handling. Minimize generation of powder/dust and avoid dispersion of dust in air. Do not shake clothing, rags or other items to remove dust.

7.2. Conditions for safe storage, including any incompatibilities

Hardmetal articles as provided do not present hazards requiring precautions for safe storage.

7.3. Specific end use(s)

Hardmetal articles are used as cutting and machining tools, mining and drilling tools, wear parts.



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8. Exposure controls / personal protection

The exposure control parameters listed below are for operations with hardmetal articles that generate dusts or fumes including grinding, cutting, or re-sharpening.

8.1. Control parameters

Country	For tungsten and insoluble compounds, as tungsten		Cobalt		Nickel	
	8-h Limit Value (mg/m3)	Short-term Limit Value (mg/m3)	8-h Limit Value (mg/m3)	Short-term Limit Value (mg/m3)	8-h Limit Value (mg/m3)	Short-term Limit Value (mg/m3)
ACGIH TLV	5	–	0.02	–	1.5	-
Austria	5*	10*	0.1	0.4	0.5	2
Belgium	5	10	0.02	–	1	-
Canada (Québec)	5	10	0.02	–	1	-
Denmark	5	10	0.01	0.02	0.05	0.1
Hungary	–	–	0.1	0.4	1	-
Poland	5	–	–	–	0.1	0.1
Spain	5	10	0.02	–	1	-
Sweden	5	–	0.02*	–	0.5	-
Switzerland	5*	–	0.05*	–	0.5	-
USA - NIOSH	5	10†	0.05	–	0.15	-
USA – OSHA	–	–	0.1	–	1	-
United Kingdom	5	10	0.1*	–	1	-

* Inhalable aerosol; † 15 -minutes-

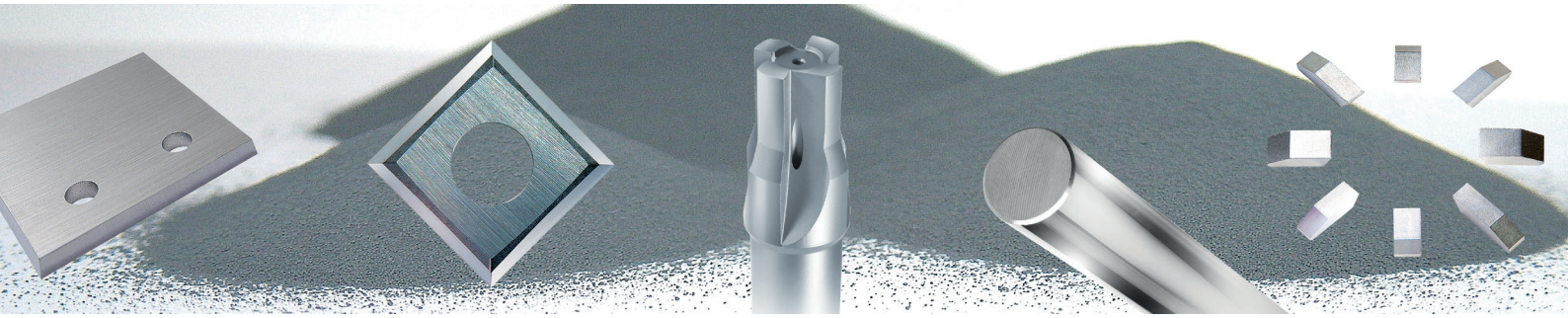
8.2. Exposure controls

Appropriate engineering controls:

In the case of dust generation during wet or dry grinding of cutting hardmetal articles, engineering controls may include local ventilation systems with dust filters depending on degree of process automation and containment (eg closed vs. open processes).

Individual protection measures:

Eye/face protection	Use of safety glasses as appropriate and reasonably necessary.
Skin protection	Use of butyl rubber, neoprene or PVC gloves and work clothes as appropriate and reasonably necessary.
Respiratory protection	In the case of dust generation, use of respiratory protection as appropriate and reasonably necessary (eg P-Series particulate respirators suitable for protection against particulates that may contain oil).



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9. Physical and chemical properties

Not applicable for hardmetal articles.

10. Stability and reactivity

10.1. Reactivity

Hardmetal articles are not reactive.

10.2. Physical and chemical properties

Hardmetal articles are chemically stable.

10.3. Possibility of hazardous reactions

Not applicable

10.4. Conditions to avoid

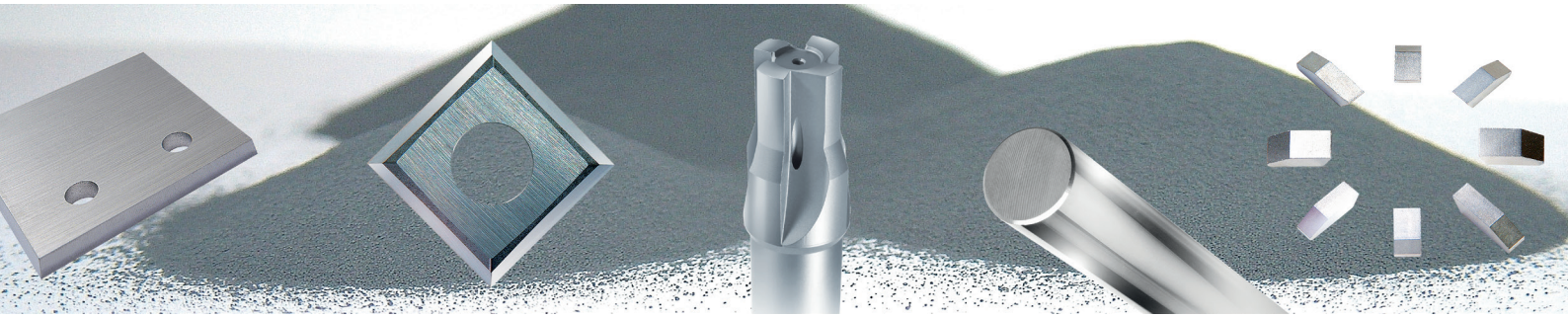
Avoid re-shape or re-grind finished hardmetal articles. Cutting, sharpening, or grinding hardmetal tools may produce dusts of hazardous substances, which may be inhaled, ingested or come in contact with eyes and skin. Return tools to appropriate locations for reconditioning services. Operations such as grinding, cutting, burning, re-sharpening of such articles may release dusts which may present a fire or explosion hazard under rare favoring conditions of particle size, dispersion, concentration, and strong ignition source.

10.5. Incompatible materials

None known

10.6. Hazardous decomposition products

None known



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11. Toxicological information

Hardmetal articles as provided to do not present a human hazard. However, during the cutting, sharpening, or grinding of hardmetal articles, some dust containing hazardous substances are produced which may be inhaled, swallowed or come into contact with the skin or the eyes. The toxicity section described below relate to these operations.

Carcinogenicity: Cobalt metal with tungsten carbide was categorized by IARC as probably carcinogenic to humans (Group 2A). The US NTP considers cobalt-tungsten carbide (powders and hardmetals) as reasonably anticipated to be a human carcinogen.

STOT- Repeated Exposure: Chronic inhalation has the potential for causing transient or permanent respiratory disease, including occupational asthma and interstitial fibrosis. It is reported that cobalt dust is the most probable cause of such respiratory diseases. Symptoms include productive cough, wheezing, shortness of breath, chest tightness and weight loss. Interstitial fibrosis (lung scarring) can lead to permanent disability. Certain pulmonary conditions may be aggravated by exposure.

12. Ecological information

Hardmetal articles as provided to do not present an environmental hazard.

12.1. Persistence and degradability

Not applicable

12.2. Bioaccumulative potential

Not applicable

12.3. Mobility in soil

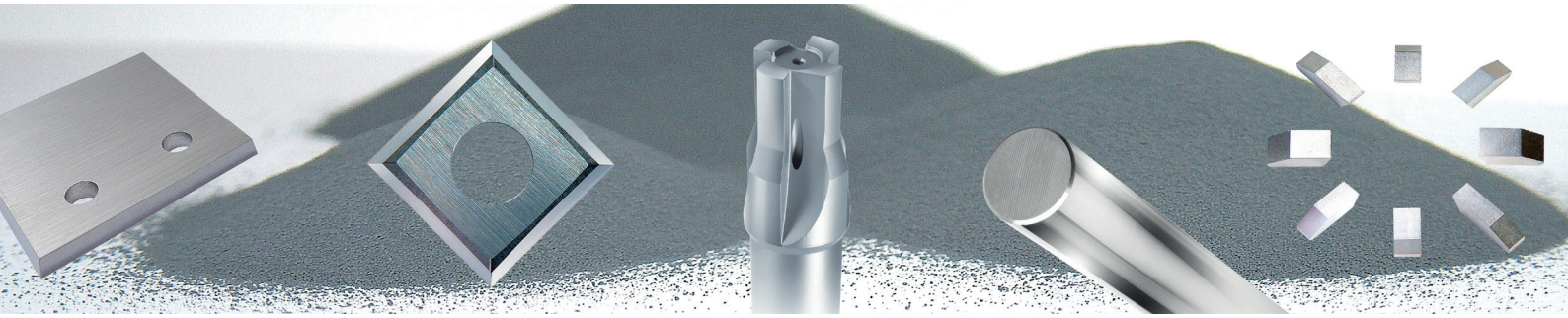
Not applicable

12.4. Results of PBT and vPvB assessment

Tungsten carbide, cobalt and nickel are inorganic substances, and therefore the PBT and vPvB assessment is not required.

12.5. Other adverse effects

None known



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13. Disposal considerations

Responsibility for proper waste disposal of hardmetal articles with the owner of the waste.

Owners are encouraged to take advantage of carbide recycling programs. Hardmetal articles are valuable articles that should be sent to an appropriate reclamation facility, if available. If material cannot be sent to a reclamation facility, dispose of all waste product and containers in accordance with local, state/provincial, federal, and national regulations.

14. Transport information

Hardmetal articles are not classified or regulated.

15. Regulatory information

15.1: Safety, health and environmental regulations/legislation specific for the article

EU Regulations: Hardmetal articles do not contain substances of very high concern (SVHC)

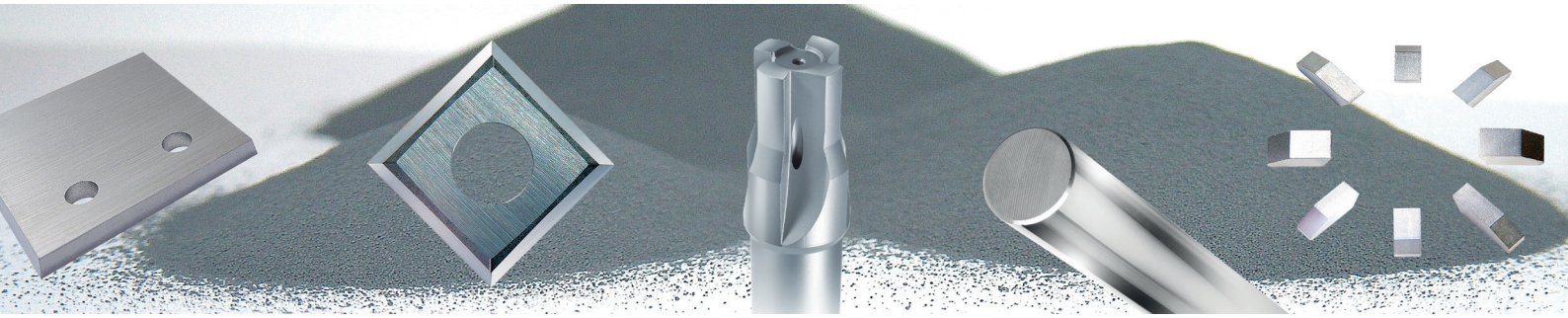
National Regulations: None known

15.2. Chemical safety assessment

Chemical safety reports (CSR)/chemical safety assessments (CSA) are not required for articles. CSR/CSAs have been carried out on tungsten carbide, cobalt and nickel.

16: Other information

Revision(s):	The product data sheet (version 3.0) was updated with the following: - Section 3: Included cobalt acute oral, acute inhalation, and carcinogenicity CLP classifications as Category 4, Category 1, and Category 1B, respectively. - Section 3: Included cobalt acute oral, acute inhalation, and carcinogenicity DSD classifications as Xn;R22, T+;R26 and Carc Cat 2;R49, respectively. The product information data sheet was updated on 28 July 2014.
References:	International Tungsten Industry Association Hardmetal Annex, October 2010. Tungsten Carbide Chemical Safety Report. September, 2010. International Tungsten Industry Association. Cobalt Chemical Safety Report, July 2012, Cobalt Development Institute.



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Abbreviations:	
Carc	Carcinogenicity
CAS	Chemical Abstracts Service
Cat	Category
CLP	Classification, Labelling and Packaging
DSD	Dangerous Substances Directive
EC	European Commission
EEC	European Economic Community
EINECS	European Inventory of Existing Commercial chemical Substances
EU	European Union
h	hours
Irrit	Irritation
m^3	Cubic meter
mg	milligram(s)
MS	Member State
NIOSH	National Institute for Occupational Safety and Health
N	Dangerous for the Environment
No.	Number
OEL	Occupational Exposure Level
OSHA	Occupational Safety and Health Administration
PBT	Persistent, Bioaccumulative, and Toxic
R	Risk Phrase
RE	Repeated Exposure
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
Repr	Reproductive
Resp	Respiratory
Sens	Sensitiser
STOT	Specific Target Organ Toxicity
SVHC	Substance of Very High Concern
T	Toxic
Tox	Toxicity
vPvB	very Persistent, very Bioaccumulative
Xn	Harmful