RESONAC

GPS/JIPS Safety Summary

1. PRODUCT NAME

BN-DX™ GRAIN

2. GENERAL STATEMENT

BN-DX™ GRAIN (cubic boron nitride) is used as a grinding and cutting tool material for iron-based high-hardness materials, making use of its high hardness secondary to diamond and its non-reaction with iron. We manufacture sintering bodies from abrasive grains of cubic boron nitride and have a grade that is applicable for grinding/cutting applications of various materials.
It is harmful to the human body and may cause allergy, asthma or dyspnea when inhaled, suspected carcinogenicity, or allergic skin reactions when adhered to the skin. Inhalation may cause renal and respiratory disorders, and prolonged or repeated exposure may cause respiratory disorders. For this reason, it is necessary to wear appropriate protective equipment in a well-ventilated place to protect the eyes, protect the skin, and prevent inhalation.

3. CHEMICAL IDENTITY

Item	Description
Chemical or generic name	Boron nitrite
Trade name	BN-DX™ GRAIN
Source/References	Section 3 of the SDS issued by Resonac Corporation

Composition

Product/ingredient name	%	Chemical Formula	Other No. Japan: Chemical Substances Control Law Japan: Industrial Safety and Health Act	CAS No.
Boron nitrite	35-45	BN	(1)-68 existing chemical substance	10043-11-5
cobalt	25-35	Co	Not applicable existing chemical substance	7440-48-4
Nickel	10-20	Ni	Not applicable existing chemical substance	7440-02-0
Nickel-phosphorus alloy	10-20	Ni・P	Not applicable Not applicable	107593-02-2

4. USES AND APPLICATIONS

Main uses	Electron grindstone, metal bond grindstone, and vitrified bond grindstone

5. PHYSICAL/CHEMICAL PROPERTIES

The product is a gray, odorless particulate matter. It is stable in the atmosphere and noncombustible in solid state and does not cause fire. Store the product in a cool, dark, and well-ventilated place.

Appearance	Solid (Gray powder)

Color	Gray
Odor	Odorless
Melting point/Boiling point	1455℃ (Nickel)、1495℃ (Cobalt)／Not available
Flammability	Non flammable
Relative density	5.3
Solubility	Water : Insoluble. Other solvents: dissolved in dilute acid.
Explosive properties	Not explosive
Oxidizing proparties	Not oxidizing
Sources/references	Section 9 and 10 of the SDS issued by Resonac Corporation

6. HEALTH EFFECTS

Effect assessment	Results (GHS Hazard Classification)
Acute toxicity (oral)	Not classified
Acute toxicity (dermal)	Classification not possible
Acute toxicity (inhalation: gas)	Not applicable
Acute toxicity (inhalation: vapours)	Classification not possible
Acute toxicity (inhalation: dust, mist)	Classification not possible
Skin corrosion/irritation	Classification not possible
Serious eye damage/eye irritation,	Classification not possible
Respiratory sensitisation	Category 1 May cause an allergic skin reaction
Skin sensitisation	Category 1 May cause allergy or asthma symptoms or breathing difficulties if inhaled
Germ cell mutagenicity	Classification not possible
Carcinogenicity	Category 2 Suspected of causing cancer
Reproductive toxicity	Classification not possible
Specific target organ toxicity – Single exposure,	Category 1 Causes damage to organs (kidney, respiratory system) Category 3 May cause respiratory irritation
Specific target organ toxicity (repeated exposure)	Category 1 Causes damage to organs through prolonged or repeated exposure (Respiratory system)
Aspiration hazard	Classification not possible
Sources/references	Section 2 and 11 of SDS issued by Resonac Corporation

・ GHS (Globally Harmonized System of Classification and Labelling of Chemicals): A system that classifies chemicals according to the type and degree of hazards, labels the information, and provides safety data sheets according to globally harmonized rules.
・ Not applicable: Since the priority of physical state, chemical structure, chemical property, and hazard items used in the GHS classification procedures does not fall under the category, it is not subject to the classification for the category.
・ Not classified: Sufficient information has been obtained to implement the GHS classification, and as a result of the classification, it does not fall under any of the hazard categories specified in the GHS. It is considered to be a lower hazard.
・ Classification not possible : There is not enough information for GHS classification, and classification is not possible.

7. ENVIRONMENTAL EFFECTS

Effect assessment	Results (GHS Hazard Classification)
Hazardous to the aquatic environment, short–	Classification not possible

term (acute)	
Hazardous to the aquatic environment, long-term (chronic)	Classification not possible
Hazardous to the ozone layer	Classification not possible
Sources/references	Sections 2 and 12 of the SDS issued by Resonac Corporation

Environmental fate/dynamics	
Mobility in soil	No additional information available.
Persistence/degradability	No additional information available.
Bioaccumulation potential	BCF = 106±53、157±135(Algae、Fish) Low bioaccumulation
Conclusion about PBT/vPvB	The criteria for persistent bioaccumulative and toxic (PBT; remaining persistently in the environment and possessing high bioaccumulation potential and toxicity) and very persistent and very bioaccumulative (vPvB; remaining very persistently in the environment and possessing very high bioaccumulation potential) chemicals are believed to inapplicable.
Sources/references	Sections 12 of the SDS issued by Resonac Corporation

8. EXPOSURE

Detals	Exposure potentials through main uses
Occupational exposures	The product is manufactured and used in used in synthesis or compounding operation in closed batches, but there is a potential for dermal or inhalation exposure in operators in case of maintenance, sampling, equipment failure, etc. (PROC 3). During batch and other process operations, there is a potential for dermal and inhalation exposure to operators during maintenance, sampling, filling, emptying, and equipment failure (PROC 4). There is a potential for dermal and inhalation exposure in operators during blending/mixing operation in batches in the formulation and manufacture of articles (PROC 5). There is a potential for dermal or inhalation exposure in operators in association with dust/vapor/aerosol generation, spillage, cleaning of equipment, etc. in the transfer of substances or preparations to ships and large-capacity containers in dedicated equipment or in the transfer of substances or preparations to small-capacity containers under conditions designed to minimize spillage (PROC 8b, 9).
Consumer exposures	This product is not used directly by general consumers.
Environmental exposures	Although emission to the environment is limited because the product is typically manufactured and used in a closed process, the product can be released primarily into the atmospheric and water environment during the manufacturing process (ERC 1). The product is used as a processing aid in manufacturing and compounding processes and is highly released primarily to the atmosphere and water environment. It may also be released into the soil environment (ERC 4).
Precautions	If there is a possibility of exposure in other uses, take appropriate measures with reference to recommended risk management measures.

9. RISK MANAGEMENT RECOMMENDATIONS

Recommended risk management measures can minimize risks to workers, consumers, and the environment from Section 8 exposure scenarios.

Detals	Risk management recommendations
Worker	Technical measures: Handle the product in a room with forced general ventilation using local exhaust ventilation by wearing appropriate protective equipment to protect operators from dust. Always wash your hands after handling the product. Handle the product with care to avoid generation of aerosol and dust and avoid adhesion of the product to eyes, skin, and clothing.
	Local and general ventilation: The product should be handled in a place where forced general ventilation is possible with local exhaust ventilation. In addition, since there is a possibility of exposure during the transfer operation to containers, etc., perform the operation in a room where forced general ventilation is possible with local exhaust ventilation.
	Acceptable concentration: ・ BN-DX™ GRAIN: Control concentration 3 mg/m^3 (when the free silicic acid content is 0%) ・ Cobalt: Control concentration 0.02 mg/m^3 (as cobalt), Japan Society for Occupational Health acceptable concentration 0.05 mg/m^3 (as cobalt), and ACGIH (American Conference of Governmental Industrial Hygienists) TLV-TWA (time-weighted average) 0.02 mg/m^3 (as cobalt) ・ Nickel: Japan Society for Occupational Health exposure limit 1 mg/m^3 (as nickel) and ACGIH (American Conference of Governmental Industrial Hygienists) TLV-TWA (time-weighted average) 1.5 mg/m^3 (as nickel) Manage and control below these values.
	Protective equipment: When handling the product, wear respiratory protective equipment (a certified dust mask [with a collection rate of 95% or higher]), protective gloves (APF20 [with a protection rate of 95%]), protective glasses, and protective clothing to avoid skin contact. [Example of protective equipment] Respiratory protective equipment: dust mask (mask with collection rate of 95% or higher) Hand protective equipment: protective gloves (APF20 [protection rate 95%]) Eye protective equipment: protective glasses
	Precautions: The operation manager should educate operators about the selection of appropriate protective equipment, proper usage method, and control method of the work site.
Consumer	Since the substance is not used by general consumers, the possibility of exposure to consumers is extremely low.
Environment	Install appropriate wastewater treatment facilities and exhaust gas treatment facilities. In addition, take measures to prevent

	leakage, and pay attention to periodic confirmation of discharge volume, daily control, and handling.
Special notes (emergency measures in case of leakage, etc.)	Precautions for human, protective equipment, and emergency measures: In case of leakage, wear appropriate protective equipment (respiratory protective equipment, protective clothing, protective gloves, and eye and face protective equipment), and remove the product using a vacuum cleaner.
	Environmental precautions: Do not discharge product into the environment such as drains or rivers. If it leaks, immediately remove it with a vacuum cleaner.
Precautions	For normal handling, emergency response, disposal, and transportation control measures, refer to sections 4, 5, 6, 7, 8, 13, and 14 of the SDS issued by Resonac Corporation.

10. STATE AGENCY REVIEW

Hazard assessment	Situations of review
International Chemical Safety Cards	International Chemical Safety Card ICSC: 0782 (Cobalt) https://www.ilo.org/dyn/icsc/showcard.display?p_lang=en&p_card_id=0782&p_version=2 ICSC: 0062 (Nickel) https://www.ilo.org/dyn/icsc/showcard.display?p_lang=en&p_card_id=0062&p_version=2
OECD HPV	High production volume chemical testing programme (Cobalt, Nickel) https://hpvchemicals.oecd.org/UI/Search.aspx
NITE-CHRIP(NITE Chemical Risk Information Platform)	https://www.nite.go.jp/en/chem/chrip/chrip_search/srhInput
GHS Classification Results by the Japanese Government	(Cobalt) https://www.nite.go.jp/chem/english/ghs/20-mhlw-2025e.html (Nickel) https://www.nite.go.jp/chem/english/ghs/14-mhlw-2221e.html

11. REGULATORY INFORMATION／GHS CLASSIFICATION AND LABELLING INFORMATION

Regulatory information only in Japan

Applicable laws	Regulatory situations
Industrial Safety and Health Act	Specified chemical substances Class 2, Group-2 Substances (Article 2, Section 1, Items 2 and 5 of Ordinance on Prevention of Hazards Due to Specified Chemical Substances) Cobalt and cobalt inorganic compounds Working environment assessment standard (Article 65-2, Paragraph 1 of the Act) Cobalt and its inorganic compounds Dangerous or Harmful Substances Subject to Be Indicated their Names(Article 57 Paragraph (1) of the Act, Article 18 item(ⅰ) and item(ⅱ) appended Table No. 9 of the Enforcement Order) Nickel and nickel compounds

	Cobalt and cobalt compounds Dangerous Substances：ignitable substances（appended table1 item 2 of Enforcement Order） Metal powder Dangerous Articles and Harmful Substances Whose Names, etc. Should Be Notified（Article 57-2 of the Act, Article 18-2 item(ⅰ) and item(ⅱ) appended Table No. 9 of the Enforcement Order） Nickel and nickel compounds（Cabinet Order Number : 418） Cobalt and cobalt compounds（Cabinet Order Number : 172） Specified Chemical Substances/substances under special supervision （Article 38-3 of Ordinance on Prevention of Hazards Due to Specified Chemical Substances） Cobalt or inorganic cobalt compounds Substances on Special medical examination, Current handling workers (Article 66, Paragraph 2 of the Act, Article 22, Paragraph 1 of the Enforcement Order) Cobalt or inorganic cobalt compounds Substances on Special medical examination, Past handling workers (Article 66, Paragraph 2 of the Act, Article 22, Paragraph 2 of the Enforcement Order) Cobalt or inorganic cobalt compounds
Poisonous and Deleterious Substances Control Act	Not applicable
Water Pollution Prevention Act	Harmful Substances（Article 2 of the Act, Article 2 of the Enforcement Order, Article 1 of the Ministerial Ordinance for Effluent Standards） Boron and boron compounds Designated substances（Article 2, Paragraph 4 of the Acr, Article 3-3 of the Enforcement Order） Nickel and nickel compounds
Fire Service Act	Category 2 combustible solids, metal powders (Article 2, Paragraph 7 of the Act, Appended Table 1, Class 2) Metal powder
Air Pollution Control Act	Hazardous Air Pollutants, Substance requiring priority action (9th report of the Central Environment Council) Boron compounds Nickel and nickel compounds Cobalt and cobalt compounds
Road Act	Restrictions on vehicle traffic（Article 19-13 of the Enforcement Ordinance, Appended Table 2 of Notification No.12 of Japan Expressway Holding and Debt Repayment Agency） Metal powder
Water Supply Act	Harmful Substances (Article 4, Paragraph 2 of the Act), Water quality standards (Heisei 15 Ministerial Ordinance No.101) Boron and boron compounds
Sewerage Act	Water Quality Criteria Substances（Article 12-2, Paragraph 2 of the Act, Article 9-4 of the Enforcement Order）

	Boron and boron compounds
Act on the Assessment of Releases of Specified Chemical Substances in the Environment and the Promotion of Management Improvement and Transfer Register / PRTR)	Class I designated chemical substance (Article 2-2 of the Act, Enforcement Ordinance Article 1 Appended Table 1) Boron Compounds (Cabinet Order Number: 405) As boron (17%) Nickel (Cabinet Order Number: 308) (15%) Cobalt and Cobalt Compounds (Cabinet Order Number: 132) As cobalt (30%)
Labor Standards Act	Occupational disease chemicals (Article 75, paragraph 2 of the Act, Enforcement Ordinance Article 35, Appended Table 1-2, Item (4)-1) Nickel and nickel compounds (except nickel carbonyl) Cobalt and cobalt compounds Carcinogen (Article 75, Paragraph 2 of the Act, Enforcement Ordinance Article 35, Appended Table 1-2, Item 7) Nickel Disease chemical substance (Article 75, Paragraph 2 of the Act, Appended Table 1-2-4 of Article 35 of the Enforcement Ordinance, Heisei 8 Labor Standards Bureau Director Notification, No.182) Cobalt and Cobalt Compounds
Soil Contamination Countermeasures Act	Specified hazardous substances (Article 2, Paragraph 1 of the Act, Article 1 of the Enforcement Order) Boron and boron compounds
UN classification	Not applicable

Hazards	Classification results (hazard information)
Health hazards	Respiratory sensitisation Category 1
	Skin sensitisation Category 1
	Carcinogenicity Category 2
	Specific target organ toxicity – Single exposure Category 1 (Kidney, respiratory system)
	Specific target organ toxicity – Single exposure Category 3 (Respiratory tract irritation)
	Specific target organ toxicity (repeated exposure) Category 1 (Respiratory system)

Labelling Information	
Hazard pictograms (GHS)	
Signal word (GHS)	danger
Hazard statements (GHS)	May cause an allergic skin reaction (H317) May cause allergy or asthma symptoms or breathing difficulties if inhaled (H334) May cause respiratory irritation (H335) Suspected of causing cancer (H351) Causes damage to organs (kidney, respiratory system) (H370) Causes damage to organs through prolonged or repeated exposure (respiratory system) (H372)

12. CONTACT INFORMATION

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13. DATE OF ISSUE / REVISION, ADDITIONAL INFORMATION

Date of issue: December 27, 2022

Revisions:

Date of revision	Revised section	Revised item	Version
January 1, 2023	3, 6, 10-13	update to the latest information	rev.2

The contents are based on the safety data sheet (SDS) revised on January 1, 2023.

Special instructions: none

14. DISCLAIMER

The safety summary is part of the effort for the voluntary management of chemical substance in the chemical industry (GPS/JIPS: Japan Initiative of Product Stewardship). The purpose of the safety summary is to provide information on the safe handling of the product as an overview and not to provide professional information, such as the risk evaluation process and its impact on human health and the environment. This document is not meant to serve as an alternative to risk evaluation, such as a Safety Data Sheet (SDS) or a Chemical Safety Report (CSR). This safety summary is being written as accurately as possible based on data such as laws, materials, and information available at the time of publication, but it does not include all data. It does not guarantee anything.