INSTRUCTIONS FOR USE/SDS

WARNING: Please read the Safety and Data Sheet (SDS) before working with this product.

COMPOSITION

77.0%	14.0%	4.7%	2.0%	1.8%	< 1	< 1	< 1	< 1
Ni	Cr	Mo	Al	Be	Mn	Fe	Si	C

Note: % values are in weight percent and reflect nominal composition.

Physical Properties:

Vickers Hardness: af=370
Yield Strength: (0.2% Offset): af=(91,400 psi) 630 MPa
Elastic Modulus: 207 GPa
Elongation: af=10%
Density: 7.8 g/cm^3 af=after firing

Thermal Properties:

Melting Range: 2120-2335˚F (1160-1280˚C)
Casting Temperature: 2500˚F (1370˚C)
Exp. Coefficient 25-500˚C: 14.5 x 10^{-6}
Exp. Coefficient 25-600˚C: 14.7 x 10^{-6}

CAUTION:

This alloy contains nickel and should not be used for individuals with known nickel sensitivity

INSTRUCTIONS FOR USE

INVESTING Use a high heat phosphate-bonded investment and mix for maximum expansion. Do not use carbon-containing investments.

BURNOUT After adequate set-up time place the ring(s) in a room temperature oven and raise the temperature to 800˚F (425˚C) for 30 minutes. Then raise the temperature to 1600˚F (870˚C) and hold for one hour plus 10 minutes for each additional ring. If you are using a rapid-fire investment, follow the manufacturer's instructions.

CASTING Wind the casting machine one more turn than you would for precious ceramic alloys. A quartz or zircon crucible is necessary. Use a propane/oxygen torch with a multi-orifice tip. Do not use flux. Place the alloy (at least 50% new metal) in a pre-heated crucible. Keep the torch moving to heat all the metal in the crucible at an even rate. The individual ingots will not pool together to form a single mass. Do not stir or rupture the oxide surface. When the flame appears to move the alloy, cast. After casting bench cool before devesting. When using induction casting machine, pre-heat the crucible. Set the arm speed to 400-450 rpm and set the power to high and be sure the alloy is pulsating and slumping. The casting temperature of automatic casting equipment should be for 2500˚F (1370˚C) with a five second heat soak.

FINISHING Grind the metal with non-contaminating aluminum oxide stones. After grinding, blast with non-recycled 50 micron aluminum oxide, and clean in distilled water in an ultrasonic cleaner for ten minutes.

DEGASSING Place the castings in the furnace at 1200˚F (650˚C) and raise 1800˚F (980˚C) with full vacuum. No Hold. A straw yellow or light grey oxide will be formed. Opaque directly on this oxide. If a reddish oxide forms, it indicates too high a temperature. A bluish oxide indicates too low a temperature. If these incorrect oxides appear, blast them off and refire accordingly.

OPAQUING Fire a thin "wash" 10-15˚F above your standard opaque firing temperature. Followed by regular opaque coats.

SOLDERING Use Super Pre Solder (NP) for pre-soldering. Use R for post soldering.

CAUTION: Super 1 contains nickel. Persons of known nickel sensitivity should avoid use of this alloy. Super 1 contains Beryllium. Dust can be toxic. Do not inhale. Grind and polish with adequate ventilation only.

SAFETY DATA SHEET

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/ UNDERTAKING

1.1. Product identifier Product name:
Alloy Name: **Super 1**
Description: Color: White ISO Type: 4

1.2. Relevant identified uses of the substance or mixture and uses advised against
Relevant identified uses of the substance or mixture Manufacturing of a fixed or removable dental prosthesis in a dental laboratory

1.3. Details of the supplier of the safety data sheet Supplier:
Manufacturer:
Company name: Dental Alloy Products
Full address: 5855 Oberlin Drive, San Diego, CA 92121-4718. USA
Telephone number: Technical Service: 1-800-255-5524 Customer Care: 1-800-255-5095
Fax: 1-858-626-8686
E-mail address of competent person responsible for the SDS: info@dentalalloyproducts.com

1.4. Emergency telephone number
Emergency telephone number: Chemtrec: 1-703-741-6090 (collect calls accepted)

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture
Classification information
This product does not meet the classification criteria in (EC) N' 1272/2008 (CLP)
This product does not meet the labeling criteria stated in 67/548/EWG and 1999/45/EC

2.2. Label elements
Labeling is in accordance with (EC) No 1272/2008 (CLP Regulation)
Labelling Information In the solid form which the product is marketed

2.3. Other hazards
EYES: Contact with eyes may cause severe irritation and possible eye burns.
SKIN: May cause severe irritation and possible burns.
INGESTION: May cause gastrointestinal irritation with nausea, vomiting, and diarrhea.
INHALATION: May cause irritation and burns to the respiratory tract.

NOTE: Exposure levels for elements in this alloy are listed in SECTION 3. The following health data is for specific elements:

BERYLLIUM Causes lung irritation, dyspnea. A pneumonitis referred to as acute beryllium disease may result from single exposure to beryllium and is occasionally fatal. This form of beryllium disease can occur as a result of exposure caused by the abrasion of dental alloys containing beryllium. Pneumonitis may result from single exposure to beryllium and is occasionally fatal. Chronic inhilation causes "berylliosis" or chronic pulmonary granulomatosis. Pneumonitis may result from single exposure and is occasionally fatal. Eye contact can also cause conjunctivis. Beryllium is considered an experimental carcinogen of lungs and bones. It has also been associated with liver damage. In addition, recent research indicates that low-level exposure to be below the PEL-TLV by way of, but not necessarily limited to, the inhalation route is associated with chronic beryllium disease (CBD). Symptoms of (CBD) include dyspnea, anorexia, weight loss, weakness, chest pain, cough, and pulmonary insufficiency. and can result in death. Beryllium is listed as: Carcinogenic to humans by the IARC (International Agency for Research on Cancer); Reasonably Anticipated to be a Human Carcinogen by the NTP (National Toxicology Program); and as a Confirmed Human Carcinogen by the ACGIH (American Conference of Governmental Industrial Hygienists).

CARBON Dust causes irritation and is possibly allergenic. Cases of pulmonary fibrosis and emphysemia have resulted from prolonged inhilation of dust.

CHROMIUM May cause histological fibrosis of the lungs. There are some references to chromium causing lung and/or nasal cancer. In addition, chromium metal has caused tumors in laboratory animals via implant and intravenous routes. Chromium is listed as a Confirmed Human Carcinogen by the ACGIH. (American Conference of Governmental Industrial Hygienists).

MANGANESE Dust inhalation may cause tightness and pain in chest, coughing, and difficulty in breathing. Inhilation of dust may cause headache, nausea, vomiting, shortness of breath, or blurred vision. Dust may irritate skin or eyes. Ingestion may cause central nervous system depression. Prolonged inhilation of Manganese in the form of its inorganic compounds may cause Manganism. Target organs: Respiratory system, central nervous system, blood, kidneys. Medical conditions generally aggravated by exposure: Chronic respiratory disease, liver or kidney disorders, psychiatric disorders, alcoholism, and nerve system disorders.

MOLYBDENUM Chronic inhilation of molybdenum compounds by experimental animals has caused appetite and weight loss, diarrhea, muscular incoordination, hair loss and gout. Excessive intake of molybdenum may interfere with copper metabolism.

NICKEL Dust may cause headache, coughing, dizziness or difficult breathing. Prolonged exposure may cause dermatitus. Ingestion may cause nausea, vomiting, headaches, dizziness, gastrointestinal irritation. Target organs: Nasal cavities, lungs shin. Nickel is listed as: Possibly Carcinogenic to Humans by the IARC (International Agency for Research on Cancer) and Reasonably Anticipated to be a Human Carcinogen by the NTP (National Toxicology Program).

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances
This product is not a substance - This is not applicable

3.2. Mixtures
Ingredients:

Metal	Wt %	Symbol	CAS NO.	ACGIH 8 HR PEL	OSHA 8 HR PEL
NICKEL	77.0	Ni	7440-02-0	1 mg/m^3	1 mg/m^3
IRON	< 1	Fe	7439-89-6	5 mg/m^3	10 mg/m^3
SILICON	< 1	Si	7440-21-3	10 mg/m^3	10 mg/m^3 (total dust) 5 mg/m^3 (respiratory dust)
CARBON	< 1	C	7440-44-0	3.5 mg/m^3	3.5 mg/m^3
MOLYBDENUM	4.7	Mo	7439-98-7	Not established	Not established
CHROMIUM	14.0	Cr	7440-47-3	0.5 mg/m^3	0,5 mg/m^3 CRVI compounds: Ceiling= 0,1 mg/m^3
BERYLLIUM	1.8	Be	7440-41-7	8-hour TWA (ST STEL Ceiling 0.05 µg/m^3 (IHL) Up to 10-hour TWA (ST) STEL (C) Ceiling Ca 0.5 µg/m^3	8-hour (TWA): 2 µg/m^3 Acceptable Ceiling Concentration: 5 µg/m^3 Acceptable max peak above the acceptable ceiling concentration for an 8-hr shift Concentration: 25 µg/m^3 Max Duration: 30 min Cal/OSHA: 0.2 µg/m^3 Ceiling: 25 µg/m^3
ALUMINUM	2.0	Al	7429-90-5	10 mg/m^3	15 mg/m^3
MANGANESE	< 1	Mn	7439-96-5	5 mg/m^3	5 mg/m^3

Note: % values are in weight percent and reflect nominal composition.

SECTION 4: FIRST AID MEASURES

4.1 . Description of first aid measures
EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids.
SKIN CONTACT: Scrub skin thoroughly with soap and water.
INGESTION: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Induce vomiting. **Never give anything by mouth to an unconscious person. Get medical aid.
INHALATION: Remove affected person to fresh air and assist with additional oxygen if necessary. Get first aid if other symptoms appear.

4.2. Most important symptoms and effects, both acute and delayed - No data available

4.3. Indication of any immediate medical attention and special treatment needed - No data available

SECTION 5: FIRE-FIGHTING MEASURES

5.1 . Extinguishing media - Metal fire powders, sand

5.2. Special hazards arising from the substance or mixture - Heating Beyond the melting range may generate fumes which are not flammable.

5.3. Advice for fire-fighters - Wear protective clothing and use a self-contained breathing apparatus

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures
For non-emergency personnel: Use proper personal protective equipment as described in section 8.
For emergency responders: Use proper personal protective equipment as described in section 8.

6.2. Environmental precautions
Collect contaminated materials in separate containers. Discharge according to local regulations.

6.3. Methods and material for containment and cleaning up
Avoid creating dust and pick-up using mechanical means

6.4. Reference to other sections - No data available

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling
Ensure the workspace has proper ventilation. Do not consume substances during work. General protective and hygiene measures Wash hands before and after breaks. Remove contaminated clothing immediately. Do not ingest, or allow to come into contact with the eyes.

7.2. Conditions for safe storage, including any incompatibilities
Keep container closed in a ventilated area

7.3. Specific end use(s) - No data available

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters
Occupational exposure limit values

8.2. Exposure controls
RESPIRATORY: Provide general ventilation and local exhaust to keep levels below the TLV stated in SECTION 2. Wear a NIOSH approved respirator for dust exceeding the TLVs.
HAND: Latex gloves are recommended while grinding, heat resistant gloves should be worn while casting and handling hot metals or molds.
EYE PROTECTION: Wear eye protection suitable to each individual operation.
OTHER: Wear apron, lab coat or other protective clothing.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance:	WHITE	Flammability:	Not Applicable
Odor:	Not Applicable	Autoflammability:	Not Applicable
pH:	Not Applicable	Explosive Properties:	Not Applicable
Boiling Point:	Not Applicable	Oxidizing Properties:	Not Applicable
Melting Range:	2120-2335 ºF (1160-1280ºC)	Vapor Pressure:	Not Applicable
Flash Point:	Not Applicable	Solubility (Water/Fat):	Insoluble

9.2. Other information - No data available

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity - At ordinary and high (below the melting range) temperatures, the material oxidizes but is stable. At very high temperatures the alloy produces fumes.

10.2. Chemical stability - Product is stable under normal storage and handling conditions. See Section 7.

10.3. Possibility of hazardous reactions - Hydrogen gas can possibly form if the product comes into contact with acid.

10.4. Conditions to avoid - N/A if the product is handled according to the In structions for Use.

10.5. Incompatible materials - Acid

10.6. Hazardous decomposition products - None are known

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects - No data is available other than the information provided in Sections 2 & 3

SECTION 12: ECOLOGICAL INFORMATION
This is an environmentally friendly material. With proper dust collecting equipment, 100% of this alloy can be recycled.

12.1. Toxicity - No data available

12.2. Persistence and degradability - No data available

12.3. Bioaccumulative potential - No data available

12.4. Mobility in soil - No data available

12.5. Results of PBT and vPvB assessment - No data available

12.6. Other adverse effects - No data available

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods
Product - Always recover all waste material and send to refining.
Packaging - Empty container completely and dispose according to local regulations.

SECTION 14: TRANSPORT INFORMATION

14.1. Transport ADR/RID/AND - This product is not subject to ADR/RID/AND regulations

14.2. Transport IMDG - This product is not subject to IMDG regulations

14.3. Transport ICAO-TI/IATA - This product is not subject to ICAO-Ti /IATA regulations

14.4. Other information - No data available

14.5. Environmental hazards - No data is available other than the information provided in Sections 2 & 3

14.6. Special precautions for user - None

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code - Not applicable

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture - Germany: Wassergefahrdungsklasse WGK (VwVwS): WGK-1 (self-assessed)

15.2. Chemical Safety Assessment - No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

SECTION 16: OTHER INFORMATION

16.1 Training advice - In addition to health, safety and environmental training programs for their workers, companies must ensure that workers read, understand and apply the requirements of this SDS.

16.2 Disclaimer - The information and recommendations set forth herein (hereinafter "information") are presented in good faith and believed to be correct as of the date hereof. However the manufacturer makes no representations as to the completeness of accuracy thereof and information is supplied upon the condition that the persons receiving the above material will make their own determination as to its suitability for their purposes prior to use. In no event will the manufacturer be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. No representations or warranties, either expressed or implied, or merchantability, fitness for a particular purpose.