


Material Name: LPW-316-1		
Issue: 05	Material Safety Data Sheet	
Date Revised: 27/08/2014		

**\*\*\* Section 1 - Identification of the Substance/Mixtures and of the Company/Undertaking \*\*\***

**1.1 Product identifier**

**Chemical Name:** Iron Base Powder  
**Synonyms:** Metal Alloy Powder

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

**Uses:** Metal Powder for Additive Layer Manufacturer or HIP detailing  
**Not to be used for:** Any other purpose

**1.3 Details of the supplier of the safety data sheet**

LPW Technology Ltd  
16 Berkeley Court  
Manor Park  
Runcorn, Cheshire, WA7 1TQ  
United Kingdom  
Tel: +44(0)1928 240 530  
E-mail address: msds@lpwtechnology.com

**1.4 Emergency telephone number**


**Acute:** 999 (Emergency EU/UK) / 911 (Emergency US)  
**Non-acute (CHEMTREC):** +1 703-527-3887 (from anywhere in the world) / 1-800-424-9300 (within US and Canada)

**\*\*\* Section 2 - Hazards Identification \*\*\***

**2.1 Classification of the substance or mixture**

May cause sensitization by inhalation and skin contact.  
May cause allergy or asthma symptoms or breathing difficulties if inhaled.  
Causes damage to organs through prolonged or repeated exposure.  
Suspected of causing cancer.  
May cause long-term adverse effects in the aquatic environment.

CLP Classification	DPD Classification
Skin Sensitiser Category 1 - H317	Toxic - R43, R48/23, R52/53
Respiratory Sensitiser Category 1 - H334	Carcinogen Category 3 - R40
Carcinogen Category 2 - H351	
STOT RE Category 1 - H372	
Aquatic Chronic Category 4 - H413	
For full wording of Hazard statements see Section 16	For full wording of Risk phrases see Section 16

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## 2.2 Label Elements



DANGER

H317 - May cause an allergic skin reaction.

H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled.

H351 - Suspected of causing cancer.

H372 - Causes damage to organs through prolonged or repeated exposure.

H413 - May cause long lasting harmful effects to aquatic life.

P260 - Do not breathe dust.

P280 - Wear protective gloves/protective clothing/eye protection/face protection.

P285 - In case of inadequate ventilation wear respiratory protection.

P302+P352 - IF ON SKIN: Wash with plenty of soap and water.

P333+P313 - If skin irritation or rash occurs: Get medical advice / attention.

Contains: Nickel and Cobalt.

## 2.3 Other hazards

Dust can irritate the eyes. High dust levels may irritate the respiratory system.

Does not fulfil the criteria for classification as PBT or vPvB.


## \*\*\* Section 3 - Composition / Information on Ingredients \*\*\*

### 3.1 Substances

Hazardous component(s)

Under CLP EC 1272/2008

Ingredient	CAS/EC Number	REACH Registration Number	Weight %	CLP Hazard Category	H-Statements
Iron	7439-89-6/ 231-096-4	Not yet available	60-100	None	None
Nickel	7440-02-0/ 231-111-4	Not yet Available	3-20	Skin Sensitiser Category 1 Carcinogen Category 2 STOT RE Category 1	H317 H351 H372
Chromium	7440-47-3/ 231-157-5	Not yet Available	5-20	Aquatic Chronic Category 4	H413

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Cobalt	7440-48-4/ 231-158-0	Not yet Available	<10	Respiratory Sensitiser Category 1 Skin Sensitiser Category 1 Aquatic Chronic Category 4	H334 H317 H413
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For full wording of H-statements see Section 16.  
Subject to exposure limit – See Section 8.

Under DPD EC1999/45

Ingredient	CAS/EC Number	REACH Registration Number	Weight %	Symbol	Risk Phrases
Iron	7439-89-6/ 231-096-4	Not yet available	60-100	None	None
Nickel	7440-02-0/ 231-111-4	Not yet Available	3-20	T	R40-43-48/23-52/53
Chromium	7440-47-3/ 231-157-5	Not yet Available	5-20	None	R53
Cobalt	7440-48-4/ 231-158-0	Not yet Available	<10	Xn	R42/43 - 53

For full wording of Risk phrases see Section 16.  
Subject to exposure limit – See Section 8.

**\*\*\* Section 4 - First Aid Measures \*\*\***

**4.1. Description of first aid measures**

**Inhalation:** Remove patient to fresh air, allow to rest and keep warm. If not breathing, give artificial respiration and seek medical attention.

**Skin contact:** Remove contaminated clothing, shoes and jewellery and wash before reuse. Wash skin with soap and water for several minutes. Get medical attention if symptoms persist.

**Eye contact:** Rinse with a gentle stream water for at least 15 minutes. Hold eye lids open. Remove any contact lenses. Get medical attention if symptoms persist.

**Ingestion:** DO NOT induce vomiting! Rinse mouth out and then drink plenty of water. Get medical attention if discomfort occurs.


**Personal precautions:** Ensure that those giving first aid treatment do not get contaminated by product spills, etc. Wear suitable protective clothing, gloves and eye protection. See also Section 8 for details.

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

May cause allergic skin reaction. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Causes damage to organs through prolonged or repeated exposure. Suspected of causing cancer.

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

No further data available for this product.

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**\*\*\* Section 5 - Fire Fighting Measures \*\*\***

**5.1. Extinguishing media**

**Suitable:** Water mist, foam, carbon dioxide or dry powder.

**Not to be used:** Water jet - will spread product.

**5.2. Special hazards arising from the substance or mixture**

Product is not flammable. Fire in the surrounding materials can give rise to toxic fire gases.

High concentration of airborne dust may form explosive mixture with air.

Decomposition of this product may yield metallic oxides.

**5.3. Advice for fire fighters**

Self-contained breathing apparatus and protective clothing.

Prevent firefighting water entering watercourses or groundwater.

Avoid creation of dusts.

**\*\*\* Section 6 - Accidental Release Measures \*\*\***

**6.1. Personal precautions, protective equipment and emergency procedures**

Use personal protective equipment, see Section 8. Avoid contact with eyes and skin and inhalation of dust. Use with adequate ventilation.

**6.2. Environmental precautions**

Prevent from entering sewers or the immediate environment. In case of large spill, inform local police, local authority, water company, appropriate local environmental authority and/or fire brigade as appropriate.

**6.3. Methods and material for containment and cleaning up**

**On soil:** Contain any spilled material immediately by vacuuming or shovelling, taking care not to raise dust, into labelled containers for disposal (See Section 13).

**On water:** None known.

**6.4. Reference to other sections**


See Section 8 for details of protective equipment.

See Section 13 for details of disposal.

**\*\*\* Section 7 - Handling and Storage \*\*\***

**7.1. Precautions for safe handling**

Use personal protective equipment, see Section 8. Avoid creating dust where possible. Ensure good dust ventilation during handling. If necessary, use local exhaust ventilation. Use non-sparking tools when opening or closing containers. Wet mopping or HEPA vacuuming is recommended to clean up any dusts that may be generated during handling and processing. Wash hands and face thoroughly before eating, drinking or smoking.

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**7.2. Conditions for safe storage, including any incompatibilities**

Store indoors. Keep in original containers. Keep dry. Good housekeeping and engineering practices should be employed to prevent the generation and accumulation of dusts.

**7.3. Specific end use(s)**

PC14 – Metal surface treatment product.  
ERC5 - Industrial use resulting in inclusion into or onto a Matrix.

**\*\*\* Section 8 - Exposure Controls / Personal Protection \*\*\***

**8.1 Control Parameters**

**Chromium (7440-47-3)**

TLV: 0.5 mg/m<sup>3</sup> as TWA  
OSHA: 1 mg/m<sup>3</sup> TWA (particulate)  
NIOSH: 0.5 mg/m<sup>3</sup> TWA (particulate)

**Nickel (7440-02-0)**

TLV: 1.5 mg/m<sup>3</sup> as TWA (inhalable fraction)  
OSHA: 1 mg/m<sup>3</sup> TWA (particulate)

**Cobalt (7440-48-4)**

TLV: 0.02 mg/m<sup>3</sup> as TWA  
OSHA: 0.1 mg/m<sup>3</sup> TWA (particulate)  
NIOSH: 0.05 mg/m<sup>3</sup> TWA (particulate)

**Monitoring procedures:** None specified

**8.2. Exposure Controls**

**Recommended engineering controls:** Ensure good ventilation, where possible at local site of dust formation. Arrange for eye wash possibility.

**Personal protection:** Always check applicability with your supplier of protective equipment.


**Respiratory protection:** Personal exposure must be controlled to conform with local/national regulations (see above). If this is not possible, respiratory protection must be worn. Full face respirator conforming to EN143, Type P3 should be used.

**Skin protection:** Chemically resistant protective overalls.

**Eye protection:** Wear safety glasses or goggles.

**Hand protection:** Always wear gloves when handling the product. Contact your supplier of protective equipment for more details. Note: Break-through times can vary depending on thickness, use and source. Change gloves regularly.

**General hygiene:** Do not eat, drink, or smoke while using this product. Immediately take off any contaminated clothing and launder before re-use. Wash hands and / or face before breaks and at the end of the shift. After the session, wash the skin and apply skin cream.

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**\*\*\* Section 9 - Physical & Chemical Properties \*\*\***

**9.1 Information on basic physical and chemical properties**

<b>Appearance:</b>	Grey metallic powder < 1.0mm	<b>Odor:</b>	None
<b>Odor Threshold Value:</b>	None	<b>pH:</b>	Not Available
<b>Melting Point (°C):</b>	Not Available	<b>Boiling Point :</b>	Not Available
<b>Flash Point:</b>	Not Available	<b>Evaporation Rate:</b>	Not Applicable
<b>Flammability:</b>	Not a flammable solid	<b>Upper Flammability Limit (UFL):</b>	Not Available
<b>Vapor Pressure:</b>	Not Available	<b>Vapor Density:</b>	Not Available
<b>Density (g/cm<sup>3</sup>):</b>	Not Available	<b>Solubility (H<sub>2</sub>O):</b>	Insoluble
<b>Partition coefficient:</b>	Not Applicable	<b>Auto-ignition temperature:</b>	Not Available
<b>Decomposition temperature:</b>	Not Available	<b>Viscosity:</b>	Not Available
<b>Explosive properties:</b>	Not Available	<b>Oxidising properties:</b>	Not Available

**9.2 Other Information**

These are typical values and do not constitute a specification.

**\*\*\* Section 10 - Stability & Reactivity \*\*\***

**10.1. Reactivity**

Stable product under recommended storage and handling conditions.

**10.2. Chemical stability**

Stable product under recommended storage and handling conditions.

**10.3. Possibility of hazardous reactions**

Stable product under recommended storage and handling conditions.

**10.4. Conditions to avoid**


High temperatures and humid conditions can cause oxide formation and / or rust on the particle surfaces.

**10.5. Incompatible materials**

Contact with water can cause oxide formation and / or rust on the particle surfaces. Avoid accidental contact with strong acidic or alkaline solutions.

**10.6. Hazardous decomposition products**

None known.

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**\*\*\* Section 11 - Toxicological Information \*\*\***

**11.1 Potential Health Effects**

**A: General Product Information**

Inhalation of metal fumes may cause metal fume fever, a flu-like illness generally lasting 24 hours or less.

Iron: Chronic inhalation of iron has resulted in mottling of the lungs, a condition referred to as siderosis. This is considered benign pneumoconiosis and does not ordinarily cause significant physiologic impairment.

Nickel: Systemic effects from ingestion of nickel salts include capillary damage, kidney damage, myocardial weakness and central nervous system depression. Allergic skin sensitization reactions are the most frequent effect of exposure to nickel compounds. Contact with nickel compounds may also result in allergic lung sensitization reactions. Nickel is a possible human carcinogen.

Chromium: Industrial exposure to chromium may cause dermatitis, skin ulcers, perforation of the nasal septum, as well as cancers of the lungs, nasal cavity and paranasal sinuses.

Cobalt: Prolonged and/or repeated contact may cause irritation and/or dermatitis. May cause skin sensitization. Repeated exposure may cause allergic respiratory reaction (asthma). Ingestion may cause gastrointestinal irritation with nausea, vomiting and diarrhea. Effects of overexposure to cobalt include lung effects (irritation, fibrosis, asthma), cardiovascular effects (cardiomyopathy), liver and kidney congestion.

**B: Substance Analysis - LD50/LC50**

**Iron (7439-89-6)**

Oral LD50 Rat: 30000 mg/kg

**Nickel (7440-02-0)**

Oral LD50 Rat: >5000 mg/kg

**Chromium (7440-47-3)**

LD50 Rat: 27.5 mg/kg

**Cobalt (7440-48-4)**


Oral LD50 Rat: 6171 mg/kg

**11.2 Carcinogenicity**

**A: General Product Information**

No carcinogenicity data available for this product. The carcinogenic effect of nickel has been well documented in occupationally exposed nickel refinery workers. Lung and nasal cancers were the predominant forms of cancer in the exposed workers. In experimental animal's injection of nickel produced injection site tumors although some of these tumors metastasized. Upon inhalation of nickel, lymphosarcomas were observed in mice and aveolar carcinomas in guinea pigs.

Cobalt is a confirmed animal carcinogen.

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**B: Substance Carcinogenicity**

**Nickel (231-111-4)**

IARC: Monograph 49 [1990], Supplement 7 [1987] (Group 2B (possibly carcinogenic to humans))

**Chromium (231-157-5)**

IARC: Monograph 49 [1990] (listed under Chromium and Chromium compounds), Supplement 7 [1987] (Group 3 (not classifiable))

**Cobalt (231-158-0)**

IARC: Monograph 86 [2006] (without tungsten carbide), Monograph 52 [1991] (Group 2B (possibly carcinogenic to humans))

**11.3 Other Toxicological Information**

Exposure to metal dusts and oxides may cause metal fume fever. Metal fume fever is a temporary flu-like condition characterized by chills, fever, muscle aches and pains, nausea and vomiting. Typically the symptoms appear within a few hours after exposure and subside within 2-3 days with no permanent effects.

Asthma induced by occupational exposure to nickel and cobalt has been documented. The asthma can result from either primary irritation or from an allergic response. Contact dermatitis in workers exposed to nickel compounds is one of the most prevalent effects of nickel exposure.

**\*\*\* Section 12 - Ecological Information \*\*\***

No data available on mixture. Data based on individual components shown below. Based upon component, product may be toxic to aquatic life.

**12.1 Toxicity**

**Iron (231-096-4)**

**Test & Species**


96 Hr LC50 <i>Morone saxatilis</i> :	13.6 mg/L	<b>Conditions</b> static
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**Nickel (231-111-4)**

**Test & Species**

96 Hr LC50 <i>Oncorhynchus mykiss</i> :	31.7 mg/L	<b>Conditions</b> adult
96 Hr LC50 <i>Pimephales promelas</i> :	3.1 mg/L	
96 Hr LC50 <i>Brachydanio rerio</i> :	>100 mg/L	
72 Hr EC50 freshwater algae (4 species):	0.1 mg/L	
72 Hr EC50 <i>Selenastrum capricornutum</i> :	0.18 mg/L	
96 Hr EC50 water flea:	510 µg/L	



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**Cobalt (231-158-0)**

**Test & Species**

96 Hr LC50 Brachydanio rerio:	>100 mg/L
48 Hr EC50 Invertebrate, Daphnia magna:	3.2 mg/L
72 Hr IC50 Algae, Selenastrum capricornutum:	0.05 – 0.26 mg/L

**Conditions**

static

**12.2 Persistence & Degradability**

May cause long-term adverse effects in the aquatic environment.

**12.3 Bioaccumulative potential**

Not expected to occur.

**12.4 Mobility in soil**

No information available for the product.

**12.5 Results of PBT and vPvB assessment**

Does not fulfill the criteria for classification as PBT or vPvB.

**12.6 Other adverse effects**

No information available for the product.

**\*\*\* Section 13 - Disposal Considerations \*\*\***

**13.1 Waste treatment methods**

**Disposal of product:** Waste product is considered Hazardous Waste and should be disposed of via a licensed operator.

**Disposal of packaging:** Contaminated packing should be disposed of as Hazardous waste according to local authority guidelines.

**\*\*\* Section 14 - Transport Information \*\*\***

Not classified as dangerous for transport

**14.1. UN number**

Not applicable

**14.2. UN proper shipping name**


Not applicable

**14.3. Transport hazard class(es)**

Not applicable

**14.4. Packing group**

Not applicable

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**14.5. Environmental hazards**

Not applicable

**14.6. Special precautions for user**

None

**14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable

**\*\*\* Section 15 - Regulatory Information \*\*\***

**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture**

Chemical Agents Directive 98/24/EC

**15.2. Chemical Safety Assessment**

A Chemical Safety Assessment has not been carried out on this mixture.

**\*\*\* Section 16 - Other Information \*\*\***

**Sources of data used in this MSDS:**

In-house data files, CLP Annex VI Tables 3.1 & 3.2, TOXNET, IARC, International Labour Organization, NIOSH Pocket Guide to Chemical Hazards, European Chemicals Agency, Institute for Health and Consumer Protection.

**S Symbol(s):**


Xn: Harmful  
T: Toxic

**R-phrases used in document:**

R40: Limited evidence of a carcinogenic effect  
R42/43: May cause sensitisation by inhalation and skin contact  
R43: May cause sensitisation by skin contact  
R48/23: Toxic: danger of serious damage to health by prolonged exposure through inhalation  
R52/53: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment  
R53: May cause long-term adverse effects in the aquatic environment

**H-statements used in document:**

H317: May cause an allergic skin reaction  
H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled  
H351: Suspected of causing cancer  
H372: Causes damage to organs through prolonged or repeated exposure  
H413: May cause long lasting harmful effects to aquatic life

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**Key/Legend:**

EEC = European Economic Community; EINECS = European Inventory of Existing Commercial Chemical Substances; ELINCS = European List of Notified Chemical Substances; EU = European Union; HMIS = Hazardous Materials Identification System; IARC = International Agency for Research on Cancer; IMO = International Maritime Organization; IATA = International Air Transport Association; LC50 = Lethal Concentration 50%; LD50 = Lethal Dose 50%; MAK = Maximum Concentration Value in the Workplace; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NIOSH = The National Institute for Occupational Safety and Health; NOHSC = National Occupational Health & Safety Commission; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; STEL = Short-term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average

The information provided on this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. Although reasonable care has been taken in the preparation of this document to assess and summarise the hazard properties of the product, the user must satisfy himself that the information contained herein is pertinent to permit safe handling under his use conditions, since the supplier cannot foresee all conditions of use.