

## Material Safety Data Sheet

### PACWELD 36 - Aluminium Wire

Identity	Supplier's Name	Supplier's Address	Date	Telephone No.	Facsimile No.
Pacweld Welding Consumable	3D Safety Services Pty Ltd	27 Sir Joseph Banks Street Botany, NSW 2019	01-10-2004	1300 663 195	1300 663 495

**This product is hazardous according to Worksafe Australia Criteria**

#### **Section 1 - Pacweld Numbers For Grouping**

36, 37, 38, 39, 321, 3038, 3039

#### **Section 2 – Material Description**

Chemical Name	CAS No.
Aluminium	7429-90-5
Copper	7440-50-8
Magnesium	7439-95-4
Manganese	7439-96-5
Silicon	7440-21-3
Chromium	7440-47-3
Gallium	7440-55-3
Iron	7439-89-6
Titanium	7440-32-6
Vanadium	7440-62-2
Zinc	7440-60-6
Zirconium	7440-67-7
Chemical Name & Formula: See Section 3	
Other Designation: Coiled Welding Wire, GTAW, MMAW & Oxy Welding Alloys	

#### **Section 3 - Hazardous Ingredients & Occupational Exposure Limits**

Alloy ingredients: (% by weight shown as a maximum or a range, except for Aluminium, which is a minimum % by weight)

Alloy	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Each	Total	Al
1100	0.95 Si & Fe	---	0.05 - 0.2	0.05	---	---	0.10	---	0.05	0.15	99.00
1188	0.06	0.06	0.005	0.01	0.01	---	0.03	0.01	0.01	---	99.88
2319	0.2	0.3	5.8 - 6.8	0.2 - 0.4	0.02	---	0.10	0.1 - 0.2	0.05 <sup>2</sup>	0.15	Rmnd <sup>3</sup>
4043	4.5 - 6.0	0.80	0.50	0.05	0.05	---	0.10	0.20	0.05	0.15	Rmnd <sup>3</sup>

4047	11.0 - 13.0	0.80	0.30	0.15	0.10	---	0.20	---	0.05	0.15	Rmnd <sup>3</sup>
4145	9.3 - 10.7	0.80	3.3 - 4.7	0.15	0.15	0.15	0.20	---	0.05	0.15	Rmnd <sup>3</sup>
4643	3.6 - 4.6	0.80	0.10	0.05	0.1 - 0.3	---	0.10	0.15	0.05	0.15	Rmnd <sup>3</sup>
5183	0.40	0.40	0.10	0.5 - 1.0	4.2 - 5.2	0.05 - 0.25	0.25	0.15	0.05	0.15	Rmnd <sup>3</sup>
5356	0.25	0.40	0.10	0.05 - 0.20	4.5 - 5.5	0.05 - 0.20	0.10	0.06 - 0.20	0.05	0.15	Rmnd <sup>3</sup>
5554	0.25	0.40	0.10	0.5 - 1.0	2.4 - 3.0	0.05 - 0.20	0.25	0.05 - 0.20	0.05	0.15	Rmnd <sup>3</sup>
5556	0.25	0.40	0.10	0.5 - 1.0	4.7 - 5.5	0.05 - 0.20	0.25	0.05 - 0.20	0.05	0.15	Rmnd <sup>3</sup>
5654	0.25	---	0.05	0.01	3.1 - 3.9	0.15 - 0.35	0.20	0.05 - 0.15	0.05	0.15	Rmnd <sup>3</sup>

- 1188 may contain Gallium, 0.03% (max), and Vanadium, 0.05% (max)
- 2319 contains Vanadium, 0.05 - 0.15% (max), and Zirconium, 0.10 - 0.025 (max)
- Rmnd = Remainder

#### Section 4 – Occupational Exposure Limits

(TWA in mg/m<sup>3</sup> unless noted)

Substance	ACGIH TLV	OSHA PEL
Aluminium, total dust	10.0	15 (total), 5 (respirable) 10.0 15 ~ (total), 5 (respirable)
Aluminium, fume	5.0	5.0 ~5.0 ~5.0
Chromium, metal	0.5	1.0 0. ~5 1.0
Chromium, 11/111 Compounds	0.5	0.5 0. ~5 0. ~5
Cr VI compounds, water soluble and certain water insoluble	0.05	0.1 (ceiling) 0.0~5 0. 1 (ceiling)
Copper, fume	0.2	0.1 0.2 0.1
Copper, dust/mist	1.0	1.0
Welding fume (PNOC)	5.0	5.0 1.0 1.0
Manganese, dust	5.0 (ceiling)	5.0 (ceiling)
Manganese, fume	1.0, 3.0 (STEL)	1.0, 3.0 (STEL) ~5.0 5.0
Magnesium oxide, fume	10	10 (total), 5 (respirable)
Silicon, nuisance dust	10 (total dust)	10 (total), 5 (respirable) 5.0 (ceiling) 5.0 (ceiling)
Titanium oxide, nuisance dust	10	10 (total), 5 (respirable)
Zinc oxide, fume	5, 10 (STEL)	5, 10 (STEL) 1.0, 3.0~(STEL) ~1.0, 3.0 ~ (STEL)
Zinc oxide, nuisance dust	10	10 (total), 5 (respirable)
• Ozone	0.1 ppm	0.1 ppm, 0.3 ppm
	0.3 ppm (STEL)	(STEL) 10 10 (total), 5 (respirable)

• Nitric oxide	25 ppm	25 ppm
• Nitrogen dioxide	3 ppm, 5 ppm (ceiling)	5 ppm (ceiling) 10 (total dust) 10 (total), 5 (respirable)

Refer to Section 8 for processes where ozone and nitric oxide limits apply.  
LD50 or LC50 found for oral, dermal or inhalation routes of administration:  
Silicon – oral rat LD50: 3160 mg/kg body weight  
Manganese – oral rat LD50: 9000 mg/kg body weight

Section 5 - Physical Data
Physical Form: Solid wire
Boiling Temperature: N/A
Freeze/Melt Temperature: 970°F - 1215°F (521°C - 657°C)
Vapor Pressure (mm): N/A
Vapor Density (air = 1): N/A
Evaporation Rate: N/A
Specific Gravity: N/A
Density: N/A
Water Solubility: Negligible
pH: N/A
Colour: Silver
Odour: None
Odour Threshold ~ (ppm): Coefficient of water/oil ~ N/A
Distribution: N/A

Section 6 – Fire & Explosion Data
Flashpoint: N/A
Auto-Ignition Temp: N/A
Flammability in air. Upper/Lower: N/A
Does not present a fire or explosion hazard under normal conditions.
Small chips, fine turning and dust may ignite readily.

Section 7 – Reactivity Data
This product is stable without any serious incompatibilities.

Section 8 – Health Hazard Information
SEE SECTION 3 FOR EXPOSURE LIMITS
Certain chromium compounds (eg: hexavalent chromium) have been shown to cause nasal and lung cancer by inhalation. Chromium and its compounds are listed in the latest Annual Report on carcinogens by the National Toxicology Program (NTP) and by the International Agency for Research on Cancer (IARC).
Hexavalent chromium compounds may be generated during welding operations, especially with Alloys 2319 and 4145. The potential for over exposure to copper fume may exist when welding, flame cutting, etc. Over exposure to copper fume can result in upper respiratory tract irritation, nausea, and metal fume fever.
Aluminium is welded in a protective, inert atmosphere such as argon or helium using the MIG or TIG process. Welding arcs from the processes create welding fumes as well as an intense ultraviolet radiation which produces ozone. Controlling the total welding fume to 5 mg/m <sup>3</sup> . Will protect against overexposure to most alloy constituents.
Welding aluminium, plasma arc cutting, and arc spray – metalizing can generate ozone. Ozone over exposure can result in mucous membrane irritation as well as pulmonary changes including irritation/congestion/oedema. Exposure to welding fumes can cause irritation of the eyes and respiratory system. Ultraviolet radiation from welding can also cause irritation or flash burns to eyes/skin.
When plasma arc cutting with auxiliary gases containing nitrogen, the exposure limits for oxides of nitrogen can be exceeded. Nitrogen dioxide can cause irritation of eyes, nose, throat and delayed pulmonary edema. Short exposure to very high concentrations (>250 ppm) may cause pulmonary oedema and death.

Nitric oxide is a severe eye, skin and mucous membrane irritant; it may cause formation of methemoglobin and subsequent action on the central nervous system. Nitrogen monoxide can be fatal if inhaled at very high concentrations (>100 ppm).

#### Section 9 - First Aid

**Inhalation:** Immediately remove to fresh air. If breathing has stopped, provide oxygen and respiration. Consult a physician.

**Skin & Eyes:** If irritation develops, consult a physician.

#### Section 10 - Spill, Leak & Disposal Procedures

Waste which cannot be reused may be disposed of in a sanitary landfill. RCRA Hazardous Waste No. Not federally regulated.

#### Section 11 - Special Protection & Precautions

Use with adequate ventilation to meet exposure limits as listed in Section 3. Where the exposure limit is or may be exceeded, use NIOSH approved respiratory protection. Select appropriate respirator (fume respirator, etc) based on actual or potential airborne contaminants and their concentrations present.

Welders should use appropriate equipment (ie: welder's helmet, faceshield, filter lens, etc) to prevent eye irritation or flesh burns. Take necessary precautions to protect skin from direct and reflected light from the arc.

Refer to OSHA 29 CFR 1910.252 for additional precautions concerning eye protection, other personal protective equipment, and other safety precautions.

#### Section 12 – Regulatory Information

Chemical substance components have been reported to the EPA Office of Toxic Substances in accordance with the requirements of the Toxic Substances Control Act (Title 40 CFR Part 710).

Chromium is listed by Pennsylvania as "Special Hazardous Substance" under Pennsylvania Worker and Community Right-to-Know Regulations. Hexavalent chromium is known to the state of California to cause cancer (California Prop. 65).

For purposes of SARA III reporting, this substance contains the following listed ingredients: copper, chromium and zinc --- CERCLA List.

Aluminium (fume/dust), copper, manganese, chromium, vanadium and zinc --- Section 313 List.

If fumes are generated during processing, this material would fit the EPA Hazard Categories of Immediate (Acute) and Delayed (Chronic) Health Hazards under SARA Sections 311, 312.

No. 214N

DOT Shipping Name, Hazard Class, ID No. (if applicable). Not Regulated Canadian TDG Hazard Class & PIN --  
- Not Regulated.

#### Section 13 - References

OSHA Standard 29 CFR 1910.252

ANSI 249.1 Safety in Welding & Cutting

U.S. Department of Health and Human Services, "NIOSH: Registry Of Toxic Effects Of Chemical Substances", 1985 - 86 Edition.

Sex, N Irving, "Dangerous Properties Of Industrial Materials", Van Nostrand Reinhold Co., Inc., 1984.

3D Safety Services Pty Ltd believes this information to be accurate and to reflect qualified expert opinion regarding current research. However, 3D Safety Services Pty Ltd cannot make any express and implied warranty as to this information.