



UNITED PM (THAILAND) CO., LTD.

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January 3, 2020.

Subject Alloy composition of UNITED # PD-2.

Dear Sirs,

Thank you for using "United's alloys.

We are glad to inform you that UNITED'S alloys are uniquely different from other available alloys. Combining the highest purity metals available, stringent quality control and special de-oxidizers, make UNITED'S alloys produce trouble-free, superior quality castings.

This is to certify that all products marketed & produced by United Precious Metal Refining Inc. U.S.A. and sold by United PM (Thailand) Co., Ltd. are completely free of Cadmium, Lead, Bismuth, Beryllium, Arsenic, Mercury & Other Toxic or Radioactive Metals from the usage or presence of any of the Substance of Very High Concerns (SVHC) published by the European Chemical Agency (ECHA).

In addition, This is to certify that are completely Free of four minerals 1.) Columbite-tantalite (Coltan) 2.) Cassiterite 3.) Wolframite 4.) Gold & any metals extracted from there minerals which are sourced from Conflict areas as defined in the "Conflict Minerals Law" was included as section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act, Passed by the US Senate on May 20, 2010 and signed by President Barack Obama on July 21, 2010.

The composition of the alloy # PD-2 is as below :-

UNITED	SILVER	COPPER	ZINC	PALLADIUM
# PD-2	53%	10%	7%	30%

If you have any question, Please feel free to contact us.

Yours faithfully,

Mr.Suwat Wongchailaisakul

Technical Sales Division



### Physical & Mechanical Properties

Composition		Color Coordinates				Density (g/cc)		As cast Hardness (HV)	
		Karat	L*	a*	b*				
Cu	9.80%	14K PD2	82.69	1.89	12.77	14K PD2	14.11	14K PD2 - 20 mins quench	244
Ag	53.10%					18K PD2	15.84	18K PD2 - 20 mins quench	226
Zn	8.00%								
Pd	29.10%								

### Melting & Casting Instructions

Temperatures			
	Karat	°C	°F
Pre alloying	14K - 18K	1140° - 1160° C	2084° - 2120° F
Casting	14K	1120° C - 1140° C	2048° - 2084° F
	18K	1135° C - 1155° C	2075° - 2111° F
Flask	14K - 18K	540° - 675° C	1004° - 1247° F

Quench Time	15-20 Minutes	Remelting	50% Fresh Mix
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### General Instructions

- Very little boric acid flux is recommended. Do not use carbon flux such as soda ash, saltpeter etc. No flux needed in bottom pour automatic casting unit.
- Flouric based investment removers are the best for silicon oxide invisible coating. Use of aggressive acid causes corrosion and surface damage. United's brite cast investment removers works effectively.
- To calculate the weight of the metal needed (in grams), multiply density (gm/cc) with weight of wax (grams). Add 10% of the total weight for button.
- Platinum investment and platinum casting machine is recommended. Follow manufacturer's instruction for burnout cycle.

**Note:** There are proprietary metals in the formulation which are not included in the composition section.

**Technical Assistance:** Always available... Call 1-800-999-3463 / 1-800-999-FINE

E-mail - [techteam@unitedpmr.com](mailto:techteam@unitedpmr.com) Web-Site - [www.unitedpmr.com](http://www.unitedpmr.com)