

# Hauser & Miller

An illustration of a blue ladle pouring a stream of golden molten metal into a square-shaped gold ingot. The background features a large, stylized, golden sunburst or gear-like pattern.

Precious Metals Since 1909

**FABRICATION & REFINING**

[www.HauserAndMiller.com](http://www.HauserAndMiller.com)

(800) 462-7447

# Our Company

1909—1947



In 1909, Gus Hauser and Charlie Miller founded Hauser & Miller to provide refining services and fabricated precious metal products of quality with integrity. This simple standard of trust has endured for over 100 years. From generation to generation, Hauser & Miller has brought the highest standards to the industry with a dedication to the ideals set by its founders at the beginning of the century. Today, we continue to provide the highest level of customer service and technical advice to our customers.

Our fabrication customers range from hobbyist and small jewelry shops to large aerospace contractors. We offer many different product variations of gold, silver, platinum, and palladium metals from sheet and wire to grain and solder. Our experience and facilities allow us to fabricate these products to meet your unique requirements. We also work with customers to develop unique products, such as Reticulation Silver, and strive for innovation. Our efficient processes and rapid response capabilities allow us to ship most orders within the same day.

Our refining department provides fast service and reliable returns for all precious metal materials. Our years of experience allow us to create profitable returns in gold, silver, platinum and palladium for our customers. We purchase metal through either our refining service or on an "as-is" basis. This allows us to handle different types of quantities, whether coins, scrap, filings, or sweeps, and meet your return needs. Fair, competitive, and fast returns have marked our philosophy for over 100 years. Our reputation in the industry is unrivaled. Whether our customers prefer cash or metal in return, our refining services exceed the needs of all who use them.

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# Ordering Information

Our hours are Monday to Friday - 8:00 AM to 4:30 PM CST

Orders for stocked items (such as casting grain, sizing wire, and solder) received by 1:00 PM CST will often be shipped the same day. Orders placed after 1:00 PM and orders requiring fabrication will typically go out the following day. For questions about products, refining, pricing, or delivery feel free to call or email us. Our fabricators and refiners have over 20 years experience and will be able to assist you.

All fabrication orders are billed at prices based on the metal market price on the date of shipment. Back-ordered items will be billed at the market when shipped along with shipping charges for the back-ordered item. Some items are subject to size restrictions. A handling charge will be applied to orders under \$50.

## Ordering Methods

**Phone:** (800) 462-7447. If you are calling after hours, you can leave us a message with your order and phone number.

**Fax:** (800) 535-3829.

**Internet:** <http://www.hauserandmiller.com/>. If you are a first time customer, please call us to setup an account and then you can use our internet ordering form. You can also email your orders directly to [support@hauserandmiller.com](mailto:support@hauserandmiller.com).

### Mail:

Hauser & Miller Co  
10950 Lin-Valle Dr.  
St. Louis MO, 63123

For your convenience, ordering and refining forms are provided at the end of this catalog.

## Payment Methods

**Credit Cards:** Visa, MasterCard, Discover, or American Express.

**Check, Money Order, and Wire Transfer:** We will provide the estimated cost of an order and then refund any overpayment or bill you for any underpayment. A 1.5% discount is offered for this method of payment.

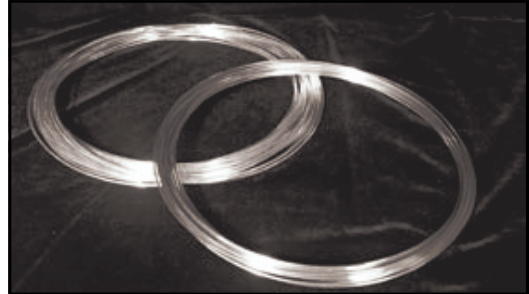
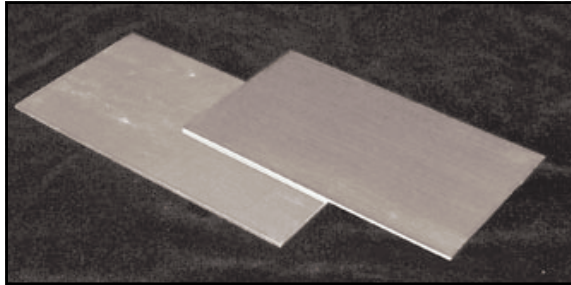
**COD:** If you have previously ordered, you may pay by COD. We recommend that you use Federal Express for this service, but also offer it through US Mail (\$1000 maximum) and UPS.

**Open Accounts:** Net 30-day terms are available for customers with approved credit. A 1.5% finance charge will be assessed each month after the initial 30 days if the balance is not paid in full. A 2.5% handling charge will be added to balances paid by credit card. A top rating in the Jewelers Board of Trade and/or Trade Credit References is considered in granting an account. If you have trade credit with other suppliers, request a credit application and we will review it as quickly as possible. If you are just starting out, we may consider extending a limited line of credit to customers who buy regularly for over a year.

## Shipment Methods

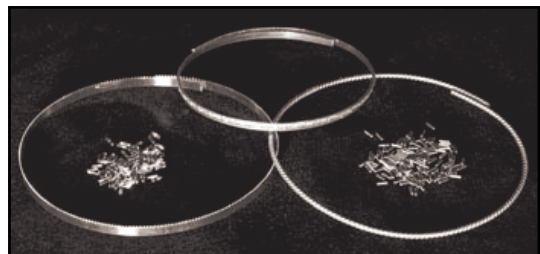
We ship packages through UPS, Federal Express, and US Mail from our location in St. Louis, Missouri. We provide numerous priority, express, and economy options. Insurance is provided on all packages at \$0.25 per \$100. Please call us to discuss what shipment method would best fit your price and timeline.

Phone: (800) 462-7447 • Fax: (800) 535-3829 • Email: [support@hauserandmiller.com](mailto:support@hauserandmiller.com)

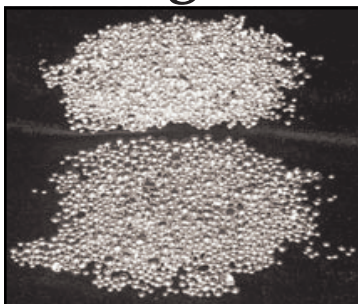


# Fabricated Metals

- Casting Grain
- Sheet
- Discs
- Round Wire
- Flat Wire
- Square Wire
- Half-Round Wire
- Cloisonné
- Special Silver Products
- Solders
- Tubing
- Bullion
- About Argentium Silver
- About Bi-Metal



# Casting Grain



We certify to comply with Gold and Silver Stamping Act on all of our grain and casting pieces. Our grain contains deoxidizing agents to facilitate problem free casting. Our pieces are cut from our sheet stock, which is alloyed for workability after casting.

K	Alloy Name & Color	Grain / Pcs	Density DWT / CU IN	Soldius Melt Pt °F	Liquidus Flow Pt °F	Casting Temp
10	Yellow AMP	Grain	119.3	1618	1666	1766
10	Yellow #7053	Pcs	126.4	1562	1634	1750
10	White	Grain	117.2	1780	1865	1965
10	White	Pcs	132.6	1690	1769	1869
14	Yellow T	Grain	135.3	1598	1670	1775
14	Yellow AMP	Pcs	135.3	1598	1670	1770
14	White #359	Grain	133.3	1705	1785	1900
14	White #525	Pcs	134.5	1724	1791	1890
14	Palladium White	Pcs	149.8	1974	2001	2125
14	Green	Pcs	145.1	1490	1576	1686
14	Pink	Pcs	138.9	1719	1737	1847
18	Yellow	Grain	161.4	1569	1605	1725
18	Regal	Grain	164.7	1650	1725	1825
18	Yellow	Pcs	162.8	1596	1652	1750
18	Pink	Pcs	159.1	1616	1688	1795
18	White	Pcs	155.0	1681	1738	1840
18	White	Grain	154.2	1681	1725	1850
18	Palladium White	Pcs	166.5	1947	1965	2075
18	Green	Pcs	165.2	1715	1746	1855
K	Alloy Name & Color	Grain / Pcs	OZ / CU IN	Soldius Melt Pt °F	Liquidus Flow Pt °F	Casting Temp
22	Yellow	Pcs				
24	Fine Gold	Pcs / Grain	10.18		1945	2045
	Sterling Silver	Grain	5.46	1475	1650	1730
	Argentium Sterling Silver	Grain	5.46	1410	1610	1750
	Fine Silver	Grain	5.57		1761	1850
	10% Iridium-Platinum	Pcs	11.35		3250	
	Pure Platinum	Pcs	11.3		3224	
	Ruthenium Palladium #839	Pcs	6.3		2900	
	Pure Palladium	Pcs	6.32		2831	

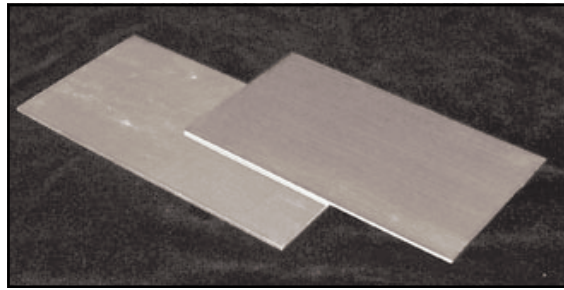
## Weight Conversion Factors for Wax to Metal

Metal	Factor	Metal	Factor
Brass & Copper	9.0	10K Gold	11.6
Sterling Silver	10.4	14K Gold	13.4
Fine Silver	10.6	18K Gold	15.5
Fine Gold	19.3	22K Gold	17.3
Platinum	21.3	Palladium	12.2

Take the weight of the wax (with the sprue) times the factor and add 10 to 20% more for the button.

Phone: (800) 462-7447 • Fax: (800) 535-3829 • Email: support@hauserandmiller.com

# Sheet



- 10K Yellow & White Gold
- 14K Yellow, White, Pink, & Green Gold
- 18K Yellow, White, Pink, & Green Gold
- 14K & 18K Palladium White Gold
- 18K & 22K Bi-metal
- Argentium Sterling Silver
- 22K Yellow & 24K Fine Gold
- Palladium & Ruthenium Palladium
- Fine Silver & Sterling Silver
- Platinum & Iridium Platinum
- Reticulation Silver

*Approximate weight per square inch. Karat gold in pennyweights(dwt) - 24K gold/silver in ounces(oz)*

	GA	IN	MM	10K	14K	18K	24K	Plat.	Pall.	Sterling/ Fine	Argentium
█	6	0.162	4							0.89	
█	PLT	0.150	3.7	18.30	20.70	24.60		33.80	19.00		
█	8	0.128	3	15.70	17.70	21.00	1.31	28.80	16.20	0.7	
█	9	0.114		14.00	15.70	18.70	1.17	25.70	14.40		
█	10	0.101	2.5	12.40	13.90	16.60	1.04	22.80	12.80	0.55	
█	11	0.091		11.10	12.60	14.90	0.91	20.50	11.50		
█	12	0.080	2	9.85	11.00	13.10	0.82	18.00	10.10	0.44	
█	13	0.072	1.7	8.77	9.94	11.80	0.74	16.20	9.10		
█	14	0.064	1.5	7.81	8.83	10.50	0.66	14.40	8.09	0.35	
█	15	0.057		6.69	7.87	9.35	0.59	12.80	7.20		
█	16	0.051	1.25	6.21	7.04	8.36	0.52	11.50	6.45	0.28	0.28
█	17	0.045		5.52	6.21	7.38	0.46	10.10	5.69		
█	18	0.040	1	4.91	5.52	6.56	0.41	9.01	5.06	0.22	0.22
█	19	0.036		4.38	4.97	5.90	0.37	8.11	4.55		
█	20	0.032	0.75	3.90	4.42	5.25	0.33	7.21	4.04	0.18	0.18
█	21	0.028		3.47	3.86	4.59	0.27	6.31	3.54		
█	22	0.025	0.625	3.09	3.45	4.10	0.26	5.63	3.16	0.14	0.14
█	23	0.023		2.75	3.17	3.77	0.24	5.18	2.91		
█	24	0.020	0.5	2.45	2.76	3.28	0.20	4.51	2.53	0.11	0.11
█	25	0.018		2.18	2.48	2.95	0.18	4.06	2.28		
█	26	0.016		1.94	2.21	2.62	0.16	3.60	2.02	0.09	
█	27	0.014		1.73	1.93	2.30	0.14	3.15	1.77		
█	28	0.013		1.54	1.79	2.13	0.13	2.93	1.64	0.07	
█	29	0.011		1.37	1.52	1.80	0.11	2.48	1.39		
█	30	0.010		1.22	1.38	1.64	0.10	2.25	1.26	0.05	

*Blank spaces indicate unavailable items.*

*Fine gold supplied in thickness .150" to .003".*

*Sterling supplied up to 12" x 24" in even gauges (12 - 26ga). Exceptions can be special ordered.*

*Call for availability on palladium and platinum sheet.*

# Sheet—Continued

## **GOLD, PLATINUM, AND PALLADIUM**

These sheets are stocked in 3" widths and no greater than 12" in length. Sheets are available in any thickness from .150" to .010". Sheets 30 gauge or less are restricted to pure material (.9995+) and are rolled in smaller widths and lengths to achieve flatness requirements (2" width or less is recommended). Wider sheets may be supplied on special request up to 6" in medium gauges (i.e. 18 or 20 gauge). Please call to discuss your requirements.

## **BI-METAL AND RETICULATION SILVER**

Both sheets are stocked in 3" widths and no greater than 12" in length. An additional charge applies for widths less than 3". 18K Bi-Metal is carried in 20, 24, and 26 gauge thickness. 22K Bi-Metal is carried in 18 and 24 gauge thickness. Reticulation silver is carried in 14 to 30 gauge thickness and is not already reticulated.

## **12" WIDE—STERLING SILVER AND FINE SILVER**

Both are available in 12" x 24" maximum dimensions in 16, 18, 20, 22, 24, and 26 gauge thickness. In sterling silver, 12 and 14 gauges are also available. If the width exceeds 6", then an additional cost is incurred (i.e. 7" x 11"). Normal stock width is 6" x 24" from 8 to 30 gauge. Sheets are cut to any width or length as long as they are less than stock size.

## **TEMPER**

Karat gold sheet is provided in 1/4 hard temper (annealed 1 B&S gauge before final reduction) unless otherwise requested. Dead soft or hard temper are available upon request at no extra charge. Sterling sheet is provided in soft temper unless otherwise requested. Hard temper sterling silver is restricted to 6" maximum width and is subject to an additional charge for the tempering.

## **BLANKS**

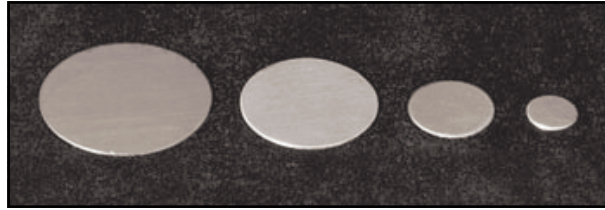
Blanks refers to metal sheets that are cut smaller than certain minimum dimensions for each respective type of metal. Since there is a significant amount of additional effort required to cut multiple small pieces, an additional charge is added to the normal sheet prices.

Sheet pieces less than the following sizes will have a charge added:

- Any gold sheet:   Single pieces - less than 1/2" square  
                          Multiple pieces - less than 1" square
- Any silver sheet:  Single pieces - less than 3" square  
                          Multiple pieces - less than 6" square



# Discs



- 10K Yellow & White Gold
- 14K Yellow, White, Pink, & Green Gold
- 18K Yellow, White, Pink, & Green Gold
- 14K & 18K Palladium White Gold
- 18K & 22K Bi-metal
- Argentium Sterling Silver
- 22K Yellow Gold & 24K Fine Gold
- Palladium & Ruthenium Palladium
- Platinum & Iridium Platinum
- Fine Silver & Sterling Silver
- Reticulation Silver

*Approximate weight per disc in 18ga (.040"). Gold in pennyweights (dwt) - Silver in ounces (oz)*

Coin Size	Fraction IN	Decimal IN	MM	10K	14K	18K	Platinum	Palladium	Silver
	1/8	0.125	3.1	0.06	0.07	0.08	0.11	0.06	0.003
	3/16	0.188	4.8	0.13	0.15	0.18	0.25	0.14	0.006
	1/4	0.250	6.4	0.24	0.27	0.32	0.44	0.25	0.011
	5/16	0.313	7.8	0.38	0.43	0.51	0.70	0.39	0.017
	3/8	0.375	9.5	0.54	0.61	0.73	1.00	0.56	0.024
	7/16	0.438	10.9	0.74	0.84	1.00	1.37	0.77	0.033
	1/2	0.500	12.7	0.96	1.08	1.29	1.78	0.99	0.043
	17/32	0.531	13.3	1.09	1.23	1.47	2.02	1.13	0.048
	9/16	0.562	14.3	1.21	1.37	1.63	2.25	1.26	0.054
	5/8	0.625	15.9	1.50	1.69	2.02	2.77	1.55	0.067
Dime	11/16	0.687	17.4	1.81	2.04	2.44	3.36	1.88	0.081
Penny	3/4	0.750	19.1	2.15	2.43	2.90	3.99	2.23	0.096
Nickel	13/16	0.812	20.6	2.53	2.86	3.41	4.69	2.62	0.113
	7/8	0.875	22.2	2.93	3.31	3.95	5.44	3.04	0.131
Quarter	1	1.000	25.4	3.83	4.33	5.16	7.10	3.97	0.172
	1 1/8	1.125	28.6	4.85	5.48	6.53	8.99	5.03	0.217
	1 3/16	1.187	30.1	5.40	6.10	7.28	10.01	5.60	0.242
Half Dollar	1 1/4	1.250	31.8	5.98	6.76	8.06	11.09	6.21	0.268
	1 3/8	1.375	34.9	7.24	8.18	9.75	13.42	7.51	0.324
Dollar	1 1/2	1.500	38.1	8.62	9.73	11.61	15.98	8.94	0.386
	1 5/8	1.625	41.3	10.11	11.42	13.62	18.75	10.49	0.453
	1 3/4	1.750	44.5	11.73	13.25	15.80	21.75	12.16	0.525
	2	2.000	50.8	15.32	17.3	20.64	28.40	15.89	0.686

*3/16" to 2" diameter from 10 to 30 gauge.*

*Silver supplied in even gauges only.*

*Argentium is supplied in 16, 18, 20, 22, and 24 gauge.*

# Round Wire



- 10K Yellow & White Gold
- 14K Yellow, White, Green, & Pink Gold
- 18K Yellow, White, Green, & Pink Gold
- 22K Yellow Gold
- Argentium Sterling Silver
- 24K Fine Gold
- Palladium & Ruthenium Palladium
- Platinum & Iridium Platinum
- Fine Silver & Sterling Silver

*Approximate weight per foot. Karat gold in pennyweights (dwt) - 24K gold and silver in ounces (oz)*

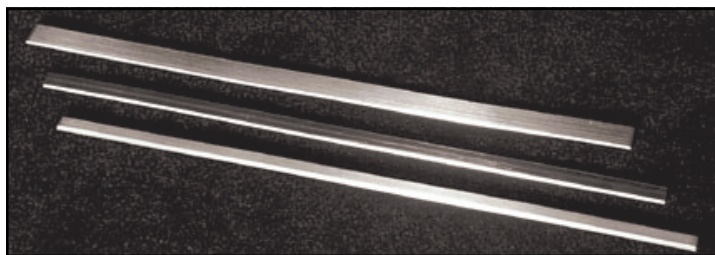
	GA	IN	MM	10K	14K	18K	22K	24K	Plat.	Pall.	Sterling Silver	Argentium Silver	Fine Silver
●	2	0.257	6								3.41		3.450
●	4	0.204	5								2.14		
●	6	0.162	4	30.74	34.70	40.60		2.52	56.00	31.20	1.36		
●	8	0.128	3	19.00	21.40	25.60		1.58	35.20	19.70	0.85	0.85	0.860
●	10	0.101	2.5	11.90	13.50	16.10	18.71	1.00	22.20	12.40	0.53	0.53	0.540
●	12	0.080	2	7.50	8.50	10.10	11.80	0.63	13.90	8.00	0.34	0.34	0.340
●	14	0.064	1.5	4.72	5.33	6.36	7.37	0.39	8.70	4.90	0.21	0.21	0.214
●	15	0.057		3.74	4.23	5.04		0.31	6.90	3.90			
●	16	0.051	1.25	2.97	3.35	4.00	4.68	0.25	5.50	3.10	0.13	0.13	0.135
●	17	0.045		2.35	2.66	3.17		0.20	4.36	2.44			
●	18	0.040	1	1.84	2.06	2.42	2.88	0.16	3.46	1.94	0.084	0.084	0.085
●	19	0.036		1.48	1.67	1.99		0.12	2.74	1.53			
●	20	0.032	0.75	1.17	1.38	1.58	1.84	0.10	2.18	1.22	0.053	0.053	0.053
●	21	0.028		0.93	1.05	1.25		0.08	1.73	0.97			
●	22	0.025	0.625	0.74	0.83	0.99	1.12	0.06	1.37	0.77	0.033	0.033	0.034
●	23	0.023			0.66								
●	24	0.020	0.5	0.46	0.52	0.63	0.72	0.04	0.86	0.48	0.021		0.021
●	26	0.016		0.29	0.33	0.39	0.46	0.02	0.54	0.30	0.013		0.013
●	28	0.013			0.21		0.30	0.015	0.34	0.19			0.008
●	30	0.010			0.13		0.18	0.009	0.21	0.11			0.005

*Odd gauges and blank spaces are non-stocked items.  
See page 14 for special shaped silver wires.*

## WIRE TEMPER




































Round wire is supplied in coil form and soft tempered unless requested otherwise. Hard temper wire is annealed and drawn hard through four gauges and is provided in 14K yellow gold stock sizes of 10, 12, and 14 gauge at no extra charge. Additional charges apply for other requested sizes and materials.

# Flat Wire



- 10K Yellow & White Gold
- 14K Yellow, White, Pink, & Green Gold
- 18K Yellow, White, Pink, & Green Gold
- 14K & 18K Palladium White Gold
- Argentium Sterling Silver
- 22K Yellow & 24K Fine Gold
- Palladium & Ruthenium Palladium
- Platinum & Iridium Platinum
- Sterling Silver

*Approximated weight per foot. Gold in pennyweights (dwt) - Silver in ounces (oz)*

	MM	10K	14K	18K	Platinum	Palladium	Sterling Silver	Argentium Silver
	8 x 4	72.57	81.96	97.73	135.11	95.23	3.25	
	8 x 3	54.42	61.47	73.30	101.33	71.42	2.44	
	8 x 2.5	45.35	51.22	61.08	84.44	59.52	2.03	
	8 x 2	36.28	40.98	48.87	67.56	47.62	1.62	
	8 x 1.5	27.21	30.73	36.65	50.67	35.71	1.22	
	8 x 1	18.14	20.49	24.43	33.78	23.81	0.81	
	7 x 4	63.50	71.71	85.52	118.22	83.33	2.84	
	7 x 3	47.62	53.79	64.14	88.67	62.50	2.13	
	7 x 2.5	39.68	44.82	53.45	73.89	52.08	1.78	
	7 x 2	31.75	35.86	42.76	59.11	41.66	1.42	
	7 x 1.5	23.81	26.89	32.07	44.33	31.25	1.07	
	7 x 1.25	19.84	22.41	26.72	36.94	26.04	0.89	
	7 x 1	15.87	17.93	21.38	29.56	20.83	0.71	
	6 x 4	54.42	61.47	73.30	101.33	71.42	2.44	
	6 x 3	40.82	46.10	54.97	76.00	53.57	1.83	
	6 x 2.5	34.02	38.42	45.81	63.33	44.64	1.52	
	6 x 2	27.21	30.73	36.65	50.67	35.71	1.22	
	6 x 1.5	20.41	23.05	27.49	38.00	26.78	0.91	
	6 x 1	13.61	15.37	18.32	25.33	17.86	0.61	
	5.5 x 3	37.42	42.26	50.39	69.67	49.10	1.67	
	5.5 x 2.5	31.18	35.22	41.99	58.06	40.92	1.40	
	5.5 x 2	24.94	28.17	33.60	46.44	32.74	1.12	
	5.5 x 1	12.47	14.09	16.80	23.22	16.37	0.56	
	5 x 4	45.35	51.22	61.08	84.44	59.52	2.03	
	5 x 3	34.02	38.42	45.81	63.33	44.64	1.52	
	5 x 2.5	28.35	32.02	38.18	52.78	37.20	1.27	
	5 x 2	22.68	25.61	30.54	42.22	29.76	1.01	
	5 x 1.5	17.01	19.21	22.91	31.67	22.32	0.76	
	5 x 1.25	14.17	16.01	19.09	26.39	18.60	0.63	
	5 x 1	11.34	12.81	15.27	21.11	14.88	0.51	
	4.5 x 3	30.61	34.58	41.23	57.00	40.18	1.37	
	4.5 x 2.5	25.51	28.81	34.36	47.50	33.48	1.14	
	4.5 x 2	20.41	23.05	27.49	38.00	26.78	0.91	
	4.5 x 1.5	15.31	17.29	20.62	28.50	20.09	0.69	
	4.5 x 1	10.20	11.53	13.74	19.00	13.39	0.46	

# Flat Wire—Continued

Approximated weight per foot. Gold in pennyweights (dwt) - Silver in ounces (oz)

	MM	10K	14K	18K	Platinum	Palladium	Sterling Silver	Argentium Silver
■	4 x 3	27.21	30.73	36.65	50.67	35.71	1.22	
■	4 x 2.5	22.68	25.61	30.54	42.22	29.76	1.01	
■	4 x 2	18.14	20.49	24.43	33.78	23.81	0.81	0.81
■	4 x 1.5	13.61	15.37	18.32	25.33	17.86	0.61	0.61
■	4 x 1.25	11.34	12.81	15.27	21.11	14.88	0.51	0.51
■	4 x 1	9.07	10.24	12.22	16.89	11.90	0.41	0.41
■	3.5 x 3	23.81	26.89	32.07	44.33	31.25	1.07	1.07
■	3.5 x 2.5	19.84	22.41	26.72	36.94	26.04	0.89	0.89
■	3.5 x 2	15.87	17.93	21.38	29.56	20.83	0.71	0.71
■	3.5 x 1.5	11.91	13.45	16.03	22.17	15.62	0.53	0.53
■	3.5 x 1	7.94	8.96	10.69	14.78	10.42	0.36	0.36
■	3 x 2.5	17.01	19.21	22.91	31.67	22.32	0.76	0.76
■	3 x 2	13.61	15.37	18.32	25.33	17.86	0.61	0.61
■	3 x 1.5	10.20	11.53	13.74	19.00	13.39	0.46	0.46
■	3 x 1.25	8.50	9.60	11.45	15.83	11.16	0.38	0.38
■	3 x 1	6.80	7.68	9.16	12.67	8.93	0.30	0.30
■	2.5 x 2	11.34	12.81	15.27	21.11	14.88	0.51	0.51
■	2.5 x 1.5	8.50	9.60	11.45	15.83	11.16	0.38	0.38
■	2.5 x 1.25	7.09	8.00	9.54	13.19	9.30	0.32	0.32
■	2.5 x 1	5.67	6.40	7.64	10.56	7.44	0.25	0.25
■	2 x 1.5	6.80	7.68	9.16	12.67	8.93	0.30	0.30
■	2 x 1.25	5.67	6.40	7.64	10.56	7.44	0.25	0.25
■	2 x 1	4.54	5.12	6.11	8.44	5.95	0.20	0.20
■	1.5 x 1	3.40	3.84	4.58	6.33	4.46	0.15	0.15

Supplied in 1' lengths unless otherwise requested.

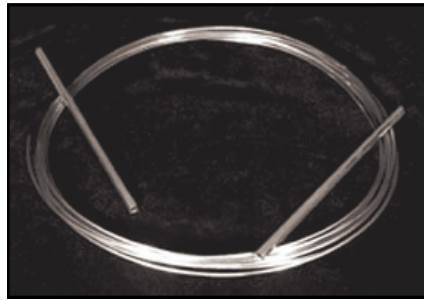
## SIZING WIRE SPECIFICATIONS

Sizing wire is supplied in 1' lengths unless otherwise requested. The minimum quantity for gold, platinum, and palladium is 1" for stock sizes and 3" for special order sizes.

## WIRE TEMPER

Our sizing wire, except sterling silver, is provided in soft temper. Soft temper wire is annealed after the finished wire size is reached. Hard temper can be provided upon request in square wire and in some of the flat stock sizes. Annealed metal is provided in a brushed finished, which can be polished.

# Square Wire



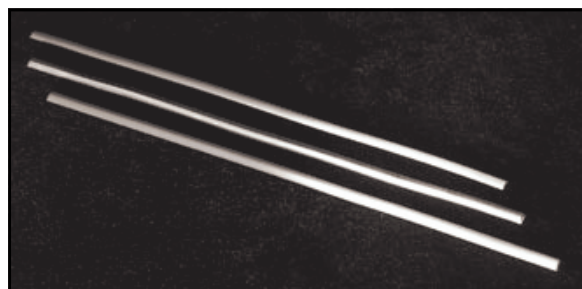
- 10K Yellow & White Gold
- 14K Yellow, White, Pink & Green Gold
- 18K Yellow, White, Pink & Green Gold
- 14K & 18K Palladium White Gold
- Argentium Sterling Silver
- 22K Yellow & 24K Fine Gold
- Palladium & Ruthenium Palladium
- Platinum & Iridium Platinum
- Sterling Silver

*Approximate weight per foot. Gold in pennyweights (dwt) - Silver in ounces (oz)*

	MM	GA	10K	14K	18K	Platinum	Palladium	Sterling Silver	Argentium Silver
■	12.5 x 12.5	1/2"						16.380	
■	9.4 x 9.4	3/8"						9.210	
■	6 x 6	2	83.26	95.00	109.70	156.90	87.38	3.725	
■	5 x 5	4	58.04	64.89	74.25	107.20	59.70	2.541	
■	4 x 4	6	36.88	41.32	50.66	69.18	37.86	1.616	
■	3.5 x 3.5		27.56	31.40	37.02	53.52	29.80		
■	3 x 3	8	20.48	23.06	26.64	37.54	21.06	0.915	
■	2.5 x 2.5	10	14.38	16.64	19.20	26.68	15.08	0.671	0.671
■	2 x 2	12	9.16	10.36	12.04	17.06	9.72	0.430	0.430
■	1.5 x 1.5	14	4.92	6.00	6.48	9.16	5.18	0.259	0.259
■	1.25 x 1.25	16	3.62	4.18	4.58	6.48	3.78	0.160	0.160
■	1 x 1	18	2.24	2.42	2.94	4.16	2.32	0.107	
■	.75 x .75	20						0.067	
■	.6 x .6	22						0.040	
■	.5 x .5	24						0.026	

*Blank spaces indicate unavailable items.*

# Half-Round Wire



- 10K Yellow & White Gold
- 14K Yellow & White Gold
- 18K Yellow Gold
- Sterling Silver
- Argentium Sterling Silver
- Iridium Platinum

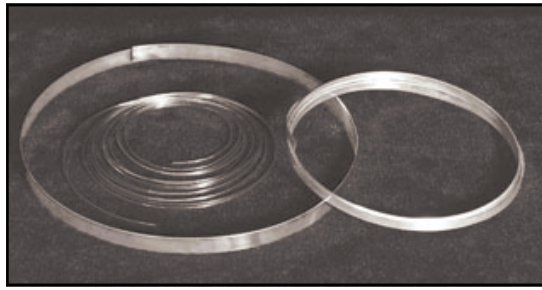
*Approximated weight per foot. Gold in pennyweights (dwt) - Silver in ounces (oz)*

	MM	GA	10K	14K	18K	Platinum	Sterling Silver	Argentium Silver
◐	6 x 3	2					1.260	
◑	6 x 2		20.84	24.54	29.18	40.54		
◒	6 x 1.5		15.88	18.18	20.96	28.56		
◓	5 x 2.5	4	24.10	27.17	32.37	42.44	1.075	
◔	5 x 2		17.98	20.48	26.30	33.76		
◕	5 x 1.5		14.82	16.32	18.54	26.80		
◖	4 x 2	6	15.50	17.67	20.22	28.10	0.691	0.691
◗	4 x 1.5		12.02	13.56	15.76	21.84		
◘	3 x 1.5	8	9.16	10.56	12.50	14.84	0.420	0.420
◙	2.5 x 1.25	10	6.04	6.60	7.74	10.57	0.270	0.270
◚	2 x 1.5		6.24	7.06	7.96	11.28		
◛	2 x 1	12	3.79	4.28	5.10	7.02	0.169	0.169
◜	1.5 x 1		3.10	3.46	3.76	6.03		
◝	1.5 x .75	14					0.106	0.106
◞	1.25 x .62	16					0.067	0.067
◟	1 x .5	18					0.045	
◠	.75 x .4	20					0.028	

*Blank spaces indicate non-stocked items.*

*Pink and green half-round wires available in some sizes. Please call to discuss specifics.  
See page 14 for special shaped silver wires.*

# Bezel Strip



- 10K Yellow & White Gold
- 14K Yellow, White, Pink, & Green Gold
- 18K Yellow, White, Pink, & Green Gold
- 14K & 18K Palladium White Gold
- 22K Yellow Gold
- Palladium & Ruthenium Palladium
- Platinum & Iridium Platinum
- Fine Silver & Sterling Silver

*Approximated weight per foot. Gold in pennyweights (dwt) - Silver in ounces (oz)*

	IN	MM	10K	14K	18K	22K	Platinum	Palladium	Sterling Silver	Fine Silver
—	1/4 x 26ga	6	5.82	6.57	7.86	9.74	10.80	6.06	0.261	0.264
—	1/4 x 28ga		4.65	5.25	6.25	7.75	8.60	4.80	0.207	0.209
—	1/4 x 30ga		3.67	4.15	4.95	6.14	6.79	3.80	0.164	0.166
—	3/16 x 26ga	4.5	4.37	4.93	5.90	7.31	8.10	4.55	0.196	0.199
—	3/16 x 28ga		3.49	3.94	4.69	5.82	6.45	3.60	0.156	0.157
—	3/16 x 30ga		2.76	3.12	3.72	4.61	5.10	2.85	0.124	0.125
—	1/8 x 26ga	3	2.91	3.29	3.93	4.87	5.40	3.03	0.131	0.132
—	1/8 x 28ga		2.33	2.63	3.13	3.88	4.30	2.40	0.104	0.105
—	1/8 x 30ga		1.84	2.08	2.48	3.07	3.40	1.90	0.082	0.083

*Additional sizes available upon request.  
See page 14 for sterling silver step bezel.*

## WIRE TEMPER

Our bezel wire is provided in soft temper. Soft temper wire is annealed after the finished wire size is reached. Our 22K bezel is shipped with temper unless otherwise requested. Annealed metal is provided in a brushed finished, which can be polished.

## Cloisonné

- 24K Fine Gold
- Fine Silver

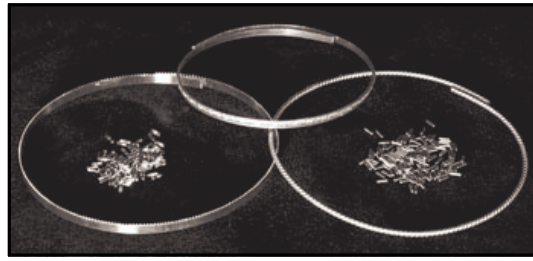
*Approximate weight per foot. Gold and silver in ounces (oz)*

IN	MM	24K	Fine Silver
.003 x .045		0.0165	0.0089
.004 x .028		0.0137	0.0074
.004 x .032		0.0156	0.0084
.004 x .040		0.0195	0.0106
.005 x .040*	1	0.0245	0.013
.005 x .050		0.0306	0.0165
.005 x .064		0.0391	0.0212
.005 x .078		0.0477	0.0258
.008 x .032*	.75	0.0312	0.017
.010 x .032		0.0391	0.0212
.010 x .040		0.0489	0.0265
3/32 x .012		0.1377	0.0745

*\* Asterisks indicate stock sizes.*

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# Special Silver Products



## Sterling Half-Bead Wire

GA	DIA	OZ / FT	LEN / OZ
7	0.144"	0.408	2' 5"
10	0.101"	0.205	4' 11"
12	0.081"	0.128	7' 10"
14	0.064"	0.110	9' 1"

## Sterling Double Half-Round

	GA	Base	Height	OZ / FT
	8	0.250"	0.065"	1.080
	10	0.200"	0.050"	0.535
	12	0.157"	0.040"	0.370
	14	0.128"	0.030"	0.222

## Sterling Full-Round Bead Wire

GA	DIA	OZ / FT	LEN / OZ
8	0.128"	0.65	1' 6.5"
10	0.101"	0.38	2' 7.5"
12	0.081"	0.24	4' 2"
14	0.064"	0.17	5' 10.5"
16	0.051"	0.13	7' 8"

## Sterling Twist Wire

GA	MM	OZ / FT
16	1.3	7.75
14	1.6	5.33
12	2	3.20
8	3.25	1.38

## Sterling Step Bezel

Step Height	Total Height	Base Width	OZ / FT
0.037"	0.095"	0.044"	0.155
0.045"	0.095"	0.045"	0.140
0.078"	0.127"	0.055"	0.255
0.045"	0.131"	0.044"	0.185

## Sterling Seamless Tubing

OD	ID	Thickness	OZ / FT
0.375"	0.343"	0.016"	1.235
0.500"	0.468"	0.016"	1.646

## Sterling Tube Beads

DESC	MM	Pieces / OZ
Plain 5/32"	4	1200
Twist 5/32"	4	963

## Sterling Square Tubing

	OD	ID	Thickness	OZ / FT
	0.117"	0.067"	0.025"	0.58
	0.102"	0.082"	0.010"	0.16

## Sterling Triangle Wire

	Base	Height	OZ / FT
	0.380"	0.225"	3.16
	0.258"	0.160"	1.643
	0.175"	0.090"	0.644
	0.156"	0.111"	0.705
	0.122"	0.095"	0.519
	0.103"	0.081"	0.399
	0.080"	0.064"	0.245
	0.050"	0.042"	0.103

## Sterling Low Dome Wire

	Base	Height	OZ / FT
	0.575"	0.070"	2.010
	0.515"	0.072"	1.730
	0.412"	0.062"	1.120
	0.232"	0.072"	0.883
	0.170"	0.040"	0.340

## Fine Silver Strip Serrated

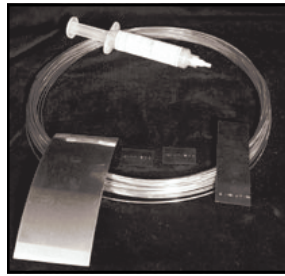
GA	Width	OZ / FT	LEN / OZ
28	1/8"	0.082	12' - 2"
28	3/16"	0.136	7' - 4"

## Fine Silver Strip Scalloped

GA	Width	OZ / FT	LEN / OZ
28	1/8"	0.093	10' - 9"
28	3/16"	0.143	7'



# Solders



## Hauser & Miller CIF Solders (Supplied in 1 and 5 dwt pieces.)

Karat	Trade Name	Content	Solidus °F	Liquidus °F
6	Yellow Easy	25.15%	1305	1345
	White Medium		1280	1395
8	Yellow Easy	33.484%	1280	1300
	White Medium		1265	1270
10	Yellow X-Easy	41.81%	1250	1285
	Yellow Easy*		1290	1320
	Yellow Medium		1335	1390
	Yellow Hard		1395	1450
	White Easy		1270	1275
	White Hard		1295	1350
14	Yellow Easy	58.484%	1265	1285
	Yellow Medium		1330	1390
	Yellow Hard		1400	1440
	White Easy		1290	1295
	White Hard		1335	1445
18	Yellow Easy	75.00%	1300	1360
	Yellow Medium		1350	1435
	Yellow Hard		1440	1530
	White Easy		1575	1580
19	White Hard	79.317%	1440	1640

Paste solders: 10K yellow easy and hard - 14K yellow easy, 14K yellow hard, and white medium.

CIF means cadmium and indium free.

\* Also recommended for green gold.

## Engelhard Formula Solders (Supplied in 1 and 5 dwt pieces.)

Number	Karat	Color / Melt	Flow Point °F
565A	8	Yellow Easy	1153
569A	10	Yellow Easy	1310
569B	10	Yellow Hard	1463
601	10	White Medium	1333
564A	14	Yellow Easy	1404
564B	14	Yellow Hard	1481
602	14	White Easy	1373
699	19	White Hard	1634

## Special Color Solders (Supplied in 1 dwt pieces.)

Karat	Color	Flow Point °F
14	Pink Hard	1425
14	Green Hard	1425

# Solders – Continued

## Noble Brand Repair Solders (Supplied in 1 dwt pieces.)

Yellow	Flow Point °F	White	Flow Point °F
Low-Y	1325	Low-W	1390
10-Y	1320	10-W	1410
14-Y	1315	14-W	1430
18-Y	1450	18-W	1525

*Noble solders are lower karat solders and are easy flowing for repair work. Their number represents the karat of gold they are designed to work with.*

## Platinum Solders (Supplied in 1 dwt pieces.)

Number	Grade	°C	°F
1000	Extra Soft	1000	1832
1100	Soft	1100	2012
1200	Medium	1200	2192
1300	Medium Hard	1300	2372
1400	Hard	1400	2552
1500	Extra Hard	1500	2732
1600	Welding	1600	2912
1700	Iridio Weld	1700	3092
747	Extra High Weld	1773	3200

## Palladium Solders

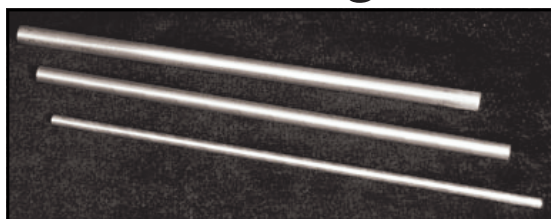
All palladium items use - platinum solders 1000-1400 grade  
 Palladium to white gold use - 19K white or 14K white hard  
 Palladium to yellow gold use - 10K yellow hard

## Silver Solders

Grade	Silver Content	Solidus °F	Liquidous °F	Heat Colors
			900	First Visible Red
			1100	Handy Flux Fluid
Extra Easy	56%	1145	1207	Dull Red
Easy	65%	1240	1325	
Medium	70%	1275	1360	
			1400	Borax Fluid
Hard	75%	1365	1450	Cherry Red
IT	80%	1340	1460	

*Sheet - 2" x 4" x 30ga - Approximate 1/2 ounce  
 Strip - 3/8" x 12" x 30ga - Approximate 1/4 ounce  
 Wire - 20ga B&S 21 ft/oz - 1/4 ounce minimum  
 Paste - 1/2 ounce tubes  
 Argentium solder available in wire and easy sheet.*

# Tubing



## Gold & Platinum Tubing

- 14K Yellow & White Gold • Ruthenium Platinum
- 18K Yellow Gold

*Approximate weight per foot in pennyweights. (dwt)*

	Wall Thickness	Size	MM	14K	18K	Platinum	Outside Diameter (IN)	Inside Diameter (IN)	Wire Insert
○	LIGHT	8L	3.25	5.96	7.18	9.80	0.125	0.105	10ga
○	0.010"	9L	2.85	5.56	6.48	8.90	0.114	0.094	11ga
○		10L	2.5	4.44	5.74	7.30	0.100	0.080	12ga
○		12L	2	3.50	4.38	5.75	0.080	0.060	15ga
○		13L	1.75	3.22	3.94	5.45	0.072	0.052	16ga
○		14L	1.5	2.84	3.46	4.66	0.064	0.046	18ga
○		16L	1.25	2.08	2.98	3.42	0.050	0.030	21ga
○		17L	1.125	1.72	2.56	3.00	0.045	0.025	22ga
○		18L	1	1.58	2.14	2.60	0.040	0.020	24ga
○	MEDIUM	6mm		17.26	20.22	28.34	0.232	0.200	5ga
○	0.15"	5mm		14.52	16.84	23.84	0.192	0.160	7ga
○		4mm		11.20	13.50	18.40	0.152	0.122	9ga
○	HEAVY	8H	3.25	11.06	13.56	18.16	0.125	0.085	12ga
○	0.20"	10H	2.5	8.06	9.96	13.23	0.100	0.060	15ga
○		12H	2	6.04	7.08	9.92	0.080	0.040	19ga

*All gold tubing sold in one foot lengths or multiples of 3".  
2mm diameter and over sold in multiples of one inch.*

## Sterling Silver Tubing

*Approximate weight per foot in ounces. (oz)*

	Outside Diameter (MM)	Outside Diameter (IN)	Wall Thickness (IN)	Weight Per FT OZ	Wire Insert
•	1	0.040	0.010	0.060	26ga
•	1.25	0.050	0.010	0.090	22ga
○	1.5	0.060	0.012	0.120	20ga
○	2	0.080	0.016	0.210	18ga
○	2.5	0.100	0.020	0.325	16ga
○	3	0.120	0.016	0.360	12ga
○	3.5	0.140	0.025	0.480	12ga
○	4	0.160	0.020	0.580	10ga
○	4.5	0.180	0.022	0.700	8ga
○	5	0.200	0.024	0.880	8ga
○	6	0.240	0.036	1.370	6ga

*Sold in 3" increments or lengths of one foot.*

*See page 14 for sterling tubing in square and larger sizes.*

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# Bullion



*\*\* Call for availability \*\**

## Fine Gold Bullion

### **BARS**

Bars are rough casted by request in 25 to 100 troy ounce ingots.

### **WAFERS**

Heavy sheet in 8 or 10 gauge cut to exact weight and stamped with our name, weight, and purity. Supplied in 1, 5, and 10 ounce wafers.

### **COINS**

U.S. Eagle Coins and Canadian Maple Leafs available for sale or return on refine lots. Other sizes and coins available upon special request.

## Fine Silver Bullion

### **BARS**

Rough casted in 50 and 100 ounce ingots and stamped with our name, weight, and purity.

### **ANODES**

Fine silver sheets for plating available in 1/4" x 4" x 18" or smaller. Other sizes available upon request if ordered in 200 ounce lots. Additional delivery time and special order charges apply.

# About Argentium Sterling Silver



## **BENEFITS**

Argentium™ Sterling Silver has many advantages in comparison to standard sterling silver:

- Firescale-free alloy.
- Highly tarnish-resistant.
- Lower heat and electrical conductivity, enabling the alloy to be resistance, plasma and laser welded.
- Annealed hardness is equal to standard sterling silver. Further hardening can be achieved by simple heat treatment (even after soldering).
- Increased ductility, to assist forming processes including spinning and stamping.
- Environmental advantages of a firescale-free alloy – cyanide and other hazardous chemicals used for stripping or plating over firescale, are eliminated.
- Production/finishing time is reduced.

## **ANNEALING**

Argentium™ Sterling Silver displays a paler colour when heated. To avoid overheating the alloy, annealing and soldering operations should be carried out in a darkened area. Furnace annealing should be carried out at 1050°F/565°C for approximately 30 minutes. During furnace annealing without a protective atmosphere, there may be some oxidation of the copper – any surface oxides can be easily removed with pickle.

## **SOLDERING**

Lower-temperature solders are recommended – medium, easy and extra-easy solders work best using standard soldering fluxes.

## **QUENCHING**

Argentium™ Sterling Silver will retain heat for longer than standard sterling silver. It is important to wait for any visible red heat to disappear from the alloy before quenching (this is best judged in a darkened area).

## **INVESTMENT CASTING**

Casting temperature range: 1750-1800°F/955-980°C. Argentium™ Sterling Silver displays a paler colour when heated/molten, therefore do not judge casting temperature by eye.

Flask temperature: Lower flask temperatures are recommended. For guidance, drop by a minimum of 85°F/30°C below regular temperatures used for standard sterling silver.

Crucibles: To avoid contamination from other alloys, it is important to use separate crucibles for Argentium™ Sterling Silver. Do not use silicon carbide crucibles.

Protective atmosphere/fluxing: A protective atmosphere is recommended when melting Argentium™ Sterling Silver. If a protective atmosphere is not available, flux can be used (boric acid is recommended). Skim any oxides off the surface before stirring.

# About Argentium Sterling Silver—Continued

Hardness – wet investment removal: Leave flasks to cool for 20-25 minutes before quenching. This will give castings approximately the same hardness as standard sterling silver (70HV). To raise the hardness to approximately 95HV, heat castings at 580°F/300°C for 30-45 minutes and air cool to room temperature.

Hardness – dry investment removal: Leave flasks to cool to room temperature before removing castings from the investment. This will give Argentium™ Sterling Silver a hardness of approximately 100HV.

Precipitation hardening: For hardness above 100HV, follow precipitation hardening instructions.

Remelting: Use at least a 50% fresh/50% scrap mix. For high-quality pieces, using more fresh metal will yield superior results. It is important that used trees and buttons are free from investment powder residue, to avoid contamination.

## **PRECIPIATION HARDENING**

The following steps will achieve a hardness of approximately 120HV:

1. Heat the alloy to a pale-red annealing temperature (approximately 1050°F/565°C, wait until any visible red heat has disappeared and then water quench.
2. Precipitation harden by heating the alloy at 580°F/300°C for approximately 30-45 minutes and air cool to room temperature.

## **FINISHING PROCESSES**

Polishing: It is important to use separate polishing wheels for Argentium™ Sterling Silver, to avoid contamination from other alloys. If this is not possible, thoroughly rake wheels before use.

Degreasing/cleaning solutions: It is important to use neutral pH degreasing/cleaning solutions (pH6-pH8) with Argentium™ Sterling Silver. Thoroughly rinse degreased articles with water and carefully dry to avoid water spotting.

Tumble finishing: Successful tumble finishing has been achieved using rough cut with epoxy cones and triangles in a vibratory tumbler and steel-shot mixture in a rotary tumbler. It is very important to maintain clean shot and solution.

Chemical treatment: Treatment processes, such as blackening with liver of sulphur, will take longer.

# About Bi-Metal

## 18K & 22K Yellow on Sterling Silver Bi-Metal

### DESCRIPTION AND USE

A layer of 18 karat gold alloy with a rich yellow color or 22 karat gold alloy with a bright yellow color is bonded with sterling silver to form a sheet of precious metal with two distinct surfaces. The 18K gold layer is similar to that of most gold filled products while the 22K is two to three times thicker than gold filled products giving it more workability. Surface treatments, such as engraving, scraping, folding, and twisting, can be used to accent the two surfaces.

### COMPOSITION

	18K		22K
By weight:	5.00% 18 karat gold		12.50% 22 karat gold
	95.00% sterling silver		87.50% sterling silver
By volume:	3.38% 18 karat gold		7.63% 22 karat gold
	96.62% sterling silver		92.36% sterling silver
24 gauge:	.00068" thick 18 karat layer	24 gauge:	.001534" thick 22 karat layer
	.01942" thick sterling layer		.018565" thick sterling layer
20 gauge:	.001082" thick 18 karat layer	18 gauge:	.003076" thick 22 karat layer
	.030918" thick sterling layer		.037223" thick sterling layer
26 gauge:	.00054" thick 18 karat layer		
	.01546" thick sterling layer		

### MELTING POINT

18K: Solidus: 1620 °F / 882 °C  
Liquidus: 1715 °F / 935 °C  
22K: Solidus: 1780 °F / 971 °C  
Liquidus 1840 °F / 1003 °C  
Sterling: Solidus: 1435 °F / 780 °C  
Liquidus: 1640 °F / 890 °C

Between 1600 °F and 1650 °F silver side will begin to flow and reticulate below the gold layer.

### ANNEALING TEMPERATURE

1140 °F to 1300 °F

### SOLDERING

On gold surface use: 14K or 18K yellow easy (soft) solder  
On sterling surface use: easy or medium silver solder

### DENSITY

	18K	22K
Specific gravity (GM per cubic CM):	10.53718	10.9367
Ounces per cubic inch:	5.5516	5.7621
Ounces per square inch:	20 gauge: .17765"	18 gauge: .23221"
	24 gauge: .11159"	24 gauge: .11583"
	26 gauge: .08883"	

### STOCK SIZES

Sheet and circles: 18K: 20 and 24 gauge  
22K: 18 and 24 gauge  
Sheet: minimum 1" x 1" maximum 3" x 12"  
Circles: 1/4" diameter to 2" diameter



# Refining Services

Refining & "As-Is" Metal Purchases

Gold • Silver • Platinum • Palladium





# Services Provided

Since our inception in 1909, we have featured precious metals refining. This specialty has brought recognition from customers who agree that the refining process is a special craft; one that requires knowledge of precious metals that only experience can provide. This capability has been an important legacy of the founding members of Hauser & Miller.

We work with customers to determine the best and most economical method to process the materials entrusted to us and proceed with the course that will provide the highest net return. In addition to our speed, accuracy, and resourceful command on the craft, we tailor our refine returns to meet the needs of our customers. Completed jobs may be returned in the form of a check, account credit, wire transfer (\$2000 minimum), or metal (1.5% discount available). Unless notified in advance, the returned form will be a check.

## Refining

Lots containing scrap and waste of unknown metal content that require refining or assaying to determine the metal content are processed as a refining job. We assay "gold only" for a quick turnaround and a lower assaying fee. At your request, we also offer an assay for silver, platinum, and palladium.

### OUR PROCEDURE

1. Upon receipt, all packages are weighed prior to opening. Your package of scrap is carefully opened and the contents are weighed again. If our weight differs from yours, we will contact you before further processing.
2. We then issue an acknowledgment report of weights, materials description, and anticipated form of settlement.
3. Your material is then melted into a bar, which is sampled and assayed to determine the exact precious metal content. Sweeps are burned and milled into a fine powder, which is mixed and assayed multiple times for accuracy.
4. On completion, a settlement report is issued showing the metal record and terms. The report is sent with your check and/or returned metal.

### SETTLEMENT TIME

Scrap: 1 week (filings and meltable scrap)

Sweeps: 2 - 4 weeks

### "As-Is" Metal Purchases

In addition to our refining service, we also purchase metal of a known grade on an "as is" basis. This typically consists of small shipments of scrap, either stamped jewelry or pieces large enough to efficiently test with acid. Small lots of filings and clippings too small to offset the minimum refining charge can also be included as a metal purchase. These lots are melted into a button and then acid tested to determine the karat. At your request, larger lots can also be handled this way if a quick return or current market is a priority.

All metal purchased is held for a 10 day approval pending your evaluation. A settlement report with a check or credit acknowledgement will be mailed within a few days of receiving of your material.

### Metal Returned

Bullion: Gold & Silver: bars, grain, or coins. Platinum & Palladium: plate or casting pieces

Fabricated: Pure metal in sheet or wire

Alloyed: Karat golds, sterling, 10% iridium platinum, or 95% palladium

Fabricated or alloyed forms are processed as a purchase of the metal resulting in your account being credited. The 1.5% discount is offered on fabricated and alloyed metal returns.

Phone: (800) 462-7447 • Fax: (800) 535-3829 • Email: support@hauserandmiller.com

# Packaging Scrap

## We Refine or Purchase:

- Karat Gold Scrap & Silver Scrap
- Platinum & Palladium Scrap
- Dental Scrap & Placer Gold
- Bench Sweeps & Filings and Buffings
- Polishings, Filters, & Emery Paper
- Gold Filled, Jewelry, Optical & Watchbands
- Gold Plated Electronic Scrap (copper base only)
- Silver Contacts & Electro-Flake
- Photo & X-Ray Ash (burned down only)
- Silver Solder (cadmium free)

## We Do Not Refine:

- Shiny Rocks or Sand
- Electronic Circuit Boards
- Plated Silver
- Pewter & Nickel-silver
- Plating Solutions
- Film & Photo Paper

## FOR THE BEST RETURN

For a better understanding of your shipment content it is best to separate and list weights of your scrap into the following categories:

- Gold scrap-karat jewelry, scrap, and bench filings
- Silver scrap and filings
- Platinum scrap and filings
- Palladium scrap and filings
- Gold filled scrap, watch bands, and optical scrap
- Floor-sweeps, polishings, buffings, emery, and filters

Note: Sweeps and polishings are processed separately from meltable scrap

## INSTRUCTIONS

Include your name, address, phone number, and copy of drivers license (if first time customer) with your processing and return instructions. For your convenience, a refine form is at the end of this catalog.

## PACKAGING

For scrap and filings use a heavy plastic bag and seal it well. Double bagging is recommended. Large mouth plastic bottles make excellent containers for scrap and filings. Pack the bags securely into a sturdy box because jostling during shipment may cause sharp objects to puncture the bags.

## SHIPPING

Packages can be sent by Federal Express, UPS, or U.S. Mail. We also accept packages at our location, but require that you setup an appointment.

Hauser & Miller Co  
10950 Lin-Valle Dr.  
St. Louis MO, 63123



# Reference

- Fraction & Gauge Equivalentents
- Weight Conversion
- Specific Gravity & Melting Points
- Avoirdupois to Troy
- Troy to Avoirdupois
- Comparative Weights
- Circumference & Areas
- Casting Tips
- Soldering Tips & Safety
- Ring Blanks

# Fraction & Gauge Equivalents

## Faction Equivalents

Eights Quarters	
1/8	0.125
1/4	0.250
3/8	0.375
1/2	0.500
5/8	0.625
3/4	0.750
7/8	0.875

Sixteenths	
1/16	0.0625
3/16	0.1875
5/16	0.3125
7/16	0.4375
9/16	0.5625
11/16	0.6875
13/16	0.8125
15/16	0.9375

Thirty-Seconds	
1/32	0.03125
3/32	0.09375
5/32	0.15625
7/32	0.21875
9/32	0.28125
11/32	0.34375
13/32	0.40625
15/32	0.46875
17/32	0.53125
19/32	0.59375
21/32	0.65625
23/32	0.71875
25/32	0.78125
27/32	0.84375
29/32	0.90625
31/32	0.96875

Sixty-Fourths	
1/64	0.015625
3/64	0.046875
5/64	0.078125
7/64	0.109375
9/64	0.140625
11/64	0.171875
13/64	0.203125
15/64	0.234375
17/64	0.265625
19/64	0.296875
21/64	0.328125
23/64	0.359375
25/64	0.390625
27/64	0.421875
29/64	0.453125
31/64	0.484375
33/64	0.515625
35/64	0.546875
37/64	0.578125
39/64	0.609375
41/64	0.640625
43/64	0.671875
45/64	0.703125
47/64	0.734375
49/64	0.765625
51/64	0.796875
53/64	0.828125
55/64	0.859375
57/64	0.890625
59/64	0.921875
61/64	0.953125
63/64	0.984375

## Gauge Equivalents

Gauge	Inches	MM
1	0.289	
2	0.258	6.5
3	0.230	
4	0.204	5.2
5	0.182	
6	0.162	4.1
7	0.144	
8	0.128	3.3
9	0.114	
10	0.102	2.6
11	0.091	
12	0.081	2.0
13	0.072	
14	0.064	1.6
15	0.057	
16	0.051	1.3
17	0.045	
18	0.040	1.0
19	0.036	
20	0.032	0.8
21	0.028	
22	0.025	0.6
23	0.023	
24	0.020	0.5
25	0.018	
26	0.016	0.4
27	0.014	
28	0.013	0.3
29	0.011	
30	0.010	0.25
31	0.009	
32	0.008	0.20
33	0.007	
34	0.006	0.15
35	0.006	
36	0.005	0.13
37	0.004	
38	0.004	0.10
39	0.004	
40	0.003	

# Weight Conversion

## Penny Weights (Equivalents in troy ounces)

DWT	Troy OZ
1	0.050
1 1/4	0.063
1 1/2	0.075
1 3/4	0.088
2	0.100
2 1/4	0.113
2 1/2	0.125
2 3/4	0.138
3	0.150
3 1/4	0.163
3 1/2	0.175
3 3/4	0.188
4	0.200
4 1/4	0.213
4 1/2	0.225
4 3/4	0.238
5	0.250
5 1/4	0.263
5 1/2	0.275
5 3/4	0.288

DWT	Troy OZ
6	0.300
6 1/4	0.313
6 1/2	0.325
6 3/4	0.338
7	0.350
7 1/4	0.363
7 1/2	0.375
7 3/4	0.388
8	0.400
8 1/4	0.413
8 1/2	0.425
8 3/4	0.438
9	0.450
9 1/4	0.463
9 1/2	0.475
9 3/4	0.488
10	0.500
10 1/4	0.513
10 1/2	0.525
10 3/4	0.538

DWT	Troy OZ
11	0.550
11 1/3	0.563
11 1/2	0.575
11 3/4	0.588
12	0.600
12 1/4	0.613
12 1/2	0.625
12 3/4	0.638
13	0.650
13 1/4	0.663
13 1/2	0.675
13 3/4	0.688
14	0.700
14 1/4	0.713
14 1/2	0.725
14 3/4	0.738
15	0.750
15 1/4	0.763
15 1/2	0.775
15 3/4	0.788

DWT	Troy OZ
16	0.800
16 1/4	0.813
16 1/2	0.825
16 3/4	0.838
17	0.850
17 1/4	0.863
17 1/2	0.875
17 3/4	0.888
18	0.900
18 1/4	0.913
18 1/2	0.925
18 3/4	0.938
19	0.950
19 1/4	0.963
19 1/2	0.975
19 3/4	0.988
20	1.000

## Grains (Equivalents in pennyweights)

Grains	DWT
1/2	0.0208
1	0.0417
1 1/2	0.0625
2	0.0833
2 1/2	0.1042
3	0.1250
3 1/2	0.1458
4	0.1667
4 1/2	0.1875
5	0.2083
5 1/2	0.2292
6	0.2500
6 1/2	0.2708
7	0.2917
7 1/2	0.3125
8	0.3333

Grains	DWT
8 1/2	0.3542
9	0.3750
9 1/2	0.3958
10	0.4167
10 1/2	0.4375
11	0.4583
11 1/2	0.4792
12	0.5000
12 1/2	0.5208
13	0.5417
13 1/2	0.5625
14	0.5833
14 1/2	0.6042
15	0.6250
15 1/2	0.6458
16	0.6667

Grains	DWT
16 1/2	0.6875
17	0.7083
17 1/2	0.7292
18	0.7500
18 1/2	0.7708
19	0.7917
19 1/2	0.8125
20	0.8333
20 1/2	0.8542
21	0.8750
21 1/2	0.8958
22	0.9167
22 1/2	0.9375
23	0.9583
23 1/2	0.9792
24	1.0000

## Conversion Figures

1 gram = 15.43240 grains      1.55517 grams = 1 dwt  
 1 gram = 0.64300 dwt      31.10348 grams = 1 troy oz  
 1 gram = 0.03245 troy oz      1 kilogram = 32.105076 troy oz

1 lb avoirdupois = 14.583 troy oz  
 2000 lb avoirdupois = 29167 troy oz  
 1 troy oz = 31.10348 grams

# Specific Gravity & Melting Point

Metal	°F	°C	Specific Gravity	Weight in Troy OZ per CU IN
Aluminum	1220	660	2.70	1.423
Antimony	1167	630	6.62	3.488
Beryllium	2340	1282	1.82	0.959
Bismuth	520	271	9.80	5.163
Cadmium	610	321	8.65	4.557
Carbon			2.22	1.170
Chromium	3430	1888	7.19	3.788
Cobalt	2723	1495	8.90	8.900
Copper	1981	1083	8.96	4.719
Gold	1950	1065	19.32	10.180
18K Green	1810	988	15.90	8.375
18K Yellow	1700	927	15.58	8.211
18K White	1730	943	14.64	7.712
18K Red	1655	902	15.18	7.998
14K Green	1765	963	14.20	7.482
14K Yellow	1615	879	13.07	6.885
14K White	1825	996	12.61	6.642
14K Red	1715	935	13.26	6.986
10K Green	1580	860	11.03	5.810
10K Yellow	1665	907	11.57	6.096
10K White	1975	1079	11.07	5.832
10K Red	1760	960	11.59	6.106
Iridium	4449	2454	22.50	11.849
Iron (Pure)	2802	1539	7.87	4.145
Lead	621	328	11.34	5.973
Magnesium	1202	650	1.74	0.917
Manganese	2273	1245	7.43	3.914
Molybdenum	4760	2625	10.20	5.347
Nickel	2651	1455	8.90	4.691
Osmium	4892	2700	22.50	11.854
Palladium	2831	1555	12.00	6.322
Phosphorus	111	44	1.82	0.959
Platinum	3224	1773	21.45	11.301
15% Iridium Plat.	3310	1821	21.59	11.373
10% Iridium Plat.	3250	1788	21.54	11.349
5% Iridium Plat.	3235	1779	21.50	11.325
Rhodium	3571	1967	12.44	6.533
Ruthenium	4500	2500	12.20	6.428
Silicon	2605	1430	2.33	1.247
Silver	1761	961	10.49	5.525
Sterling Silver	1640	893	10.36	5.457
Coin Silver	1615	879	10.31	5.430
Tin	450	232	7.30	3.846
Zinc	787	419	7.13	3.758

# Specific Gravity & Melting Point—Continued

## HOW TO DETERMINE SPECIFIC GRAVITIES OF ALLOYS

1. Find the reciprocal of the specific gravity of each metal in the alloy. This is done by dividing 1 by the specific gravity. For example, the specific gravity of silver is 10.49 and the reciprocal is 1 divided by 10.49 or 0.094966.
2. Multiply each reciprocal by the number of parts per thousand of that metal to be used.
3. Add the results of the multiplication together.
4. Divide 1000 by this total - the answer is the specific gravity of the alloy.

Example\*:

Find the specific gravity of 14K yellow gold having 583 parts gold, 104 parts silver, and 313 parts copper.

### FIRST FIGURE THE RECIPROCALLS OF THE SPECIFIC GRAVITIES:

Fine gold: 1 divided by 19.32 = 0.051759  
Fine silver: 1 divided by 10.49 = 0.094966  
Fine copper: 1 divided by 8.96 = 0.111617

Fine gold: 1 divided by 19.32 = 0.051759  
Fine silver: 1 divided by 10.49 = 0.094966  
Fine copper: 1 divided by 8.96 = 0.111617

### THEN MULTIPLY:

Fine gold: 583 parts by 0.051759 = 30.128  
Fine silver: 104 parts by 0.094966 = 9.876  
Fine copper: 313 parts by 0.111617 = 34.956  
Total: 1000 75.014  
1000 divided by 75.014 = 13.33 (the specific gravity of the alloy)

\* *The specific gravity for any one karat will naturally vary for each composition.*

# Avoirdupois to Troy

Avoirdupois LB	Troy OZ
1	14.583
2	29.167
3	43.750
4	58.333
5	72.917
6	87.500
7	102.083
8	116.667
9	131.250
10	145.833
11	160.417
12	175.000
13	189.583
14	204.167
15	218.750
16	233.333
17	247.917
18	262.500
19	277.083
20	291.667
21	306.250
22	320.833
23	335.417
24	350.000
25	364.583
26	379.167
27	393.750
28	408.333
29	422.917
30	437.500
31	452.083
32	466.667
33	481.250
34	495.833
35	510.417
36	525.000
37	539.583
38	554.167
39	568.750
40	583.333
41	597.917
42	612.500
43	627.083
44	641.667
45	656.250
46	670.833
47	685.417
48	700.000
49	714.583
50	729.167

Avoirdupois LB	Troy OZ
51	743.750
52	758.333
53	772.917
54	787.500
55	802.083
56	816.667
57	831.250
58	845.833
59	860.417
60	875.000
61	889.583
62	904.167
63	918.750
64	933.333
65	947.917
66	962.500
67	977.083
68	991.667
69	1006.250
70	1020.833
71	1035.417
72	1050.000
73	1064.583
74	1079.167
75	1093.750
76	1108.333
77	1122.917
78	1137.500
79	1152.083
80	1166.667
81	1181.250
82	1195.833
83	1210.417
84	1225.000
85	1239.583
86	1254.167
87	1268.750
88	1283.333
89	1297.917
90	1312.500
91	1327.083
92	1341.667
93	1356.250
94	1370.833
95	1385.417
96	1400.000
97	1414.583
98	1429.167
99	1443.750
100	1458.333

Avoirdupois OZ	Troy OZ
1	0.912
2	1.823
3	2.734
4	3.646
5	4.557
6	5.469
7	6.380
8	7.292
9	8.203
10	9.115
11	10.026
12	10.937
13	11.849
14	12.760
15	13.672



# Troy to Avoirdupois

Troy OZ	Avoirdupois LBs. & OZ
1	1.1
2	2.2
3	3.3
4	4.4
5	5.5
6	6.6
7	7.7
8	8.8
9	9.9
10	11.0
11	12.1
12	13.2
13	14.3
14	15.4
15	1-0.5
16	1-1.6
17	1-2.7
18	1-3.8
19	1-4.9
20	1-6.0
21	1-7.1
22	1-8.2
23	1-9.3
24	1-10.4
25	1-11.5
26	1-12.6
27	1-13.7
28	1-14.8
29	1-15.9
30	2-1.0
31	2-2.1
32	2-3.2
33	2-4.3
34	2-5.4
35	2-6.4
36	2-7.5
37	2-8.6
38	2-9.7
39	2-10.8
40	2-11.9
41	2-13.0
42	2-14.1
43	2-15.2
44	3-0.3
45	3-1.4
46	3-2.5
47	3-3.6
48	3-4.7
49	3-5.8
50	3-6.9

Troy OZ	Avoirdupois LBs. & OZ
51	3-8.0
52	3-9.1
53	3-10.2
54	3-11.3
55	3-12.4
56	3-13.5
57	3-14.6
58	3-15.7
59	4-0.8
60	4-1.9
61	4-3.0
62	4-4.1
63	4-5.2
64	4-6.3
65	4-7.4
66	4-8.5
67	4-9.6
68	4-10.7
69	4-11.8
70	4-12.8
71	4-13.9
72	4-15.0
73	5-0.1
74	5-1.2
75	5-2.3
76	5-3.4
77	5-4.5
78	5-5.6
79	5-6.7
80	5-7.8
81	5-8.9
82	5-10.0
83	5-11.1
84	5-12.2
85	5-13.3
86	5-14.4
87	5-15.5
88	6-0.6
89	6-1.7
90	6-2.8
91	6-3.9
92	6-5.0
93	6-6.1
94	6-7.2
95	6-8.3
96	6-9.4
97	6-10.5
98	6-11.6
99	6-12.7
100	6-13.8

Troy OZ	Avoirdupois LBs. & OZ
200	13-11.5
300	20-9.2
400	27-6.9
500	34-4.6
600	41-2.3
700	48-0.0
800	54-13.8
900	61-11.5
1000	68-9.2
2000	137-2.3
3000	205-11.5
4000	247-4.7
5000	342-13.8

# Comparative Weights

<b>Coin Silver</b>		
0.978	times as heavy as	Fine Silver
0.995	times as heavy as	Sterling Silver
<b>Sterling Silver</b>		
0.987	times as heavy as	Fine Silver
1.005	times as heavy as	Coin Silver
0.899	times as heavy as	10K Yellow Gold
0.796	times as heavy as	14K Yellow Gold
0.668	times as heavy as	18K Yellow Gold
0.485	times as heavy as	Platinum
1.189	times as heavy as	18% Nickel Silver
1.228	times as heavy as	Brass
1.182	times as heavy as	Bronze
1.425	times as heavy as	Pewter
<b>10K Yellow Gold</b>		
0.885	times as heavy as	14K Yellow Gold
0.743	times as heavy as	18K Yellow Gold
1.049	times as heavy as	10K Green Gold
1.045	times as heavy as	10K White Gold
0.539	times as heavy as	Platinum
0.964	times as heavy as	Palladium
1.018	times as heavy as	Lead
1.366	times as heavy as	Brass
1.113	times as heavy as	Sterling Silver
<b>14K Yellow Gold</b>		
0.839	times as heavy as	18K Yellow Gold
0.920	times as heavy as	14K Green Gold
1.036	times as heavy as	14K White Gold
1.130	times as heavy as	10K Yellow Gold
0.609	times as heavy as	Platinum
1.089	times as heavy as	Palladium
1.151	times as heavy as	Lead
1.543	times as heavy as	Brass
1.257	times as heavy as	Sterling Silver
<b>18K Yellow Gold</b>		
0.980	times as heavy as	18K Green Gold
1.064	times as heavy as	18K White Gold
1.192	times as heavy as	14K Yellow Gold
0.726	times as heavy as	Platinum
1.298	times as heavy as	Palladium
1.371	times as heavy as	Lead
1.839	times as heavy as	Brass
1.498	times as heavy as	Sterling Silver
<b>Platinum</b>		
1.788	times as heavy as	Palladium
0.958	times as heavy as	Iridium
0.998	times as heavy as	5% Iridium Platinum
0.996	times as heavy as	10% Iridium Platinum
0.994	times as heavy as	15% Iridium Platinum
1.716	times as heavy as	Rhodium
1.758	times as heavy as	Ruthenium
0.954	times as heavy as	Osmium
2.063	times as heavy as	Sterling Silver

# Circumference & Areas

Size in Inches	Circumference Inches	Area in Square Inches	Area in Square Inches
1/4	0.785	0.049	0.063
1/2	1.571	0.196	0.250
3/4	2.356	0.442	0.563
1	3.142	0.785	1.000
1 1/4	3.927	1.227	1.563
1 1/2	4.712	1.767	2.250
1 3/4	5.498	2.405	3.063
2	6.283	3.142	4.000
2 1/4	7.069	3.976	5.063
2 1/2	7.854	4.909	6.250
2 3/4	8.639	5.940	7.563
3	9.425	7.069	9.000
3 1/4	10.210	8.296	10.560
3 1/2	11.000	9.621	12.250
3 3/4	11.780	11.040	14.060
4	12.570	12.470	16.000
4 1/4	13.350	14.190	18.060
4 1/2	14.140	15.900	20.250
4 3/4	14.920	17.720	22.560
5	15.710	19.640	25.000
5 1/4	16.490	21.650	27.560
5 1/2	17.280	23.760	30.250
5 3/4	18.060	25.970	33.060
6	18.850	28.270	36.000
6 1/4	19.640	30.680	39.060
6 1/2	20.420	33.180	42.250
6 3/4	21.210	35.780	45.560
7	21.990	38.480	49.000
7 1/4	22.780	41.280	52.560
7 1/2	23.560	44.180	56.250
7 3/4	24.350	47.170	60.060
8	25.130	50.270	64.000
8 1/4	25.920	53.460	68.060
8 1/2	26.700	56.750	72.250
8 3/4	27.490	60.130	76.560
9	28.280	63.620	81.000
9 1/4	29.060	67.200	85.560
9 1/2	29.850	70.880	90.250
9 3/4	30.630	74.660	95.060
10	31.420	78.540	100.000

Size in Inches	Circumference Inches	Area in Square Inches	Area in Square Inches
10 1/4	32.200	82.520	105.060
10 1/2	32.990	86.590	110.250
10 3/4	33.770	90.760	115.560
11	34.560	95.030	121.000
11 1/4	35.340	99.400	126.560
11 1/2	36.130	103.870	132.250
11 3/4	36.910	108.430	138.060
12	37.700	113.100	144.000
12 1/4	38.480	117.860	150.060
12 1/2	39.270	122.720	156.250
12 3/4	40.060	127.680	162.560
13	40.840	132.730	169.000
13 1/4	41.630	137.890	175.560
13 1/2	42.410	143.140	182.250
13 3/4	43.200	148.490	189.060
14	43.980	153.940	196.000
14 1/4	44.770	159.490	209.060
14 1/2	45.550	165.130	210.250
14 3/4	46.340	170.870	217.560
15	47.120	176.720	225.000
15 1/4	47.910	182.650	232.560
15 1/2	48.690	188.690	240.250
15 3/4	49.480	194.830	248.060
16	50.270	201.060	256.000
16 1/4	51.050	207.390	264.060
16 1/2	51.840	213.830	272.250
16 3/4	53.620	220.350	280.560
17	53.410	226.980	289.000
17 1/4	54.190	233.710	297.560
17 1/2	54.980	240.530	306.250
17 3/4	55.760	247.450	315.060
18	56.550	254.470	324.000
18 1/4	57.330	261.590	333.060
18 1/2	58.120	268.800	342.250
18 3/4	58.910	276.120	351.560
19	59.690	283.530	361.000
19 1/4	60.480	291.040	370.560
19 1/2	61.260	298.650	380.250
19 3/4	62.050	306.360	390.060
20	62.830	314.160	400.000

## RULES RELATING TO CIRCLES AND OVALS

- The circumference of a circle is the diameter x 3.1416.
- The diameter of a circle is the circumference multiplied by 0.31831.
- The area of a circle is the diameter x diameter x 0.7854.
- The area of an oval is the longest diameter x the shortest x 0.7854.
- A circle is 0.7854 times as heavy as a square of the same size.

# Casting Tips

## **MELTING TEMPERATURE**

It is generally recommended that you should cast at 100 °F above the flow point of the metal to allow it to be thoroughly molten. Caution should always be taken to avoid overheating. As a rule, the mold should be 800 °F to 1000 °F below the melting point of the metal at the time of casting. The flask will cool approximately 100 °F per minute after removal from the oven. Have everything ready and check your equipment before you start to melt to be sure it will operate properly. Melt the metal thoroughly and cast immediately. Overheating is often the result of malfunctioning equipment.

## **POROSITY - CAUSES**

There are two types of porosity: gas porosity and shrinkage porosity. Gas porosity is usually caused either by overheating the metal or exposing the molten metal to air. It can also be caused by sulfur dioxide from recycled metal contaminated with investment. Shrinkage porosity is by far the most common porosity. It occurs when hot molten metal is not allowed to feed the casting as it cools and shrinks.

## **POROSITY PREVENTION**

**Sprue size** - Make sure the sprue is at least as heavy as the heaviest section of the casting. Metal shrinks as it solidifies, if additional molten metal is not allowed to fill in, a void will result. If the sprue is too thin, it will solidify before the casting cutting off the supply of molten metal to the still molten inner sections of the casting.

A common mistake is to have a large sprue that is tapered down as it attaches to the casting piece. This restricting acts like a nozzle and the molten is sprayed into the mold. The sprue should be uniform in thickness up to the point where it attaches to the piece. At that point it should be flared to allow a smooth flow of metal into the casting. Metal flow into the piece should be as straight as possible.

## **SPRUE LOCATION**

Always attach the sprue to the heaviest section of the casting. This allows the heavier section to be fed after the thinner section has solidified. Multiple sprues are sometimes necessary if the casting has more than one heavy section.

## **PLACEMENT OF CASTING ON THE TREE**

Always place the heaviest pieces close to the button and the lightest pieces at the other end where there is more pressure to promote better filling. In addition, the casting should not be placed too close to one another on the tree. When pieces are too close, localized heating of the investment results in poor heat extraction, i.e. "hot spots."

## **MELTING PRACTICE**

It is very important to protect the metal from oxidizing and absorbing unwanted gases. Protecting the metal from contacting the air can be achieved in several ways: with a gas flame, a protective inert gas such as Argon, Nitrogen, or by using flux.

# Casting Tips—Continued

## HEATING THE METAL

The proper temperature is a critical factor in obtaining good castings. When the metal is too cold, it freezes in the mold before completely filling it. When the metal is too hot, shrinkage porosity occurs in the heavier sections or immediately adjacent to them. Overheating the metal causes base metals (primarily zinc) to be “burnt off” or evaporated. As the base metals are lost, the percentage of gold (karat) increases. Each time the alloy is reused some of the special deoxidizers are lost. To minimize losses, keep a close watch on the metal temperature and always use at least 50% to 75% new alloy. We strongly discourage adding pure zinc or alloy to compensate for losses.

## CASTING TEMPERATURE

The casting temperatures given in the table are suggested starting temperatures. These temperatures result in good casting for most people. You may have to increase or decrease these slightly. (Usually not more than 50 °F.)

## FLASH TEMPERATURES

Depending upon the size of the pieces being cast and how much fine detail they contain, the temperature will have to be adjusted. Large plain pieces require a lower flask temperature of 800 °F to 950 °F while pieces with fine detail or filigree require higher flask temperatures of 900 °F to 1150 °F. Another rule of thumb is when flasks are used in a vacuum/vacuum-assist casting machine; they should be 75 °F to 100 °F hotter than when casting the same pieces in a centrifugal machine.

# Soldering Tips & Safety

## Soldering Tips

### **SILVER SOLDER - RECOMMENDED USES**

Easy - This solder flows easily and is deep penetrating. It should be used on pieces requiring a few widely separated joints; also as last solder on multiple soldering operations.

Medium - Excellent for ring joints and general purpose. The melting point is enough above easy for protection in multiple solderings.

Hard - Used for first soldering on many joint operations and requires great skill in using. Used in multiple operations requiring more than two solders.

IT - Special enameling solder where color is important under transparent or translucent enamels.

### **GOLD SOLDER - RECOMMENDED USES**

Easy - For repairs and final soldering.

Medium - For repairs and secondary soldering.

Hard - For general purpose, sizing, and color match.

## **Hints for Soldering**

The process of joining metals with solder is simple and well understood by gold and silversmiths. There are, however, a few important points which deserve mention. Soldering troubles can usually be traced back to an oversight of one of them.

### **LOCATION OF SOLDERING EQUIPMENT**

Color is your indication of heat. Heat colors cannot readily be distinguished in a bright light, select the darkest corner of the room for your soldering.

### **FITTING PREPARATORY TO SOLDERING**

The pieces to be joined must fit perfectly; this is of the utmost importance for technical excellence of your work. Solder will not compensate for careless fitting.

### **CLEANING**

The pieces to be joined must be free of any oxides, dirt, or grease. These may be removed with scraper, file, crocus cloth, or polish buff depending on circumstances.

### **FLUX**

Apply the flux with a brush to join areas to be soldered as well as the pellets or strip of solder. Flux forms a protective coating allowing the silver to flow into the joint. The flux must be entirely fluid below the melting point of the solder.

### **PREHEATING**

Using a soft blue flame, concentrate heat on the part with greatest weight. Bring both parts to soldering temperature at the same time.

# Soldering Tips & Safety—Continued

## **BALLING OF SOLDER**

Improper fluxing or the presence of dirt may cause balling of solder. It may also be caused by insufficient heat or a flame concentrated on the pellets rather than on the pieces being joined.

## **FLOW POINTS**

Color, your indication of heat, shows first at the ends of wire and the edge of sheet. When working with sterling silver, never heat the silver above 1500 °F, because it begins to break down at this point. It is liquid at 1640 °F.

## **Solder Safety**

## **CADMIUM**

All noble solders and the following Hauser & Miller solders: 6K yellow easy, 8K yellow easy, 10K yellow easy, HM 564B, HM 564A, and HM 569A contain cadmium. Safety precautions should always be followed when soldering or brazing any alloys. Cadmium replacements, such as indium and other low fusing alloys (zinc, tin, etc.), are required to reduce the melting point of solders. They also produce hazardous fumes if overheated or improperly fluxed. Fluoride fumes from fluxes may also be produced during soldering. The following well-tested precautions should be implemented to avoid the hazards from these fumes.

## **VENTILATE CONFINED AREAS**

Use ventilation fans and exhaust hoods to carry all fumes away from work and worker. Do not lean over the work area. Try to work at eye level.

## **CLEAN METALS THOROUGHLY**

A surface contaminant of unknown composition on metals may add to fume hazards and may cause a flux breakdown that occurs too rapidly leading to overheating.

## **USE SUFFICIENT FLUX**

Flux protects the metals being joined during the heating cycle. Full flux coverage reduces the chance of fumes.

## **HEAT METALS BROADLY**

Heat the metals broadly and uniformly. Intense localized heating uses up flux and increases the danger of fuming. Apply heat only to metals being joined not to filler metal. (Direct flame on filler metals causes overheating and fuming.)

## **KNOW YOUR METALS**

Be especially careful not to overheat assembly when using filler metals that contain cadmium. Consult the Material Safety Data Sheet for the alloy and solder used.

# Ring Blanks

U.S. Size	Metric Size (MM)	Inside Diameter (MM)	12ga	14ga	16ga	18ga	20ga	22ga	24ga
1	39.0	12.4	45.5	44.0	43.0	42.1	41.5	40.8	40.5
1 1/4	39.6	12.6	46.2	44.6	43.6	42.7	42.1	41.5	41.1
1 1/2	40.2	12.8	46.8	45.2	44.3	43.3	42.7	42.1	41.8
1 3/4	40.8	13.0	47.4	45.8	44.9	44.0	43.3	42.7	42.4
2	41.5	13.2	48.0	46.5	45.5	44.6	44.0	43.3	43.0
2 1/4	42.1	13.4	48.7	47.1	46.2	45.2	44.6	44.0	43.6
2 1/2	42.7	13.6	49.3	47.7	46.8	45.8	45.2	44.6	44.3
2 3/4	43.4	13.8	49.9	48.4	47.4	46.5	45.8	45.2	44.9
3	44.0	14.0	50.6	49.0	48.0	47.1	46.5	45.8	45.5
3 1/4	44.6	14.2	51.2	49.6	48.7	47.7	47.1	46.5	46.2
3 1/2	45.2	14.4	51.8	50.2	49.3	48.4	47.7	47.1	46.8
3 3/4	45.9	14.6	52.4	50.9	49.9	49.0	48.4	47.7	47.4
4	46.5	14.8	53.1	51.5	50.6	49.6	49.0	48.3	48.0
4 1/4	47.1	15.0	53.7	52.1	51.2	50.2	49.6	49.0	48.7
4 1/2	47.8	15.2	54.3	52.8	51.8	50.9	50.2	49.6	49.3
4 3/4	48.4	15.4	55.0	53.4	52.4	51.5	50.9	50.2	49.9
5	49.0	15.6	55.6	54.0	53.1	52.1	51.5	50.9	50.6
5 1/4	49.6	15.8	56.2	54.6	53.7	52.8	52.1	51.5	51.2
5 1/2	50.3	16.0	56.8	55.3	54.3	53.4	52.7	52.1	51.8
5 3/4	50.9	16.2	57.5	55.9	55.0	54.0	53.4	52.8	52.4
6	51.5	16.4	58.1	56.5	55.6	54.6	54.0	53.4	53.1
6 1/4	52.2	16.6	58.7	57.1	56.2	55.3	54.6	54.0	53.7
6 1/2	52.8	16.8	59.3	57.8	56.8	55.9	55.3	54.6	54.3
6 3/4	53.4	17.0	60.0	58.4	57.5	56.5	55.9	55.3	55.0
7	54.0	17.2	60.6	59.0	58.1	57.1	56.5	55.9	55.6
7 1/4	54.7	17.4	61.2	59.7	58.7	57.8	57.1	56.5	56.2
7 1/2	55.3	17.6	61.9	60.3	59.3	58.4	57.8	57.1	56.8
7 3/4	55.9	17.8	62.5	60.9	60.0	59.0	58.4	57.8	57.5
8	56.6	18.0	63.1	61.5	60.6	59.7	59.0	58.4	58.1
8 1/4	57.2	18.2	63.7	62.2	61.2	60.3	59.7	59.0	58.7
8 1/2	57.8	18.4	64.4	62.8	61.9	60.9	60.3	59.7	59.3
8 3/4	58.4	18.6	65.0	63.4	62.5	61.5	60.9	60.3	60.0
9	59.1	18.8	65.6	64.1	63.1	62.2	61.5	60.9	60.0
9 1/4	59.7	19.0	66.3	64.7	63.7	62.8	62.2	61.5	61.2
9 1/2	60.3	19.2	66.9	65.3	64.4	63.4	62.8	62.2	61.9
9 3/4	60.9	19.4	67.5	65.9	65.0	64.1	63.4	62.8	62.5
10	61.6	19.6	68.1	66.6	65.6	64.7	64.1	63.4	63.1
10 1/4	62.2	19.8	68.8	67.2	66.3	65.3	64.7	64.1	63.7
10 1/2	62.8	20.0	69.4	67.8	66.9	65.9	65.3	64.7	64.4
10 3/4	63.5	20.2	70.0	68.5	67.5	66.6	65.9	65.3	65.0
11	64.1	20.4	70.7	69.1	68.1	67.2	66.6	65.9	65.6
11 1/4	64.7	20.6	71.3	69.7	68.8	67.8	67.2	66.6	66.3
11 1/2	65.3	20.8	71.9	70.3	69.4	68.5	67.8	67.2	66.9
11 3/4	66.0	21.0	72.5	71.0	70.0	69.1	68.5	67.8	67.5
12	66.6	21.2	73.2	71.6	70.7	69.7	69.1	68.5	68.1
12 1/4	67.2	21.4	73.8	72.2	71.3	70.3	69.7	69.1	68.8
12 1/2	67.9	21.6	74.4	72.8	71.9	71.0	70.3	69.7	69.4
12 3/4	68.5	21.8	75.0	73.5	72.5	71.6	71.0	70.3	70.0
13	69.1	22.0	75.7	74.1	73.2	72.2	71.6	71.0	70.7







10950 Lin-Valle Dr. Saint Louis, MO 63123  
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# REFINING INSTRUCTIONS

Customer #: \_\_\_\_\_

Date: \_\_\_\_\_

NAME: \_\_\_\_\_

CONTACT: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY/STATE/ZIP: \_\_\_\_\_

PHONE: \_\_\_\_\_

Please include a copy of your drivers license for personal accounts or business card for commercial accounts

- Refine the enclosed material (melt & assay)
- Purchase the enclosed scrap as is
- Process at your discretion for best yield

TO: Hauser & Miller Company  
 10950 Lin-Valle Drive  
 St. Louis, MO 63123

## MATERIAL SHIPPED

Material usually REFINED		Material usually PURCHASED as is			
TYPE	WEIGHT	TYPE	WEIGHT	TYPE	WEIGHT
Mixed Karat	_____	10 Karat	_____	Watch Bands	_____
Bench Filings	_____	14 Karat	_____	Gold Filled	_____
Sweeps	_____	18 Karat	_____	Platinum	_____
Polishings	_____	Dental Yellow	_____	Palladium	_____
Platinum Filings	_____	Dental White	_____	Sterling	_____
Mixed Silver	_____	Optical	_____	Mixed Silver	_____
Other	_____	Bullion	_____	Other	_____

## SETTLEMENT OPTIONS

- CHECK-PAYABLE TO: \_\_\_\_\_
- CREDIT ACCOUNT
- BULLION BARS/COINS-SIZE: \_\_\_\_\_
- FABRICATED METAL PRODUCTS PER ENCLOSED ORDER

SPECIAL INSTRUCTIONS: \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

SIGNED: \_\_\_\_\_

CALL (800) 462-7447 OR EMAIL REFINING@HAUSERANDMILLER.COM WITH QUESTIONS



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