Cookson

COOKSON'S TECHNICAL INFORMATION BOOKLET

All the essential technical information and guidance you need as a student

cooksongold.com 0845 100 1122

Q&A

Not sure where to start? Cookson has the answers for you! Check out our quick list of FAQs below, or visit Cooksongold.com; your source of knowledge for all of your jewellery making projects.

For answers to all your jewellery questions scan the QR Code or go online to http://tiny.cc/kod2jw

01

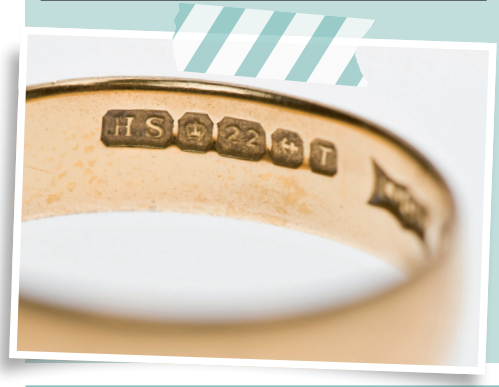
How much material do you need to make a wedding ring?

This very much depends on the size ring you require.

Cookson Precious Metals Ltd provide a handy conversion chart which does all the hard work for you – providing you with a comparison of:

- British & European finger sizes
- Internal diameter (mm & in)
- Internal circumference (mm)

Remember the size gives an internal measurement; you will have to increase the length when using a thick metal gauge.



02

How do you fit chain into chain ends - crimp or solder?

The best and strongest method is to solder - using hard solder will provide extra strength.

03

What solder should I use when soldering 9ct Yellow to Silver?

When soldering 9ct to Silver you can use either Silver or 9ct solder. However if the item is to be hallmarked you must bear in mind the solder must be of hallmarkable quality, and the item will be assayed as the metal with the lowest hallmark, in this instance Silver.

Borax (**999 098**) or Auflux (**998 108**) are ideal fluxes for this process.

04

Why have a hallmark?

Items of jewellery are hallmarked to identify what type of precious metal the piece is made from. Gold, Silver and Platinum are all hallmarked.

Items of Silver jewellery which weight below 7.78g, Gold items below 1g and Platinum items below 0.5g are exempt and do not require a hallmark. Hallmarks can only be marked by one of the four official assay offices; Birmingham, London, Sheffield & Edinburgh, with each office having its own unique mark.

The assay offices test all items which require marking, taking a small sample to complete the test. The test confirms the legal standards of fineness or purity. Once happy with the result they will apply the appropriate hallmark to the item.

05

Why does my solder not run freely?

Check that the joint is clean, and that there is no flux on the surface.

See the TECHNICAL HINTS on page 6 more tips!

06

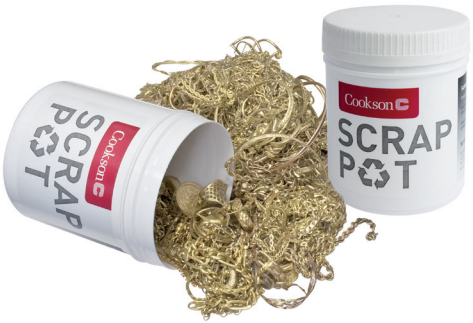
Why use solder paste?

Rather than buy separate solder and flux, solder paste comes conveniently mixed together in a syringe.

To solder an item of jewellery simply apply the paste to the item that needs soldering, remove excess paste and apply heat to solder as normal. Using solder paste ensures that you do not have to apply flux and solder separately.

The syringe aids easy application and helps remove the often tricky problem of getting the solder to balance on the item before it is soldered.

Plus the solder paste mix ensures that solder will not 'jump-off' the item when heat is applied.



07

How does your scrap service work?

At Cookson we make selling your scrap as easy as possible, with a dedicated scrap expert guiding you through the process.

Materials you can send to us:

- Jewellery scrap
- Clean scrap
- Un-hallmarked
- Assayed bars
- Bench lemels
- Sweepings (polishing, emery floor sweeps)
- Carpets & floorings
- Vacuum bags
- Unwanted / damaged jewellery & watch parts
- Hand wash tank waste
- Dental materials
- Industrial materials

Returning your scrap to Cookson is simple

Collect scrap in our free scrap pot, then simply post it back to your local Cookson branch in Birmingham or London.

Ask for a free special delivery envelope (or go online to print a postage paid address label), to ensure your scrap is safely return to Cookson - call 0121 212 6420.

Drop your scrap into any one of our two trade counters, located in Birmingham's Jewellery Quarter and in Hatton Garden, London.

Our settlement terms

There are a number of options available to meet your individual requirements: cheque payments, cash or we can credit the precious metal contents of your scrap material directly to a Cookson Metal account - whichever is the easiest option for you.

Contact our Scrap Team:

BIRMINGHAM (Main scrap collection and reprocessing centre)
Tel : 0121 212 6420

LONDON (Collection centre)
Tel: 020 7400 6508

08

How do I use Gimp?

Here's how to use Gimp to protect silk and bead cord, plus strengthen your strand:

1 String the first three beads.

2 Carefully cut about 6mm (1/4'') of the Gimp and string it onto your bead cord. Next string one end of the clasp on to cord.

3 Leave 100mm (4'') of cord between the needle and the three beads. Thread the cord back through the first bead. The wire will form a loop on which the clasp rests.

4 Tie a single knot with both cords between the first and second beads, pulling tightly to secure the knot. String and secure the second knot in the same way.

5 Then string through the third bead and trim the excess. Secure each of these end knots with glue.

6 String the rest of the strand. Repeat steps 1 – 5 on the final three beads. (Don't leave extra cord between beads at this end).

09

What thickness wire do I need to make jump rings, and should it be hard or soft?

The most popular size for jump rings is approximately 0.8mm.

Half hard or hard is the ideal temper to use.

technical hints

The tricks of the trade aren't just for the experts anymore! Practice makes perfect, so check out some of our top tips to get you started on your next project.

For more technical hints scan the QR Code or go online to http://tiny.cc/kod2jw

Create a hammered effect on metal

To create a hammered effect, the metal that needs to be textured first should be annealed and then held on either a steel stake or flatbed. Before you start hammering, the hammers used should be cleaned to remove any oil or dirt as these will mark the metal. There should be direct contact made through the end of the hammer, the metal and the steel stake. It is also best to work on the metal directly from above, when the hammer is at an angle, it can leave deep marks in the metal which are difficult to remove. As the metal is worked, it does harden so the piece might be required to be annealed again.

To mark the Silver, use a ball-pein hammer (code **999 89P**) or planishing hammer (code **999 89S** or **999 89X**).

Polishing

Polishing can be completed by hand or by machine. However, in either case there are a few standard stages that are usually followed. You can achieve a variety of finishes on metal, including highly polished, matt and textured.

The first step in finishing is filing to remove surface marks from the metal and get the desired shape. Files take away a lot of metal, so care must be taken. It is a good idea to try and keep the piece as unmarked as possible by this stage as no amount of final polishing will remove deep scratches.

Then a variety of abrasives can be used to continue the filing stage. Sandpaper is available in varying grades to remove surface marks. It can also be used on sticks, taped down flat or on pendant drill mandrels, etc... This helps to ensure that all surfaces of the piece are reached. There are also various pendant drill attachments that can be used, e.g. rubber abrasives. Water of Ayr stones are lightly abrasive and are used with water. Care must be taken at all stages not to take away too much metal by overworking the piece.

Textured and matt finishes can be achieved at any stage of this process, by using punches, heating methods, frosting wheels, pendant drill attachments etc... The best way to clean up a textured surface is using bristle brushes by hand or machine, polish is optional with these brushes.

The various polishing compounds available come in two main types:

TRIPOLI LUSTRE
Or equivalent grade polishes, for general-purpose use, with a fairly high abrasive content. The best mops to use with Tripoli are the calico mops, which can be loaded with polish and cleaned with mop rakes.

ROUGE
Available in various grades/types for different metals and used with calico mops or for final polishing the softer reflex type mops.

These polishes can be used by hand or on mops/brushes for machine polishing. A variety of mops/brushes and felts can be used. However the most important rule is never to mix polishes on mops, always keep polishes and polishing tools separate and wash the metal being polished between stages. Always use eye, breathing and hand protection when using polishing machinery and make sure you have nothing that could catch in the machinery, e.g. hair, clothing, jewellery, etc...

Soldering

There are two general techniques used to apply solid solder

Preplacement

Small pieces of solder are placed at the joint seam prior to heating. Heat is then applied until the solder flows into the joint.

Feeding

The fluxed joint is heated to temperature and the tip of the solder wire is fed into the joint and should melt on contact.

Using both these techniques the part of the joint to which the molten solder is required should be heated more strongly than the remainder ensuring the solder will flow towards the hottest section. Continued flame impingement on the molten solder may result in the vaporisation of lower melting point constituents. Higher temperatures may then be required to complete the joint. The time and temperature required to complete a joint must be kept to a minimum.

Flux

Gold and Silver Flux residues may normally be removed by soaking in hot water. Any further residues that persist may then be removed by brushing. In difficult cases, the workpiece should be impressed in 5 - 10% sulphuric acid solution for 2 - 5 minutes, rinsed in hot water and brushed again.

For mass production, batch or conveyer type furnaces may be used. However, the quantities of components to be soldered must be large enough to justify the relatively high capital expenditure and development of a method for each particular soldering operation.

All workpieces can be successfully finished by the standard practices and processes currently available. It must be noted that powdered Borax does not always meet the requirements for all applications where the extensive range of solders now available may be used.

Which Solder to use - Gold, Silver and (particularly) Platinum

Solders are typically classified according to their melting points - "easy", "medium" and "hard", referring to the ease of melting the solder. Hence an "easy" solder melts before a "hard" one and this can be used where a sequence of joints are to be made.

Usually a solder must conform to the same hallmarking rules as the metal being joined - for example, a 9ct solder must contain at least 37.5% Gold.

However, there are some concessions, which are:
Platinum solders must contain at least 95% precious metals by weight, chosen from Silver, Gold, Platinum, Palladium, Iridium and Osmium. There is no minimum Platinum content specified.

Solders for White Golds may be Hallmarked on concession down to 50% Gold content. 22ct solder must contain at least 80% Gold.

Avoiding Firestain

Firestain occurs when the Copper contained in Silver alloys is oxidised during annealing or soldering - it can be seen as a dark stain on the surface of the metal after polishing.

Light firestaining can usually be polished out, or may respond to pickling in a bath of 10% sulphuric acid or another proprietary pickle, however silver plating may be the only answer to heavy firestain.

If a protective atmosphere is not available to carry out annealing operations, the following steps can be taken:

- Avoid prolonged heating wherever possible.
- Ensure that a large enough flame is used to get soldering and annealing jobs completed in the minimum amount of time.
- The entire workpiece can be coated with a flux which will form a glassy coat on the metal, protecting it from the atmosphere.
- Use a large, bushy flame when annealing, which allows the job to be completed quickly and provides a slightly reducing atmosphere.

table of comparative weights

To use the table below, simply take the unit figure of the metal to which comparison is required and then follow the line to the right or left of this figure that is the relative weight unit for the chosen metal. Typically, a Silver model may be made for subsequent casting using the cuttlefish method producing a casting in 18ct Yellow Gold HB.

	PURE PLAT.	FINE GOLD	22ct DS	18ct MW	18ct HB	14ct AY	GW PD	9ct DF	STERLING	COPPER	BRASS	WAX
Pure Plat.	1.00	0.90	0.83	0.75	0.72	0.60	0.54	0.52	0.48	0.42	0.40	0.05
Fine Gold	1.11	1.00	0.92	0.84	0.80	0.67	0.60	0.58	0.53	0.47	0.45	0.05
22ct DS	1.21	1.08	1.00	0.91	0.87	0.73	0.66	0.63	0.58	0.51	0.49	0.06
18ct MW	1.33	1.19	1.10	1.00	0.96	0.80	0.72	0.69	0.64	0.56	0.54	0.06
18ct HB	1.39	1.25	1.15	1.05	1.00	0.84	0.75	0.72	0.66	0.58	0.56	0.06
14ct AY	1.65	1.48	1.37	1.25	1.19	1.00	0.90	0.86	0.79	0.69	0.67	0.08
GW Palladium	1.84	1.65	1.52	1.39	1.32	1.11	1.00	0.96	0.88	0.77	0.75	0.09
9ct DF	1.92	1.72	1.59	1.45	1.38	1.16	1.04	1.00	0.92	0.80	0.78	0.09
Sterling Silver	2.09	1.87	1.73	1.57	1.50	1.26	1.14	1.09	1.00	0.87	0.84	0.10
Copper	2.39	2.14	1.98	1.80	1.72	1.44	1.29	1.24	1.14	1.00	0.97	0.11
Brass (90/10)	2.47	2.22	2.05	1.86	1.78	1.49	1.35	1.29	1.18	1.03	1.00	0.11
Wax	21.30	19.30	17.80	16.20	15.50	13.00	11.70	11.20	10.30	9.00	8.70	1.00

unit conversion

CARATS	to grains	x 3.0865
	to grams	x 0.2
	to milligrams	x 200
GRAINS	to carats	x 0.324
	to grams	x 0.0648
	to milligrams	x 64.799
	to oz, avoir	x 0.002286
	to oz, troy	x 0.00208
	to pennyweight	x 0.04167
GRAMS	to carat	x 5
	to grains	x 15.4324
	to oz, avoir	x 0.03527
	to oz, troy	x 0.03215
	to pennyweight	x 0.64301
KILOGRAMS	to oz, avoir.	x 35.274
	to oz, troy	x 32.1507
	to pennyweight	x 643.015
	to lb, avoir	x 2.2046
	to lb, troy	x 2.6792

Multiply the known unit by the figure to the right of the measurement you desire. For instance, how many grains are in 3 carats?

known	x	# from chart	=	answer
3	x	3.0865	=	9.2595

OZ, AVOIRDUPOIS	to grains	x 437.5
	to grams	x 28.3495
	to oz, troy	x 0.91146
	to pennyweight	x 18.2291
	to lb, troy	x .07595
OZ, TROY	to grains	x 480
	to grams	x 31.1035
	to oz, avoir	x 1.0971
	to pennyweight	x 20
	to lb, avoir	x 0.06857
PENNYWEIGHTS (DWT)	to grains	x 24
	to grams	x 1.5551
	to oz, avoir	x 0.05486
LB, AVOIRDUPOIS	to grains	x 7000
	to grams	x 453.59
	to kilogram	x 0.4536
	to oz, troy	x 14.5833
LB, TROY	to gram	x 373.242
	to kilogram	x 0.3732
	to oz, avoir	x 13.165
	to lb, avoir	x 0.82286
FEET	to centimetres	x 30.48
	to metres	x 0.3048
METRES	to feet	x 3.2808
	to inches	x 29.37
	to yards	x 1.0936
MILLIMETRES	to feet	x 0.00328
	to inches	x 0.03937
	to centimetres	x 2.54
	to metres	x 0.0254
	to millimetres	x 25.4

ring sizing

FINGER SIZE BRITISH	FINGER SIZE EURO	INTERNAL DIAMETER mm	INTERNAL DIAMETER ins	INTERNAL CIRCUM mm
A		12.1	0.48	37.5
	38	12.1	0.48	
A½		12.3	0.48	38.4
	39	12.4	0.49	
B		12.5	0.49	39.0
B½		12.7	0.50	39.6
	40	12.7	0.50	
C		12.9	0.51	40.2
C½	41	13.1	0.51	40.8
D		13.2	0.52	41.4
	42	13.4	0.53	
D½		13.4	0.53	42.0
E		13.6	0.54	42.6
	43	13.7	0.54	
E½		13.8	0.54	43.2
	44	14.0	0.55	
F		14.0	0.55	43.8
F½		14.2	0.56	44.4
	45	14.3	0.56	
G		14.4	0.57	45.0
G½		14.6	0.58	45.6
	46	14.6	0.58	
H		14.8	0.58	46.2
	47	15.0	0.59	
H½		15.0	0.59	46.8
I		15.2	0.60	47.4
	48	15.3	0.60	
I½		15.4	0.61	48.0
	49	15.6	0.61	
J		15.6	0.61	48.6
J½		15.8	0.62	49.2
	50	15.9	0.63	
K		16.0	0.63	49.8
K½		16.2	0.64	50.4
	51	16.2	0.64	
L		16.4	0.65	51.0
	52	16.6	0.65	
L½		16.6	0.65	51.6
M		16.8	0.66	52.2
	53	16.9	0.66	
M½		17.0	0.67	52.8
N		17.2	0.68	53.5
	54	17.2	0.68	

FINGER SIZE BRITISH	FINGER SIZE EURO	INTERNAL DIAMETER mm	INTERNAL DIAMETER ins	INTERNAL CIRCUM mm
N½		17.4	0.68	54.1
	55	17.5		0.69
O		17.6	0.69	54.7
O½		17.8	0.70	55.4
	56	17.8	0.70	
P		18.0	0.71	56.0
	57	18.1	0.71	
P½		18.2	0.72	56.7
Q		18.4	0.72	57.3
	58	18.5	0.73	
Q½		18.6	0.73	57.9
R		18.8	0.74	5
	59	18.8	0.74	
R½		19.0	0.75	59.2
	60	19.1	0.75	
S		19.2	0.75	59.9
S½		19.4	0.76	60.5
	61	19.4	0.76	
T		19.5	0.77	61.1
	62	19.7		0.78
T½		19.7	0.78	61.8
U		19.9	0.79	62.4
	63	20.1	0.79	
U½		20.1	0.79	63.0
V		20.3	0.80	63.7
	64	20.4	0.80	
V½		20.5	0.81	64.3
	65	20.7	0.81	
W		20.7	0.82	64.9
W½		20.9	0.82	65.5
	66	21.0	0.83	
X		21.1	0.83	66.1
X½		21.3	0.84	66.7
		21.3	0.84	66.7
Y		21.5	0.85	67.3
	68	21.6	0.85	
Y½		21.7	0.85	67.9
Z		21.9	0.86	68.5
	69	22.0	0.86	
Z½		22.1	0.87	
Z+1		22.3	0.88	
Z+2		22.7	0.89	
Z+3		23.1	0.91	

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