

Setting the Standard

Injection Wax Technical Information

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...high quality & the best surface finish demanded by the jewellery industry





Introduction

SRS has developed and are manufacturing a full range of injection waxes which are exclusively available for the jewellery industry throughout the world.

At the SRS research and development facility we are able to develop, test and fine tune a range of waxes which are then manufactured in our own wax plant.

SRS waxes are used to reproduce high quality wax pieces or patterns efficiently, at high quality with the best surface finish demanded by the jewellery industry.



The advantages of using SRS Injection Waxes...

- Comprehensive range of injection waxes and colours for all jewellery applications
- Range incorporates wax types suitable for hot climates
- Itigh quality waxes for producing high quality wax pieces or patterns
- Flow characteristics or viscosity adapted for the application
- Second Second
- 🧭 Waxes suitable for fine filigree work, intricate detail and stone-in-place wax setting
- Minimal shrinkage and low ash content for cleaner burnout properties

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GRS Premium Waxes



GRS Premium[®] speciality injection waxes are manufactured in Stoke-on-Trent, England using high quality raw materials to produce a consistent high performance product.

Within the GRS Premium[®] range you will find a wax with the optimum flow, solidification point, hardness, flexibility, memory and shrinkage to meet all of your requirements.

Choose from the range below to determine which of these top quality waxes best suits your needs.



Finest Filigree - R36WF

Injection Temp: 68°C / 155°F

Finest Filigree is specifically designed for injecting detailed patterns and providing a wax that is flexible and strong enough to enable removal from the mould without damage. Finest filigree is also recommended for stone in place setting.

Flexi Blue - R34WF

Injection Temp: 68°C / 155°F

Flexi Blue is the most flexible wax in the GRS Premium[®] range. This wax has high plasticity giving the wax exceptional memory and durability. Flexi Blue is a very durable wax widely used for stone in place and will withstand rough handling and removal from very complex moulds.

Sturdy Green - R35WF Injection Temp: 72°C / 160°F

Sturdy Green is the hardest and most durable wax in the range. This wax is perfect for use in metal moulds or where the patterns have sharp detail or where a high degree of accuracy is needed. It has a high flexibility and low shrinkage and is therefore easy to remove and easy to read.





General Purpose - R37WF Injection Temp: 65°C / 150°F

General Purpose wax is a formulation which is suitable for most jewellery designs. This product has a balanced set of characteristics for the most demanding wax applications, with good flow, low shrinkage and easy to read. This wax is available in aqua, burgundy and turquoise.



...our aim is to provide the best choice of products for the jewellery manufacturer at the highest quality



Wax Technical Data

	FINEST FILIGREE R36WF	FLEXI BLUE R34WF	STURDY GREEN R35WF	GENERAL PURPOSE R37WF
FLOW (CPs)	338	375	590	204
HARDNESS (N)	195	171	250	225
FLEXIBILITY (N)	506	394	400	594
SOLIDIFICATION POINT (°C)	64	61	64	63
LINEAR SHRINKAGE (%)	2.0	1.7	1.7	2.1
INJECTION TEMP (°C)	70	70	73	70



Characteristics of the GRS Premium Range







GRS Waxes Superflow

Competitor vs Superflow - Viscosity



Superflow Jewellery Wax Additive thins wax, making it more fluid and aids flow to make it inject smoothly into finely detailed moulds.

Simply add up to 30% to your standard wax, directly into the injector unit to reduce the viscosity of your wax.

To return the wax to its original characteristics, simply add more of your standard wax, no need to empty and clean your wax pot.





SRS Waxes Universal Quality Range

Our Universal range of waxes are manufactured in Stoke-on-Trent, England. Using only raw materials of consistently good quality

With our very widest, deepest knowledge of jewellery production comes an understanding of what is needed from the wax. Our Research and Development team have gained a vast knowledge in the production of injection wax and work on producing for the most demanding of injection circumstances.



Type R1 Injection Temp: 71°C / 160°F

Type R1 is a high quality economic all purpose wax that covers a variety of applications, R1 is formulated to produce wax patterns with a high level of surface finish and detail reproduction across a wide range of item cross sections and designs.

Type R2 Injection Temp: $71^{\circ}C / 160^{\circ}F$

Type R2 is a premium grade injection wax developed specifically for fine filigree type applications. Extremely flexible and easy flowing resulting in an exceptionally smooth and shiny surface finish. Will hold sharp details. Almost no shrinkage producing very high detail while enabling easy pattern removal without breakage. R2 is ideal for stone in place casting.

Type R3 Injection Temp: $72^{\circ}C / 162^{\circ}F$

Type R3 is specifically developed for the production of large patterns and statues. Its accuracy and durable, yet flexible characteristics, with a slow cooling time, excellent flow properties and extremely low viscosity and shrinkage make it ideal for large pieces.

Type XR2025 Injection Temp: 71°C / 160°F

Medium hardness wax, ideal for filigree work with high flexibility.

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Type XR2028 Injection Temp: 70°C / 158°F

Perfect for larger, intricate jewellery patterns. Very flexible, easy to remove from your rubber moulds.

Type R32WP Injection Temp: 69°C / 156°F

R32WP has a high flexibility, low hardness and is ideal for most patterns produced in the modern wax room.

Type R33WS Injection Temp: 73°C / 163°F

This is a hard wax, very suited to larger patterns yet still has high level of flow ability.

Type R40WP Injection Temp: 71°C / 160°F

Reproduces perfectly smooth surface finishes on patterns, with high flexibility, used equally for both large bangles and rings.

Wax Technical Data

	RI	R2	R3	XR2025
FLOW (cPs)	172	236	275	118
HARDNESS (N)	178.5	207.8	175.5	220.5
FLEXIBILITY (N)	456.3	387.5	418.8	562.5
SOLIDIFICATION POINT (°C)	64	58	62	65
LINEAR SHRINKAGE (%)	1.83	1.04	1.38	2.22
INJECTION TEMP (°C)	71	71	72	71
	VD0000		0.001	
	XKZUZO	ROZVVP	KSSVVS	R4UWP
FLOW (CPs)	206	192	202	299
FLOW (cPs) HARDNESS (N)	206 216	192 180.8	202 225.2	299 164.5
FLOW (cPs) HARDNESS (N) FLEXIBILITY (N)	206 216 500	192 180.8 425	202 225.2 593.8	299 164.5 420.5
FLOW (cPs) HARDNESS (N) FLEXIBILITY (N) SOLIDIFICATION POINT (°C)	206 216 500 65	192 180.8 425 64	202 225.2 593.8 63	299 164.5 420.5 62
FLOW (cPs) HARDNESS (N) FLEXIBILITY (N) SOLIDIFICATION POINT (°C) LINEAR SHRINKAGE (%)	206 216 500 65 1.94	192 180.8 425 64 1.81	202 225.2 593.8 63 2.04	299 164.5 420.5 62 2.04



Characteristics of the SRS Universal Quality Range



Injection Wax Properties



High Quality Waxes

- Better reproduction of rubber mould details
- Excellent surface therefore less metal loss at finishing
- Easier removal from mould due to high quality material
- Higher flexibility low cost waxes tend to be brittle
- Low ash content therefore lower chance of residue in castings

Injection Wax Manufacturing Properties & Parameters

- Viscosity
- Hardness
- Flexibility
- Shrinkage
- Drop melting point
- Congealing point
- Penetration hardness



Equipment Preparation

- Air filters should be installed on the air lines to the wax pot
- A moisture trap should be installed before the pot
- Set the temperature on the wax pot according to the manufacturers recommendations
- Store wax in a sealed bag or container to avoid contamination
- Check wax for signs of contamination or air bubbles when refilling the pot
- Periodically clean the wax pot





Sprueing Technique

- Good sprueing techniques are essential to obtain good castings
- Metal should be able to enter the mould cavity quickly and easily without restrictions
- Sprue size should be proportionate to the casting and round sprues flared at the casting are the most affective.
- Attach sprue to the heaviest area of the casting as the heaviest areas will solidify first. The is allows the heavy area to draw molten metal from the sprue as it solidifies
- Multiple sprues may be needed on the more complex castings to obtain the best results.
- Avoid sharp bends as any restrictions can cause turbulence in the metal flow causing mould erosion and porosity from entrapped mould gasses.









- For the main sprue always use a wax with lower melting temperature than the wax patterns. This will allow the wax to flow out of the mould cavity without boiling inside the mould thus reducing mould erosion.
- Avoid mixing light and heavy wax patterns on the same tree. If you need to mix place the big pieces close to the base and the small pieces at the top.
- The wax patterns should angled at 45°C upwards to the main sprue this allows the wax to flow out and the molten metal to flow in without restrictions
- Care should be taken attaching the wax patterns to the main sprue. Avoid leaving molten wax or depressions on the sprues as they cause protrusions of investment powder that could break off during casting and cause inclusions in the metal.
- Allow enough space 1 cm between the flask wall and the wax patterns for investment to fill around and 2.5cm at top of the tree to the top of the flask.
- Leave 1cm space between the button and the first row of the wax patterns



Sporueing Technique

Achieving the Best Results from SRS Wax

Your Wax Pot

- Wax pots should be drained and cleaned on a regular basis
- Fill your wax pot at the end of the day
- Allow your SRS wax time to reach the correct injection temperature
- If you have to refill the wax pot during the day use the following procedure:
 - 1. Increase the pot temperature to 90°C to fast melt the wax
 - 2. Stir the added wax to eliminate bubbles and to distribute the heat
 - 3. Take a temperature reading to ensure correct injection pressure
 - 4. Before re-use allow the pot to settle and recheck the injection pressure
 - 5. Pull vacuum on the wax pot to ensure there is no air trapped

Operation

• Keep the pot on continuously at the injection temperature to keep the wax at an even temperature

Wax Temperature

- Use the recommended wax injection temperature
- Use a calibrated thermometer exclusively for your wax pot
- Immerse the thermometer into the wax to get an accurate reading

Injection Pressure

- To get the best results set the pressure at the lowest pressure setting
- Always clean the nozzle before daily use

Shutting Down Night

- Release the air pressure
- Refill the wax pot
- Ensure wax pot is left switched on



Injection Wax Trouble Shooting

Shrinkage too high

Wax too hot, sprue too narrow, injection pressure too low.

Wax does not fill Wax too cold, pressure too low, sprue too narrow.

Mould overflow / fill

Wax too hot. Too much pressure. Mould not clamped well enough during injection. Poor cut mould. Injection dwell time to long. Lack of vents within the mould.

Distorted wax patterns

Poor master pieces. Caused by cleaning flash off with a knife.

Air bubbles

Wax temperature incorrect (too hot/cold). Not enough wax in the pot. Too much injection pressure or pressure too low. Moisture in the wax or airlines. Wax at a low level in wax pot.

Incomplete wax patterns

Wax temperature too low. Injection pressure too low. Overheating of the wax. Low wax level in the wax pot.

Distorted wax patterns

Opening mould too soon.

Rough wax patterns

Excess talc or release agent on the moulds.



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