

## **Qiiicote®** Release agents for composites

### **Introduction**

PRF **Qiiicote®** is a range of advanced mould surface preparations and mould release agents consisting of:

- Tool surface cleaners
- Tool surface sealers
- Semi-permanent mould release
- Advanced PVA release agent
- “Smart” internal release agents

### **Qiiicote® Semi-Permanent release agents**

**Qiiicote®** semi-permanent release agents are single-part curing systems which work by forming a microscopic layer of “non-stick” polymer film bonded to the tool face. They prevent intimate contact of the component resin system (matrix), thereby allowing the cured component to be parted from the tool. The blended polymers are dissolved in solvent or water (depending on the product) and applied as a liquid onto the tool face. Several coats are applied, with each being cured, until the required film thickness is reached. Once the tool is conditioned, multiple releases of components can be made without contaminating transfer, before the tool will require servicing with a fresh application of release agent.

Major advantages of using **Qiiicote®** semi-permanent systems are:

- High temperature processing capability (up to 430°C depending on type);
- No contaminating transfer to the component surface;
- Speed and ease of application combined with the maximum number of part releases ensures very high cost-effectiveness;
- Products are available for most applications.

**Qiiicote®** semi-permanent release agents can be used on a large range of tooling substrates including carbon fibre composite, glass fibre composite, metal, glass & tooling block.

**Qiiicote®** release agents may also be used directly on mould tool surfaces prepared with other proprietary brands of semi-permanent release agents. When doing this we recommend first thoroughly cleaning down with **Qiiicote®** C120 cleaner to ensure the surface is completely contamination free, and always run a small trial to confirm compatibility of the materials.

**Please refer to the product guide and application instructions for the specific product referred to in the following pages.**



## Pattern and Mould Tool Surface Preparation

### Stage 1 – Preparing the mould tool surface

The tool surface should be prepared to the required quality of finish. If this involves the use of cutting compounds, the surface must be wiped clean and washed down with water to remove any water soluble residue.

### Stage 2 – Cleaning the surface

Solvent soluble contaminants such as wax, oil and silicones that are used in the formulation of cutting/polishing compounds must be completely removed from the tool face to ensure good adhesion of the semi-permanent sealant and release agent. **Qiicote®** light cleaner **C120** is formulated to remove such contaminants.

Mould tool cleaner **Qiicote® C120** is applied to the surface using a clean cloth with the mould surface being wiped down thoroughly and wiped dry immediately before the cleaner has evaporated. Two applications are recommended using clean lint-free cloths, regularly changed, to ensure contamination is removed from tool surface and not re-deposited elsewhere on the surface. Use a soft, lint-free cloth to remove the cleaner. The mould should now be clean and ready for the surface sealer.

Note 1: Ensure that all surfaces that are to be prepared with release agent (including run off areas) are thoroughly cleaned with **Qiicote® C120**.

Note 2: It is imperative that the surface is completely free of contaminants and, if necessary, heavy contamination should first be removed using **Qiicote® C110 - Heavy Duty Cleaner** before continuing as described above.

### Stage 3 – Seal the surface

The tool surface is porous at the microscopic level and has to be sealed before the application of semi-permanent release agent. This is done using **Qiicote® S200**.

#### Sealing method 1 (high gloss finish)

Having thoroughly cleaned the tool surface, apply **Qiicote® S200 sealer** by spraying, brushing or wiping, at temperatures between 15°C - 30°C. Only a small area, a maximum of 1 sq/m, should be coated at a time. Remove the sealer, before it has evaporated, with a soft, lint-free cloth; first wiping dry with a clean cloth followed by polishing by hand with a second clean cloth. Three coats should be applied, with each coat being cured (in accordance with the instructions) before the next application.

#### Sealing method 2 (apply and leave)

**Qiicote® S200 sealer** may also be applied by spraying, brushing or wiping on and then immediately drying in accordance with the curing instruction below. When using this 'apply & leave' method the surface finish will be less glossy than when polished dry.

#### Curing **Qiicote® S200 sealer**

Which ever method of application is chosen, the curing procedure is the same. Cure each of the first 2 coats for 30 minutes at 23°C or 15 minutes at 60°C. After applying the final coat, cure for 60 minutes at 23°C or 15 minutes at 120°C. Alternatively, leave overnight, at room temperature (23°C), to enable the sealer to cure before applying the selected **Qiicote®** release agent.

Note: The entire mould tool surface must be sealed including the run off surfaces. Ensure that there are no un-coated areas, (whilst keeping overlaps to a minimum) and take extra care with intricate details in the mould tool design.

### Stage 4 – Applying **Qiicote®** mould release agent

The selection of the mould release agent depends on several factors, but notably: the processing temperature; the tool material; the type of component matrix to be used; the tool surface condition and the manufacturing process. The **Qiicote®** product selector guide will ensure the correct mould release is chosen for a particular application.

### **Applying Qiiicote® semi-permanent release agent**

A new mould will require several coats of **Qiiicote®** semi-permanent release agent to build up the film thickness after which multiple releases will be able to be made before the mould requires re-conditioning with a fresh coat. **Qiiicote®** semi-permanent release agent may be applied by brush, spray or lint-free cloth, and immediately polished off. Alternatively, if a high gloss finish is not required, it can be applied and left on. Each coat of **Qiiicote®** semi-permanent release agent must be cured in accordance to the instructions; the time and temperatures stated are the minimum requirements.

Note: Curing for longer and elevating the temperature will improve the cure of the film and increase the number of component part releases.

For exact details regarding the number of coats to be applied, curing detail and instructions on the application of the selected release agent refer to the relevant product technical data.

For a new tool, after the first component part has been released, a further application of **Qiiicote®** semi-permanent release agent, in accordance with the above instructions, should be made before the second component part is produced and one more application before the third. This process will build up the film thickness on the surface and increase the number of part releases before the need to re-apply release agent.

### **Time –Temperature relationship**

The performance of **Qiiicote®** sealers and semi-permanent release agents is dependent upon three factors: curing time, curing temperature and number of layers applied. Increase in any one of these factors will provide a better cure of the film and thus a better performance. However an increase in more than one, or all three factors, will give a significantly improved performance; improving the release and increasing the number of releases per part.

### **Tacky tape test**

A simple test to check that the film is adequately cured and that the mould tool is ready for moulding is to take a length of masking tape and present the tacky side to the mould tool surface. If the tape fails to stick readily to the surface the tool should be ready.



## **Qiiicote® Tool Surface Cleaners**

**Qiiicote® C110** tool surface cleaner is a heavy-duty solvent-based cleaner for the removal of resin residue, vac bag sealant, wax, grease and contamination. A final application of cleaner C120 is recommended to ensure the complete removal of contamination before the use of **Qiiicote®** mould sealer or release agents

**Qiiicote® C120** tool surface cleaner is a light solvent cleaner used for the preparation of the mould surface prior to the application of **Qiiicote®** sealers or release agents.

**Qiiicote® C130H** high temperature tool heavy-duty surface cleaner will remove very heavy soils, resin residue and surface contamination without dulling the surface. Due to the low flash point of the formulated blend of solvents used in **Qiiicote® 130H** cleaner, this product may be used on mould surfaces up to 100°C. Elevating the temperature improves cleaning efficiency, which is at its best when the temperature is at its highest (100°C). The contaminating residue will loosen from the surface and may be wiped off with a damp cloth whilst the mould tool is hot.

## **Qiiicote® Tool Surface Sealer S200**

**Qiiicote® S200** tool surface sealer is specially formulated for use as a foundation coat to seal micro-porosity in the tool surface before the application of **Qiiicote®** release agent. It will also seal defects in the tool surface such as light scratches and is suitable for use on the surface of carbon fibre and glass fibre tools made from epoxy or polyester, metal tools and tooling block. Having a processing temperature of 400°C makes it a perfect surface preparation for both our solvent and water-based release agents. **Qiiicote®** tool surface sealer also provides an excellent foundation prior to the application of wax-based release agents, improving the component release from the tool when using these systems.

## **Qiiicote® semi-permanent release agents for composites**

**Qiiicote®** semi-permanent release agents are available in both solvent and water-based formulas. The product range covers most applications within the various industries of advanced composites; GPR; thermoplastics. Please see the Selector Guide for more details.