

UHV Portfolio for Viscous Lithography Manufacturing and Hot Lithography

High-viscosity photopolymer grades across rigid and elastomeric envelopes with product-specific biological documentation

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Highlights

- The portfolio comprises eleven UHV Bio grades; biological documentation varies by exact product and tested condition.
- The Bio designator is not standalone evidence of biocompatibility.
- Processing temperature changes viscosity, cure kinetics, stability and exposure response.
- HDT, hardness and other numerical claims require method, specimen, conditioning and report traceability.
- Finished regulated devices require device-specific risk management, biological evaluation and conformity assessment.

Abstract

The UHV portfolio contains eleven high-viscosity grades spanning rigid to soft-elastic envelopes for equipment capable of controlled high-viscosity or heated-vat processing. Selection requires rheological, thermal and mechanical requirements plus compatibility with the exact machine and temperature-controlled workflow.

The Bio designator must not be used as standalone evidence of biocompatibility. Product-specific biological documentation should identify the tested formulation, specimen preparation, post-processing, endpoint, report and limitation.

Heating can alter viscosity, working time, cure kinetics and stability. The validated operating window must therefore be grade- and platform-specific rather than generalized across all viscous-lithography systems.

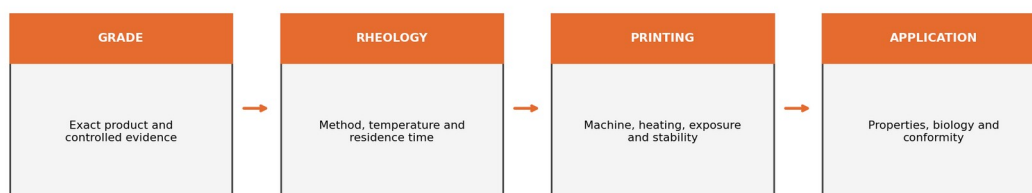
Keywords UHV · viscous lithography · Hot Lithography · high viscosity · heated vat · biological documentation

Source use. Product evidence is controlled in [1]; photopolymer background in [2–3]; biological, thermal and additive-manufacturing methods in [4–6].

1. Product-by-product evidence

Each grade is recorded using: product name; measured mechanical or thermal property; validated processing window; available biological documentation; intended engineering use; and explicit limitations. Evidence from one grade is not extrapolated to the other ten.

- Use current TDS/report identifiers.
- Separate commercial designators from measured endpoints.
- Withhold untraceable HDT, hardness or viscosity numbers.



Release requires traceable evidence at every gate; a catalogue label cannot bypass the chain.

Figure 1. WP-15 evidence gates from controlled material description to final acceptance.

2. Heated-process validation

The process window includes vat and material temperature, temperature uniformity, residence time, viscosity method and temperature, exposure response, recoating, stability and post-cure. Standard ambient-vat use is not assumed unless compatibility is validated.

- Define thermal history and maximum residence time.
- Recalibrate cure at the operating temperature.

- Monitor phase stability and sedimentation where relevant.

3. Biomedical and regulated-use boundary

A mechanically suitable prototype is not automatically biologically suitable or compliant. Any regulated finished device requires intended-use definition, manufacturing validation, device-specific biological evaluation and the applicable conformity route.

4. Minimum controlled evidence before release

Control field	Required record	Release interpretation
Grade	Exact product and controlled evidence	Catalogue description only until evidence is linked
Rheology	Method, temperature and residence time	Control process variables and change triggers
Printing	Machine, heating, exposure and stability	Report method, result, uncertainty and limits
Application	Properties, biology and conformity	Apply final acceptance and responsibility boundary



Description ≠ measured result ≠ certification or finished-device approval

Figure 2. WP-15 separates catalogue positioning, measured evidence and final application decisions.

KEY INSIGHT

Precise product or application language is retained only when the exact formulation, method, processed specimen and controlled evidence can be traced.

5. Limitations

- Bio is a product designator, not a biological-safety classification.
- Evidence for one UHV grade cannot be transferred to another.
- Mechanical range does not establish biomedical suitability.
- Heated processing requires grade- and machine-specific limits.
- Untraceable numerical product claims remain withheld.

6. Conclusions

- The portfolio comprises eleven UHV Bio grades; biological documentation varies by exact product and tested condition.
- The Bio designator is not standalone evidence of biocompatibility.
- Finished regulated devices require device-specific risk management, biological evaluation and conformity assessment.
- This corrected candidate remains local and on HOLD until series-wide scientific, metadata and visual release checks are complete.

Revision note

Version 5.5 removes portfolio-wide biocompatibility and universal heated-processing claims, introduces product-specific evidence records and withholds numerical properties lacking controlled report traceability.

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Disclosure. Dr. Juan Segurola is founder and Scientific Director of 3Dresyns by Resyner Technologies S.L., the supplier of the materials discussed.

References

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