

2 THE DEMOULDING PROCESS OF DECORATIVE GRC ELEMENTS FREE OF BREAKAGE BY PUR-RUBBER MOULDS

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SUMMARY: High-quality elastomers with shrinkage-free setting offer the mould-maker a high level of precision. Properties such as high tear resistance, good values regarding elongation at break and good resistance against UV light, allow planning for a minimum of 100 reuses when manufacturing repeated components. This leads to economic and exact estimation. Elastic moulds enable the user to realise an endless variety of new creative designs in GRC, in order to enter new markets.

KEYWORDS: Elastic demoulding and GRC elements, patterned concrete, re-usable PUR-rubber moulds, RECKLI standard formliners, RECKLI special moulds, make-your-own moulds.

INTRODUCTION

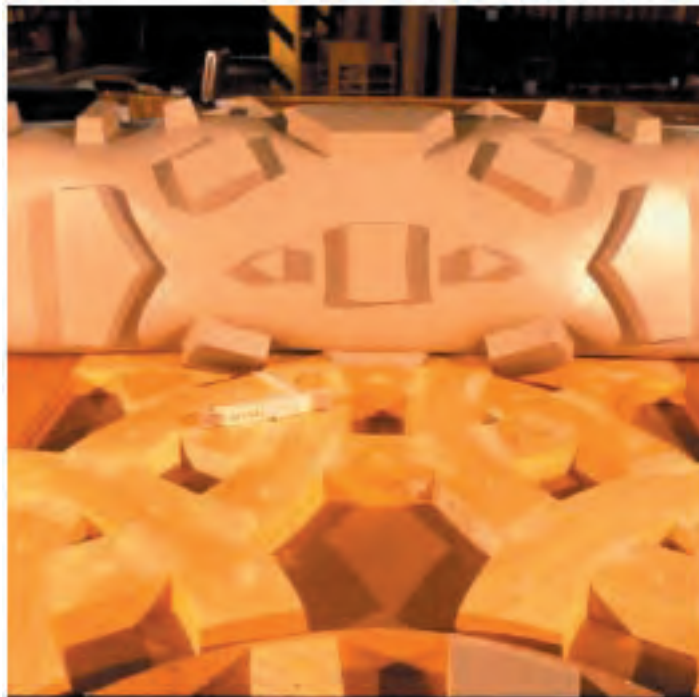


Figure 1 - Mould shop, RECKLI-Chemiewerkstoff GmbH, Germany

The development of GRC for the production of decorative products could only easily be realised by the use of an elastic mould.

Both materials, GRC and the elastic moulds, have encouraged the further development of this young building material.

The demoulding process, free of any breakage of both the form and the concrete part, offers the designer and the manufacturer nearly no limits regarding patterns and design. The reusability of the forms makes possible good economic use of the building material GRC.

Elastomers based on PUR particularly offer the following features:

- high reusability
- high dimensional precision (nearly no shrinkage)
- good re-shaping
- high elongation at break
- high tensile strength
- long durability of the forms



Figure 2 - Detail, museum, Teranganu, Malaysia

In mould manufacture there are six different possibilities to achieve the most economic formliner system or self-manufactured moulds:

1. Standard formliners 100× reusable
2. Standard formliners 50× reusable
3. One-Timer-Formliners
4. Liquid synthetic material based on PUR
5. Liquid synthetic material based on SI
6. Special forms following on customers' requests



Figure 3 - Precast yard, Comp. Pergola Garden, Qatar

DETAILED DESCRIPTION

- 1. Standard formliners 100x reusable**
Full synthetic rubber-formliners $\gamma = 1.4^2$
Standard catalogue, approx. 200 different patterns
Pattern depth: approx. 0–2cm
Measurement: max. 4 × 10m
- 2. Standard formliners 50x reusable**
Light synthetic rubber formliners $\gamma = 0.8^3$
Standard catalogue, approx. 50 different patterns
Pattern depth: approx. 2–15cm
Measurement: max. 1 × 5m
- 3. One-Timer-Formliners**
Elastic front part (PUR foam) bonded to a hardboard backing
Standard catalogue, approx. 15 different patterns
Pattern depth: approx. 2–20 mm
Measurement: 0.75 × 3.00m fix
- 4. Material for Make-your-own-moulds**
PUR Elastomer, Shore A 30, A 40, A 55 and A 70, pourable
PUR Elastomer, brush-on type, Shore A 55
- 5. Material for Make-your-own-moulds**
SI Elastomer, Shore A 5, A 10, A 15, A 20, A 25 and A 31, pourable
SI Elastomer, brush-on type, Shore A 15
- 6. Special forms on customer's request**
Pattern depth: 0 to not restricted
Measurement: up to max. 4 × 10m



Figure 4 - Rock decoration, Bad Füssing, Germany

MAKE-YOUR-OWN MOULDS OF PUR ELASTOMER

Model area:	Sucking: PUR sealing Non absorbing: Mould Wax
Mixing process:	See appendix, PUR-Elastomer
Demoulding:	12–24 h
Concrete casting:	Form pretreatment Stripping Wax TL

Table 1 - Checklist for application of PUR-Elastomer, two components

Preparation	
Storage	18–20°C room temperature 18–25°C material temperature, pot life 5 min 25–30°C material temperature, no pot life
Mixing tool	Drilling machine
Mixing paddle	Type 2: 2–4.5kg Type 3: 9–22.5kg
Rotation speed	500–770rpm
Application	
Pretreatment of the surface, general	1. Absorbing foundations: sealing and mould wax 2. Non-absorbing foundations: mould wax
Pretreatment of the surface, plaster	1. Polishing wax 2. Sealing and mould wax
Mixing process	
Step 1	Stir base component
Step 2	Check for sedimentation
Step 3	Use the complete drum contents. Mixing time approx. 60 s, unique colour tone
Step 4	Refill Pour the mixture into another receptacle. Mixing time approx. 50 s
Step 5	Useing partial quantities according to weight parts
Demoulding	After 12–24 hours, check measurements and fixing