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## Advanced Materials

# RenCast® 205-3 / Ren® 205-3 / DT 081 / DT 082

## THREE COMPONENT RAPID-CURING POLYURETHANE CASTING SYSTEM

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### APPLICATIONS:

Foundry patterns	Patterns plates
Core boxes	Cores
Gating	Risling
Negative and ancillary molds of all types	Trials castings
Prototypes	Copy milling patterns and styling models
Machining supports	Trimming and assembly jigs

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### METHOD OF APPLICATION:

Solid or face casting.

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### MIXING INSTRUCTIONS:

#### Reaction Ratios:

	<u>Unfilled</u>	<u>DT 081</u>	<u>DT 082</u>
RenCast® 205-3 (Resin) or (Hardener)	100 pbw	100 pbw	100 pbw
Ren® 205-3 (Hardener) (polyol)	100 pbw	100 pbw	100 pbw
DT 081 Low Density Filler	--	100 pbw	--
DT 082 High Density Filler	--	--	300 pbw

**Polyurethane RenCast® 205-3 should be shaken thoroughly before use** to redisperse a desiccating agent which may have settled out.

The three components of the system can be added to one another in any sequence. They should be mixed thoroughly, **but not for longer than 60 to 90 seconds**.

The mix is then poured into a mold pretreated with release agent.

Theoretically, there is no limit to the thickness of the layer or the volume of mix which can be cast in a single operation because the system shows only low exothermic temperature rise. In practice, the short pot life of the mix does set definite limits.

Thick layers are best built up by casting a series of thin layers. To ensure durable adhesion between layers, each successive layer should be cast before the previous one has gelled. This entails casting successive layers at intervals of less than 7 minutes.

The pourability of the system can be improved by reducing the filler content.

The cured castings are impact resistant and easy to machine.

Note that filler content can be varied. Adjust filler to lower level if a lower mixed viscosity is desired.



**Unfilled Properties  
(100 Resin:100 Hardener by weight)**

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**TYPICAL MIXRD PROPERTIES:**

Property	ASTM Test Method	Test Values <sup>(1)</sup>
Gel time (4fl. oz.)	D-2471	6 minutes
Color            Resin Hardener Mixed	Visual	Dark Brown Cream Beige
Viscosity, mixed	D-2393	80 cP
Demoldable    10 mm layer 30 mm layer		After 90-100 minutes After 60 minutes
Exothermic temperature rise, 40 mm layer		96°C

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**TYPICAL CURED PROPERTIES:**

Property	ASTM Test Method	Test Values <sup>(2)</sup>
Density (g/cc)	D-792	1.12
Hardness (Shore D)	D-2240	70
Ultimate Compressive Strength (psi)	D-695	5,000
Compressive Modulus (psi)	D-695	167,000
Ultimate Flexural Strength (psi)	D-790	5,600 <sup>(3)</sup>
Flexural Modulus (psi)	D-790	168,000
Ultimate Tensile Strength (psi)	D-638	3,300
Tensile Modulus (psi)	D-638	170,000
% Elongation	D-638	9%
Tg per DMA °F (°C)	D-4065	172 (78)
Coefficient of Thermal expansion (in/in °F) -30°C to +30°C	D-3386	7.61 x 10 <sup>-5</sup>
Shrinkage (in/in) cast Mold #0	D-2566	0.0022
Notched Izod Impact (ft. lb./in)	D-256	0.35
Deflection Temperature °F (°C) @ 66 psi @ 264 psi	D-648	137 (58.5) 121 (50)

<sup>(1)</sup> Tested @ 77°F.

<sup>(2)</sup> Cure Schedule – 7 days @ 77°F (25°C), tested @ 77°F

<sup>(3)</sup> Stress at Peak. Samples did not break.

**Filled Properties  
Using DT 081 Filler  
(100 Resin:100 Hardener:100 Filler by weight)**

**TYPICAL MIXRD PROPERTIES:**

Property	ASTM Test Method	Test Values <sup>(1)</sup>
Gel time (4fl. oz.)	D-2471	73 minutes
Color            Resin Hardener Mixed	Visual	Dark Brown Cream Beige
Viscosity, mixed	D-2393	1,400 – 1,700 cP
Demoldable      10 mm layer 30 mm layer		After 90-120 minutes After 30-60 minutes
Exothermic temperature rise, 40 mm layer		65°C

**TYPICAL CURED PROPERTIES:**

Property	ASTM Test Method	Test Values <sup>(2)</sup>
Density (g/cc)	D-792	0.95
Hardness (Shore D)	D-2240	73
Ultimate Compressive Strength (psi)	D-695	4,500
Compressive Modulus (psi)	D-695	313,000
Ultimate Flexural Strength (psi)	D-790	4,000
Flexural Modulus (psi)	D-790	325,000
Ultimate Tensile Strength (psi)	D-638	2,400
Tensile Modulus (psi)	D-638	373,000
% Elongation	D-638	1.01%
Tg per DMA °F (°C)	D-4065	170 (82)
Coefficient of Thermal expansion (in/in °F) -30°C to +30°C	D-3386	4.12 x 10 <sup>-5</sup>
Shrinkage (in/in) cast Mold #1	D-2566	0.0023
Notched Izod Impact (ft. lb./in)	D-256	0.2233
Deflection Temperature °F (°C) @ 66 psi @ 264 psi	D-648	144 (60) 134 (57)

<sup>(1)</sup> Tested @ 77°F.

<sup>(2)</sup> Cure Schedule – 7 days @ 77°F (25°C), tested @ 77°F

**Filled Properties  
Using DT 082 Filler  
(100 Resin:100 Hardener:300 Filler by weight)**

**TYPICAL MIXRD PROPERTIES:**

Property	ASTM Test Method	Test Values <sup>(1)</sup>
Gel time (4fl. oz.)	D-2471	9-10 minutes
Color            Resin Hardener Mixed	Visual	Dark Brown Cream Beige
Viscosity, mixed	D-2393	2,000 – 3,000 cP
Demoldable      10 mm layer 30 mm layer		After 90-120 minutes After 60-90 minutes
Exothermic temperature rise, 40 mm layer		40-45°C

**TYPICAL CURED PROPERTIES:**

Property	ASTM Test Method	Test Values <sup>(2)</sup>
Density (g/cc)	D-792	1.65
Hardness (Shore D)	D-2240	80
Ultimate Compressive Strength (psi)	D-695	6,100
Compressive Modulus (psi)	D-695	527,000
Ultimate Flexural Strength (psi)	D-790	5,200
Flexural Modulus (psi)	D-790	512,000
Ultimate Tensile Strength (psi)	D-638	3,200
Tensile Modulus (psi)	D-638	587,000
Tg per DMA °F (°C)	D-4065	180 (82)
Coefficient of Thermal expansion (in/in °F) -30°C to +30°C	D-3386	4.56 x 10 <sup>-5</sup>
Shrinkage (in/in) cast    Mold #1 Mold #2	D-2566	0.0027 0.0045
Notched Izod Impact (ft. lb./in)	D-256	0.36
Deflection Temperature °F (°C) @ 66 psi	D-648	127 (53)

<sup>(1)</sup> Tested @ 77°F.

<sup>(2)</sup> Cure Schedule – 7 days @ 77°F (25°C), tested @ 77°F

**NOTE:** Typical Properties – These physical properties are reported as typical test values obtained by our test laboratory. If assistance is needed in establishing product specifications, please consult with our Quality Control Department.

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**STORAGE/HANDLING INFORMATION:****RenCast® 205-3 and Ren® 205-3**

Store at 70-90°F. This product is moisture-sensitive and packaged under a blanket of dry nitrogen. Maintain factory seal. After use, reblanket with dry nitrogen and tightly reseal.

Stir well before use. This material will separate.

Work in a well ventilated area and use clean, dry tools for mixing and applying. For two component system, combine the resin and hardener according to mix ratio. Mix together thoroughly and use immediately after mixing. Material temperature should not be below 65°F (18°C) when mixing.

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**SHELF LIFE:**

Provided materials are under the recommended storage conditions in their original containers, they will remain in useable condition for at least two years from date of shipping.

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**PACKAGING:**

This product is available in the following package size(s):

- RenCast® 205-3 is available in small kits of 15# total weight, pails of resin (38#), and pails of hardener (38#).
- DT 081 is available in 50# bags and DT 082 is available in 33# pails.

Please call Customer Service (800-367-8793) for price and availability.

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**SAFETY/HANDLING PRECAUTIONS:**

Do not use or handle this product until the material Safety Data Sheet has been read and understood.

**RenCast® 205-3**

**WARNING!** Harmful if inhaled. Causes skin and eye irritation. Cause allergic skin and respiratory reaction. Avoid contact with eyes, skin, and clothing. Avoid breathing vapor or mist. Avoid prolonged or repeated contact with skin. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

**Ren® 205-3**

**WARNING!** Causes skin and eye irritation.. May cause allergic skin reaction. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated contact with skin. Wash thoroughly after handling.

**DT 081 Filler**

**CAUTION!** In accord with good industrial practice, handle with due care. Avoid dusty conditions. Use with adequate ventilation. Do not breathe dust. Avoid contact with eyes, and clothing. Wash thoroughly after handling.

**Notice!** Contains crystalline silica. Breathing dust may cause cancer and delayed lung injury.



**DT 081 Filler**

**CAUTION!** In accord with good industrial practice, handle with due care. Avoid dusty conditions. Use with adequate ventilation. Do not breathe dust. Avoid contact with eyes, and clothing. Wash thoroughly after handling.

Nuisance dust may be generated when sanding or sawing cured material.

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**FIRST AID:**

In case of contact with:

**Skin:** Immediately wash with soap and water. Remove contaminated clothing and launder before reuse. Destroy contaminated shoes.

**Eyes:** Immediately flush with water for at least 15 minutes. Call a physician.

**Ingestion:** If conscious, give plenty of water to drink. Do not induce vomiting. Call a physician.

**Inhalation:** Remove to fresh air. Administer oxygen or artificial respiration if necessary. Call a physician.

**Other:** Referral to physician is recommended if there is any question about the seriousness of any injury.

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**PRECAUTION NOTE:**

Thermosetting systems generate heat when curing. The amount of heat and the period of time in which heat is released vary significantly between systems. Additionally, ambient or compound temperature, amount of material mixed, and construction and shape of the mold or container can also be factors in the temperature profile of a mixed system.

In some cases, the thermosetting reaction can be vigorous, generating heat sufficient to cause decomposition of the system with subsequent liberation of large volumes of acrid smoke.

A good rule of thumb is never mix more material than can be applied during the stated pot life or gel time. Also take care when using materials in applications other than stated on the Product Data Sheet, i.e., a laminated resin for casting.

Please feel welcome to call our Product Information Department or your local Ren<sup>®</sup> representative for instructions before you start your job.

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