

# PRODUCT SHEET

## Ecodur 201

### Product Description

Castagra Ecodur 201 is a high performance, low cost system for lining water/chemical tanks, tankers, pipes, and more. It has been independently tested and certified by CSA International as a product suitable for use in drinking water tanks, piping systems and related structures and surfaces as a lining or coating.

### Surfaces

Castagra Ecodur 201 strongly bonds to steel, concrete, wood, asphalt, fiberglass, brick, itself and more.

### Chemical Resistance

Consult a Castagra representative for specific recommendations.

### Product Characteristics

Non-toxic, VOC/BPA free, environmentally benign.  
Excellent cold weather application performance.  
100% solid, single coat application, fast curing.  
Made of natural products, castor oil and gypsum.  
NSF/ANSI 61 certification for potable water.  
Class A fire rating.  
98-100% adhesion compared to just 50% for epoxy.  
Remains flexible with 20 - 100% elongation.  
Encapsulate whatever it is applied to.  
Thermal and electrical insulating properties.  
Good general solvent, acid & base resistance.  
Autobonds 100% to previous Ecodur coats with no time limit.

### Recommended Coat Thickness:

Consult a Castagra representative for specific recommendations.

### Durability:

ASTM C627 [16,000 passes of an average sized car] (HBT AGRA)[no debonding or deterioration occurred]

### Estimated Tensile Strength:

ASTM D412 (HBT AGRA) 900 Psi (6 MPa)

### Pull-off strength from steel (Charter):

ASTM D4541-09 AT 23° C / 73° F

1000 psi - with 95-100% cohesive

### Knife Adhesion Test (charter):

PDO SP-2095 App B.2 / ASTM D6677

0 mm (2 mm allowed) - Rating 10 (ASTM D6677)

### Estimated Elongation (HBT AGRA):

ASTM D412 - 50 - 100%

### Flexibility (Charter):

-CSA Z245.20-10 Section 12.11m @-30° C / -22° F

Shoe Radius 95mm, Chord 152mm, Arc 178mm  
>4.07 degree Bend/PD

### Chemical Resistance Test

#### Attached Cell Method (Charter):

(40% MEG & 60% Oilfield formation water)  
for 7 days @93° C/200° F - No defects. No blisters, delamination, cracks.  
No adhesion loss.

#### Electrical Impedance Spectroscopy:

(EIS) (Charter) ISO 16773-2; 2007

96 hours @ 23°C with 5% NaCl followed by 7 day attachment cell method chemical test. Log Z value at 0.1 Hz:9.19 ohms-cm<sup>2</sup> before chemical test and 9.46 ohms-cm<sup>2</sup> after chemical test - results higher than 9, indicating good barrier and corrosion protection properties that remained excellent after chemical resistance test.

#### Cathodic Disbondment - EN 10288 (Charter):

48 hours @ 65° C / 149° F @ -1.5V in 3% NaCL electrolyte.  
6mm (avg. of 6 tests), 7mm allowable for oil & gas,  
12mm allowable for water

#### Crack Bridging (HBT AGRA):

1/16" (1.6mm)

#### Estimated Impact Resistance (IZOD) (HBT AGRA):

(Drops sharply at -20° C)

2 FT-LBSf/inch (11 Kgf-mm/mm)

#### Hardness - Shore Durometer (HBT AGRA):

D 50+/-10

#### Heat Resistance – Continuous:

200° F (93° C)

#### Minimum Service Temperature:

-20° to -40° F (-30° to -40° C)

#### Water Absorption:

- ASTM D570 (1993) (HBT AGRA) - ASTM D570-98 (2005) (Charter) 0.3 % 30 g/m<sup>2</sup> @ 85° C / 185° F - 30 days

#### Rapid Chloride Permeability (AGRA):

ASTM C1202

17 (NIL) coulombs [after 6 hours]

#### Tensile Bond Strength to Concrete (HBT AGRA):

5 cycles freeze/thaw & water immersion

200 - 300 PSI (1.5 - 2.0 MPa)

#### Coefficient of Slip Resistance (HBT AGRA):

Rubber test surface wet/dry CAN/CGSB-75.1-M88

0.92 / 0.95

#### Abrasion Resistance (Polyhedron)

25.7 mg loss - ASTM 4060, CS-10, 1000 Cycles, 500g load

#### Liquid (un-cured) Product Properties for Ecodur 201:

Mix Ratio by Weight 83 parts catalyst (Part A)

17 Parts resin (Part B) (or 5:1 PBW)

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Mix Ratio by Volume \*\*\* 4.3:1 CAT-Part A to RES-Part B

\*\*\* Do not use volume approach without performing a shop test to verify the ratio yields the correct combination of flexibility and hardness for a particular application. Volume measurements are subject to variations during mixing and stirring that might entrain air.

Mixed Viscosity at 23°C 2000 - 3000 CPS  
 Resin Viscosity at 23°C 200 CPS  
 Catalyst Viscosity at 23°C 6000 - 10000 CPS  
 Specific Gravity (Approximate) Catalyst: 1.4  
 Resin: 1.2 (Mixed S.G. depends on blowing) Mixed (Max): 1.4

### Surface Preparation

Anchor profile minimum 2 mils.  
 Surface chlorides less than 10 ppm.

Surface Preparation for Steel:

- NACE-2 / SSPC-SP10 (near white blast)
- NACE-3 / SSPC-SP6 (commercial blast) acceptable in certain approved case-by-case situations.
- Surface must be clean, dry, and in sound condition. Remove all mill scale, oil, dust, grease, dirt, loose rust, and other foreign material.

Surface Preparation for Concrete:

- NACE - 6/ SSPC 13

### Application Instructions

#### Manual

Mix each container thoroughly (separately) with a concrete or mortar mixer prior to use. Use the metal mixing blade and tap on the inside walls of the bucket including corners where the bucket floor meets the bucket wall. Gypsum clumps will deposit in this area. Mix Part A (white) with Part B (brown) until Part A and Part B are fully mixed together.

#### Spraying

Special equipment and procedures are required for spray applications. Consult certified spray applicators for additional information on spraying application of Castagra Ecodur 201.

#### Brush

Apply to clean, dry surface using notched squeegee to build to 0.020" - 0.100" total thickness in a single coat or a two coat combined application. For non-skid, broadcast silica or similar hard material evenly over coated surface to achieve specified non-skid requirements.

Optional: roller apply more product after non-skid has been applied to encapsulate grit.

### Curing

Ecodur 201 with No Added DOTL Curing Agent

Temp	Dry to Handle Time	Cure to 90%
160°F (70°C)	30 min	6 hrs
120°F (50°C)	45 min	8 hrs
90°F (32°C)	1 hr	12 hrs
75°F (24°C)	2.5 hrs	24 hrs
60°F (15°C)	5 hrs	48 hrs
35°F (2°C)	10 hrs	4 days
20°F (-7°C)	24 hrs	8 days
-20°F (-30°C)	2 days	16 days

Ecodur 201 with 1.0 wt% added DOTL curing agent (2 kg/drum) (5 lbs or 80 oz)

Temp	Dry to Handle Time	Cure to 90%
160°F (70°C)	15 sec	2 min
120°F (50°C)	30 sec	5 min
90°F (32°C)	1 min	10 min
75°F (24°C)	2 min	20 min
60°F (15°C)	5 min	1 hr
35°F (2°C)	10 min	2 hrs
20°F (-7°C)	30 min	6 hrs
-20°F (-30°C)	1 hr	8 hrs

These are estimates and should be verified in actual operating conditions. Cure times are influenced by numerous factors.

### Notes

No primers/sealers required. Cross roll or use air lance to remove surface air bubbles during first hour of cure. Subsequent coats can be applied to partially or fully cured surface. For filling large holes or voids, simply trowel up to 2 inches thickness of product into the holes/voids.

### Storage Procedure

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## Ecodur 201 Part A:

Storage Temperature: No less than 32°F (0°C).

Storage: Recommend storing product upside down for ease of mixing when used and flip over several days before use. Shelf

Life: 1 year.

## Ecodur 201 Part B:

Storage Temperature: 75° to 105°F (24° to 41°C).

Moisture: Product must be kept free of moisture. Keep container closed because the product absorbs moisture from the air over time. Moisture in the product causes it to produce CO2 gas which may cause pressure build-up inside a sealed container. Shelf Life: 1 year.

## Coverage Chart

Thickness	Gallons per 100 sq ft
20 mils	1.37
40 mils	2.74
60 mils	4.11
80 mils	5.48
100 mils	6.85
120 mils	8.22
Theoretical coverage sq ft/gal @ 1 mil dft	1,467

## Application Conditions

Temperature Requirements: -13°F (-25°C) to 200°F (93°C)

Dew point temperature 5°C or 10°F below the substrate temperature.

## Ordering Information

	Ecodur 201S Kit	Ecodur 201M Kit	Ecodur 201M TOUCH UP Kit
<b>Packaging</b>	4 x Part A, 1 x Part B	1 x Part A, 1 x Part B	1 x Part A, 1 x Part B
<b>Weight</b>	2,900 lbs	50 lbs	10 lbs
<b>Volume</b>	~250 gals	~4.31 gals	~0.86 gals

## Standard Color: Natural White.

Special Order Colors: Battleship Gray, Dark Gray, Barrow Brown, Camel.

## Safety Precautions

Refer to the SDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Castagra representative for additional technical data and instructions.

## Disclaimer

The information and recommendations set forth in this data sheet are based upon tests conducted by or on behalf of Castagra Products, Inc. Such information and recommendations set forth herein are subject to change and pertain to the product offered at the time of publication. Consult your Castagra Products, Inc. representative to obtain the most recent data information and application bulletin.

## Warranty

Castagra warrants that at the time of shipment of the Products from Castagra's facility and for 1 year thereafter, Products that are manufactured by Castagra shall be:

- Free of manufacturing defects
- Meet the physical properties published by Castagra as of the date of shipment when applied in accordance with Castagra's written directions and tested in accordance with ASTM and Castagra standards.
- If, prior to the expiration of such one (1) year period, any Castagra Manufactured Products do not comply with the foregoing warranties Castagra, shall either replace such Castagra Manufactured Products or refund the price paid by the Client.
- This warranty shall be void if the Castagra Manufactured Product has been used contrary to Castagra's written instructions or directions.
- The Client shall assign the warranties and remedies set forth in this paragraph to each of its customers. The Client shall not provide to its customers any warranties on the Products except as set forth in this paragraph.

The above warranties cease to be effective if the products are altered or repaired other than by persons authorized or approved by Castagra to perform such work. Repairs or replacement deliveries do not interrupt or prolong the term of the warranty. The warranties above cease to be effective if the Client fails to operate and use the products sold hereunder in a safe and reasonable manner and in accordance with any written instructions from the manufacturer.

Under no circumstances shall Castagra be liable for incidental, punitive or consequential damages or for lost profits, whether such liability is a result of negligence, strict liability, breach, or any other theory of law.