ECOSTRUCT™ DATA

FEATURE	eco-2	eco-3
Wall Thickness	180 mm (7 ")	270 mm (10.6")
Unit Weight	7,2 Kg (16 lbs)	10,2 Kg (22 lbs)
Strength	20,7 MPa (3000 psi)	20,7 MPa (3000 psi)
Absorption	160 Kg/m3 (10 pcf)	160 Kg/m3 (10 pcf)
Fire Resistance	2 Hours	4 Hours
Noise Resistance	50 Db	54 Db
Heat Coefficient *	0,52	0,44
Heat Resistance**	(R 1.92)	(R 2.26)

** Overall Heat Transmission in W / m2.K for ungrouted Ecostruct™ with 25 mm insulation insert + 50mm wallboard and radiant barrier.*

*** Resistance = K.m2 / W*

LICENSED MANUFACTURER / DISTRIBUTOR

ECOSTRUCT™ GUIDE SPECIFICATIONS

1.0 **GENERAL** - Work under this section includes furnishing and installing multi-chamber, interlocking concrete masonry units meeting the trademark requirements of the Ecostruct™ system, together with all samples, certifications, inserts, reinforcements and related built-ins as shown and/or specified in the construction documents.

2.0 - **MATERIALS** - Multi-chamber, interlocking masonry units covered under this Specification shall meet the quality control, dimensional tolerances and structural requirements of the Ecostruct™ system, as established by the Rapid Building Systems Division of Synthesis International, Inc., and except as specified herein, shall conform to the material characteristics stipulated by ASTM C-90 for Grade N, Type II or Type I units.

2.1 - **Ecostruct™ Geometry** - Ecostruct™ stretchers shall contain multiple parallel chambers of biaxial configuration separated by vertical concrete diaphragms not less than 1.375" (35 mm) in thickness and covered by concrete face shells of different profiles according to function and exposure. Face shells and load bearing diaphragms shall be connected by fractional concrete webs designed to obstruct passage of moisture by weeping and gravity, while allowing free access for insulation, reinforcement, grout and air in the vertical and horizontal axis. Top and bottom surfaces of Ecostruct™ units shall be cast with continuous interlock means having a minimum shear capacity of 750 lb/ft (1.118 Kg/m) in the horizontal direction, and having adequate tolerance to be laid without mortar bed, while permitting construction of curved walls in minimum radii of 6'-0" (1.80 m). The Ecostruct™ system shall include miscellaneous assembly corner/jamb units with integral interlock as required to generate wall transitions such as corners, tees and wall ends in combination with standard Ecostruct™ stretchers.

2.2 - **Physical Characteristics of Ecostruct™** units delivered to the site shall not be inferior to:
- Compressive strength = 20.7 MPa (average) 19.3 MPa (unit) [3,000 psi (average) 2,800 psi (unit)]
- Maximum water absorption = 160 kg/m3 [10 lb/cu.ft.] (as measured on oven-dry units)

2.3 - **Dimensional tolerances of Ecostruct™** units shall not differ by more than 1.5 mm [0.0625"] from the manufacturing dimensions specified by the Licensor of the system (RBS).

2.4 - **Concrete unit additives**, such as air-entraining agents, water repellents, silica and integral pigments utilized in Ecostruct™ units shall require documentation of their inclusion in applicable ASTM Standards, or test and experience records substantiating that said admixtures are not detrimental to the durability and/or performance of the Ecostruct™ system, but in any case their proportions may not exceed 10% of the cement weight in the block mix.

2.5 - **Mortar** shall be Type M or S per ASTM C-270, and **Grout** shall comply with ASTM C-476.

2.6 - **Reinforcements** shall comply with ASTM A-615 or A616 for deformed bars, and ASTM A-153 for anchors and ties. RBS approved adhesive shall be used in lieu of wire reinforcing.

2.7 - **Insulation inserts** shall be premanufactured and installed in the block at the factory, composed of expanded or foamed styrene of not less than 21.4 Kg.m3 [1.5 lb/cf] density, 25.4 mm [1"] thickness, fabricated to be of suitable shape to fit tightly in Ecostruct™ cavities, and dimensioned to contact adjacent inserts across joint spaces without gaps.

3.0 - **CERTIFICATION** - Ecostruct™ units furnished shall bear manufacturer's certification corresponding to allowable compressive strength, absorptivity, and other quality control requirements for compliance under the Ecostruct™ trademark. Contractor shall furnish acceptable test evidence that Ecostruct™ units and associated elements comply with the requirements of this Specification. Present certificates for approval prior to material use on the job.

3.1 - **Samples** - Submit four samples of masonry units to illustrate color, texture and pigmentation range.

3.2 - **Mock-ups** - Construct representative masonry panel 1.20 m long by 1.20 m high (4 feet x 4 feet), including mortar, flashing and typical accessories for each type of masonry wall required by the project, and obtain approval for workmanship and assembly configuration prior to start of work. Mock-ups shall be maintained protected for the duration of the job and used as quality control samples to be matched by actual work.

4.0 - **INSTALLATION** - Protect Ecostruct™ units from rain and wetness prior to, during, and after erection, until walls are fully coped and flashed. After due verification that all field conditions are ready and acceptable for masonry work, and ensuring that items provided under other sections are properly sized and located, establish lines, levels and coursing in the horizontal and vertical directions. Provide adequate protection of masonry walls from wind forces during construction, until laterally supported and structurally homogeneous with the rest of the building. Mix mortar in the specified proportions in quantities corresponding to rate of work. No regular mortar more than 2 1/2 hours old shall be used. Prior to this, retempering with water is permissible. Except for full-mortar bed base course, Ecostruct™ units shall be laid mechanically interlocked on adhesive bed with full face shell vertical mortared joints in staggered (running-bond) pattern. Vertical (head) joints shall be 3/16" (5 mm) thick and tooled flush with adjacent block faces, taking care to keep clear built-in Ecostruct™ electrical raceways and chambers from mortar droppings and debris. Provide weeps at base courses, directly above metal flashing, by leaving 5 cm [2"] tall clear openings in head joint mortar at not more than 70 cm [28"] spacings. Install flashings continuously at base course, and where indicated on the drawings, taking care to lap joints a minimum of 15 cm [6"] and seal watertight with approved sealant. Turn flashing up to create vertical dams as and where shown on the drawings. Grouting of Ecostruct™ block cells shall be with fine grout, low lift technique, and using pump; grouted cells shall be vibrated. When outside air temperature drops below 5° C [40° F], follow procedures for cold weather as published by the International Masonry Institute All-Weather Committee. Install all ties, anchors, weep hole insect protection, flashings and control joints, as shown on the drawings.

5.0 - **QUALITY ASSURANCE** - In general, all masonry work shall be performed to comply with assembly dimensional tolerances and quality control requirements of ACI 530 and ACI 530.1

6.0 - **CLEAN UP** - Remove all scaffolding, wall bracing and equipment. Clean up debris, surplus materials and packaging, and remove from premises. Remove excess mortar and adhesive and clean smears as work progresses. Clean all masonry surfaces which are to remain exposed with an approved cleaning method and solution using non-metallic tools, and present masonry work in finished condition for final inspection and approval.

Another Innovation from:

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EcoStruct™

Patented

04200 / RBS
BuyLine

Multifunction, High Productivity Concrete Masonry Systems

Another innovative EcoBloQ™ product line from
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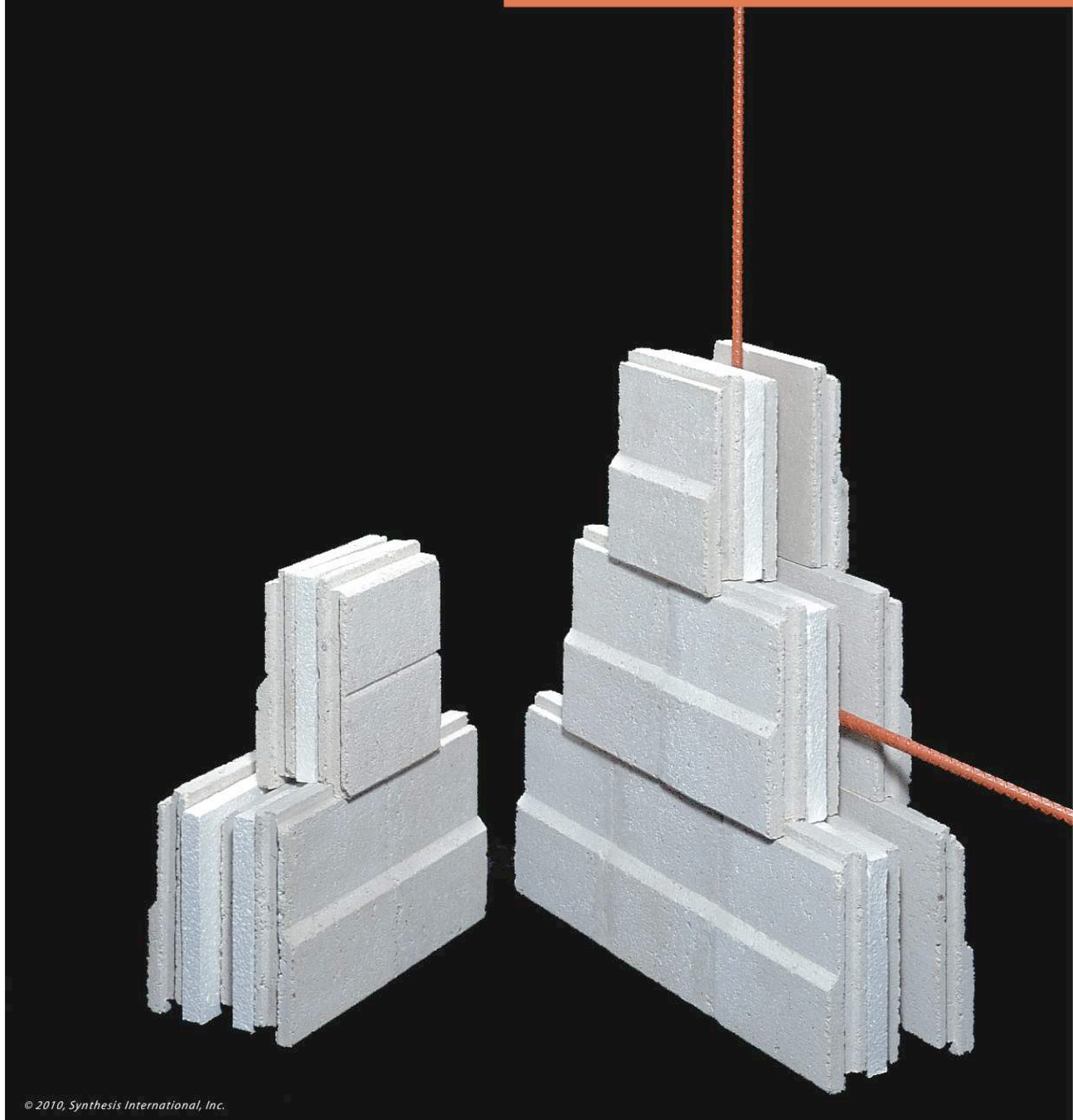


The Advanced Masonry System that offers Unbeatable Performance at Lower Cost

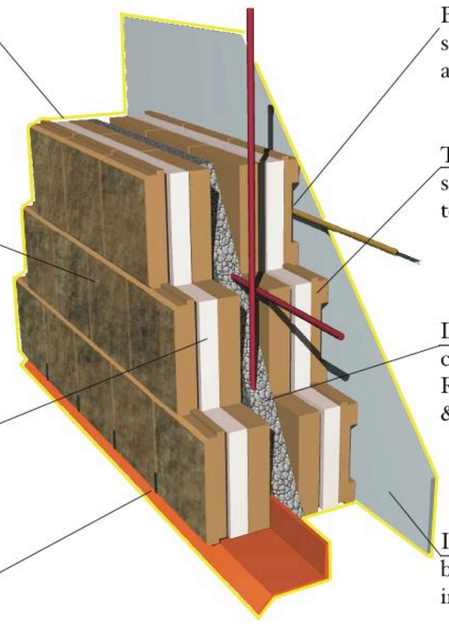
Quality and Economy made possible by the exclusive features of EcoStruct™

• MULTIFUNCTION VALUE:
The patented multicell geometry of EcoStruct™ incorporates building structure, thermal and moisture protection, built-in furring and utility raceways, all protected by handsome exterior architectural textures finished at the factory.

• MOISTURE CONTROL:
EcoStruct™ achieves cavity wall performance within a single wythe, and obviates the expense of additional coatings through its innovative HPE™ (Hydrostatic Pressure Equalization) technology.

• INSULATION:
The independent insulation layers of EcoStruct™ minimize thermal bridges and eliminate grout intrusions, even in fully reinforced walls.

• RAPID INSTALLATION:
The outstanding quality and productivity enabled by EcoStruct™ are the result of low unit weight and self-aligning, interlocking joints. Substantial reductions in cement grout, mortar and veneers significantly increase installed economy and construction speed.



HPE™ moisture control cell designed to equalize the pressure of wind driven rain for positive drainage

Wide variety of durable FINISHES available in a range of colors, profiles and textures

INSULATION layers may incorporate radiant barriers for enhanced energy economy

Standard flashing is used to drain HPE™ cells through weep slots

Built-in UTILITY raceways simplify installation of electrical and communications wiring

THERMAL mass storage inner shell modulates interior temperature swings

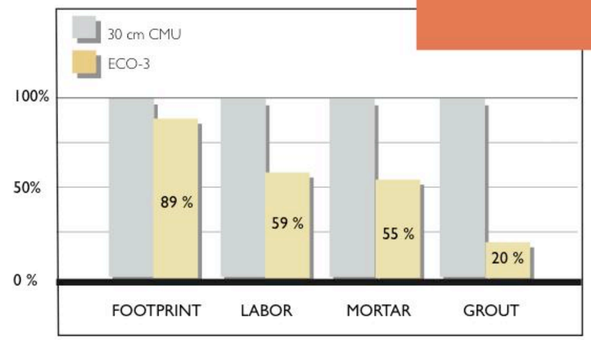
Dedicated grout cavity accepts conventional and post-tension REINFORCEMENT vertically & horizontally

Interior FINISHES and wall board are applied directly to the integral furring of Ecostruct™

ECO-NOMY

Based on cost and time-motion studies in actual projects, the graph at right illustrates the economies of building walls with ECOSTRUCT™ in comparison to conventional CMU walls.

As demonstrated under equivalent application conditions (wall size, structural loading, etc.) ECOSTRUCT™ generates material and labor savings in wall construction, in addition to economies in other trades such as electrical, communications and plumbing works, etc.



Dimensional Compatibility

ECOSTRUCT™, like the entire ECOBLOQ™ family of products, are based on the Universal Architectural Module (UAM™) an ergonomically developed, three dimensional grid that makes RBS products fully compatible with Imperial System (foot/inch) building elements, as well as with metric decimal (meter/cm) buildings and products.

Multiple Architectural Finishes

SMOOTH • SIDING • BRIQ • HALF-SPLIT • FULL-SPLIT • BATTEN

RBS ECOSTRUCT™ STRUCTURAL PROPERTIES

SYSTEM	UNIT PROPERTIES (1)				UNREINFORCED RBS MASONRY ASSEMBLAGE CAPACITY							
					UNGROUTED UNITS				GROUTED UNITS (2)			
	NET AREA ungrouted unit		COMPRESSIVE STRENGTH (f_u)		Allowable Compressive Strength ($f'm$) (3)		Wall Capacity (4) per unit length		Allowable Compressive Strength ($f'm$) (3)		Wall Capacity (4) per unit length (F_a)	
	cm^2	in^2	MPa	Psi	MPa	Psi	kN / m	kips / ft	MPa	Psi	kN / m	kips / ft
ECOSTRUCT-2™	122	18.9	33.0	4,800	15.43	2,240	253.93	17.40	17.56	2,548	443.15	29.68
			25.8	3,750	12.95	1,880	214.38	14.69	14.64	2,125	361.20	24.75
			20.7	3,000	10.87	1,578	179.94	12.33	12.32	1,789	303.55	20.80
			19.3	2,800	10.19	1,479	168.70	11.56	11.71	1,699	288.81	19.79
ECOSTRUCT-3™	177	27.5	33.0	4,800	15.43	2,240	409.81	26.28	17.56	2,548	652.35	44.70
			25.8	3,750	12.95	1,880	343.07	22.0	14.64	2,125	544.06	37.28
			20.7	3,000	10.87	1,578	267.99	18.50	12.32	1,789	458.10	31.39
			19.3	2,800	10.19	1,479	253.20	17.35	11.71	1,699	440.30	30.17

NOTES:
(1) From unit tests. Strength values may be interpolated.
(2) Single cavity grouted for total Net Area equivalent to 1.5 times Net Area of ungrouted unit.
(3) Computed from "Structural Testing of EcoStruct™ Masonry System", W. Li - NCMA Lab. - 1998.
(4) Load computed from allowable axial compressive stress (Fa) calculated using UBC slenderness method:
$Fa = 0.25\ f'm\ [\ 1 - \frac{(h)2}{140\ r}\ ]$ for unreinforced wall effective heights of 280 cm (lateral support spacing).