ADHESIVE

DURAL 617NS

NON-SAG EPOXY ADHESIVE

EUCLID CHEMICAL

PACKAGING
DURAL 617NS is packaged in 2 litre and 4 litre kits.

APPROXIMATE YIELD
1m²/litre at 1mm thick

CLEAN-UP
Clean equipment immediately after use with Pro-Struct 105 Cleaner and rinse with clean water.

SHELF LIFE
24 Months if stored between 15°C to 30°C.

DESCRIPTION

DURAL 617NS is a multi-purpose solvent-free epoxy structural adhesive used to bond concrete to concrete, steel to concrete, and fresh concrete to cured concrete. The non-abrasive gel lubricates surfaces for easy location of segmental concrete elements and positioning of shear pins. It can be pressure injected or hand applied into 15mm cracks or can be mixed with pre-packaged Stonhard 622 Aggregate for making a patching mortar. Dural 617NS meets ASTM C881 Types I, II, IV and V, Grade 3, Class B and C.

PRODUCT CHARACTERISTICS

FEATURES / BENEFITS
- Segmental bonding adhesive (SBA)
- High modulus fibre reinforced
- Moisture insensitive during & after cure
- Low temperature cure

PRIMARY APPLICATIONS
- Bonds and seals precast elements for bridge, tilt-up and roof structure construction
- Structural adhesive for steel plate and Carbocomp Plus Carbon Fibre Strips bonding and stitching with rebar to strengthen concrete or brick elements, increasing load bearing capacity especially where reinforcement corrosion, mechanical or fire damage has occurred
- Bonding fresh concrete to hardened concrete or steel
- Sealing overhead and vertical cracks and setting ports for pressure injection
- Surface repair of non-moving cracks on concrete structures
- Anchor grouting of bolts, starter bars, dowels and special fasteners
- Pick-proof adhesive for public and correctional facilities, around ceramic and steel units, door frames, windows and setting of burglar proofing
- For bonding of Flexible Tapes over expansion joints for water retaining structures and cracked effluent or storage tanks and pipes

TECHNICAL INFORMATION

The following are typical values obtained under laboratory conditions. Expect reasonable variation under field conditions.

TYPICAL PROPERTIES	AT 25°C
Colour	Grey
Consistency	Paste
Volume Solids	100%
Number of Components	2
Mix Ratio By Volume (Base:Activator)	1:1
Pot Life	60 to 90 minutes
Apply Over	Prepared metal and concrete
Apply By	Notched trowel or putty knife
Initial Set	3 Hours at 25°C 9 Hours at 4°C
Service	24 Hours
Full Cure	7 Days

TECHNICAL INFORMATION

The following are typical values obtained under laboratory conditions. Expect reasonable variation under field conditions.

TYPICAL PROPERTIES	AT 25°C
Application Temperature Range	4°C to 35°C
Maximum Service Temperature	70°C
Sag	10mm thick
Compressive Strength	>60 MPa at 24 hours >75 MPa at 3 days
Concrete Bond Strength 12mm Rebar Pull-out Depth 120mm	Breaks concrete Steel bar failure at 52 MPa
Shear Bond Strength, Steel to Steel	>14 MPa
Squeezability	0.15KN
Water Absorption	Less than 0.15%
Shrinkage	<0.05%
Elongation at Break	2%
Thermo-stability	Approximately 70°C
VOC	3 g/l

DIRECTIONS FOR USE

Surface Preparation:
Surfaces must be clean, sound, dry or damp, but free of standing water. Exposed concrete surfaces must be sandblasted or chipped to show the well-bonded main aggregate. Steel should be grit blasted clean, free of rust, paint or foreign matter likely to affect the bond or performance of the repair.

Mixing: Precondition material to between 10°C and 23°C before using. Pre-mix each component of the kit. Add the Activator component to the Base component and mix thoroughly for 3 minutes with a slow speed drill fitted with a stirrer. Do not aerate or mix more material than can be placed in 30 minutes. To prepare an epoxy mortar, slowly add pre-packaged Stonhard 622 dry graded aggregate to a kit of mixed resin and mix to a uniform consistency.

PLACEMENT OF DURAL 617NS
Structural adhesive: Apply adhesive to strengthening material or prepared substrate, working into surface for positive adhesion. Secure the bonded unit firmly into place, squeezing out excess adhesive and holding until set. Glue line not to exceed 6mm.

Fresh concrete to hardened concrete or steel: Apply onto solid surfaces and place fresh concrete while adhesive is still tacky. If adhesive becomes glossy and loses tack, remove and recoat.

Pressure injection: Apply over surface cracks and seal ports until cured. With appropriate high pressure equipment, inject gel adhesive until crack is filled. Refer to Dural 618LV "Recommendation for Crack Injection".

Anchor bolts, dowels and pins: Annular space around bolt should not exceed 3mm. Embedment depth 10 to 15 times bolt diameter. Inject material into rear of hole to avoid air pockets and coat anchor with adhesive, inserting by slowly rotating into hole.

ALLOWABLE SPACING AND EDGE DISTANCE (D = ANCHOR DIAMETER)

	Distance for full anchor capacity (Critical Distance)	Distance for reduced anchor capacity
Edge distance – Tensile Load	12D	4D
Spacing between anchors	24D	8D
Edge distance – Shear Load	12D	4D

Security proof adhesive: Using a caulking gun, dispense an appropriate size bead between unit and structure. Tool around area to be sealed. Protect installed unit with masking tape, removing whilst uncured to create a neat seal.

METHODOLOGY FOR STEEL PLATE BONDING

Concrete preparation: Concrete should be at least 28 days old and have a minimum compressive strength of 25 MPa and a minimum tensile strength at the application position of 2.5 MPa. Remove cement laitance by scabbling or grit-blasting to sufficient depth to expose main concrete aggregate. After preparation is completed, the bonding surface must be clean, dry, sound and level.

Steel preparation: Mild steel plates to grade as specified by the engineer shall be dry grit-blasted to a white metal finish in accordance with ISO 8501 Sa2½ to obtain a 100 to 140 micron blast profile. Blasting should be done on site immediately prior to bonding and, if this not practical, the plates can be shop-blasted but must be transported and bonded on site the same day. In coastal environments, a Weber Reilly Soluble Salt Test should be done to ensure a figure not exceeding 100mg/m² is indicated. The non-bonding face must receive two coats of Carbomastic 15 to achieve a final D.F.T. of 250 microns.

Priming of concrete: Apply Dural 618LV Low Viscosity Primer to the concrete surface at a spread rate of 3 to 4m²/litre. While the primer is still wet and receptive, bond the plate as detailed below.

Application of structural steel plates: Remove the Dural 617NS Structural Adhesive from the containers into a larger bucket and mechanically mix for 4 to 5 minutes. Apply the mixed adhesive to the steel plate in a triangular wedge, with apex of the adhesive at the centre of the plate. Place plate into position and support / prop and mechanically fix. Props must remain in position for at least 7 days or longer if the average day temperature is lower than 25°C.

Fireproofing: Protection of bonded plates can be achieved by applying Pyrocrete 241 (available from StonCor Africa, Tel: 011-254-5500).

METHODOLOGY FOR PC CARBOCOMP PLUS REINFORCEMENT BONDING

Surface preparation: Remove cement laitance by scabbling or grit blasting to sufficient depth to expose main concrete aggregate. After preparation, the bonding area must be clean, surface dry, sound and level. Repair unevenness and weak zones with an epoxy mortar. Maximum deviation of surface not to exceed 5mm over a 2m length. Test tensile strength of concrete at application position (strengths measured less than 2.5 MPa must be reported to the Engineer). Before application of Carbon Fibre strips, the prepared surfaces are to be vacuumed to ensure a dust-free surface. For very porous substrates, first prime with Stonprime 639 / Dural 618LV and allow to fully cure.

Application of strips: Measure and cut Carbon Fibre strips to exact required lengths. Drill 12mm diameter holes at both ends of Carbon Fibre strips, at least 50mm from the ends. Mark out positions of end anchors on concrete soffit. Drill a 12mm x 70mm deep hole into the concrete at one end, spaced as indicated by the Engineer. Adjust where reinforcement is encountered (keep anchors in a straight line along the length of the laminate strip). Install M10 anchors (chemical anchors in stainless steel preferred) in strict accordance with the manufacturer's instructions.

Prepare Dural 617NS in accordance with the manufacturer's instructions. Precondition material to between 10°C and 23°C before using. Premix each component in the kit. Add the Activator component to the Base component and mechanically mix thoroughly for 4 to 5 minutes. Do not aerate or mix more material than can be placed in 30 minutes.

Remove peel ply from the Carbon Fibre strips if applicable. Apply mixed adhesive to the Carbon Fibre strip in a triangular wedge with apex of the adhesive at the centre of the strip. If adhesive becomes glossy or loses tack, remove and re-apply.

Install laminate onto soffit, over anchor bolt on one end, using a roller or a straight edge, exerting constant pressure, squeezing out excess adhesive. Remove all squeezed out adhesive immediately. Final glue line should not exceed 3mm. Once adhesive has set, drill hole on opposite end into the concrete. Install anchor as previously described.

For bolted ends, install 5mm x 50mm x 50mm steel washer plate as detailed. A thin layer of adhesive to be applied between the washer and carbon strip before tightening of nuts. Recommended torque of 50kNm to be applied on nuts, ensuring that over-tightening does not occur.

Should it be required that two Carbon Fibre strips be sandwiched, then the peel ply must be removed from the first layer before gluing on the second layer.

Clean up excess laminate glue with product approved by the manufacturer.

Fireproofing: Contact StonCor Africa for fireproofing advise (Tel: 011-254-5500).

PRECAUTIONS / LIMITATIONS

- Application temperature of substrate to be 4°C and rising. Low temperatures adversely affect application spread rates and time to achieve bond.
- Hot temperatures decrease working time.
- Do not apply over free standing water.
- Do not thin with solvent.
- Do not inject moving or leaking cracks.
- Minimum age of concrete must be 28 days.
- Use materials in strict accordance with the manufacturer's Safety Data Sheet.
- Protective clothing and equipment will significantly reduce risk of injury.
- Body coverage apparel, safety goggles and impermeable gloves are recommended.
- In case of contact, flush with copious amounts of water and seek medical attention.
- Dispose of waste materials and containers in strict accordance with Government regulations.