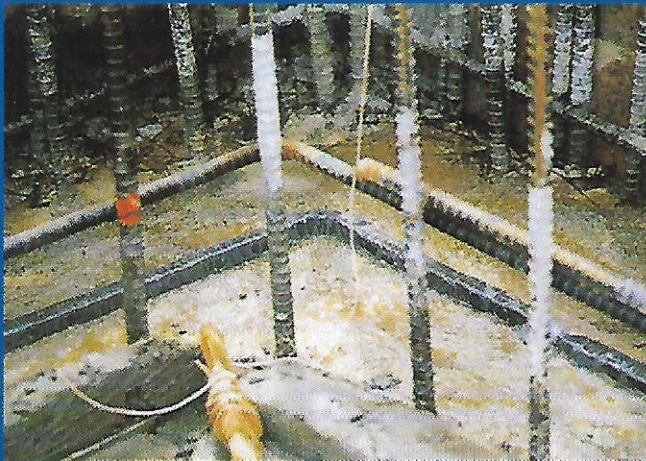
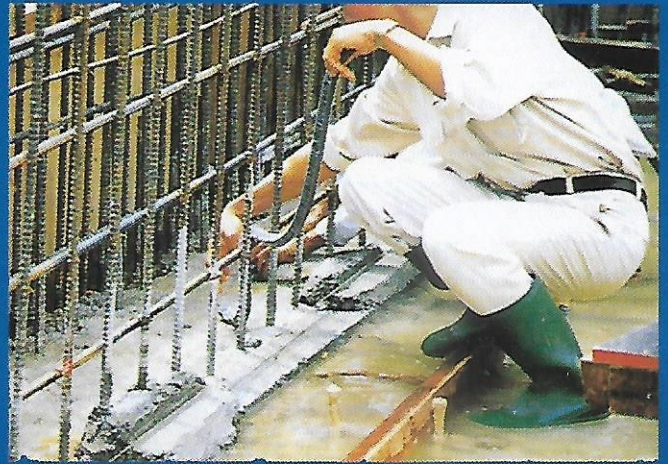
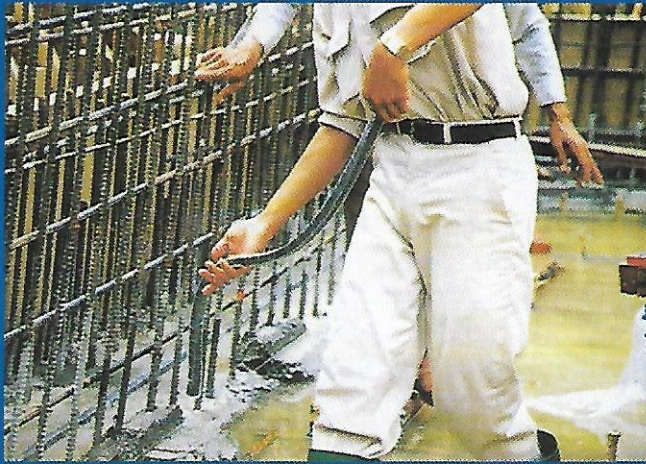


KUNISEAL C-31DS

PLASTICIZED BENTONITE BASED CONCRETE WATERSTOP MATERIAL



CLP
Since 1947

KUNIMINE INDUSTRIES CO., LTD. JAPAN

KUNISEAL C-31DS - Plasticized Bentonite Based Concrete Waterstop Materials

DESCRIPTION

Kuniseal C-31DS is a plasticized bentonite based concrete waterstop material that acts as a moisture barrier in concrete construction joints.

Kuniseal C-31DS comprises three key components as follows:-

- Bentonite is the main component, which will absorb water, causing it to swell and act as water barrier in the concrete.
- The bentonite material is blended with a special mineral oil, which acts to control the swelling time.
- Covering the blended bentonite material is a water soluble film. The latter acts as an adhesive, which becomes tacky upon contact with water.

HOW DOES KUNISEAL WORKS?

Kuniseal C-31DS waterstop-bar is a technologically uniquely developed bentonite composite which has high chemical resistance and is capable of storing water in its molecular structure by increasing volume and swelling into an impermeable gel.

The gel formation of the swelling action will cause **Kuniseal C-31DS** waterstop-bar to profile itself exactly into the joint, filling all cavities and fine cracks and capillaries, effectively stopping water seepage, even at high external water pressure.

Indeed, the plasticised bentonite feature of **Kuniseal C-31DS** makes it pliable and when applied to a construction joint, it follows the rough contours of the substrate surface and permeates into the capillaries of the concrete which creates extra bond strength and makes it an integral part of the construction joint.

Further, **Kuniseal C-31DS** waterstop-bars will not transport water through their polymer matrix and thus, not act as a capillary duct. The swelling action is limited to the parts exposed to water. Movements in the construction joint from shrinkage or settlement in the substrate, are taken up by the elastic profile of **Kuniseal C-31DS**.

On swelling when in contact with water, **Kuniseal C-31DS** will not change its homogeneous structure of the bentonite matrix so as to maintain its solid structure integrity which will not deteriorate due to uncontrolled expansion, unlike many of the rubber and rubber-bentonite composite based waterstops.

PACKING

20 X 1m/carton of 11kg

Dimension per bar: W28 x H12 x L1000mm

Loading on pallet: 30 cartons

FIXES

Kuniseal C-31DS is suitable for all construction joints which are subjected to hydrostatic pressure. Some areas of application include:-

- Septic tanks, sanitary and storm sewer manholes.
- Tunnel construction joints.
- Piping sleeves.
- Foundation slabs and walls.
- Retaining walls, elevator shafts.
- Liquid storage tanks, box culverts utility pits.
- Pre- cast segments.
- Pipes, steel H beams and other penetrations.
- Non-moving cold construction joints.
- Rough surface joint.
- New-to-existing concrete - installs.

FEATURES

- Self adhesive and nailing is not required.
- Easily joined by joining butt ends together.
- Easy to cut, shape and form to joints.
- Can be applied on most substrates.
- Can still be installed on sites with protruding rebars.
- Stable under hot and cold temperatures.
- Self-healing seal.
- Controlled expansion of the seal.
- No damage to concrete.
- Extreme durability.

TECHNICAL DATA AND CHEMICAL COMPOSITION

ITEM OF TEST PRODUCT	TEST RESULT
Bentonite	≤ 70%
Oil compound	≤ 40%
Polymer-modified bitumen	≤ 30%
Hydrostatic pressure resistance	0.5Mpa/72.5psi
Adhesion to concrete ^{*1}	632.7gf/cm ²
Adhesion to iron plate ^{*1}	296.7gf/cm ²
Specific Gravity	≤ 1.20
Ignition loss ^{*1*2}	≤ 40%
Coefficient of swelling ^{*3}	≥ 110%

*1 Measurement after 1day.

*2 Kuniseal C-31DS subjected to 1000^o C for 1 hour.

*3 Volume expansion for one side of Kuniseal C-31DS when soaked in water for 24 hours.

LIMITATION

Kuniseal C-31DS waterstop-bars are designed for non-moving construction joints only. They are not expansion joints.

INSTALLATION METHOD

1

Clean and Wet Surface

All joints to be installed with **Kuniseal C-31DS** must first be cleaned. Free standing water and excessive dirt and dust must be removed. **Kuniseal C-31DS** is to be installed on moist surfaces. Alternatively, soak **Kuniseal C-31DS** in water just before installation. The installed waterstop-bar should always be protected from excessive and prolonged exposure to continuous downpours and pooling water.



2

Install Kuniseal

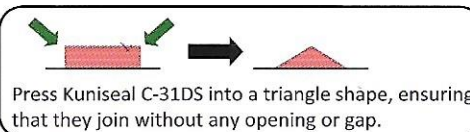
For normal joint widths of 200-400mm, **Kuniseal C-31DS** is typically placed in the middle of the joint, or at least 30mm from the edge of the concrete structure. For vertical and suspended installations such as cast in place slab, if or where nailing is necessary, it may be mechanically fixed with 2 or 3 nails per meter. Do not peel off the adhesive film covering.



3

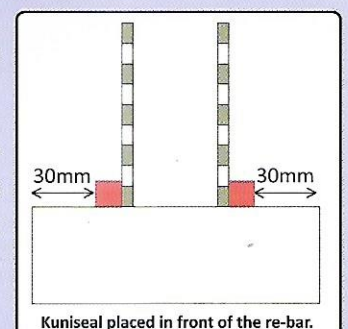
Butt Join Each Piece

Kuniseal C-31DS waterstop-bars are butt jointed, not spliced or overlapped. On placing 2 pieces together press the ends firmly to each other to make a bond.



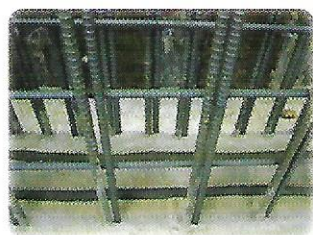
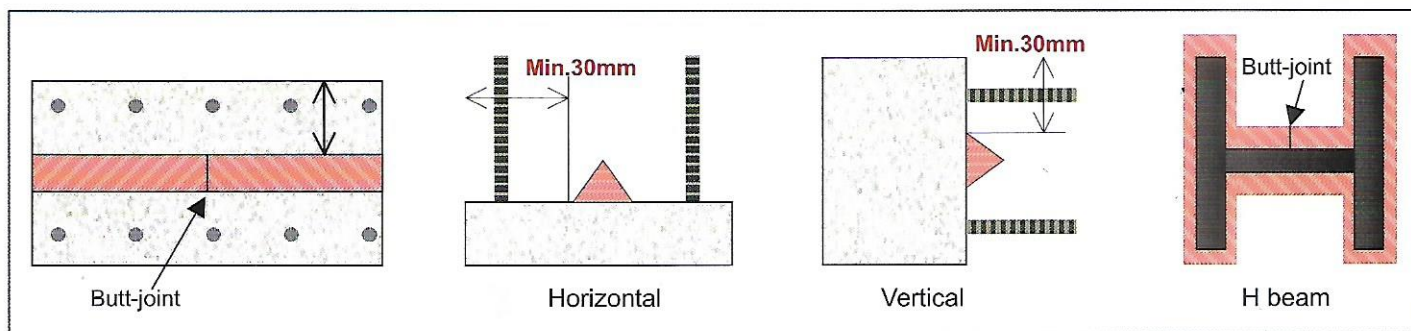
Kuniseal C-31DS is far superior in performance compared to other competing waterstops as follows: -

- ❑ **EASE OF INSTALLATION.** On contact with water, **Kuniseal C-31DS** will become very tacky and firmly adhere onto the concrete substrate. No external glue or nailing is necessary. As such, it would still be feasible to install at sites where there are many protruding rebars, which is impossible for some other waterstops.
- ❑ **NO EXCESSIVE STRESS TO CONCRETE.** Some other waterstops will expand and create a force that can lead to cracks in the concrete. **Kuniseal C-31DS**, on the other hand, will merely swell into a gel like material that would seep into and seal any void in the concrete. The swelling action is also limited to the parts exposed to water.
- ❑ **INTEGRAL PART OF CONCRETE.** Some other waterstops that do not integrate together with the concrete, will create a capillary duct way along the installed waterstop within the concrete that allows water to travel, thereby compounding the water leakage problem. In contrast, **Kuniseal C-31DS** bonds onto the concrete and becomes part of the concrete.
- ❑ **NO DISLOCATION PROBLEM.** **Kuniseal C-31DS** will not be easily dislodged when the concrete is poured in because the water soluble plastic carrier film wrapping **Kuniseal C-31DS** will become very sticky with water, causing it to affix firmly onto the substrate.
- ❑ **EASY TO SHAPE AND FORM JOINT.** **Kuniseal C-31DS** can be easily shaped, simply by pressing; and the butt joining method can save material cost.
- ❑ **PROTECTS AGAINST CORROSION.** As there is no pressure applied to the construction joint, it is possible to place **Kuniseal C-31DS** waterstop-bars on the positive side of the construction joint to protect the reinforcing bars from corrosion.

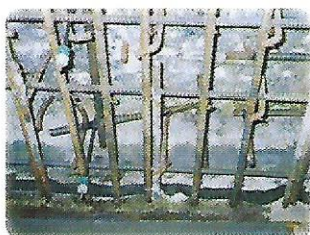


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EXAMPLES OF INSTALLATION POSITION



Horizontal Joint



Rough surface Joint



Slab Joint



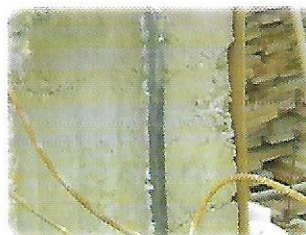
Wire Net



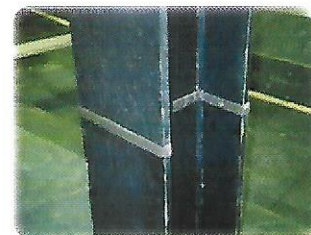
Vertical Joint



Lining Joint



Remolding joint



H Beam

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