

Manol Water-proof Liquid

FOR QUALITY FIRST
CONSTRUCTION
WORLD-WIDE

マニール

Manol®

Water-proof Liquid

PERFECT WATER-PROOFING, DAMP-PROOFING AGENT FOR MORTAR & CONCRETE

FOR CIVIL ENGINEERING, BUILDING CONSTRUCTION
& PLASTERING WORKS



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SOLE MANUFACTURER & DISTRIBUTOR

Manol Co., Ltd.

TOKYO JAPAN <Since 1921>

PERFECT WATER-PROOFING, DAMP-PROOFING AGENT FOR MORTAR & CONCRETE

Manol Water-proof Liquid

Expert field engineers, without very few exception, maintain that water-proofing play a key role in construction projects.

Since cement mortar and concrete are well-known porous materials, they tend to absorb water and moisture by capillarity and other characteristics leaving many problems to be solved. MANOL WATER-PROOF is simply and economically usable to protect every concrete structure from water and moisture. It also prevents buildings from deterioration, it contributes to fine outlook and conservation of living comfort of a building as well as durability of the structure itself.

ADVANTAGES

- MANOL WATER-PROOF is a milky-white emulsion mainly consisting of polymerized oil aluminum, synthetic resin and resin ester.
- It combines with hydrated lime processed from hydrolysis of cement, makes cement particles water-repellent without hindering hardening system, and reduces swelling tendency by lowering movement of capillary water.
- Derivative combined with cement, a material of constant quality, does not interact with salt or acid in air and water. It prevents neutralization of cement, produces higher durability of structure by protecting steel and wood from rust and decay, causing permanent water-tightness.
- Another advantage is its simpleness in use: dilute MANOL in water and mix with cement and aggregate. This care-free handling results in easier placeability and lower placing cost.



National Diet of Japan



Stands base of JINGU baseball stadium



DESCRIPTION

Composition	Appearance	RH	Specific Gravity	Chemical & Mechanical Stability	Packaging
Polymerized oil aluminum resin ester	Milky white Liquid	9.5	1.0	Good	18 kgs can 200 kgs drum

DIRECTIONS FOR USE

Prior to pouring MANOL mix completely every batch because MANOL WATER-PROOF is highly sensitive to hydrolytic derivative of cement.

1. STANDARD DOSAGE

Waterproofing Motar	2 % of cement weight	MANOL 0.5 kg per cement 1bag (25 kg)
Waterproofing Concrete	1 % of cement weight	MANOL 0.25 kg per cement 1bag (25 kg)

Measure MANOL and water in accordance with performance purposes. Shake the solution and mix fully with cement and aggregates.

2. MATERIALS USABLE WITH MANOL

- Every type of cement.
 - Fresh water
- Caution : Use fresh cement and pure aggregates free from all foreign and deleterious materials.

3. TYPICAL PERFORMANCE DATA

A. Materials required for making 1m² of MANOL mortar

Mixing Ratio Cement : Sand	Motar Layer (mm)	Cement (kg)	Sand (kg)	Water (kg)	Raw Liquid (kg) (C×2%)
1 : 2	10	6.0	12.0	2.9	0.12
	15	9.0	18.0	4.4	0.18
1 : 2.5	10	5.3	13.3	2.7	0.11
	15	7.9	19.8	4.0	0.16
1 : 3	10	4.6	13.9	2.6	0.09
	15	6.9	20.8	3.9	0.14

B. Materials required for making 1m³ of MANOL mortar

Mixing Ratio Cement : Sand	Cement (kg)	Sand (kg)	Water (kg)	W / C (O/wt)	Raw Liquid (kg) (C×2%)
1 : 2	600	1200	288	50	12.0
1 : 2.5	525	1313	268	53	10.5
1 : 3	463	1389	259	58	9.3

C. Materials required for making 1m³ of MANOL concrete

W / C (O/wt)	Slump (cm)	Fine Aggregate (cm)	Water Content (kg/m ³)	Weight (kg/m ³)			Raw Liquid (kg) (C×1%)
				Cement	Sand	Gravel	
55	18	39.1	174	315	697	1088	3.15
60	18	40.7	173	289	736	1071	2.89

MANOL SPECIFICATIONS OF MORTAR WATERPROOFING WORK

WATERPROOF WORK

1. SCOPE OF APPLICATION

The specifications herein provided shall be applicable to mortar waterproofing in use of MANOL products for concrete works such as underground structures, water tank, exterior wall, interiors, roof and verandah.

2. PREPARATION

- Chipping and Cleaning
- Stopping Water
- Mending of Irregularities
- Levelling of Dents and Caves of Concrete Surface
- Water Sprinkling

3. MORTAR WATERPROOFING

(1) Wall Surface

- Primer (Bonding, Waterproofing Layer) *1

Polymer cement paste shall be applied with trowel in the thickness of 1 to 3 mm to the concrete in a wet condition.

- Middle Coat (Waterproofing Layer) *2

While the Polymer cement paste primer is still wet, waterproofing mortar to form the middle coat shall be applied with wooden trowel in the thickness of 10 mm and the brush marks shall be left on the slab texture.

- Finishing Coat (Waterproofing Finish Layer) *3

After the middle coat waterproofing mortar has hardened, the topcoat waterproofing mortar shall be applied with metal trowel in the thickness of 10mm.

(2) Floor Surface

- Primer (Bonding, Waterproofing Layer)

Application same with (1)-a above.

- Top Coat (Waterproofing Finish Layer)

While the Polymer cement paste primer is still wet, top coat waterproofing mortar shall be applied with metal trowel to the thickness of 30mm.

(3) Mixing

*1 Polymer Cement Paste

1/5 solution of MANOL Polymer #1000 (Polymer : Water=1 : 4) shall be mixed with cement.

The mixing ratio shall be cement 1:Polymer Solution 0.45 and mixing shall be done with hand-mixer.

*2 Middle Coat Waterproofing Mortar

Firstly mix cement with sand dry, and add the specified amount of MANOL water-proof liquid diluted with water 50 times by volume.

*3 Finishing Mortar

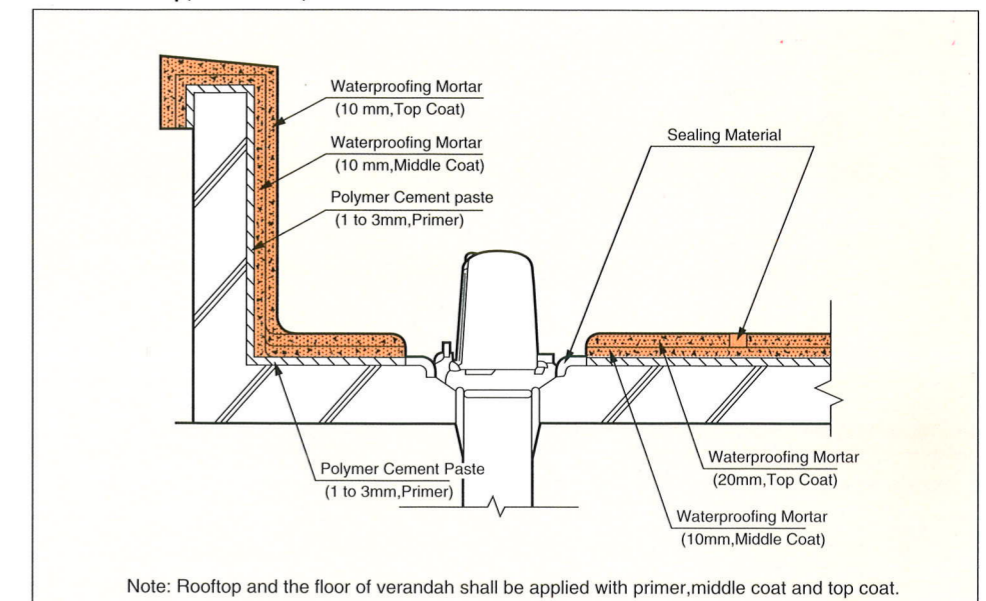
Firstly mix cement with sand dry, and add the specified amount of MANOL water-proof liquid diluted with water 25 times by volume.

STANDARD MIX DESIGN (per square meter)

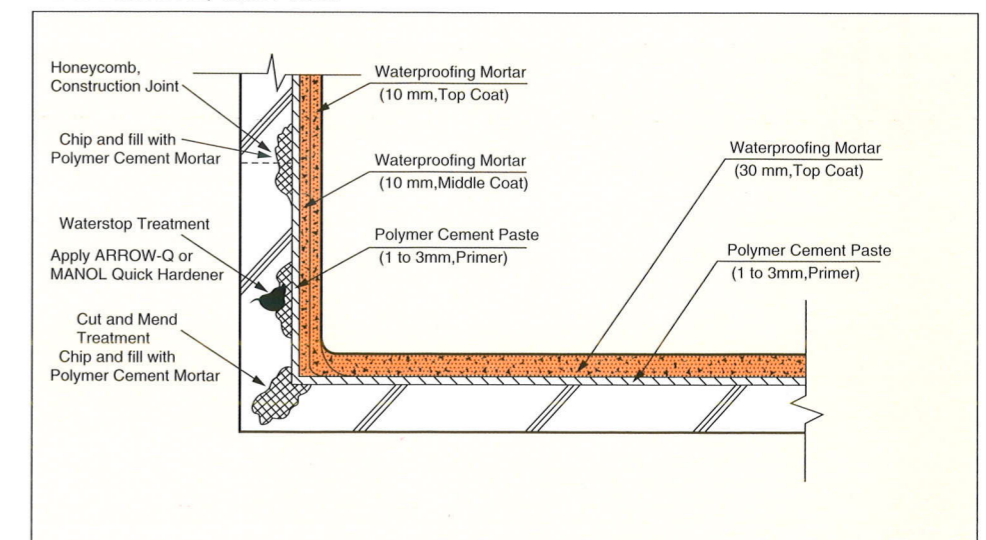
Category	Material	Thickness (mm)	Cement : Sand (Weight Ratio)	Cement (kg)	Sand (kg)	Water (kg)	Waterproofing Agent (kg)	Polymer (kg)
WALL SURFACE	Primer	1 to 3	1 : 0	2.5		0.9		0.24
	Middle Coat	10	1 : 2.5	5.5	13.8	2.8	0.055	
	Finishing Coat	10	1 : 3	5.0	15.0	2.7	0.11	
	Total	20		13.0	28.8	6.4	0.165	0.24
FLOOR SURFACE	Primer	1 to 3	1 : 0	2.5		0.9		0.24
	Top Coat	30	1 : 3	15.0	45.0	8.1	0.33	
	Total	30		17.5	45.0	9.0	0.33	0.24

WORKING DRAWINGS

D-1 Rooftop, Verandah, Drain Base



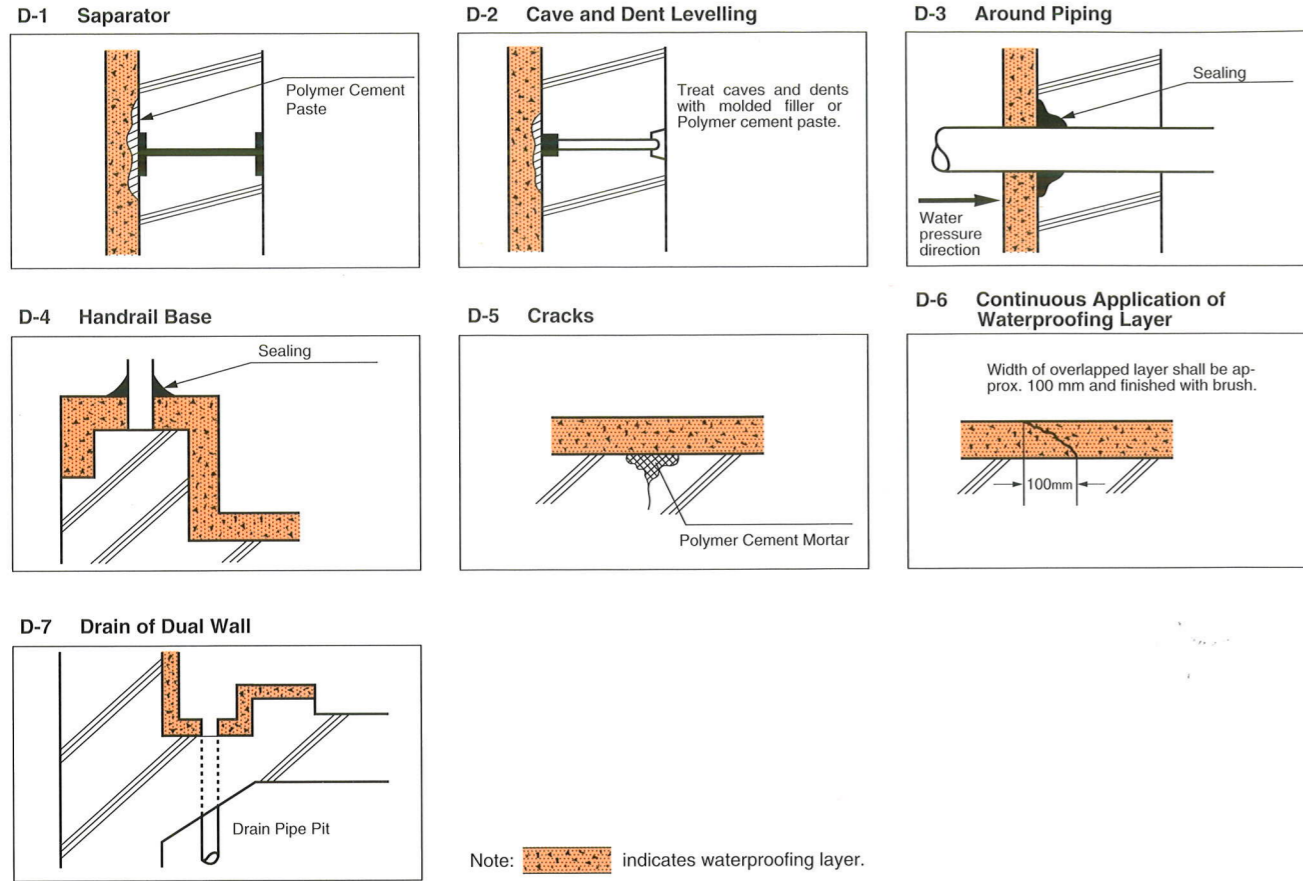
D-2 Basement, Water Tank



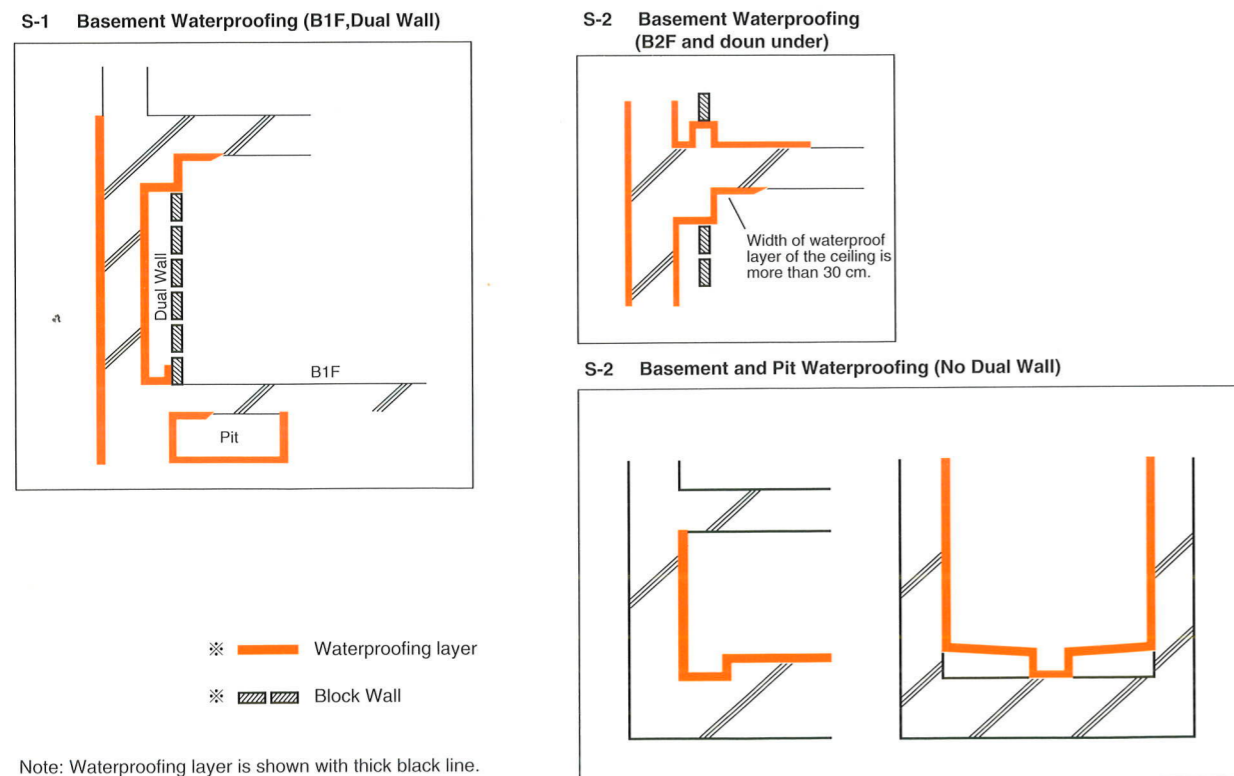
Note: indicates waterproofing layer.

Manol Water-proof Liquid

DETAILED DRAWINGS



SKETCHES OF WORKS FINISHED



TEST RESULT

MORTAR TEST

Test Method: Based on JIS A-1404 「Test Method of Cement Waterproofing Agent for Architectural Use」
Proportion: Cement : Sand = 1 : 3 (weight ratio)

1. Setting Test

Test Piece	Item	Water Content W/C(O/wt)	Setting Time		Mechanical Stability
			Time Start (hours)	Time End (hours)	
Plain		26.5	2 : 30	3 : 45	Good
C × 2% mix		26.0	2 : 45	4 : 10	Good

2. Strength Test

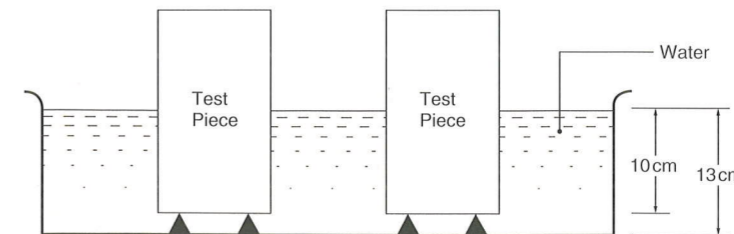
Test Piece	Item	Strength Ratio	
		Bending	Compressive
Plain		1.00	1.00
C × 2% mix		0.98	0.98

3. Absorption & Permeability Test

Test Piece	Item	Absorption Ratio			Permeability Ratio
		1 hours Passed	5 hours Passed	24 hours Passed	
Plain		1.00	1.00	1.00	1.00
C × 2% mix		0.60	0.62	0.67	0.66

CONCRETE TEST

Test Method: Test pieces are placed in the water container as below and water absorption ratio is tested according as the passage of time.



Proportion: Cement : Sand : Gravel = 1 : 2 : 3 (weight ratio)

1. Absorption Test

Test Piece	Item	Absorption Ratio		
		1 hours Passed	5 hours Passed	24 hours Passed
Plain		1.00	1.00	1.00
C × 1% mix		0.38	0.47	0.65

CAUTION:
Since the Manol Waterproof Liquid possesses air-entraining properties, when mixed with concrete, it may entrain more than the prescribed amount of air and reduce the design strength of the end product. Be aware of this and provide the proper compensation if required.