

*ADEKA ULTRASEAL<sup>®</sup> Waterstops  
by OCM, Inc. Chicago*

**ADEKA ULTRASEAL<sup>®</sup>**

**P-201 Submittal**

**Hydrophilic waterstop  
in a 320 ml cartridge**



**A wide variety of uses:**

- \* Used with Adeka strip products
  - \* Cold/construction/control joints
  - \* Waterstop for expanded metal forms
  - \* Piping penetrations
  - \* Crack / joint repair
  - \* Sheet pile interlock sealant
  - \* Precast segment sealant
- Utility vaults  
Manholes  
Tunnels  
Riser rings

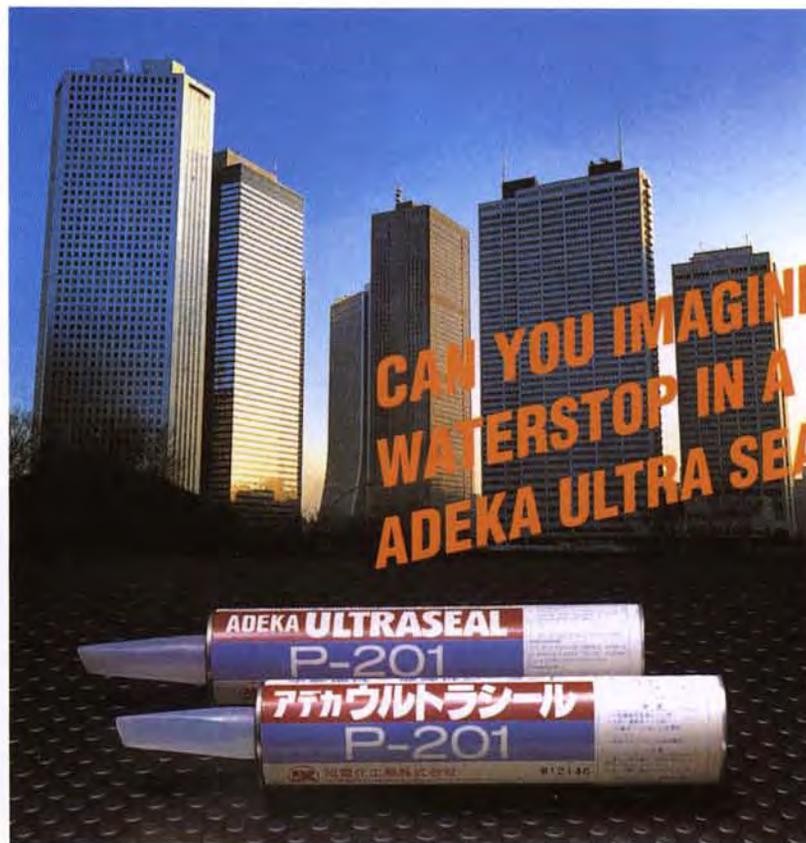
NOTE: The information contained herein is based on our present state of knowledge and is intended to provide general notes on Adeka Waterstops and their uses. Any recommendations or suggestions, which may be made, are without guarantee, since the conditions of use are beyond our control. Furthermore, nothing contained in this publication shall be construed as a recommendation for any use that may infringe patent rights. Readers are cautioned to satisfy themselves as to the suitability of such goods for the purposes intended prior to use

**800-999-3959 or [www.adeka.com](http://www.adeka.com)  
for more information**





Water Swelling, One-component elastic Sealant  
**ADEKA ULTRA SEAL<sup>®</sup>**  
**P-201**



**ASAHI DENKA**

**ADEKA ULTRASEAL P-201 is an unconventional, unique one-component elastic sealant, which has been developed to obtain perfect water stoppage as well as excellent adaptability.**

**Water Swelling, One-component elastic Sealant**

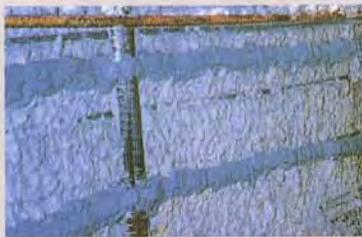
# ADEKA ULTRA SEAL<sup>®</sup>

# P-201



## Properties

1. Excellent adaptability owing to the self-swelling property when in contact with water as well as being one-component.
2. Perfect stopping when swelled by water (maximum:double)
3. Well adherence to various materials such as concrete, metals, glass, etc.
4. Applicable to the wet surfaces.



# Properties of P-201

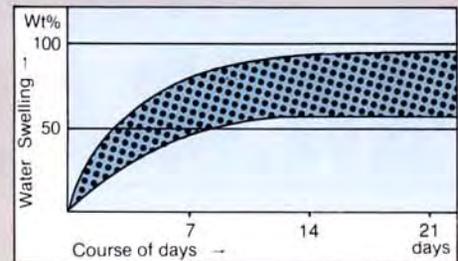
## Before Hardening (JIS-A-5758) After Hardening (JIS-K-6301)

Appearance	Putty	Hardness (Shore)	20 ≤
Specific gravity (20°C/68°F)	1.28 ± 0.15	Tensile Strength (MPa)	2.5 ≤
Extrusion (5°C/41°F)	Under 30 sec.	(lbs/in <sup>2</sup> )	350 ≤
Extrusion (20°C/68°F)	Under 20 sec.	Elongation (%)	700 ≤
Slump (23°C/73.4°F)	3mm >	Tear Strength (MPa)	1.2 ≤
Tack-free (20°C 60%RH)	10 hours >	(lbs/in <sup>2</sup> )	171

## Water-Swelling

### Conditions in Measuring

- Size of the testing piece: 20 × 10 × 50 mm
- Temperature of water: 20 ± 5°C
- Let the test piece soak in water after it is cured-then check the increase in volume.

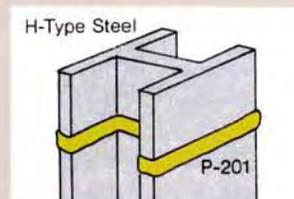


## Adherence by Tensile Strength (JIS-A-5758)

	Glass Board	Aluminium Board	Mortar Board
Stress of 50% Tensile Strength (MPa) (lbs/in <sup>2</sup> )	0.39 (55.7)	0.38 (54.3)	0.38 (54.3)
Stress of Maximum Tensile Strength (MPa) (lbs/in <sup>2</sup> )	1.45 (207.1)	1.46 (208.6)	1.55 (221.4)
Elongation of Rupture (%)	540	595	580

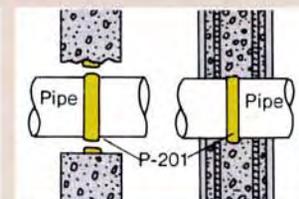
## Application Examples

### H-Type Steel



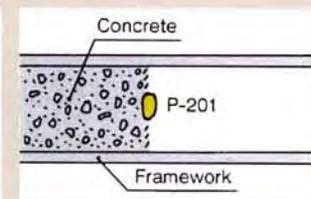
- Highly efficient in water stoppage
- No later adjustment (no demolding paper)
- Simple procedure

### Piping



- No box punching
- A unity of walls because of distribution bar up to the body

### Wire-Net



- Cost effective in water-proof work
- Time-effective in construction
- Follow-up water stoppage for gaps

## Other Applications

- Water stoppage at concrete joints
- Corner base plate
- Inverted casting
- Segment sealant
- Waterproof for segment
- Waterproof work
- Anti-salt measures
- Joints at tunnel work
- Secondary concrete products, & others.

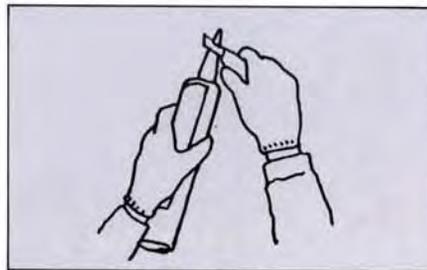
# Procedure in Applying

## 1



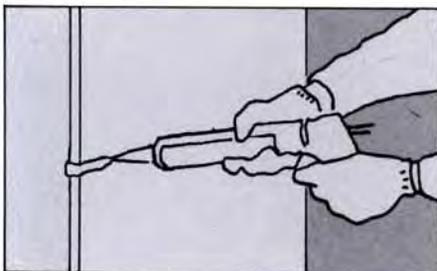
Clean the surface.  
Remove the dirt,  
oil and scale.

## 2



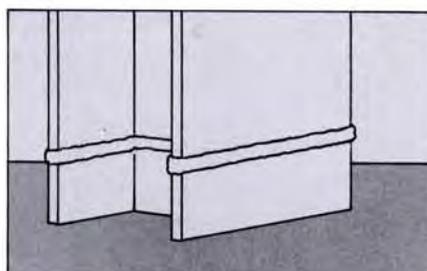
Cut nozzle at area  
for desired dimension.  
Puncture damp-proofing  
film. Remove rear cap.

## 3



Apply P-201 to  
the surface with  
no gap.

## 4



Avoid contact with water  
until being hardened.



## NOTES

1. The information contained in this brochure is given in good faith but no liability of final function at the job site is assumed nor is freedom from any industrial properties owned by ASAHI DENKA KOGYO K.K. or others implied.
2. The information contained in this brochure may change without notice.
3. Review Material Safety Date Sheet before using ADEKA products.

## Package

- Cartridge: 320cc (400g) 6 cartridges in a carton × 4

## Precautions in Handling

1. Store in cool dry area. Do not expose to the direct sun exposure.
2. Do not install P-201 as a surface coating cover, open joints, with filling material.
3. Clean surface, remove dirt and oil before application. Cut nozzle of area for desired dimension. Puncture damp-proofing film, Remove rear cap.
4. Prevent water contact until it is cured.
5. If in doubt, always use a small area and check to see if P-201 will work in that application.
6. Avoid contact with skin, If contact occurs, wipe off immediately and wash with soap and water. Get medical attention if required.
7. Use within six months after date of manufacture.



**ADEKA®**  
EVER  
CREATIVE &  
INNOVATIVE

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# P-201

Manufactured by Adeka Corporation  
Tokyo, Japan  
Imported by OCM, Inc.  
Chicago, IL.

[www.adeka.com](http://www.adeka.com)

800.999.3959

Info@adeka.com

## PRODUCT DESCRIPTION:

Single component hydrophilic grey paste

## PACKAGING INFORMATION:

24 Cartridges per case

320 ml (10.8 oz) per cartridge

## EXPANSION INFORMATION BY VOLUME:

Approximately 100% (2 times by volume)

## HYDROPHILIC WATERSTOP IN A CARTRIDGE

One of the most versatile Adeka products

## GENERAL DESCRIPTION

ADEKA ULTRASEAL® P-201 is a water-swelling, single component, elastic sealant. P-201 is packaged in 320 ml (10.8 oz) cartridges or in 3.17 gallon bulk pails.

### WATERSTOP FOR:

- \* Cold/construction/control joints
- \* Expanded metal forms
- \* Piping penetrations
- \* Crack / joint repair
- \* Sheet pile interlock sealant
- \* Precast segment sealant

Utility vaults  
Manholes  
Tunnels  
Riser rings



P-201 is used as a waterstop in new construction and in repair applications. It can be placed on damp or uneven surfaces and functions in a wide range of temperatures and ground water conditions water.

## TYPICAL USES:

P-201 will expand up to 2 times (100%) **by volume** in the presence of water. It will expand in the direction of least resistance. When expansion is inhibited, the product will produce expansion pressure against the resisting substance. This expansion pressure will effectively seal off water penetration. The amount of concrete coverage required depends on bead size. The coverage may range from 2" (¼" bead) to 4" inside a double mat of rebar (½" bead). Bead size also determines hydrostatic head resistance

P-201 (3/16x3/4)	50 ft	21.8	0.15
P-201 (3/8 x3/4)	150 ft	72.5	0.50

## STANDALONE WATERSTOP

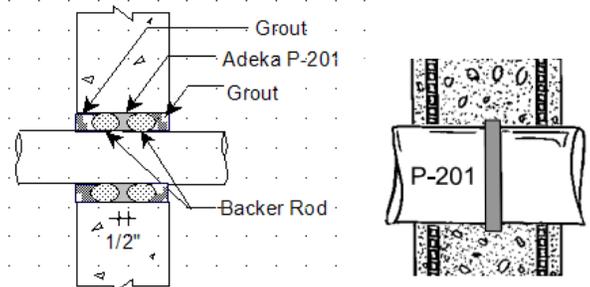
Use in below grade cast-in-place concrete joints. P-201 can replace conventional waterstop in non-moving joints.

CAVEAT: P-201 must cure before placing second concrete. Curing time varies by bead size, temperature and humidity. Place concrete without displacing or deforming the bead of P-201.



## PIPE PENETRATIONS

ADEKA ULTRASEAL® P-201 is an excellent product to seal CIP pipe penetrations or in "block out" pipe penetrations. Check [www.adeka.com](http://www.adeka.com) for details concerning annular spaces greater than 2".



Less than 2.0" annular space

## PIPE PENETRATION WITH SMALL ANNULAR SPACE

## EXPANDED METAL WATERSTOP

Use to waterproof expanded metal (stay in place) forms. Allow curing time before placing second concrete.



Stay in place expanded metal forms

## PRECAST SEGMENTS

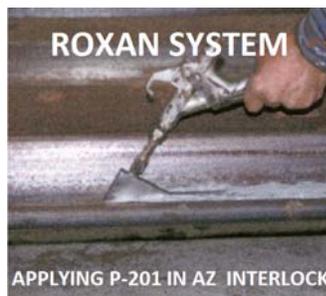
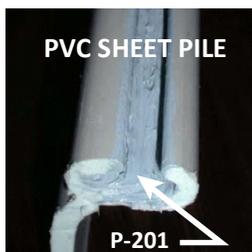
Excellent product to seal joints between precast segments. Use on box culverts, manhole, utility vaults, riser rings and many other precast units. Apply bead of P-201 and place second segment before P-201 cures.



Precast Box Culverts

## SEALING SHEET PILE INTERLOCKS

Use P-201 to seal PVC and AZ sheet pile interlocks. AZ sheet piles are treated with P-201 "Roxan System".



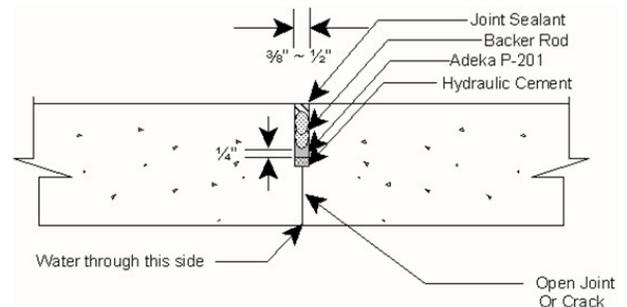
## OTHER USES FOR P-201



Use to fill rough areas when using Adeka strip products. Apply on PVC waterstop weld seams.



Waterstop H-Piles



Waterstop Open Joints / Cracks

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VISIT [WWW.ADEKA.COM](http://WWW.ADEKA.COM) FOR MORE INFORMATION OR CALL 800.999.3959

# Adeka Ultra Seal<sup>®</sup> P-201

## Performance Specification

Adeka Ultra Seal P-201 for use in waterstopping cracks, cold joints, construction joints, piping penetrations, between precast segments or between other structural elements against penetration of water from wet-face of structure. Used in conjunction with Adeka strip products on rough concrete.

The Product shall be a Hydrophilic Urethane Paste, (cartridge or bulk), and shall meet the minimum performance requirements as shown in the above table. Hydrophilic agent shall be a urethane polymer. The product shall withstand a 150 hydrostatic head when applied in a ½" bead.

Adeka Ultra Seal P-201 is manufactured by Adeka Corporation and distributed by OCM, Inc. Chicago, IL. USA Call (303) 904-4624 for sales and technical information.

Property	P-201
Hardness Hs	A45
Tensile Strength MPa	4 MPa
Elongation (%)	850 %
Specific Gravity	1.25
Volume Exp. %	100%
<sup>1</sup> Mass Change%	Not greater than 5.0 %

<sup>1</sup> Mass Change % measures the durability of the product. It reflects the amount of material that is lost through repeated cycles of hydration and dehydration.

[www.adeka.com](http://www.adeka.com)  
email: [info@adeka.com](mailto:info@adeka.com)  
800.999.3959

## **ADEKA ULTRA SEAL® P-201 ADVANTAGES**

**ADEKA ULTRA SEAL P-201 is a water-swelling, single component, elastic sealant that has a putty-like consistency. P-201 cures when in the presence of moisture. Curing time is dependent upon bead size, temperature and humidity conditions. Time will vary but normally P-201 will become firm in approximately 36 hours. Once cured, P-201 shows the same performance as pre-formed Adeka Ultra Seal products, that is, it exhibits a "DOUBLE LOCKING" function by its expansion and its own elasticity.**

- \* Maximum expansion of two times by volume.**
- \* Adheres to concrete, metals, glass, PVC, fiberglass, etc.**
- \* Can be used in damp conditions.**
- \* Applicable to uneven or rough surfaces.**
- \* Excellent chemical contaminant resistance.**
- \* Use in the presence of water contaminated by gasoline, fuel oil, and other hydrocarbons. Contact your local Adeka Ultra Seal Representative for detailed information.**
- \* Excellent for piping penetrations.**
- \* One of the most versatile Adeka Ultra Seal products.**

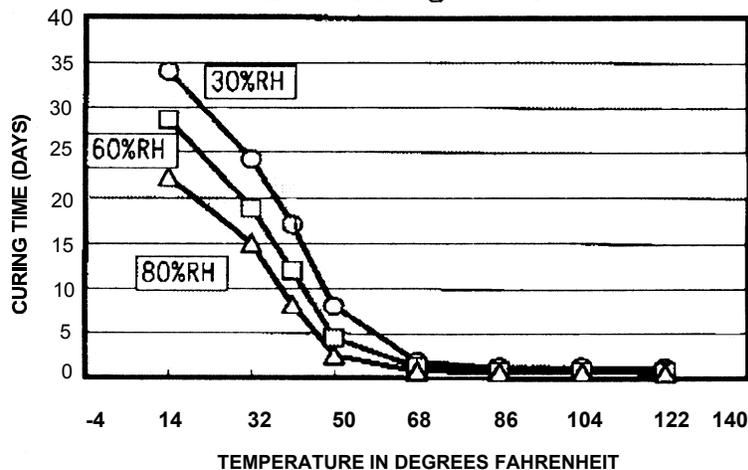
# ADEKA ULTRASEAL P-201 COVERAGE AND CURING TIME

One cartridge of P-201 = 320 ml  
(approx. 11 oz or 19.5 in<sup>3</sup>)

Bead Size Inches	Feet per Cartridge
1/4 x 1/4	25
1/4 x 3/8	17
1/4 x 1/2	13
1/4 x 3/4	8.5
1/4 x 1	6.3
3/8 x 3/8	11.5
3/8 x 1/2	8.5
3/8 x 3/4	5.5
3/8 x 1	4.3
1/2 x 1/2	6.5
1/2 x 3/4	4.3
1/2 x 1	3.2
3/4 x 3/4	2.8
3/4 x 1	2.1
1 x 1	1.6

P201 CURING TIME			
		Deg F.	Days to Cure
P-201 Bead 10mm (0.39")	30% Relative Humidity	86	1.0
		77	2.0
		68	2.5
		59	5.0
		50	8.0
		41	17.5

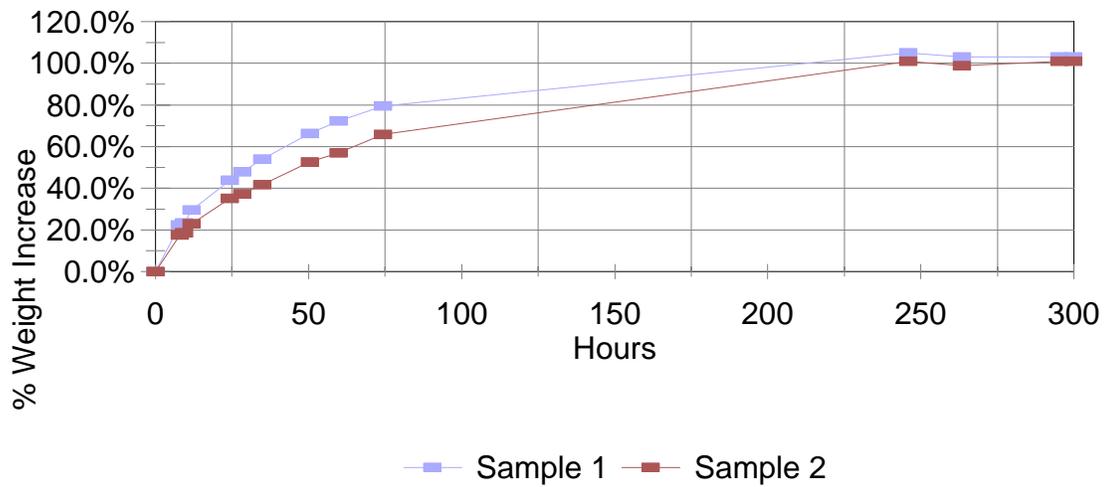
**P-201 Curing Time**



# *P-201 Volume Expansion vs. Time*

Weight increase from water intake = volume increase

## **P-201**



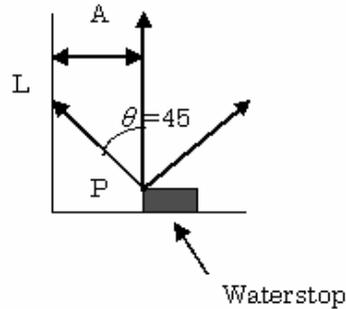
## HYDROSTATIC HEAD RESISTANCE ADEKA ULTRASEAL PRODUCTS

	Hydrostatic Head	psi	MPa
MC2010MN	150 ft	72.5	0.50
MC2005T	50 ft	21.8	0.15
KBA	20 ft	8.7	0.06
KM3030M	100 ft	43.5	0.30
P-201 (3/16x3/4)	50 ft	21.8	0.15
P-201 (3/8 x3/4)	150 ft	72.5	0.50

CALL 800.999.3959 OR VISIT [WWW.ADEKA.COM](http://WWW.ADEKA.COM)  
FOR MORE INFORMATION

## Calculation of minimum concrete coverage for ADEKA ULTRASEAL P-201

Our newest calculation for minimum coverage for P-201 is as follows.



$$P = p * B \quad (1)$$

$$P' = P * \cos\theta \quad (2)$$

$$L = P'/\tau_a \quad (3)$$

$$A = L * \sin\theta \quad (4)$$

P	repulsive force (kgf/cm)
p	swelling pressure of waterstop (kgf/cm <sup>2</sup> )
B	width of waterstop (cm)
P'	swelling pressure of waterstop for 45 direction (kgf/cm)
L	Length of 45 direction (cm)
$\tau_a$	allowable shear stress of concrete (kg/cm <sup>2</sup> )
A	Minimum coverage (cm)

In this case,  $p = 60$  (kgf/cm<sup>2</sup>) for ADEKA ULTRASEAL P-201 from our data.

strength of concrete	(psi)	2600	2600	2600	
	(kgf/cm <sup>2</sup> )	180	180	180	
$\tau_a$		5.3	5.3	5.3	
p		60	60	60	
B	(cm)	0.64	0.95	1.27	<b>P-201 Bead Size</b>
	(inch)	1/4	3/8	1/2	
P		38.1	57.15	76.2	
P'		26.9	40.4	53.9	
L		5.1	7.6	10.2	
A	(cm)	3.6	5.4	7.2	
	(inch)	1.4	2.1	2.8	
minimum coverage	(cm)	4	6	8	<b>Concrete Coverage</b>
	(inch)	2	3	4	

## **Durability data of ADEKA ULTRASEAL P-201**

### 1. Purpose,

There is a difficulty to predict durability of materials. Because, it need to consider many condition to estimate its durability. But we have to know materials durability to use it. Degradation of materials is one of chemical reaction, so we can know its durability from heat degradation. Generally, Arrhenius's method is used to estimate durability of materials.

Relationship between speed of chemical reaction and temperature is shown as follows by S. A. Arrhenius in 1889.

$$K = A \exp(-E_a/RT) \text{ -----(1)}$$

K : velocity constant

R : gas constant

T : absolute temperature

A : frequency factor

E<sub>a</sub> : activation energy

To estimate materials durability, expression (1) leads expression (2).

$$\ln(t) = E_a/(RT) + \text{const.} \text{ -----(2)}$$

t : hours

Expression (2) means, logarithm of time "t" proportional to (1/T).

So, promoted test results at high temperature can estimate life of materials at normal condition.

We choose half-life of material's elongation data to estimate durability of ADEKA ULTRASEAL P-201.

2. Promoted degradation test

Testing condition is shown at table-1.

Table-1) Testing condition

Test item	Elongation
Temperature	50,70 and 90 degrees C
Predict method	Half-life of elongation
Testing method	JIS K 6251

Result

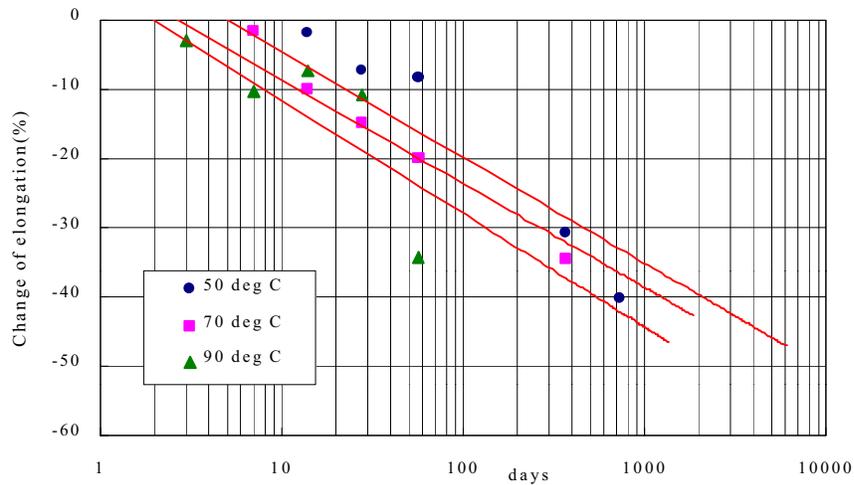


Fig.1) Relationship between change of elongation and days

We can read half-life of elongation from Fig.1) as follows, Expression (3) - (5) show approximate expression of change of elongation and days data.

$$y = -6.6362 \ln(x) + 10.69 \text{ -----(3)}$$

$$y = -6.5231 \ln(x) + 6.4195 \text{ -----(4)}$$

$$y = -7.1223 \ln(x) + 4.826 \text{ -----(5)}$$

y : change of elongation

x : days

Temperature (Deg C)/(Deg F)/(K)	Days	t (hrs)
90 / 194 / 363	2,203	52,884
70 / 158 / 343	5,705	136,932
50 / 122 / 323	9,370	224,886

3. Predict of material's life

Expression (2) and Table-1 show relationship of ln (t) and 1/T as follows.

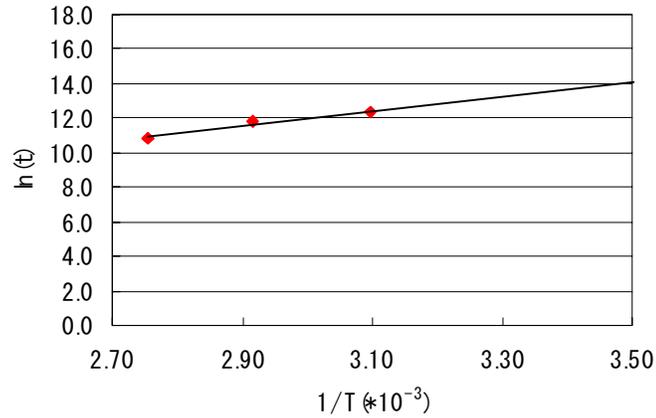


Fig.2 ) Relationship between ln (t) and (1/T)

$$\ln (t) = 4.2122 * (1/T) * 10^3 - 0.633 \text{ -----(6)}$$

Expression (6) leads durability of ADEKA ULTRASEAL P-201 at 20 – 30 degrees C as follows.

Table-2. Durability of ADEKA ULTRASEAL P-201

Temperature (Deg C)/(Deg F)/(K)	Predicted Durability (years)
20 / 68 / 293	106
25 / 77 / 298	83
30 / 86 / 303	66

This predict method results estimate degradation time at controlled conditions, so these data does not estimate durability at actual condition. Materials are using in many kinds of conditions, so its durability are different in many cases. But this durability data is useful to know ADEKA ULTRASEAL P-201 has good degradation resist ability.

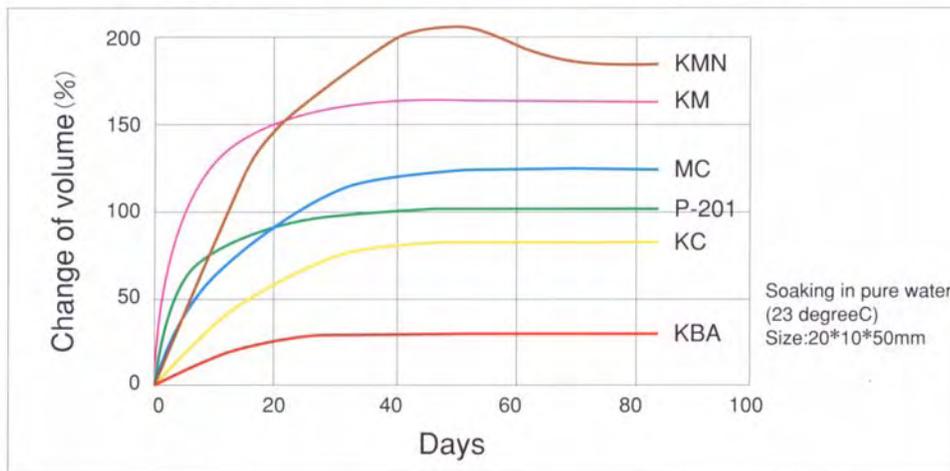
(End)

# ADEKA ULTRA SEAL

## P-201 ADHERENCE BY TENSILE STRENGTH

	Glass Board	Aluminum Board	Mortar Board
Stress of 50% Tensile Strength (kgf/cm <sup>2</sup> )(lbs/in <sup>2</sup> )	3.9 [55.7]	3.8 [54.3]	3.8 [54.3]
Stress of Maximum Tensile Strength (kgf/cm <sup>2</sup> )(lbs/in <sup>2</sup> )	14.5 [207.1]	14.6 [208.6]	15.5 [221.4]
Elongation of Rupture (%)	540	595	580

## CHANGE OF VOLUME OF ADEKA ULTRASEAL



## ADEKA ULTRASEAL TYPES AND PHYSICAL PROPERTIES

	MC	KC	KM	KMN	KBA	P-201	A-50	A-30	Method	
General physical properties	Unvulcanized rubber	Vulcanized rubber	Vulcanized rubber	Vulcanized rubber	Vulcanized foam	One component paste	Liquid	Liquid		
Hardness	A30	A50	A33	A48	HsC22*	A45	A20	A30	JIS K 6253	
Tensile strength	MPa	0.9	9.0	6.0	9.5	0.8	4.0	5.0	3.7	JIS K 6251
Elongation	%	560	680	800	660	350	850	1000	1000	JIS K 6251
Change of volume	vol%	120	80	170	220	30	100	400 (5.0)	200 (3.0)	In House
Specific gravity		1.18	1.42	1.18	1.37	0.60	1.25	1.05	1.04	JIS K 6350

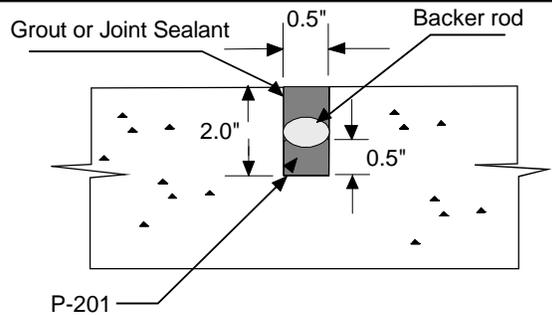
Physical property values are representative of measurements and not standard values.  
Physical property values of P-201 A-50 and A-30 (excluding specific gravity) are after curing.  
Specific gravity value is before curing. (P-201:JIS A 5758, A-50 and A-30: Hydrometer)

\*JIS K 7312

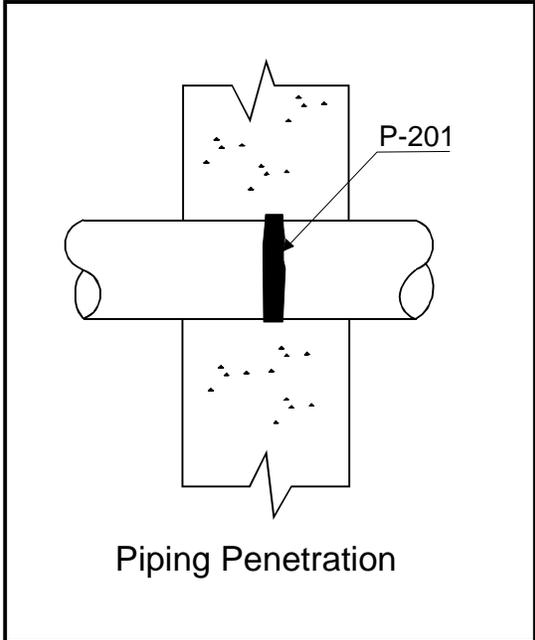
\*JIS : Japanese Industrial Standard.

1 MPa=10.2kgf/cm<sup>2</sup>

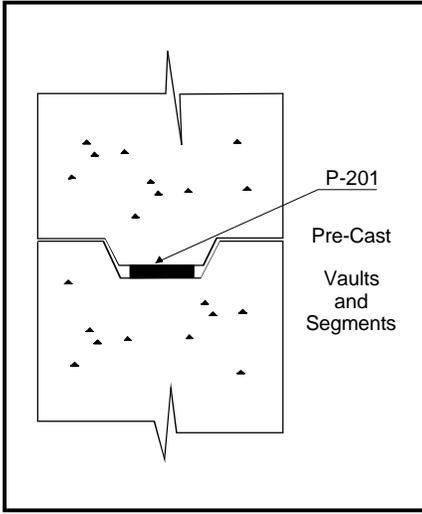
# Typical Uses of P-201



Control Joint and Crack Repair

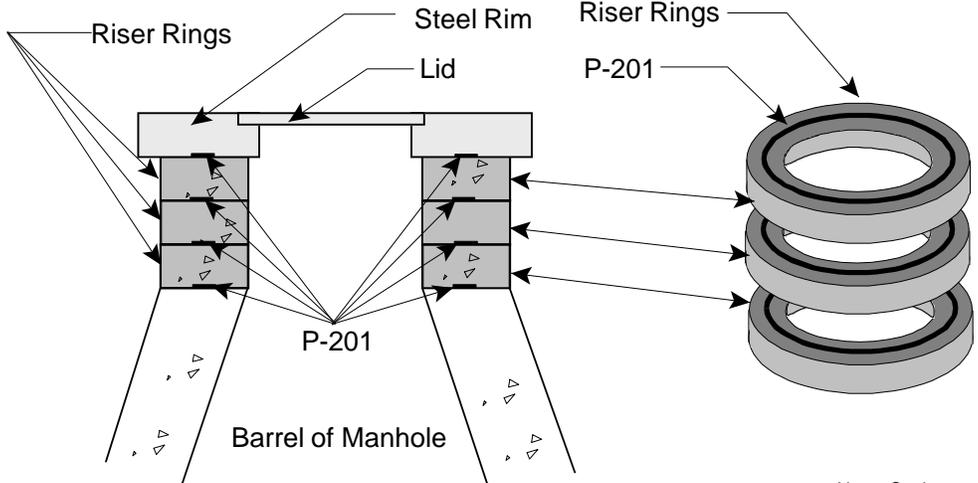


Piping Penetration



Pre-Cast Vaults and Segments

## 1/2" X 3/4" P-201 Bead Between Riser Rings

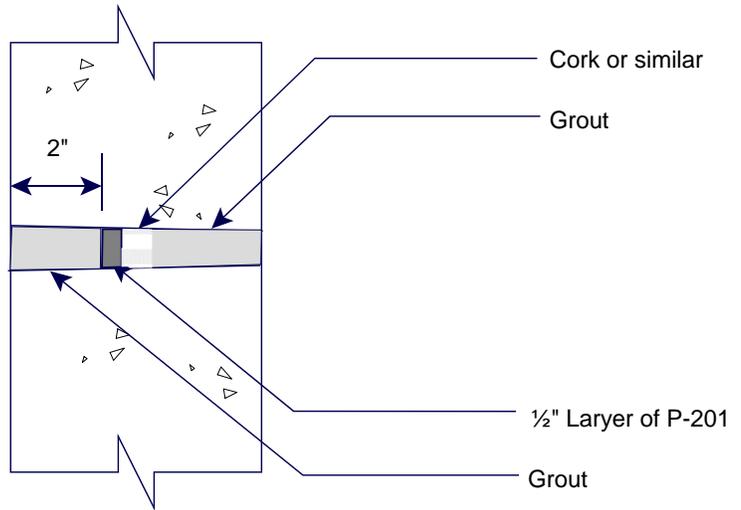


Cross Section of Manhole with riser rings

Not to Scale

# TYPICAL USES FOR ADEKA ULTRA SEAL

## P-201



### Sealing Taper Tie Holes With Adeka Ultra Seal P-201

