PO-MAT® Polyurethane Mat

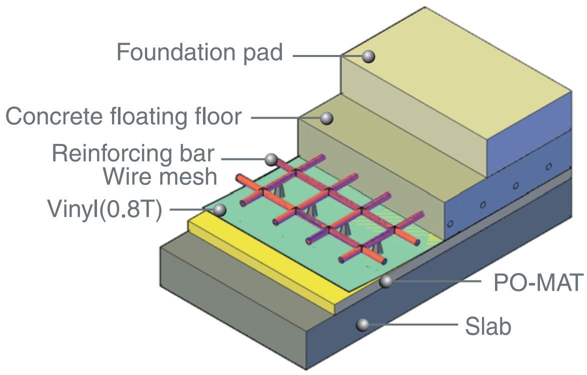
Features

Microcellular Polyurethane Mat is elastic and capable of supporting a wide range of dynamic loads owing to micro-sized air gap inside. In particular, the thickness of the Floating Slab can be reduced as the load is distributed evenly over the surface. Because Mat itself maintains elasticity and isolates noise, extra Floating Slab lifting is not required. It comes in different colors depending on its density, which makes it easier to select, handle and install.

Specification

Model	A25	B25	C25	D25	E25	F25	G25	H25
Color	Green	Yellow	Blue	Pink	Brown	Red	Gray	Black
Thickness	25T							
Density(kg/㎥)	150± 20%	220± 20%	300± 20%	400± 20%	500± 20%	600± 20%	800± 20%	1000± 20%
Rated Load(N/㎟)	0.01± 20%	0.03± 20%	0.05± 20%	0.10± 20%	0.15± 20%	0.40± 20%	1.50± 20%	5.00± 20%
Rated Def. (mm)	6.0						3.0	1.5
Size	1000mmX1000mmX25T							

(NOTE) The mentioned size and scale can be altered to improve the quality performance and capacity of the product without any notice.



PO-MAT Durability Test Data

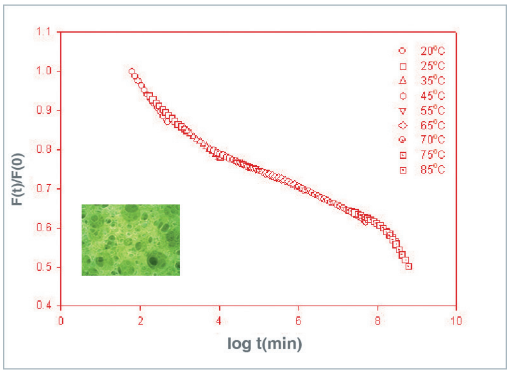
PO-MAT Model	Density (kg/㎥)	Lifetime (room temperature:20℃)	Activation Energy (kJ/mol)
A-25	150	612Year	200
B-25	220	630Year	207
C-25	300	644Year	206
D-25	400	652Year	185
E-25	500	660Year	219
F-25	600	675Year	193

Test Equipment(DMA 2980, TA Instrument)

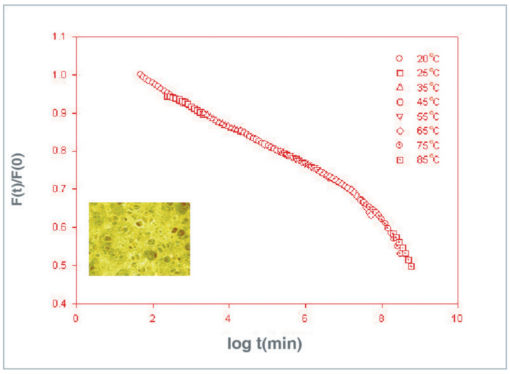
- The data above is the result of the test performed upon request by the Department of Chemical Engineering at Hanyang University. The test was conducted to predict durability using Time Temperature Superposition (TTS) and observe stress-relaxation under constant compression strain.

★ TTS : The higher the temperature, the less time is required for stress-relaxation; this principle is used to predict changes in mechanical behavior over time at a given temperature when temperature is changed within a measurable time range.

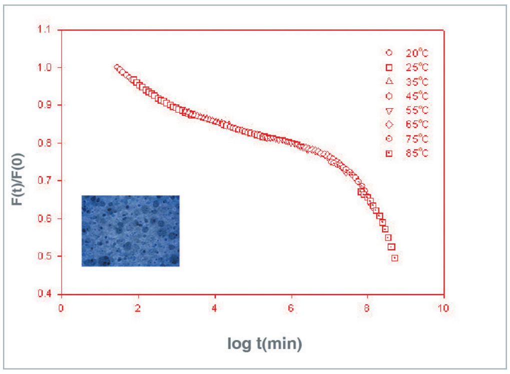
■ The PO-MAT Durability Test Resulting Graph



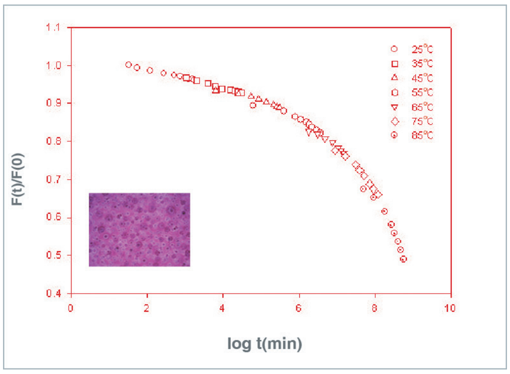
- Sample A : Green
- Density : 150Kg/㎥
- Durability :Durabity 612yrs(20)



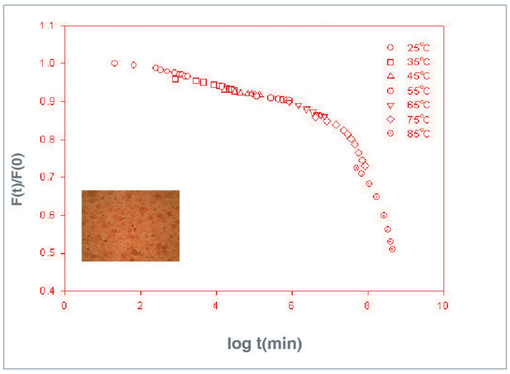
- Sample B : Yellow
- Density : 220Kg/㎥
- Durability : Durabity 630yrs(20)



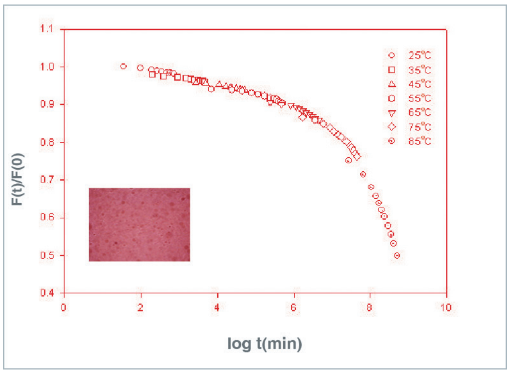
- Sample C : Blue
- Density : 300Kg/㎥
- Durability :Durabity 644yrs(20)



- Sample D : Pink
- Density : 400Kg/㎥
- Durability :Durabity 652yrs(20)



- Sample E : Brown
- Density : 500Kg/㎥
- Durability :Durabity 660yrs(20)



- Sample F : Red
- Density : 600Kg/㎥
- Durability :Durabity 675yrs(20)

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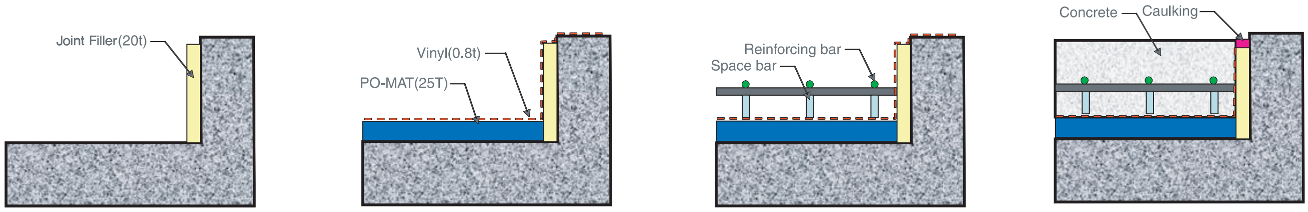
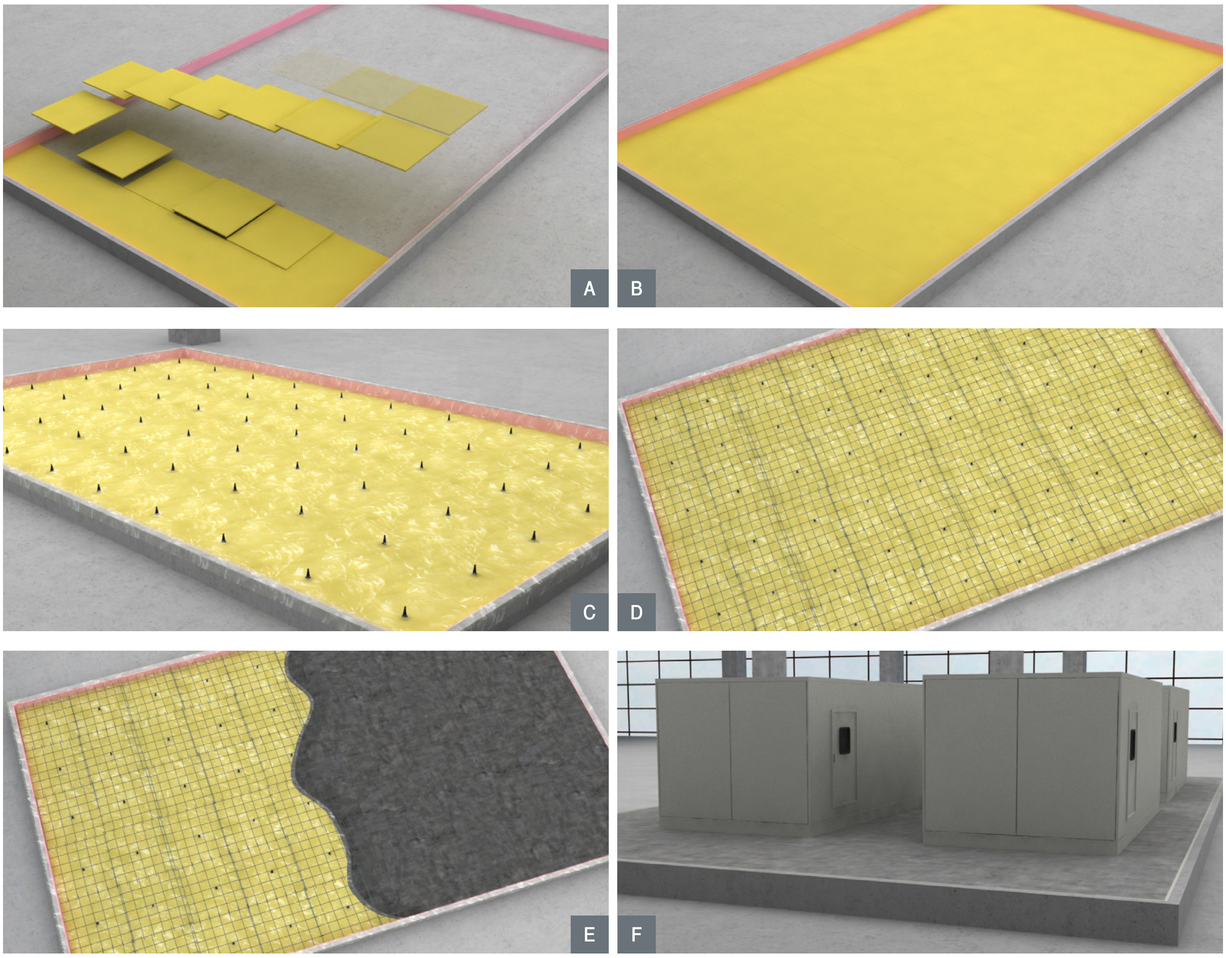
■ PO–MAT Installation Order



1. Clean the floor where the PO MAT is to be installed, keep level and install the MAT when the floor is dried.
2. Cover drain, vertical pipes, ducts and electric line–passing parts with joint filler and/or heat insulating materials.
3. Attach joint filler on surrounding walls and pillars that come in contact with double–bottomed slab.
4. Install the PO–MAT according to the approved drawing, in a way that manufacturer's name and model comes on top.
5. Install 2 layers of 0.08 mm–thick polyethylene (PE) plastic on top of the PO–MAT and attach using the OPP adhesive tape.
6. Install a wire mesh or steel reinforcement as shown in the approved drawing. Be cautious not to damage the plastic.
7. Place concrete and then leave it for curing. (According to the construction specification standard)
8. Then, do the caulking with 10mm–thick sealant.



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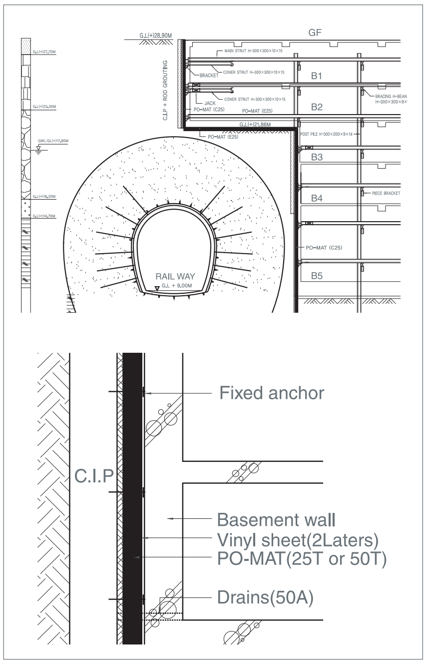
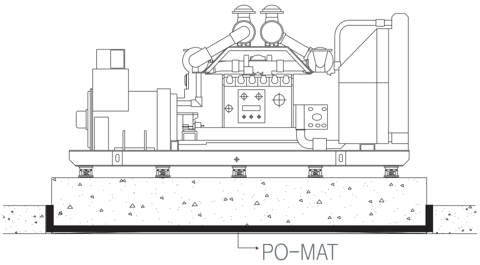
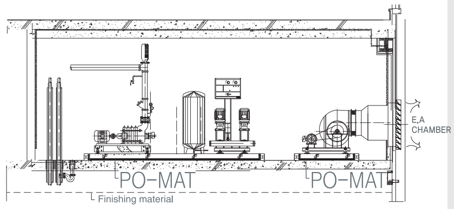
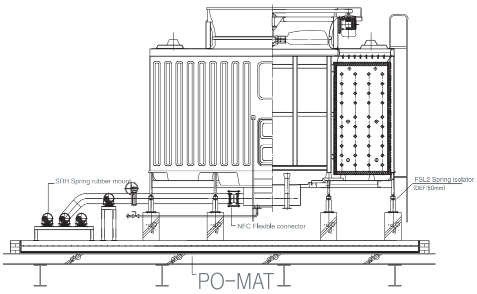
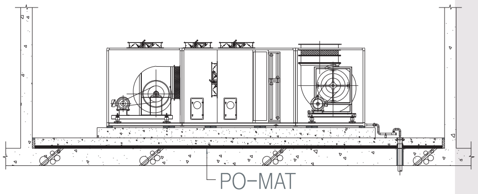
■ PO–MAT Construction Method



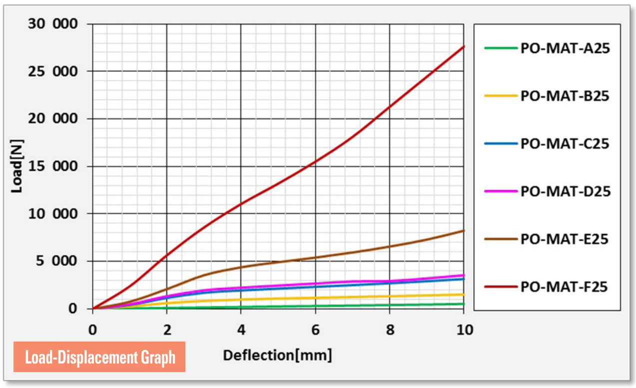


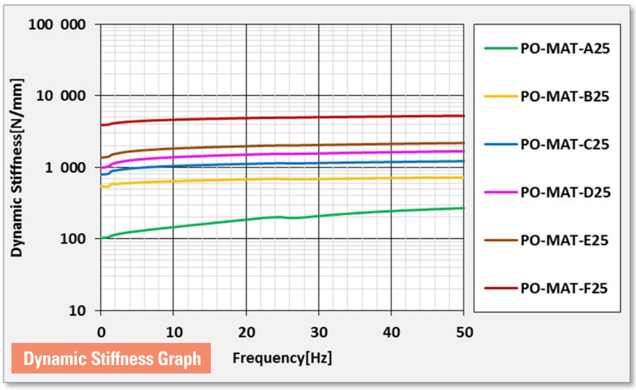


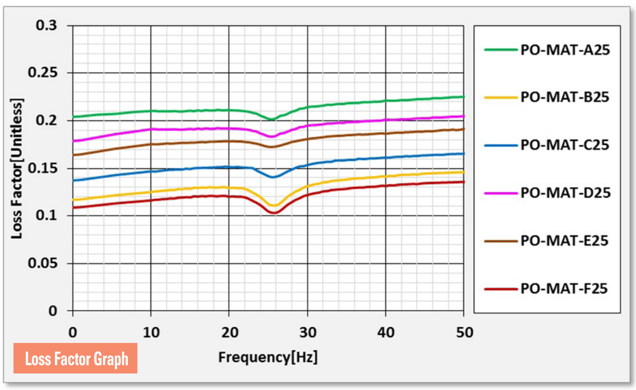


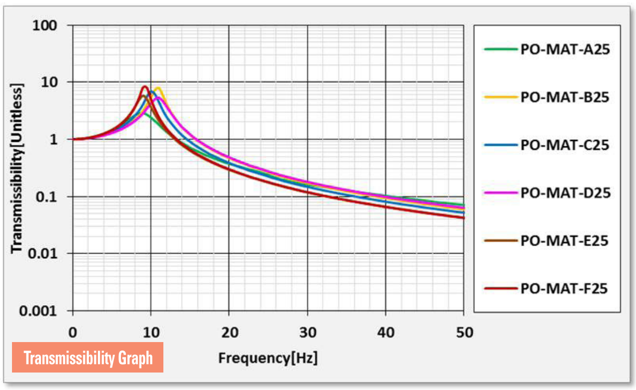


■ 25T Test Data









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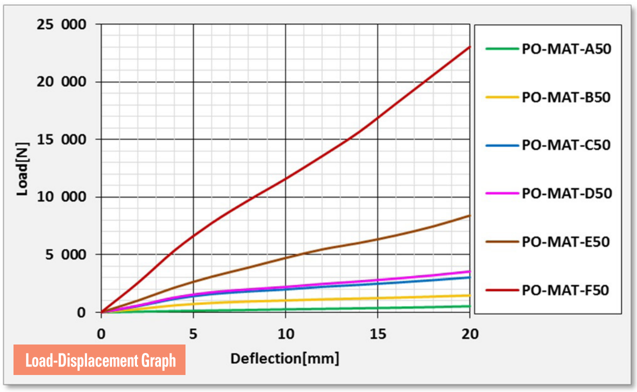
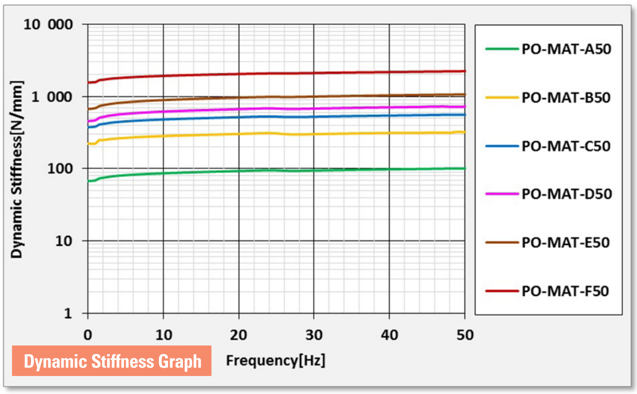
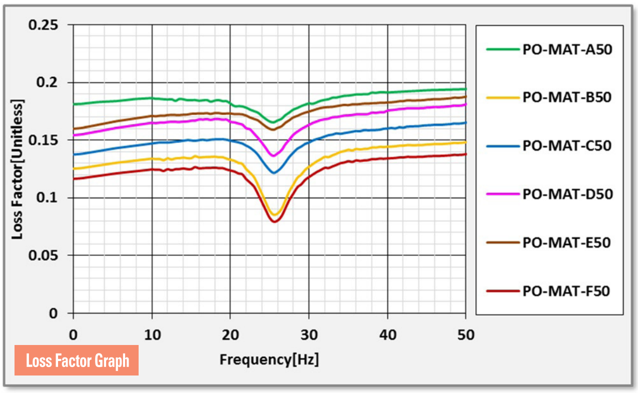
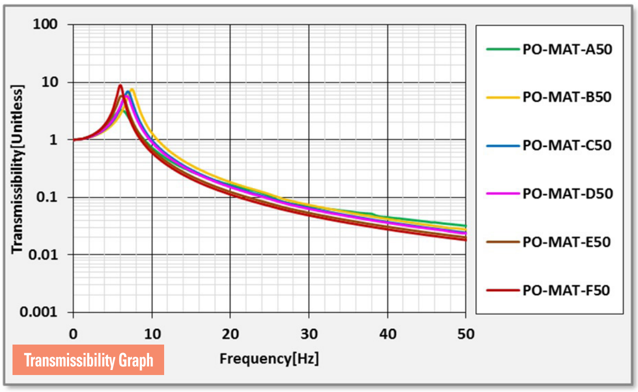
50T Test Data









Explanation(Commonness)

1. Vibration Transmissibility(T_r)

Vibration Transmissibility is the amplitude ratio of Output to Input.

$$T_r = \frac{Output\ Amplitude}{Input\ Amplitude} = \sqrt{\left(\frac{1}{1-\eta^2}\right)^2}, \eta = \frac{Disturbing\ Frequency\ of\ the\ equipment}{Natural\ Frequency\ of\ the\ Isolator(\ Damping(c) = 0\ )}$$

2. Natural Frequency(F_n) of Vibration Isolation System

The mass and spring stiffness dictate a natural frequency of the system.

$$F_n = \frac{1}{2\pi}\sqrt{\frac{k}{m}}$$

3. Isolation Efficency(E)

Isolation Efficiency in percent transmission is related to Vibration Transmissibility $E = 100(1 - T_r)$

ex) Disturbing Frequency of the equipment=100 Hz,

Natural Frequency of the isolator=10Hz

$$T_r = \sqrt{\left(\frac{1}{1-\eta^2}\right)^2} = \sqrt{\left(\frac{1}{1-\left(\frac{100}{10}\right)^2}\right)^2} = 0.101 \quad E = 100(1 - T_r) = 100(1-0.101)=99(\%)$$

4. Loss Factor(ζ)

① Loss Factor is the double damping ratio on natural frequency of Vibration Isolation System $\eta = 2 \times \zeta(Damping\ Ratio)$

② The damping ratio is a dimensionless measure describing how oscillations in a system decay after a disturbance.

$$\zeta = \frac{Actural\ Damping}{Critical\ Damping}$$

5. Dynamic Stiffness(k_d)

The dynamic stiffness is the frequency dependant ratio between a dynamic force and the resulting dynamic displacement.

$$k_d = \frac{Force(Frequency)}{Vibration\ Response}$$