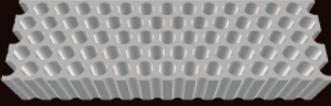
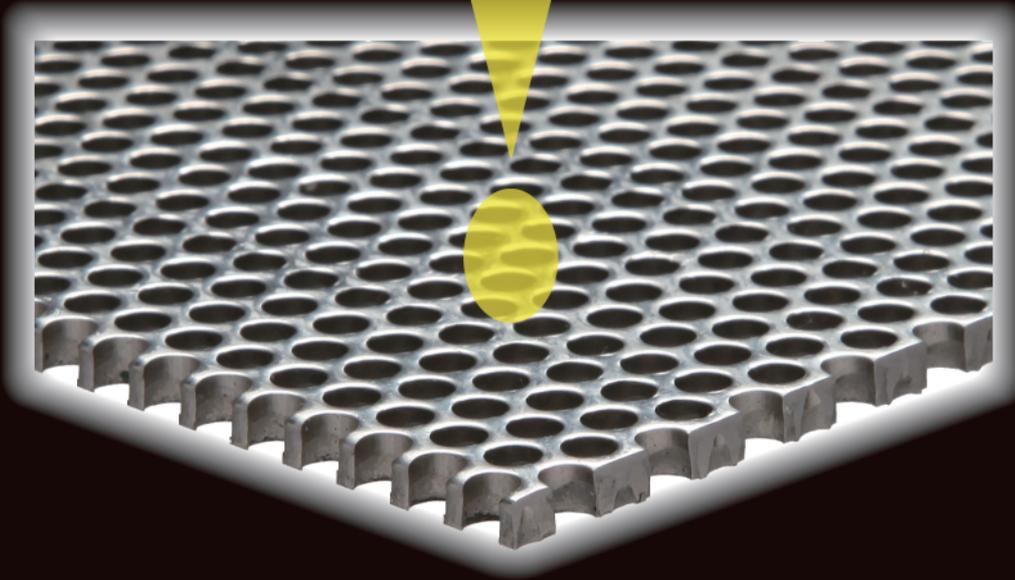


SUPER PUNCHING

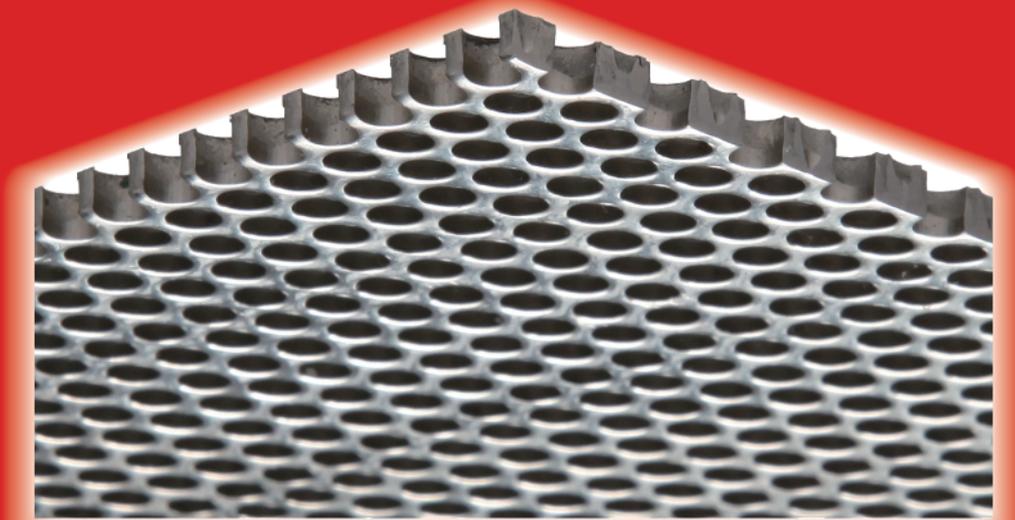


Registered trademark

**Going Beyond
The Limits**



SUPER PUNCHING™



OKUTANI Ltd.

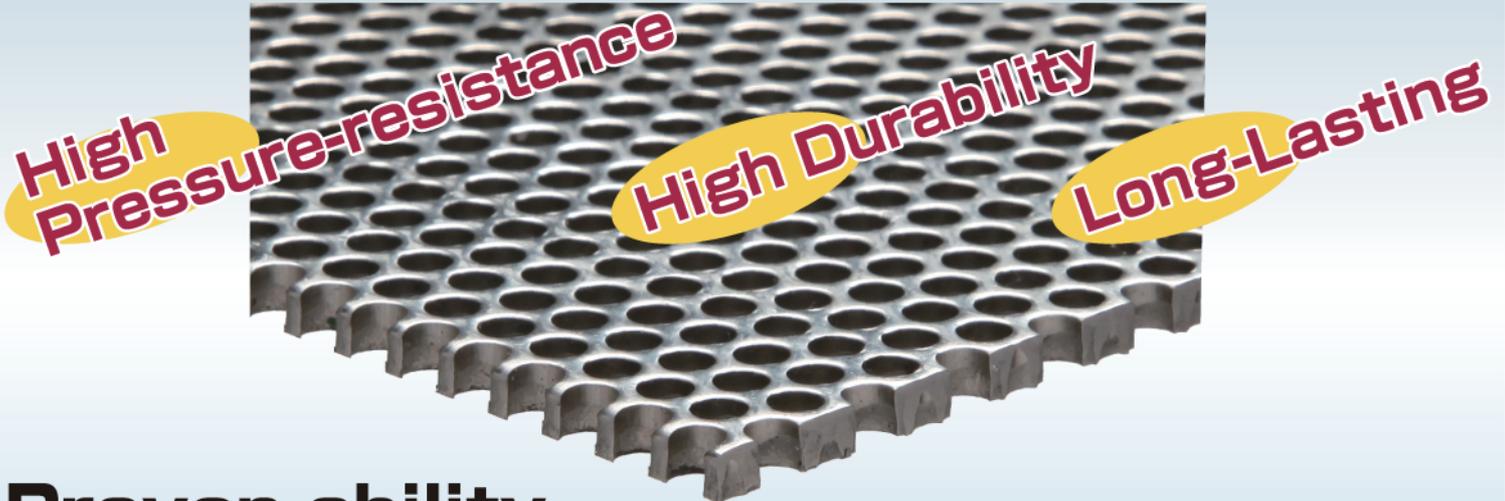
Perforated metal & wire mesh since 1895

SUPER PUNCHING

Featuring One-of-a-Kind Technology

SUPER PUNCHING™ Debut!!

Registered trademark



Proven ability to bore holes with diameters smaller than the thickness of the metal sheet.

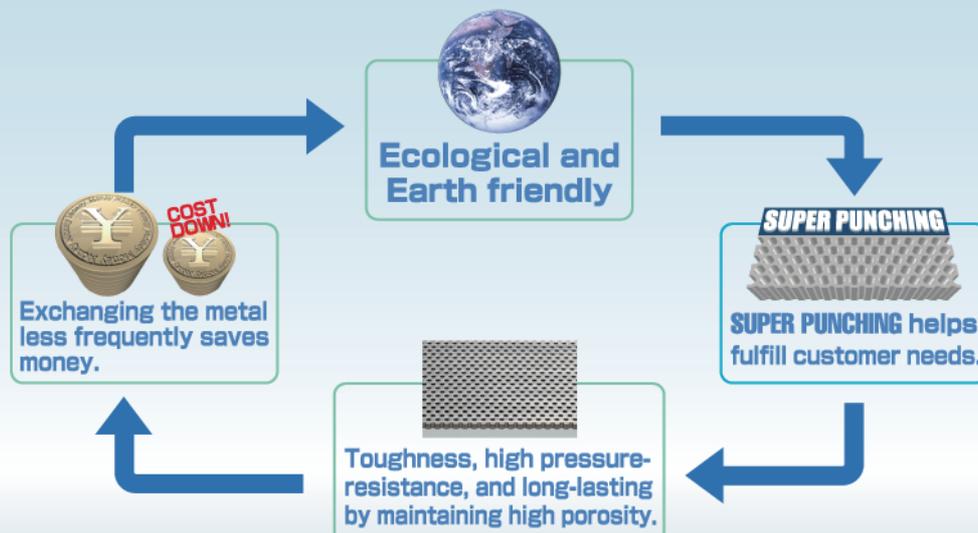
About SUPER PUNCHING™

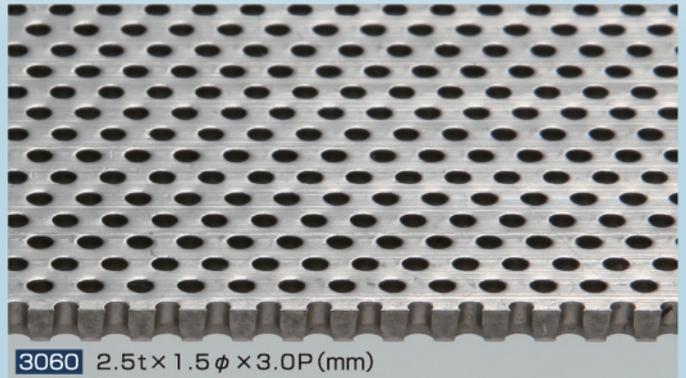
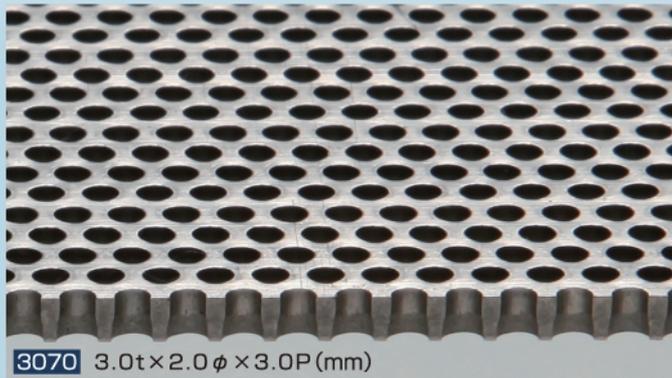
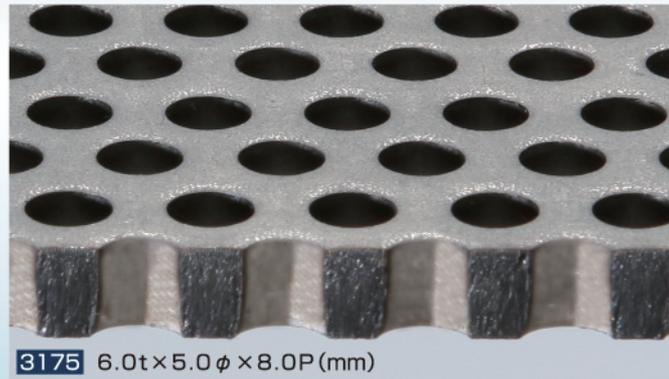
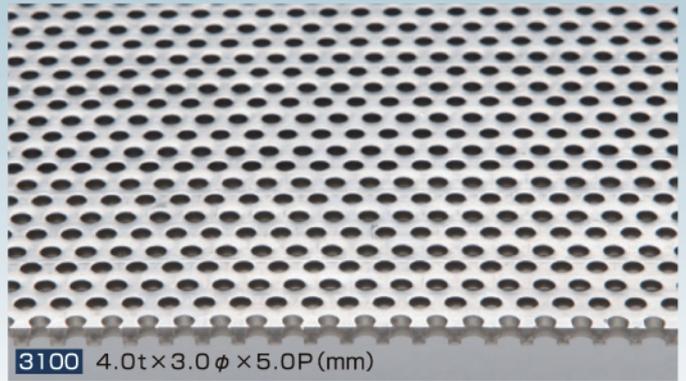
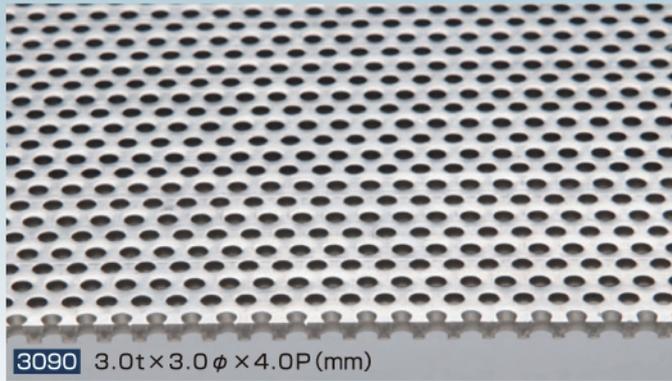
- Proven ability to bore holes with diameters **smaller than the thickness** of the metal sheet.
- Smaller pitch size than ever before! **Small pitch sizes** punch pressed.
- **Strengthen the metal** by thickening the sheet and retaining the hole diameters.

Super Punched workpieces are for :

- Products that need high-pressure resistance, and high durability.
- Situations where standard punched metal workpieces can't be used.
- Nuclear plants, Crude-processing plants, Wastewater treatment plants.
- Aircrafts, Watercrafts, Trains.
- Granulators, Crushers.
- Trommels.

SUPER PUNCHING™ CYCLE



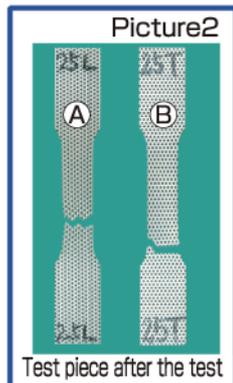


List of SUPER PUNCHING™ Standard Models

Model	Thickness (mm)	Hole diameter (mm)	Hole pitch (mm)	Open area (%)
3010	1.0t	0.75φ	1.5	22.5%
3015	1.0t	0.75φ	2.0	12.7%
3020	1.0t	0.8φ	1.6	22.5%
3023	1.0t	0.9φ	2.0	18.2%
3025	1.2t	1.0φ	2.0	22.5%
3028	1.2t	1.0φ	3.0	10.0%
3030	1.5t	1.0φ	3.0	10.0%
3033	1.5t	1.0φ	2.5	14.4%
3040	2.0t	1.2φ	2.4	22.5%
3045	2.0t	1.5φ	3.0	22.5%
3050	2.0t	2.0φ	3.0	40.0%
3060	2.5t	1.5φ	3.0	22.5%
3065	2.5t	2.0φ	3.5	29.4%

Model	Thickness (mm)	Hole diameter (mm)	Hole pitch (mm)	Open area (%)
3070	3.0t	2.0φ	3.0	40.0%
3075	3.0t	2.0φ	4.0	22.5%
3080	3.0t	2.5φ	5.0	22.5%
3090	3.0t	3.0φ	4.0	50.6%
3095	3.0t	4.0φ	5.0	57.6%
3100	4.0t	3.0φ	5.0	32.4%
3105	4.0t	3.5φ	6.0	30.6%
3110	4.0t	4.0φ	6.0	40.0%
3150	5.0t	4.0φ	8.0	22.5%
3155	5.0t	4.5φ	9.5	20.2%
3170	6.0t	4.5φ	10.5	16.5%
3175	6.0t	5.0φ	8.0	35.2%
3180	6.0t	6.0φ	9.0	40.0%

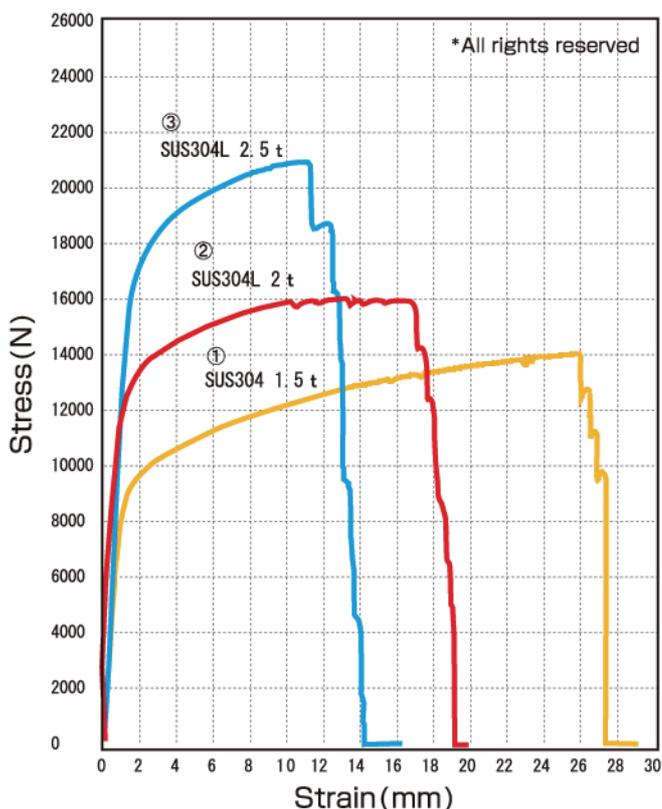
1. Purpose	Tensile strength test for SUPER PUNCHING™ perforated metal
2. Samples to be tested	Stainless steel perforated metal (details as below)
3. Test Method	<p>Tensile Test JIS Z 2201 & Z 2241 (98) corresponding to ISO 6892</p> <p>(1) Testing equipment : Shimazu Universal Tester type : AG-X100kN</p> <p>(2) Test conditions</p> <p>(a) Number of test pieces : 6 pieces (* 1)</p> <p>(b) Environmental temperature : Room temperature (23°C or 73.4°F)</p> <p>(c) Test speed : 30% of width (mm)/min</p> <p>(d) Dimensions of test piece : 25mm width × 210mm length</p> <p>(3) Perforated patterns : D1.5mm × P3.0mm staggered and reverse staggered patterns.</p>



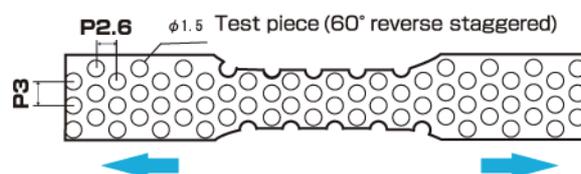
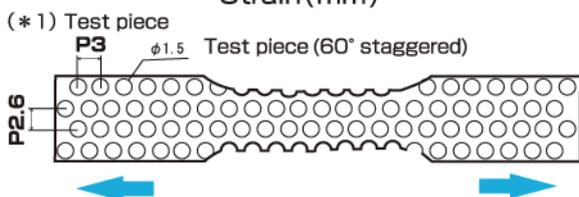
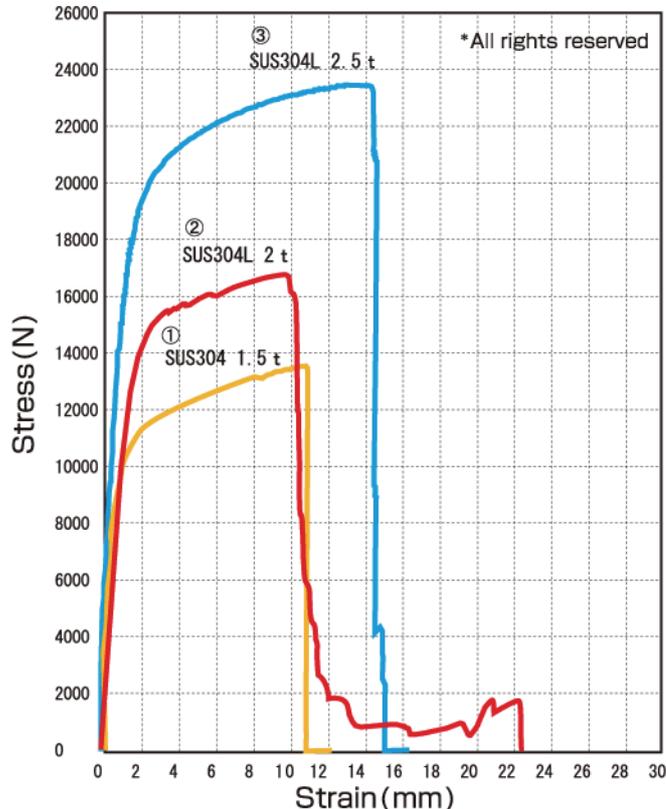
Result of tensile test

Type of patterns	Material (* 2)	Nominal thickness	Actual thickness	Ultimate strength(N)	The ratio against 1.5mmT
Staggered	SUS304	1.5	1.46	13,941	1
	SUS304L	2.0	1.92	16,066	1.16
	SUS304L	2.5	2.44	20,891	1.50
Reverse staggered	SUS304	1.5	1.47	13,513	1
	SUS304L	2.0	1.93	17,054	1.17
	SUS304L	2.5	2.46	23,496	1.74

(A) Stress-Strain Curve (Staggered)

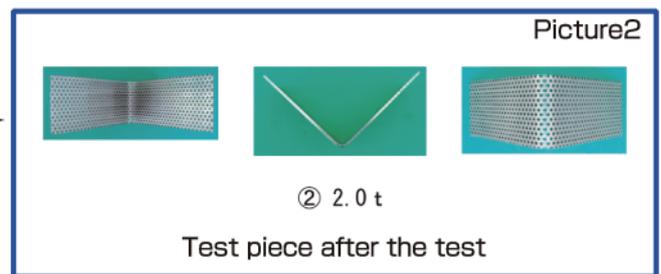
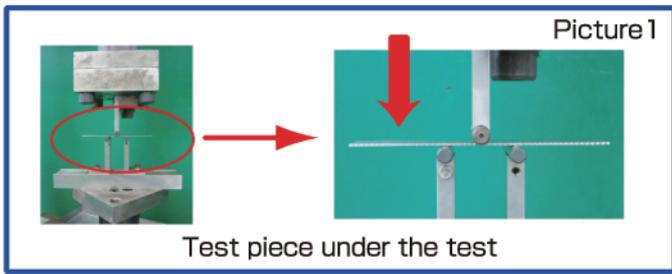


(B) Stress-Strain Curve (Reverse Staggered)



(* 2) Material JIS SUS304 : ISO X5CrNi18-10 (EN 1.4301)
JIS SUS304L : ISO X2CrNi18-9 (EN 1.4307)

1.Purpose	Flexural test for SUPER PUNCHING™ perforated metal
2.Samples to be tested	Stainless steel perforated metal (details as below)
3. Test Method	<p>Three point bending flexural test</p> <p>(1) Testing equipment : Shimazu Universal Tester type : AG-X100kN</p> <p>(2) Test conditions</p> <p>(a) Number of test pieces : 3 pieces (*3)</p> <p>(b) Environmental temperature : Room temperature (23°C or 73.4°F)</p> <p>(c) Test speed : 1mm/min</p> <p>(d) Dimmensions of test piece : 40mm width × 150mm length</p> <p>(3) Perforated patterns : D1.5mm × P3.0mm staggered (*3)</p>

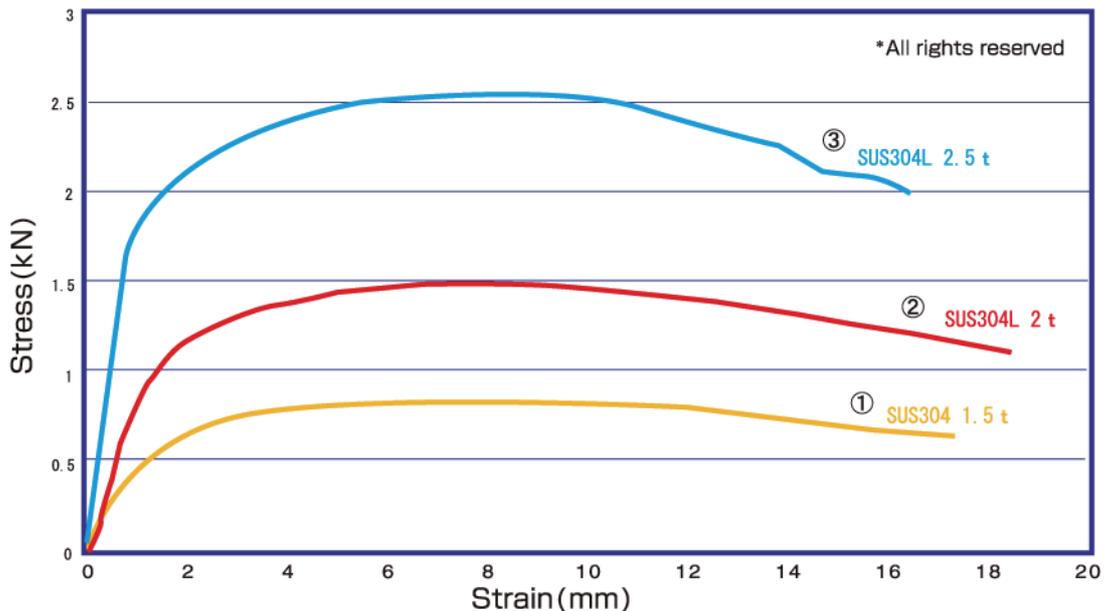


Result of bending test

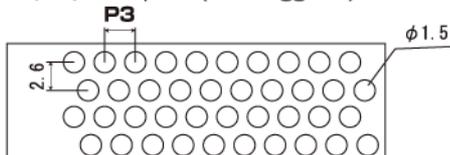
Type of patterns	Material (*4)	Dimensions of specimen (mm)		Max. flexural load Pmax (kN)	Max. flexural stress σmax (MPa)
		Width (b)	Thickness (h)		
Staggered	SUS304	40.0	1.47	0.848	841
	SUS304L	40.0	1.91	1.485	869
	SUS304L	40.0	2.49	2.553	904

Remarks : Maximum flexural stress $\sigma_{max} = 3PL/2b'h^2$, L=40mm, b'=b-1.5×8

Stress-Strain Curve (Staggered)



(*3) Test piece (60° staggered)



(*4) Material SUS304L : ISO X2CrNi18-9 (EN 1.4307)2.5t×φ 1.5×P3.0 (mm)
 SUS304L : ISO X2CrNi18-9 (EN 1.4307)2.0t×φ 1.5×P3.0 (mm)
 SUS304 : ISO X5CrNi18-10 (EN 1.4301)1.5t×φ 1.5×P3.0 (mm)

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Over 1000 items are here



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HEAD OFFICE: 4-5-5, AIOI-CHO, CHUO-KU, KOBE 650-0025, JAPAN
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 AKASHI FACTORY: Phone:+81 78-974-1907 FAX:+81 78-974-1959
 SAKAI FACTORY: Phone:+81 72-361-9121 FAX:+81 72-361-9122

E-mail : info@okutanikanaami.co.jp
 http : [//www.okutanikanaami.co.jp](http://www.okutanikanaami.co.jp)