

## SOSEI-FORMA 3D-Forming + Precision Shearing

### Technology

#### 3D Forming

- Molding of complex three-dimensional shapes
- High-precision molding of 3D shape
- Net shape by press molding

#### Precision Shearing

- Suppresses shear droop to the limit
- Suppresses Fracture surface to the limit
- Improvement of surface roughness of sheared surface
- Improved dimensional accuracy

### Benefit created by SOSEI-FORMA Technology

#### Benefit

1. Cost and lead time reduction
2. Utilization of materials that are difficult to process  
(Example : High-strength steel plate and stainless steel)
3. Contribution to a low-carbon society

### New Product Development

#### HEAT SINK



#### 【Feature】

- ✓ Molding from aluminum and copper materials
- ✓ Better thermal conductivity than aluminum die casting
- ✓ Any pin-fin shape can be molded
- ✓ Net shape 100%

Thermal conductivity (25°C) W / (m · k)

MATERIAL	ADC12	A6063	C1100
Thermal conductivity	92	209	396

Existing		Benefit provided by Daido in SOSEI-FORMA
Process	Problem	
Die-casting ↓ Machining	<ul style="list-style-type: none"> <li>• Aluminum Die-cast</li> <li>• Need to machining for precision</li> <li>• Die life is short.</li> <li>• Can't process thin-wall</li> <li>• Low thermal conductivity</li> </ul>	<ul style="list-style-type: none"> <li>➢ <b>Cost reduction</b></li> <li>➢ <b>Less Machining</b></li> <li>➢ <b>Long Die life</b></li> <li>➢ <b>Weight reduction (Thin-wall)</b></li> <li>➢ <b>Improve heat dissipation</b></li> </ul>

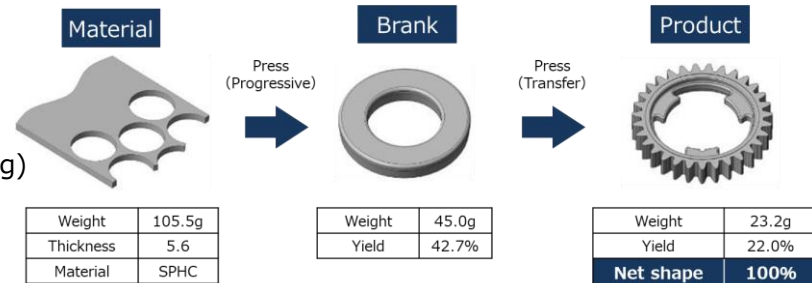
### Application example of SOSEI-FORMA

#### Gear of Electric actuator



#### 【Feature】

- Made from steel sheet by 3D forming
- Module 1.25, Thickness 5.6mm outer teeth blanking
- Precision of outer teeth JIS-P6 (After pressing)
- Droop of outer teeth less than 0.2mm
- Shear plane over 95%
- Net shape 100%

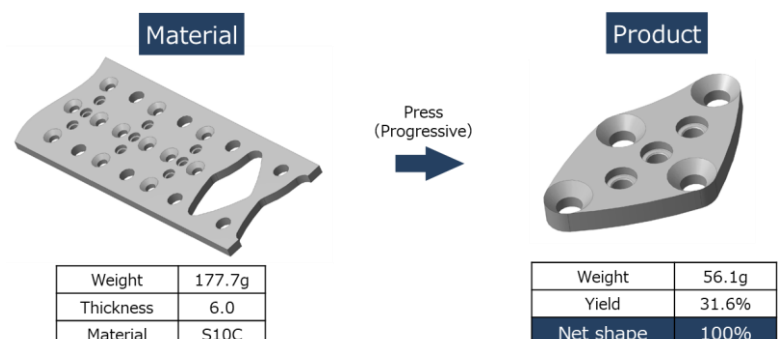


#### Airtight PLATE of Compressor





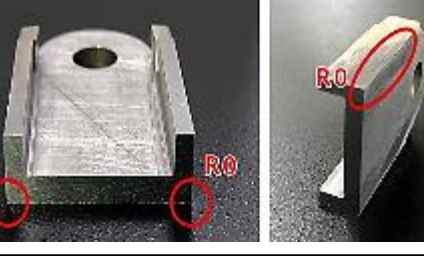





#### 【Feature】

- One process from steel sheet
- Flatness less than 0.03mm
- Countersinking by press
- Net shape 100%



## Benefit created by SOSEI-FORMA technology

Production Image	Existing		Value provided by Daido	
	Problem	Actual	Improve	Value
	<ul style="list-style-type: none"> <li>Aluminum Die-cast</li> <li>Need to machining for precision</li> <li>Die life</li> <li>Can't process thin-wall</li> <li>Low thermal conductivity</li> </ul>	Die-casting ↓ Machining	Press ↓ <b>(Machining)</b>	<ul style="list-style-type: none"> <li>Cost reduction</li> <li>Weight reduction (Thin-wall)</li> <li>Improve heat dissipation</li> </ul>
	<ul style="list-style-type: none"> <li>Broaching 2mm</li> <li>Difficult to process</li> </ul>	Press ↓ Broaching	Press ※ <b>Broach in press</b>	<ul style="list-style-type: none"> <li>Cost reduction</li> <li>Press and Broaching</li> </ul>
	<ul style="list-style-type: none"> <li>Assembling</li> <li>Welding</li> </ul>	Press+Machinig Two parts ↓ Assemble/ Welding	Press ↓ <b>(Machining)</b> <b>One parts</b>	<ul style="list-style-type: none"> <li>Cost reduction</li> <li>Reduce Assembly</li> <li>Reduce Welding</li> </ul>
	<ul style="list-style-type: none"> <li>Sintered parts is low strength</li> </ul>	Sintering ↓ Machining ↓ Heat treatment	Press ↓ <b>Machining</b> ↓ <b>Heat treatment</b>	<ul style="list-style-type: none"> <li>Improve strength</li> </ul>
	<ul style="list-style-type: none"> <li>Bending radius</li> </ul>	Angle by machining	<b>Angle by press forming</b>	<ul style="list-style-type: none"> <li>Improve precision</li> <li>Improve productivity</li> </ul>
	<ul style="list-style-type: none"> <li>Want to replace cutting with press working</li> <li>Want to omit heat treatment</li> </ul>	Machining ↓ Heat treatment	Press ※ <b>Strain hardening</b>	<ul style="list-style-type: none"> <li>Cost reduction</li> <li>Reduce Machining</li> <li>Eliminate H/T</li> </ul>
	<ul style="list-style-type: none"> <li>Need abrasion resistance for sliding part</li> </ul>	Press	Press ↓ <b>Chromizing</b>	<ul style="list-style-type: none"> <li>Add abrasion resistance</li> </ul>
	<ul style="list-style-type: none"> <li>SUS304/SUS630</li> <li>Difficult to press</li> <li>Can't H/T</li> <li>High material cost</li> </ul>	SUS304/SUS630 ↓ Machining	<b>SUS403</b> ↓ Press ↓ ※ <b>SN-treatment</b>	<ul style="list-style-type: none"> <li>Use low cost material</li> <li>Can improve corrosion and strength by SN-treatment</li> </ul>

**No Image**

※SN treatment : Special heat treatment that balances strength and corrosion resistance with stainless steel