



RingMash Machine

for powertrain components

ORIGIN RingMashing

- Unifying of coaxial parts
- Unifying two different metals
- Solid phase bonding, process below melting points of each metal



ORIGIN ELECTRIC CO., LTD.

ORIGIN RingMashing

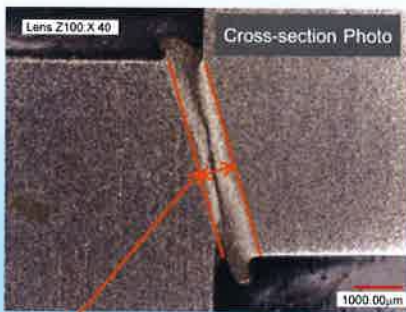
Process of *RingMash* - Unifying of coaxial parts -

1. Press and bonding current discharge.
2. Plasticizing area by delivering bonding current, Joule heat.
3. Mechanical force pushes out surface layers, oxidized layers, outwardly, results applicable interatomic penetration and bonding takes place.
4. Solid phase bonding.

Note; Solid Phase Bonding

Bonding process takes place below melting points of each metal.

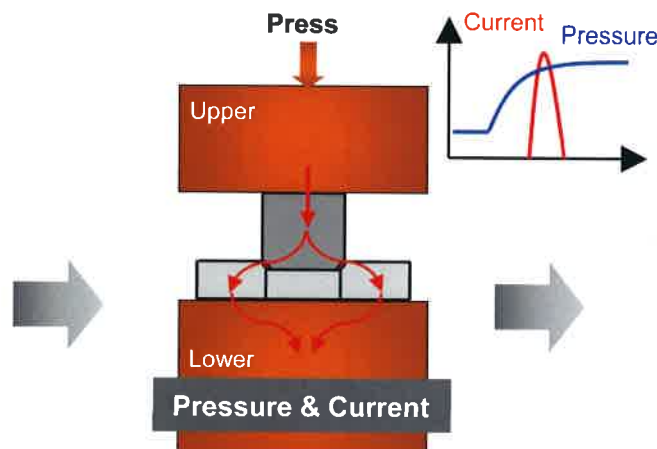
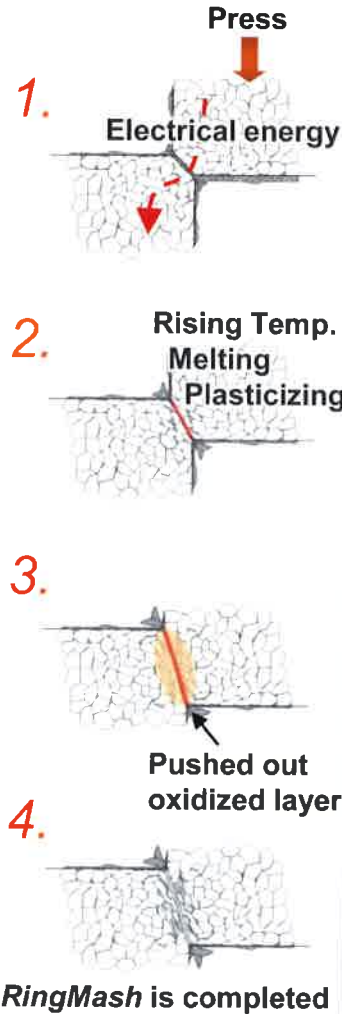
Small bonding heat-affected zone (HAZ)



Heat-affected zone (HAZ) up to 1mm

Short process time

1.~ 4. 10s mil sec

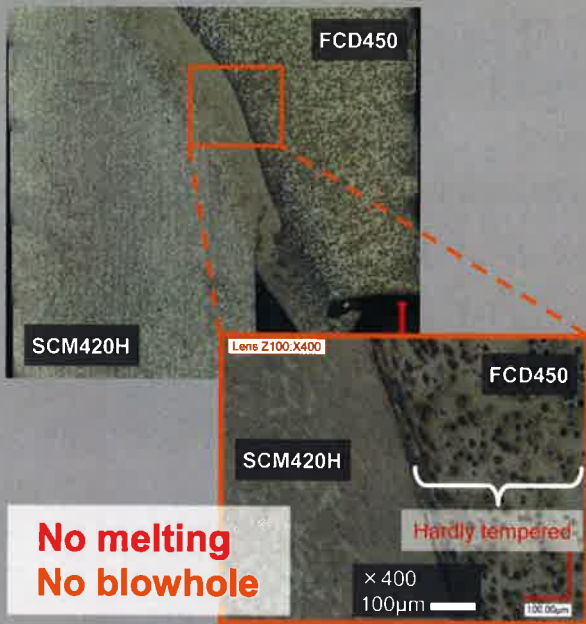


Parameters

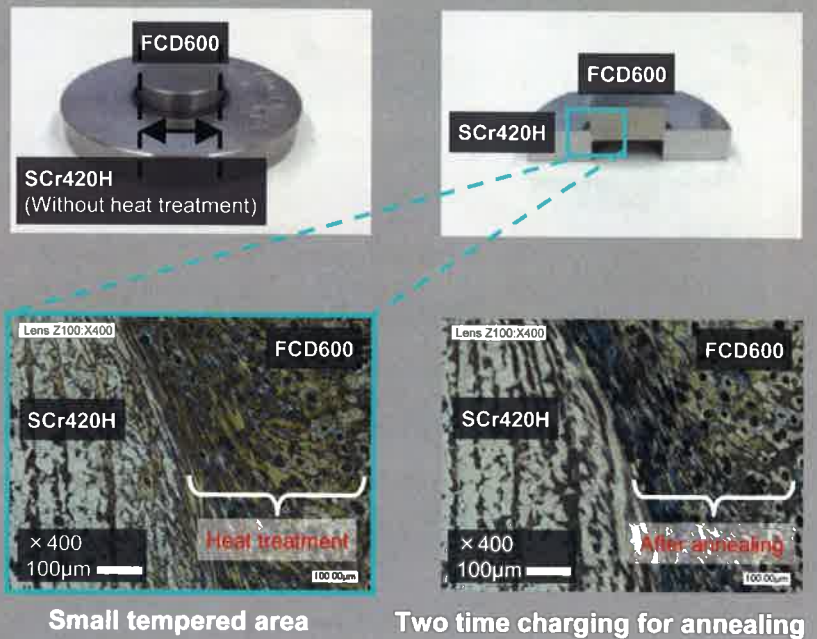
- Pressures ; 1) Speed of adding pressure, 2) Pressure during welding, 3) Final pressure
- Welding current ; 1) Current value, 2) Duration of current time
- Contact length of work, etc.

RingMash takes place between two different metals

FCD450 & SCM420H (JIS)



FCD600 & SCr420H (JIS)



Characteristics of RingMash

- **Easy centering** : Only simple jig is required.
- **Simple bonding surface contour, results less processing cost.**
- **Short process time** : 10s mil sec.
- **Dimensional deformation area by bonding is significantly minimum, results high dimensional accuracy.**
- **High torque and alignment can be achieved.**

Benefits of RingMash

- **Less component, weight reduction**
- **Less manufacturing, less process time**

Applications

- **Differential gear**
- **Transmission gear**
- **Torque converter**
- **Career cover & plate**
- **Belt drive**
- **Others**



Best Suitable Application Is For Power Train Components

Technical Data

Model	F225W-G15A	
Utility	Electricity	3 ϕ AC200V 50/60Hz 120kVA
	Compressed air	0.5-0.7MPa Max.1,000NL/min
	Cooling water	0.05-0.15MPa 3-5L/min
Size and weight	Main body unit	Size: 3,400 x 1,600 x 3,400mm Weight: 16,500kg
	Power supply unit	Size: 2,100 x 600 x 2,000mm Weight: 1,200kg
	Capacitor unit	Size: 1,700 x 1,000 x 2,300mm Weight: 1,500kg
	Hydraulic unit	Size: 1,800 x 1,050 x 1,820mm Weight: 900kg
Main body unit	Pressurizing method	Compressed air pressurizing method vertical press type
	Cycle time	Standard 10sec
	Electrode force	Forging pressure Max.270kN (0.7MPa)
	Stroke of electrode	170mm 1st step:120mm (oil pressure) + 2nd step:50mm (air pressure)
	Size of depth	Size between right and left gateposts 1,000mm (Flexible leads are excluded)
	Shape of electrode	Upper and lower platen
	Distance of upper and lower platen	510mm
Power supply unit	Output	225.5kJ
	Charge speed	10sec (at 900V)
	Adjustable range of charge voltage	100-900V
Capacitor unit	Energy capacity	225.5kJ (Max.short-circuit current 750kA)
	Capacitor capacity	556,800 μ F
Hydraulic unit	Cylinder output force	Max.300kN
	Hydraulic fluid	High flash point mineral oil
	Tank volume	250L
System requirements	Temperature	5-35 $^{\circ}$ C
	Humidity	45-85% (There must not be dewfall)



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