

Work Procedures [Filler Injection]





Product Name [High-performance copper filler]

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

Form No.

Procedure Name (Filler injection)

1701-001

No	Work Procedures	Tips to improve quality	Points to check	Tools and materials	Possible errors	Safety points
	Check the ventilation of the work space		Check if the room is not sealed.			Prevent damage to health caused by inhaling vapor.
	Confirm that there is no fire in the work space		Do not bring the filler close to fire.			Prevent fire.
	Preparation of protective equipment					
	1. Safety glasses		Make sure there is no damage on the frame or lenses.	}	Especially be careful with the curing agent.	Ensure physical safety. Check SDS
	2. Thin vinyl gloves 		Make sure there is no tearing of vinyl.			
	3. Mask					
	4. Work clothes (long sleeves)		Avoid the filler touching the skin.			
	~ Work procedure ~					
1	Preparation		(Check the points that cannot be corrected after filling.)			Improve workability.
	1) Clean the cooling hole	Remove foreign matters.	Clean it with air blow.	Parts cleaners, etc.	Dust caught in the hole during construction.	Wear safety glasses.
	2) Check the fitting of the cooling hole and the copper tube	0.15 mm of gap is recommended.	Check the diameters of cooling hole and copper tube.	Calipers, etc.	Insufficient cooling.	
	3) Temporarily attach the copper tube to the cooling hole	The tip of the tube should touch the bottom at a point.	Check if the tip and brim of the tube properly touch the hole by using the actual copper tube.	Copper tube, red lead.	Poor adhesion to the bottom.	
	4) Calculate the amount of filler to use	Fill it up to 90% of the tube length	check the amount before mixing as it cures quickly.	Simplified calculation table	Overflow from the spout.	
2	Mix copper paste and curing agent.	* Mixing ratio (weight ratio) paste: curing agent = 1000: 34	<Stir thoroughly>	Amount of curing agent = copper paste x 0.034	If the curing agent is not enough, it will not cure properly.	Follow the label strictly.
	* When using the entire amount of bottled copper paste, go to 2)					If the curing agent is too much, it will generate heat and smoke.
	1) Prepare paper cups.  (when using a portion of the bottled copper paste)		Choose a cup size that matches the filling amount.		Too much or not enough filler.	
	2) Mix copper paste and curing agent	Use the whole amount of curing agent when using up 100 g bottle of the copper paste.	Cut the tip of the dropper with scissors.	Scissors, spatula, etc.		Wear glasses and a mask.
	 ← Main agent of copper powder paste + curing agent		Stir the entire mixture quickly and accurately Use mixing tool such as a spatula.			

	3) Add solvent (when viscosity is too low in winter)	Adjust the viscosity to pour easily.	Add 1 to 2 cc at a time to adjust.	Spatula, etc.	Deterioration of filling viscosity.	Wear glasses and a mask.
		There was no case the solvent was used in the past.	Do not add too much solvent.		Copper powder precipitation due to decreased viscosity/	
3	Inject the filler into the cooling hole	Fill it up to 90% of the tube length.	Pour it into the center of the cooling hole.	Make a crease to the paper cup.	Overflow around the cooling hole.	Clean it with JK wipers if it overflows.
			It is recommended to complete pouring the filler within 5 minutes after mixing the copper paste and the curing agent.	Make a crease in the spout of the paper cup to make it easier to pour.	If left longer than 5 minutes, the filler begin to cure, and it becomes harder to insert the copper tube.	
4	Insert and set the copper tube	Insert it to the bottom position.	Insert it at the position checked at the preparation.	Speed up the process of 3 and 4.	Curing (within 5 minutes)	Do not insert it forcibly.
	(Leave it for 60 minutes after setting the copper tube.)	Insert it with a light load.	Do not hit with a hammer.		Prevent deformation of the copper tube.	Prevent burning of the solvent.
5	Tighten the plug or insert the brim part	Check the specified point for the brim end.		Dedicated tool / TIG	Prevent deformation of the copper tube.	
6	Cure the filler completely.	Curing temperature 20 degrees or more is recommended.	It completely cures in about 10 hours in summer.		The resin flows in uncured state.	Do not burn the resin directly.
		Burn around the filler with a burner in winter.	Be careful of curing temperature in winter.			
	Tighten the plug / or temporarily attach the brim	Check the specified point for the brim end.		Dedicated tool / TIG	Rotation and extraction of the copper tube.	
7	Heat input (heat treatment or TRY can be used instead)	Heat input of 300 °C or higher.	Can also be sprayed.			Do not burn the resin directly.

Necessary protective equipment				* If the main agent, solvent, or special cleaner comes into contact with your body during operation, take prompt and appropriate actions according to each Safety Data Sheet (SDS). * If there is physical abnormality, seek medical attention.
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No	Product name	Quantity	Price	No	Product name	Quantity	Price	Issue	Date	Modification	Preparer
①	Safety glasses			⑥	JK wiper			5			
②	Vinyl gloves			⑦	Paper cup			4			
③	Mask			⑧	Spatula			3			
④	Apron			⑨	Simple funnel			2	Sep. 13, 2021	Contents review	T.W
⑤	Special cleaner			⑩	Scale that can measures 0.1 g			1	June 25, 2017	Originally issued	T.W

Filing period: 5 years after the filler is discontinued