DuPont™ 5062R and 5063R

Gold Brazing Low Temprature Braze System

Product Description

DuPont™ 5062R and 5063R constitute a two component all thick films paste system designed to facilitate the use of high temperature solders and low temperature alloys on :

- 96% alumina and Low temperature cofire ceramic (DuPont™ GreenTape™ 951 low temperature co-fired ceramic system).
- Alumina
- Multilayer hybrid circuits

Product Benefits

- High strength, high reliability attachment mechanism
- Hermetic packaging
- Compatibility with thick film resistors, as well as all conventional IC and lid attach processes
- Phthalate and Cadmium free*

* Phthalate and Cadmium oxide 'free' as used herein means that cadmium and phthalate are not intentional ingredients in and are not intentionally added to the referenced product. Trace amounts however may be present

Processing Summary – 5062R

Screen Type

- Print onto fired substrate using a 325 mesh stainless steel screen with a 13 µm emulsion build up.

Drying

- Allow prints to level for over 10 minutes at room temperature, then dry for ≥ 10 -15 minutes at 150°C

Firing

- 850°C peak held for 10 minutes on 30 minute cycle in an air atmosphere (see Chart 1). Fired thickness should be 9-12µm.Do not exceed 12 µm fired thickness.

Processing Summary – 5063R

Screen Type

- Print onto fired 5062R using a 325 mesh stainless steel screen with 13 µm emulsion build up. Ensure that 5063R completely covers the 5062R print.

Drying

- Allow prints to level for over 10 minutes at room temperature, then dry for ≥ 10 -15 minutes at 150°C

Firing

- 850°C peak held for 10 minutes on 30 minute cycle in an air atmosphere (see Chart 1).

Repeat previous Prinng and Drying steps

- Ensure that 5063R completely covers the 5062R print

Firing

- 850°C peak held for 10 minutes on 30 minute cycle in an air atmosphere (see Chart 1). Total 5063R fired thickness should be > 30 µm.

Attachment

Once the substrate has been prepared with 5062R and 5063R pins, window frames or heat sinks may be attached with braze alloys (Au/Sn), preforms or pastes/ Brazing is performed in nitrogen atmosphere using fixed fixtures which position the attachment and braze alloy directly on top of the 5062R/5063R metallization.

Table 1 – Typical Physical Properties

Test	Properties	Properties
Product	5062R	5063R
Viscosity (Pa.s) Brookfield HBT, utility cup and spindle,(SC4-14/6R),10 rpm, 25°C±0.2°C)	300 – 400	225 - 325
Thinner	DuPont™ 9450	DuPont™ 9180R
Shelf Life (months)	6	6

Tables 1 shows anticipated typical physical properties for DuPont™ 5062R and 5063R based on specific controlled experiments in our labs and are not intended to represent the product specifications, details of which are available upon request.

Table 2 – Typical Fired Properties[1]

Test	Properties
Fired Thickness (µm)	
5062R	9 – 12
5063R	≥30
Total	≥39
Resistivity (mΩ/sq)	
5062R(@10µm fired thickness)	≥5
PGA Reliability [1,2,3]	
Thermal Cycle (lbs)[2]	≥10
Thermal Ageing (lbs)[3]	≥10

Test Procedure

1.Average tensile pull strength of a pin in a standard grind array (PGA) brazed on 96% alumina or 951 GreenTape™ . PGA consist of 1.8 mm diameter pas od 5062R/5063R, and a 400 µm diameter Kovar pin with a 800 µm diameter nail head. Firing: 30 minute cycles to a peak temperature of 850°C for 10 minutes

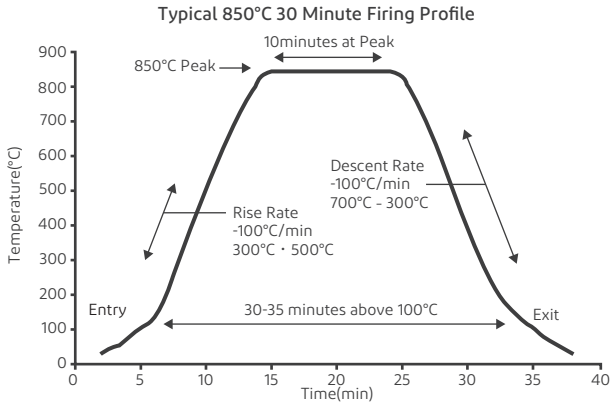
2.1000 cycles, -40°C to 125°C. Rapid transfer

3.1000 hrs in ait at 150° ensile strength 370-450g (E-3.16S)

Thinner

5062R and 5063R compositions are optimized for screen printing and thinning is not normally required. Use the DuPont™ recommended thinner for slight adjustments to viscosity or to replace evaporation losses. The use of too much thinner or the use of a non recommended thinner may affect the rheological behaviour of the materials and their printing characteristics. Please refer to table 1.Typical Physical Properties'.

Chart 1 – Firing Profile



Compatibility

Whilst DuPont™ has tested this composition with the materials specified above and the recommended processing conditions, it is impossible or impractical to cover every combination of materials, customer processing conditions and circuit layouts. It is therefore essential that customers thoroughly evaluate the material in their specific situations in order to completely satisfy themselves with the overall quality and suitability of the compostion for its intended application(s).

Storage and Shelf Life

Containers may be stored in a clean, stable environment at room temperature (between 5°C – 30°C) with their lids tightly sealed. Storage in high temperature (<30°C) or in freezers (temperature <0° C) is NOT recommended as this could cause irreversible changes in the material. The shelf life of compositions in factory-sealed (unopened) containers between (5°C – 30°C) is 6 months from date of shipment.

Substrates

Substrates of different compositions and from various manufacturers may result in variations in performance properties.

Firing

Fire in well ventilated belt, conveyor furnace or static furnace. Air flows and extraction rates should be optimized to ensure that oxidizing conditions exist within the muffle and that no exhaust gases enter the room.

Printing

The composition should be thoroughly mixed before use. This is best achieved by slow, gentle hand stirring with a clean burr-free spatula (flexible plastic or stainless steel) for about 1-2 minutes. Care must be taken to avoid air entrapment. Printing should be performed in a well ventilated area.
Note: optimum printing characteristics are generally achieved in the room temperature range of 20°C-23°C. It is therefore important that the material, in its container, is at the temperature prior to commencement of printing. Class 10,000 printing area is recommended for building complex hybrids and multilayer circuits, otherwise severe yield losses could occur. Refer to 'Processing Summary'.

Drying

Allow prints to level at room temperature, then dry in a well ventilated oven or conveyor dryer. Refer to 'Processing Summary'.

General

Performance will depend to a large degree on care exercised in screen printing. Scrupulous care should be taken to keep the composition, printing screens and other tools free of metal contamination. Dust, lint and other particulate matter may also contribute to poor yields.

Safety and Handling

For Safety and Handling information pertaining to this product, read the Material Safety Data Sheet (MSDS).

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For more information on DuPont™ 5062R and 5063R or other DuPont products, please visit our website.

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