

Technical Data Sheet

THICK FILM MATERIALS

Product Type: Resistors

Product Name: HTR12000AR

CELCION

2 Ω/□ to 10 Ω/□ Resistor System



Description

The HTR12000AR series is a Pb-free resistor series that was developed for applications which require peak firing temperatures lower than traditional thick film resistors series. The HTR12000AR series is formulated to fire at a 550 °C peak firing temperature, which makes this series compatible with the Celcion materials. This resistor series makes heaters on aluminum possible.

Key Benefits

- REACH¹ and ROHS² compliant
- Free of lead
- Low temperature 550 °C firing
- Compatible with the IP6075 and C8829D

Typical Properties

HTR12000AR Series	HTR12045AR	HTR12019AR	HTR12020AR	HTR12035AR	HTR12038AR
Resistance (Ω/□) Termination: C8829D fired at 550 °C. Resistor geometry 1 x 1 mm printed with 280 mesh screen.	2 ± 10 %	10 ± 10 %	20 ± 10 %	40 ± 10 %	100 ± 10 %
TCR (ppm/°C) Cold TCR: -55°C to +25 °C Hot TCR: +25 °C to +125 °C	± 700	± 700	± 700	± 700	± 700
ESD (1 %) 1 x 1 mm resistor % resistance change after 2 x 2000 volt pulses	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Viscosity

100 – 200 Kcps, Brookfield HBT,
SC4 – 14 spindle and 6R utility cup at 10 rpm, 25 °C

Solids

R405A and R410A 77.0 ± 1.0 %
All other values 70.0 ± 1.0 %

Recommended Pb/Cd Free 500 °C overglaze – IP9035A, IP9038A
Recommended Pb/Cd Free 600 °C overglaze – IP9036A
Recommended Pb/Cd Free 850 °C overglaze – IP9217
Recommended Pb/Cd Free Termination Conductors – C2130B, C2180 and C4729

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Recommended Processing Guidelines

Printing Conditions

280 – 400 mesh, 1.1 mil wire and 0.5 mil emulsion screen
Allow prints to level for 5 – 10 minutes at room temperature

Print Speed

Up to 10 in/sec (25 cm/sec)

Drying Conditions

150 °C for 10 minutes

Firing Conditions

Firing range between 550 °C
Recommended 550 °C peak temperatures with a 2 – 3 minutes dwell time
Total cycle time of 30 minutes

Thinner

RV-372

Thickness Information (µm)

	HTR12045AR	HTR12019AR	HTR12020AR	HTR12035AR	HTR12038AR
Dry	21 – 25	21 – 25	20 – 24	10 – 12	10 – 12
Fired	20 – 24	20 – 24	18 – 22	9 – 11	9 – 11

Warranty

Material guaranteed to meet specifications for 6 months from date of shipment.

Storage

Store in a dry location at 5 – 25 °C.

DO NOT REFRIGERATE.

Allow paste to come to room temperature prior to opening. Spatulate well before using, as settling may occur during storage.

Legend:

1) REACH compliant according to the latest ** Annex XIV to Regulation (EC) of the European Parliament and of the council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (“REACH”) by European Chemicals Agency and its subsequent amendments; the material does not contain any substance listed in Annex XIV.

2) RoHS compliant according to the latest ** Directives (European Union) of Restriction of Hazardous Substances (“RoHS”) and its subsequent amendments (including the exceptions related to Pb).

* See the data sheet issue date (DD/MM/YY) as reference of validity of latest edition which is available on request

Heraeus Electronics
Heraeus Deutschland GmbH & Co. KG
Heraeusstraße 12 – 14
63450 Hanau, Germany
www.heraeus-electronics.com

Americas
Phone +1 610 825 6050
electronics.americas@heraeus.com

China
Phone +86 21 3357 5457
electronics.china@heraeus.com

Asia Pacific
Phone +65 6571 7677
electronics.apac@heraeus.com

Europe, Middle East and Africa
Phone +49 6181 35 3069, +49 6181 35 3627
electronics.emea@heraeus.com