

## 3M™ Electrically Conductive Single-Sided Tapes 1020BC Series

### Product Description

3M™ Electrically Conductive Single-Sided Tape 1020BC Series is a family of single-sided conductive black foil tapes that consist of a XYZ-axis conductive black copper foil backing and an acrylic adhesive layer with high electrical performance. Compared to other conventional single sided conductive tapes, 3M tape 1020BC series provides excellent XYZ-axis based conductivity, reliable contacts to small size grounding areas, excellent EMI shielding and electrical reliability over time. The product's adhesive is an acrylic based adhesive which offers high adhesion and good grounding performance to many surface types which make the tape useful for grounding and EMI shielding designs.

### Key Features

- XYZ-conductivity
- Excellent conformability and quick bonding
- Good handling and workability
- Excellent EMI/EMC shielding performance
- Three thickness options: 12, 20, 25 µm thickness

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| Conductive Layer (Black)    |
|-----------------------------|
| Copper Foil                 |
| Conductive Acrylic Adhesive |
| Release Liner               |

### Product Construction / Materials Descriptions

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

| 3M™ Electrically Conductive Single-Sided Tape 1020BC Series |                                      |
|-------------------------------------------------------------|--------------------------------------|
| Property                                                    | Value                                |
| Color                                                       | Top side: Black<br>Back side: Copper |
| Conductive Adhesive Type                                    | Acrylic conductive adhesive          |
| Release Liner                                               | Transparent PET release liner        |

Note: The product is available in 500 mm x 100 meter. Contact your local 3M representative for more information.

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## Typical Physical Properties and Performance Characteristics

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes. Final product specifications and testing methods will be outlined in the products Certificate of Analysis (COA) that is provided once the product is approved by 3M for general commercialization and development work is completed.

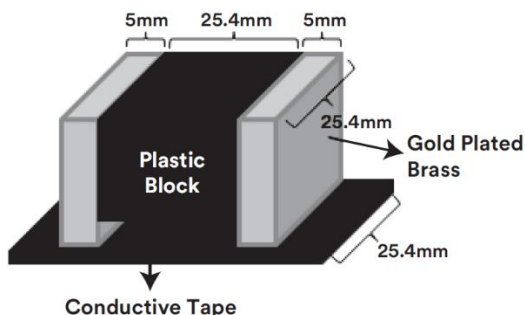
| 3M™ Electrically Conductive Single-Sided Tape 1020BC Series                                                   |                        |                                             |
|---------------------------------------------------------------------------------------------------------------|------------------------|---------------------------------------------|
| Properties                                                                                                    | Test Method            | Typical Value                               |
| <b>Total thickness (backing plus adhesive)</b><br>3M tape 1020BC-10<br>3M tape 1020BC-20<br>3M tape 1020BC-25 | ASTM method D1000*     | 0.012 mm<br>0.020 mm<br>0.025 mm            |
| <b>180° peel adhesion to SUS</b><br>3M tape 1020BC-10<br>3M tape 1020BC-20<br>3M tape 1020BC-25               | ASTM method D1000*     | 700 gf/inch<br>1100 gf/inch<br>1300 gf/inch |
| <b>Surface resistance of black foil</b>                                                                       | 3M test method ETM-1** | 0.1 ohms                                    |
| <b>Electrical resistance through adhesive</b>                                                                 | 3M test method ETM-7** | 0.015 ohms                                  |

\*Tested in accordance with ASTM method D1000

\*\*3M test method as described below.

### ETM-1 Test Method: XY-Axis Electrical Resistance of the Backing\*\*

Prepare the tape strip in 25.4 mm width and place the adhesive side of the tape down on to a clean glass plate using light finger pressure. Place the gold-plated block jig (250 g weight) onto the backing side of conductive tape, then start measuring the DC resistance between the electrodes with micro-ohm meter and record the resistance after 15 ~ 60 seconds.

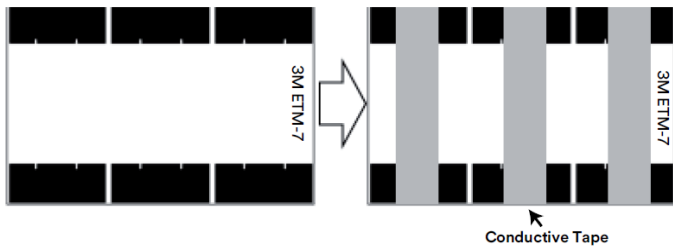


\*\*3M test method as described below.

### ETM-7 Test Method: XY-Axis Electrical Resistance through Adhesive\*\*

Place a strip of the single (double) side conductive tape in 10 mm x 50 mm with adhesive side down between the electrodes on 3M ETM-7 testing board. After initial hand lamination to provide for a 10 mm x 10 mm contact area between the tape and electrodes, apply a 2kg rubber roller across the tape one time. Application method simulates a typical manufacturing process that might be used to apply the tapes to a surface. After 20 minutes of dwell time, the DC resistance between the electrodes are measured with a micro-ohm meter. The resistance results are recorded after 5 ~ 30 seconds for initial resistance.

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\*\*3M test method as described below.

## Shielding Effectiveness

Many factors determine the shielding effectiveness of a conductive adhesive tape, including type and thickness of the conductive layers, adhesive strength, degree of contact, smoothness of application surface and test frequency. For 3M™ Electrically Conductive Single-Sided Tape 1020BC Series, the typical shielding effectiveness is expected to be in the range of 40 dB to 70 dB, using a standard EMI shielding test methods and through the thickness of the sample tested.

## Applications

3M™ Electrically Conductive Single-Sided Tape 1020BC Series is typically used for applications requiring excellent electrical conductivity and EMI/EMC shielding. Common uses include grounding and EMI shielding in equipment and components.

## Application Techniques

Note: Carefully read and follow the manufacturer's precautions and directions for use when working with solvents. Tape application below 10°C (50°F) is not suggested. Once properly applied, low temperature holding power is generally satisfactory.

The bond strength of 3M™ Electrically Conductive Single-Sided Tape 1020BC Series depends on the amount of adhesive-to-surface contact developed during application and substrate type and surface conditions.

- 1) Firm application pressure helps develop better wet-out and adhesive contact and may lead to improved bond strength as well as electrical conductivity. Pressure must be applied to the bond area after assembly to ensure sufficient wet-out of the 3M tape 1020BC series adhesive to the substrates and to engage the conductive acrylic adhesive fillers with the substrates to make electrical connection. Mechanical pressure (roller, metal bar) or finger pressure at 5-15 psi. (Optimally the application conditions are determined via a set of Design of Experiments (DOE) using a range of application pressures, dwell time and temperatures (suggested initial range might include 5-15 psi, 2-5 seconds, 21°C-38°C).
- 2) Heat may be applied simultaneously with pressure to improve wetting, final bond strength and electrical conductivity. Suggested temperature range to evaluate is in the 38°C-60°C range.
- 3) To obtain optimum adhesion, the bonding surfaces must be clean, dry and well unified. Some typical surface cleaning solvents are isopropyl alcohol or heptane.

## Storage and Shelf Life

The shelf life of 3M™ Electrically Conductive Single-Sided Tape 1020BC Series is 12 months (9 months for 1020BC-10) from the date of manufacture when stored in roll form, in the original packaging materials, and stored at 21°C (70°F) and 50% relative humidity.

The shelf life of 3M™ Electrically Conductive Single-Sided Tape 1020BC-10 Series is 6 months from the date of manufacture when stored in roll form, in the original packaging materials, and stored at 21°C (70°F) and 50% relative humidity. Once the tape is removed from the original packaging materials, the tape should be converted, shipped and stored in the prescribed temperature and humidity-controlled conditions to ensure stable tape performance. Adhesion, tack, conductivity and reliability of the tape in an application can be reduced if the tape is not controlled to the prescribed handling and usage conditions.

## **3M™ Electrically Conductive Single-Sided Tape 1020BC Series**

In addition, in some application's the tape may be converted (die cut, laminated to other materials or release/processing liners) in such a manner that the release liner that the product tape is shipped with is removed and the different release or processing/carrier liner is applied to the adhesive side of the tape. The new release/carrier liner may transfer release agents (silicone, fluoro-polymer, etc.) to the tape's adhesive surface and thus reduce the applied tack and/or adhesion strength of the tape in the end user's application to a surface versus when no release/carrier liner changes have occurred. Any proposed release/carrier liners to be used with the tape should be tested with the tape to ensure that the tapes performance is not negatively impacted for the intended end use application and that shelf life is not negatively impacted. If a poor performing liner is selected for a liner exchange, it can have a significant negative impact on the conductive tapes adhesion/tack/electrical performance and/or significantly reduce shelf life.

### **Certificate of Analysis (COA)**

The 3M Certificate of Analysis (COA) for this product is established when the product is manufactured and deemed commercially available from 3M. The COA contains the 3M test methods, specifications limits and test results for the products performance attributes that the product will be supplied against. Contact your local 3M representative for this product's COA.

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**Safety Data Sheet:** Consult Safety Data Sheet before use.

**Regulatory:** For regulatory information about this product, contact your 3M representative.

**Technical Information:** The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

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