

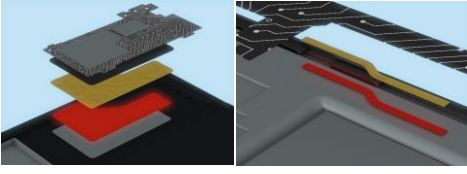
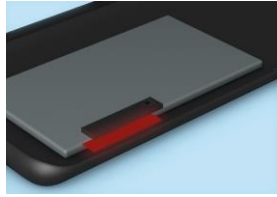
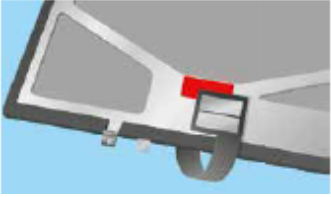
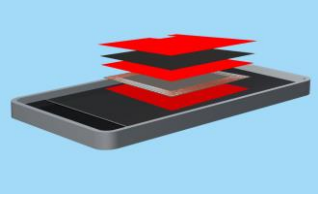
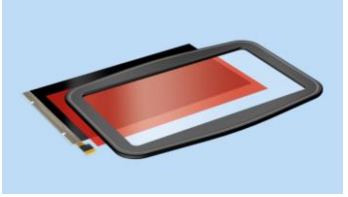

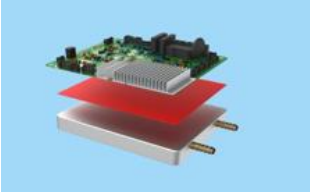
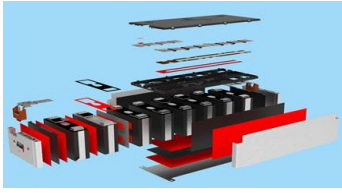
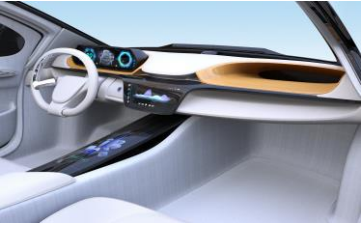

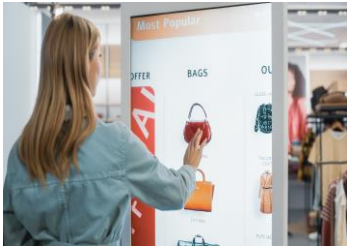


tesa[®] solutions for heat management

Thermally conductive tapes

Introduction in key markets and applications

tesa® TCT Series Thermal Interface Materials



| | | | | | |
|--|--|--|---|---|--|
| <p>Lead applications Electronics</p> | <p>Vapor chamber / heat pipes</p>  | <p>5G mm wave antenna</p>  | <p>FPCs</p>  | <p>Graphite sheet mounting</p>  | <p>Displays/tablets/PCs</p>  |
| <p>Lead applications Automotive</p> | <p>Display mirrors</p>  | <p>eMobility / power electronics</p>  | <p>Battery cooling systems</p>  | <p>Displays</p>  | |
| <p>Lead applications Other markets</p> | <p>LED panel lights</p>  | <p>LCD modules</p>  | <p>IC/CPU modules</p>  | <p>EV charging stations</p>  | |

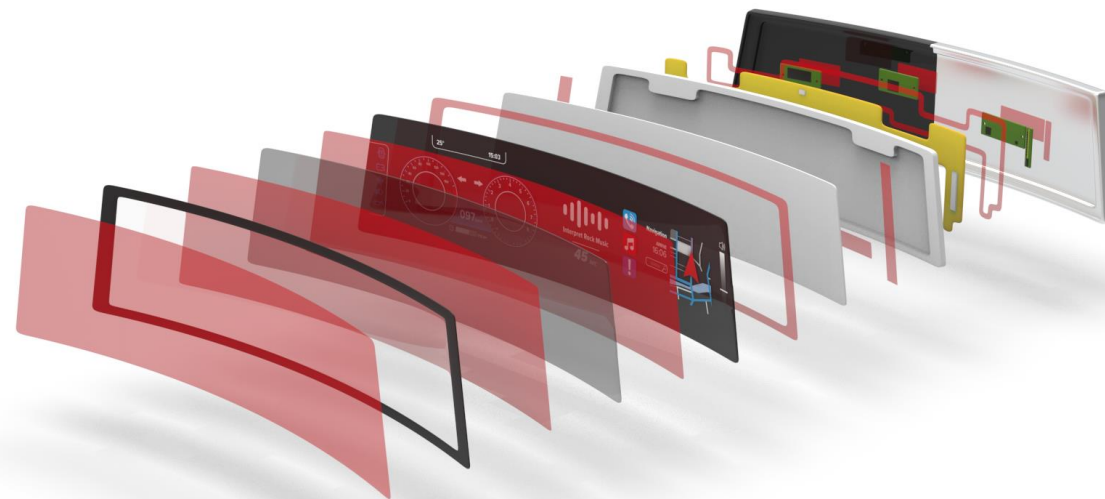
Display application

Conducting the heat from the PCBA to magnesium

- Secured heat transmission
- Thermal conductivity ≥ 0.7 W/mK
- Good bonding and surface wetting
- Design gap of ~ 100 μm

Solution

- tesa[®] 58394
- Best combination to fulfill customer requirements



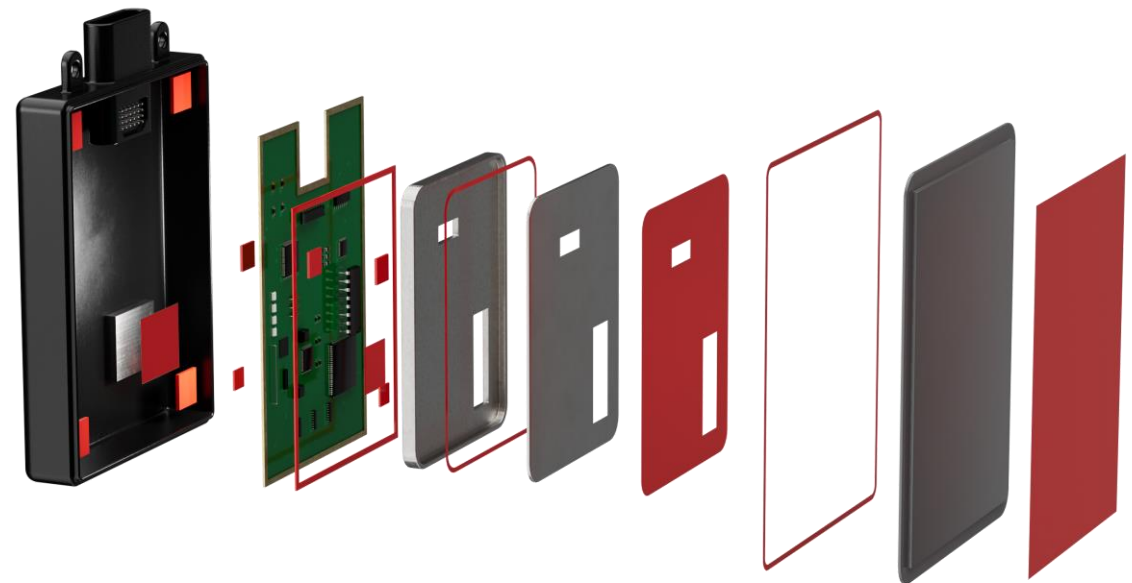
ADAS application

Conducting the heat from PCBA to heat sink

- Gap filling
- No leakage, stable formulation of adhesive
- High temperature performance (~125°C)

Solution

- tesa® 58326
- Best combination to fulfill customer requirements



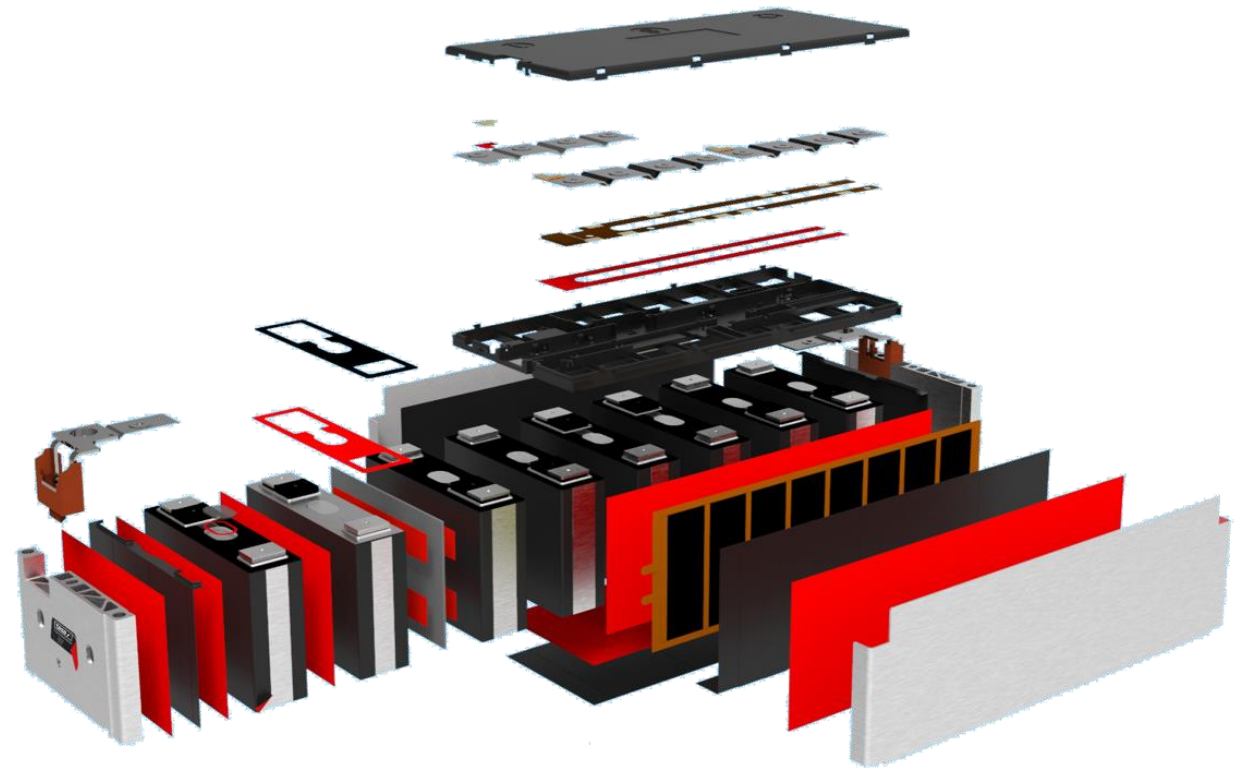
Battery application

Conducting the heat from the busbar

- Secured heat transmission
- Thermal conductivity $>1.5 \text{ W/mK}$
- Electrical insulation $>7 \text{ kV}$
- High gap filling of 3.7 mm
- Good convertibility because of challenging shape

Solution

- Laminate of tesa® 58328
- Best combination to fulfill customer requirements



Mechanics of thermal transfer

tesa® TCT Series Thermal Interface Materials



Heat transfer

The heat transfer only happens at connected areas between surfaces.

Ceramic fillers offer excellent thermal conductivity, along with electrical insulation and fulfill the requirements of many applications dealing with heat transfer.

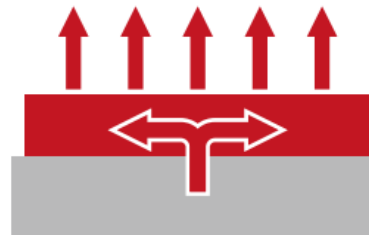
Key features affecting heat dissipation



- Good bonding to ensure parts in connection

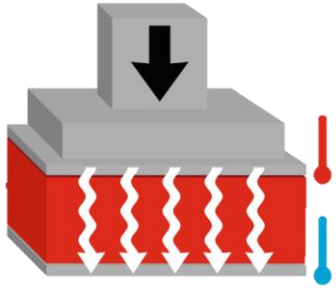


- Eliminate poor conductor of heat as much as possible, i.e. air



- High thermal conductivity material to ensure heat transfer efficiency

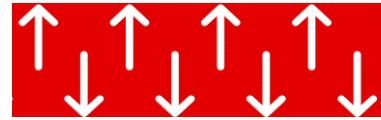
Focus



1. Heat transfer

High capability to transfer heat, defined by thermal conductivity and thermal impedance.

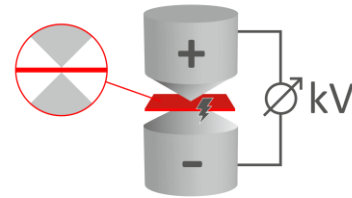
- Thermal conductivity up to $>2 \text{ W/mK}$
- Thermal impedance up to $<11 \text{ Kcm}^2/\text{W}$



2. Bonding & wetting

Wide range peel force with great wetting performance for improved bonding.

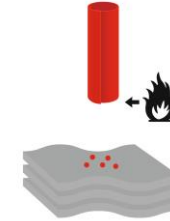
- Peel adhesion: 0.7 to 10.5 N/cm
- Wetting: 84 to 96%



3. Electrical insulation

Ceramic fillers enabling high electrical insulation feature.

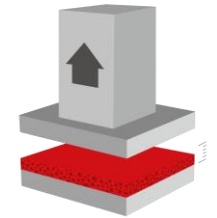
- Breakdown voltage up to $>13\text{kV}$
- CTI 600



4. Flame retardancy

Ceramic fillers enabling high flame retardancy feature.

- UL 94-V2
- UL 94-V0



5. Compression

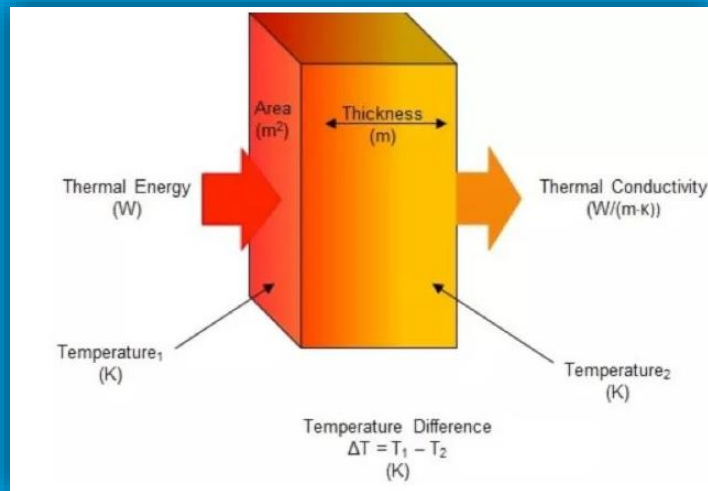
Defined compressibility for gap filling performance.

- Compression of 25%: 78 to 95kPa

Thermal conductivity

Material's ability to transfer heat.

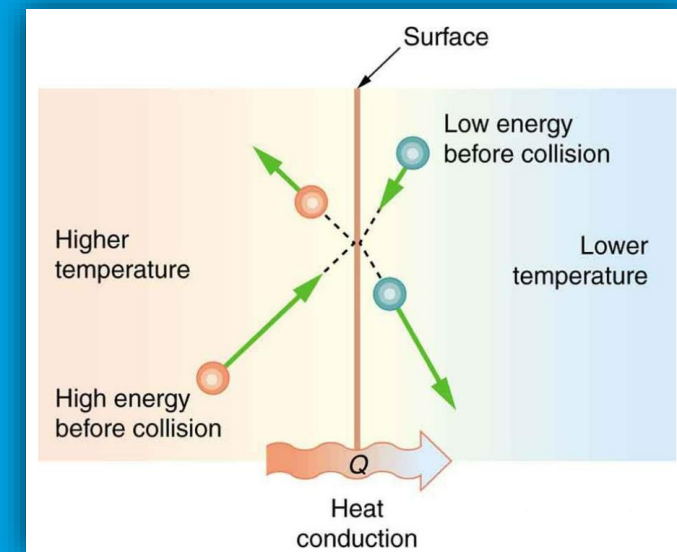
Intrinsic material property. Independent from material shape, size, or thickness.



Thermal impedance

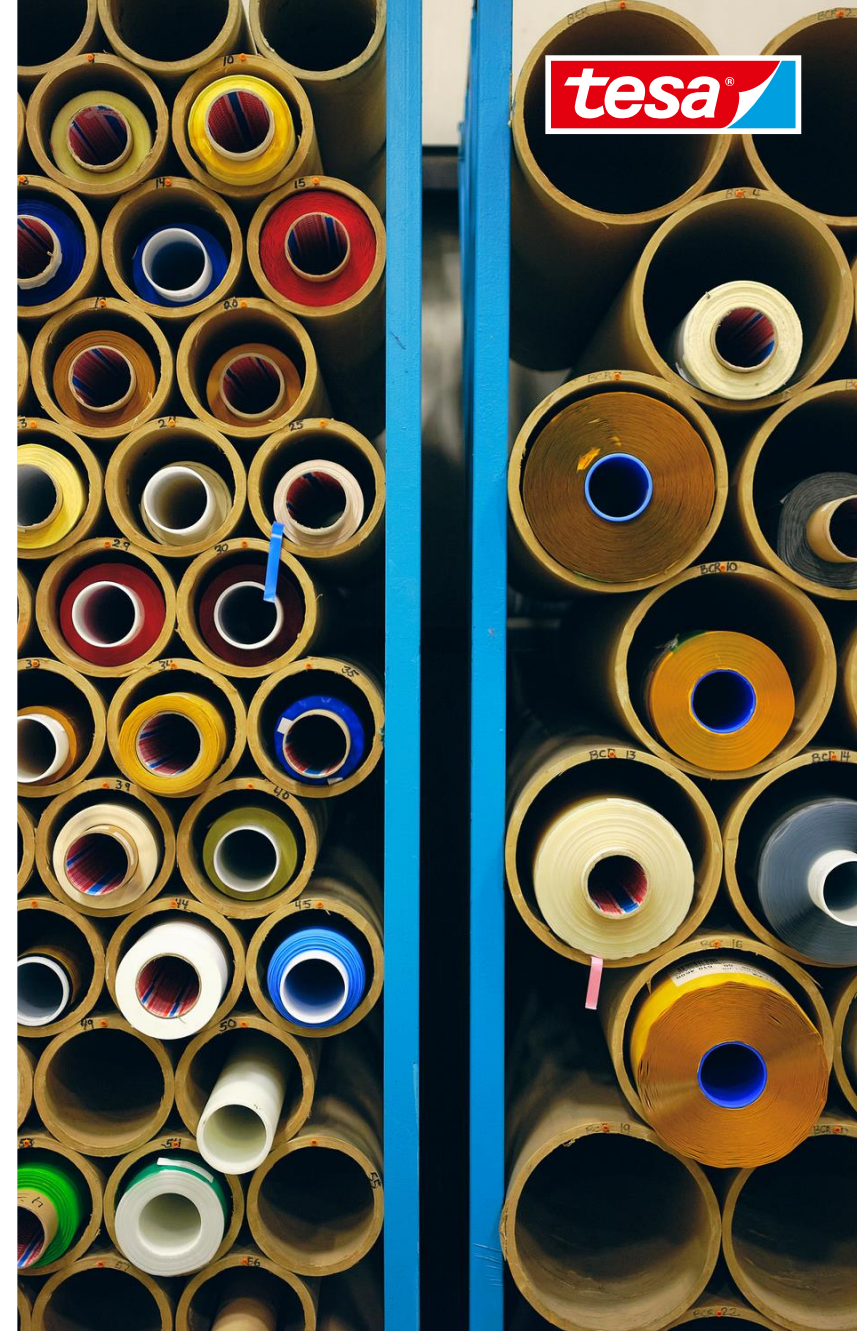
Material's resistance to heat transfer efficiency

Dependent on material shape, size, and thickness.



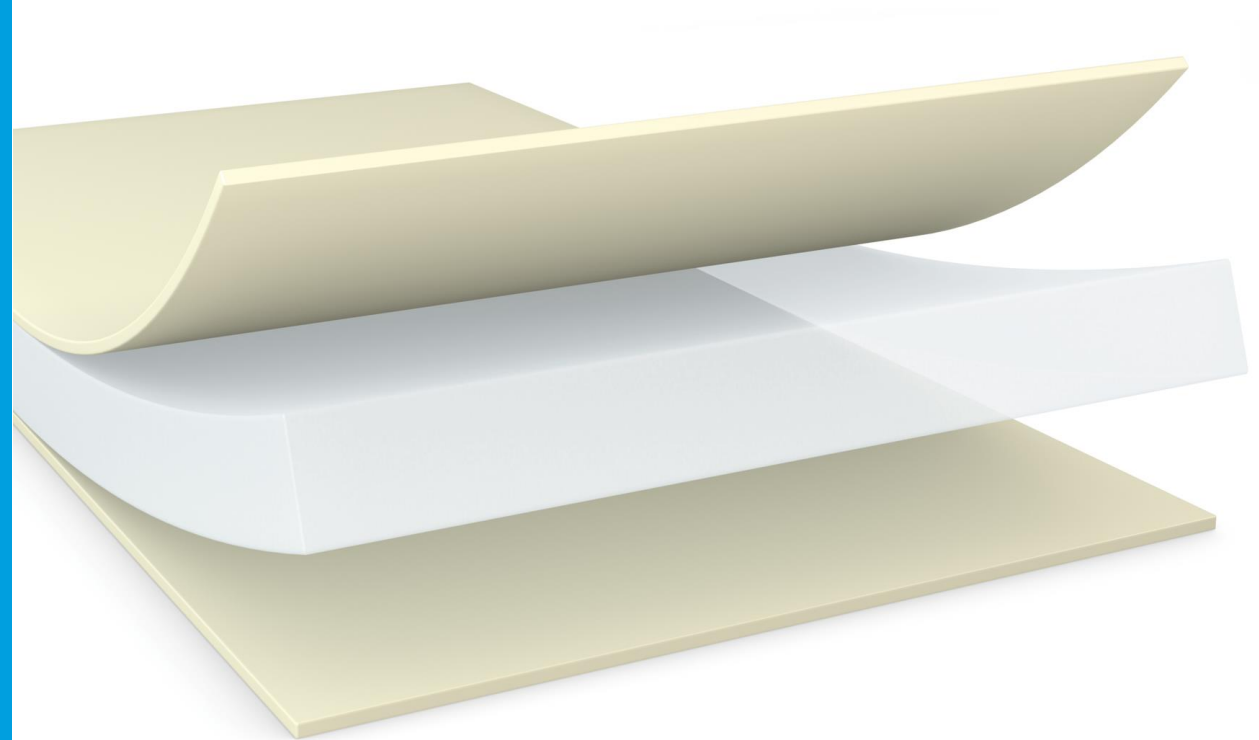
Products

tesa® TCT Series Thermal Interface Materials



FACT SHEET.

- Acrylic-based formulation with very good electrical insulation feature.
- Wide range of thicknesses and thermal conductivities.
- Excellent reliability performance at critical conditions.
- Good flame retardancy.
- REACH, RoHS, halogen-free.



| | Thickness | Thermal conductivity | Thermal impedance | Peel adhesion | Wetting | Breakdown voltage | Flame retardancy | Compression | Comment |
|--------------------|----------------|----------------------|------------------------------|---------------|---------|-------------------|------------------|-------------|---|
| tesa® 6073x | 50–100 µm | 0.7 W/mK | 1.6–1.8 Kcm ² /W | +++ | +++ | ++ | + | + | Lamination / mounting Great bonding/wetting Good conductivity |
| tesa® 6074x | 10–100 µm | 1.0 W/mK | 0.6–1.1 Kcm ² /W | ++ | ++ | ++ | + | + | Lamination / mounting Good bonding/wetting Great conductivity |
| tesa® 5839x | 125–800 µm | 0.8 W/mK | 2.4–11.7 Kcm ² /W | +++ | +++ | +++ | ++ | ++ | Mounting Good conductivity Great el. insulation |
| tesa® 5832x | 1,200–2,000 µm | >2.0 W/mK | 5.6–9.6 Kcm ² /W | + | +++ | +++ | +++ | + | Gap filling Great conductivity Great el. insulation |

| IBNR* | Article code | Thickness (µm) | Width (mm) | Length (M) | MOQ logs |
|-------------------------|---------------------|-----------------------|-------------------|-------------------|-----------------|
| tesa [®] 58326 | 58326-00000-00 | 1,200 | 950 | 20 | 1 |
| tesa [®] 58327 | 58327-00000-00 | 1,500 | 950 | 20 | 1 |
| tesa [®] 58328 | 58328-00000-00 | 2,000 | 950 | 16.5 | 1 |
| tesa [®] 58394 | 58394-00000-00 | 125 | 1,000 | 33 | 1 |
| tesa [®] 58395 | 58395-00000-00 | 250 | 1,000 | 33 | 1 |
| tesa [®] 58398 | 58398-00000-00 | 400 | 1,000 | 33 | 1 |

*Further tesa[®] 583xx Automotive TCT/TIM thicknesses and tesa[®] 6073x and 6074x thinner material MOQs on request



tesa® products prove their impressive quality day in, day out in demanding conditions and are regularly subjected to strict controls. All technical information and data above mentioned are provided to the best of our knowledge on the basis of our practical experience. They shall be considered as average values and are not appropriate for a specification. Therefore tesa SE can make no warranties, express or implied, including, but not limited to any implied warranty of merchantability or fitness for a particular purpose. The user is responsible for determining whether the tesa® product is fit for a particular purpose and suitable for the user's method of application. If you are in any doubt, our technical support staff will be glad to support you.