Thermal Papers for Tickets
Quality paper is the foundation. Incomparable added value is created by excellent coating. This is our passion: First class HiTec Paper.
Widest range of thermal papers for ticket applications

The areas of application for thermal papers are more diverse than ever before. Lottery and gaming, admission, and transport tickets are all major parts of the ticket application segment. Along with POS and label applications, these areas have been subject to significant development over the past few years. Whether it is lottery tickets, TITO tickets, admission tickets, boarding passes, ATBs, bus tickets or pay and display parking tickets: printers, OEMs and users around the world rely on thermal papers by Mitsubishi HiTec Paper.

The requirements for thermal papers are just as varied as their areas of application. The products must be suitable for elaborate printing and resistant to external influences. Furthermore, the printed image must remain readable for up to several years. It is important that thermal papers are able to pass through the printer trouble-free and quickly and they must be ideal for further processing. In addition to all of this, security features are often required.

With the widest range of thermal papers worldwide and its unique modular system, Mitsubishi HiTec Paper has a suitable thermal paper for any ticket application and is able to cater for all requirements. To make sure that we stay on top of the latest developments, we are in regular contact with all leading OEM companies and we are members of relevant associations.

We produce our own base papers and are therefore able to provide particularly heavyweight paper or special thicknesses upon request. Our range also includes thermal papers based on recycled paper. With or without a protective top coating, a range of optional security features can also be integrated in the base paper. All our papers are developed to produce sharp printing results. Grades suitable for Digital Printing are, of course, also available.

And if you ever can’t find a suitable type of thermoscript paper – just talk to us! We will of course produce speciality papers tailored to meet our customers’ requirements.

GOOD TO KNOW
All thermoscript ticket papers are FSC® Mix and PEFC™ certified available.
Sophisticated.

Requirements for thermal papers for ticket applications

The requirements for thermal papers used for ticket applications are just as diverse as the applications themselves. After all, a final product will only convince the market if the paper is precisely matched to the requirements of a particular application. The thermal paper range by Mitsubishi HiTec Paper is designed to meet these requirements.

Best Pre-Printability

- Suitable for
  - Traditional printing technologies (UV Offset, UV Flexo, Water-based Flexo)
  - Digital printing technologies (HP Indigo, Inkjet-UV)
  - Hybrid printing technologies
- Additional pigment coating enables for very good printability of the reverse side
- Close cooperation with leading printing ink manufacturers

Optimised Resistance Properties

- Functional and protective coatings (top coat) to match each application
- Resistance properties in line with the respective requirements to provide for perfect readability of the print
- Long durability of the printed image (7 to 25 years)
- Strong resistance against climatic and chemical influences

High Sensitivity

- High sensitive papers for use on high-speed printers
- Maximum optical density with low energy transfer
- Particularly high contrast thermal printing and high resolution for ideal bar code readability

TL 3000 after plasticiser testing

<table>
<thead>
<tr>
<th>Spiel</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
<th>8.</th>
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<td>3 4</td>
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<tr>
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<td>6 20 27 29 45</td>
<td>3 7</td>
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</tbody>
</table>

Losnummer: 7874378

Dynamic printing density

GeBE-PRINTER LAB

Dynamic printing density

Unsuitable paper after plasticiser testing

<table>
<thead>
<tr>
<th>Spiel</th>
<th>1.</th>
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<tr>
<td>1. Spiel</td>
<td>3 5 14 22 25</td>
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<td></td>
<td></td>
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<tr>
<td>2. Spiel</td>
<td>8 26 37 38 46</td>
<td>2 3</td>
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<tr>
<td>3. Spiel</td>
<td>1 26 27 30 38</td>
<td>4 8</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4. Spiel</td>
<td>6 20 27 29 45</td>
<td>3 7</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Losnummer: 7874378
Reliable Security

Combinable security features that are integrated in the base paper:

› Coloured centre = coloured base paper
› Coating mark = markings that are visible in the paper similar to a watermark
› UV-fluorescent fibres
› Visible security fibres
› Colour reaction to special test pens

See pages 9 to 11 for further information.

Sharp Print Image

› The clear, sharp and high-contrast print image enables top barcode readability

Outstanding Processing & Finishing Properties

› Excellent flatness
› Very good punchability
› Ideal cutting properties
› High degree of product quality consistency
› Highly consistent printing results

What’s more

Our thermoscript range also meets many other requirements, including:

› Glossy or matt reverse side
› Top suitability for stamping
› Barrier coat on the reverse side

You have a particular requirement?
TALK TO US!
sales.mpe@mitsubishi-paper.com
Players taking part in lotteries, betting or casino games have great expectations. After all, they have high hopes for a substantial prize! The requirements for papers for lottery and betting tickets are at least as high. There are few areas in which it is more important to ensure that the paper used features top protection against environmental impacts and that readability and validity are not endangered - regardless of the stresses such papers are exposed to.

Mitsubishi HiTec Paper provides thermal papers that are specifically developed for lottery and betting applications. Our own base papers and the innovative thermal and protective coatings are perfectly matched. Essential features, besides top durability, include high dynamic sensitivity, good suitability for pre-printing and reliable security. After all, the piece of paper could be the entrance to a whole new world.

OEM Approvals
Our thermal papers are tested with regard to application-specific requirements and trouble-free operation and are recommended by leading manufacturers of thermal printers and by lottery companies, such as: AXIOHM | CUSTOM | FUJITSU | ICT | IDEMIA | IGT | INTRALOT | JCM GLOBAL | KEBA | NANOPTIX | NOVOMATIC | PMC | SCIENTIFIC GAMES | SNBC | STAR MICRONICS | TRANSACT | WINCOR NIXDORF

**Grade Overview**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Top Coat</th>
<th>Substance</th>
<th>Caliper</th>
<th>Dynamic Sensivity</th>
<th>Resistance</th>
<th>Archivability</th>
<th>BP free</th>
<th>P free</th>
<th>Special Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>TL 1000</td>
<td>-</td>
<td>81 gsm</td>
<td>85 µm</td>
<td>•••</td>
<td>•••</td>
<td>10 years</td>
<td>✓</td>
<td>-</td>
<td>good offset printability</td>
</tr>
<tr>
<td>TL 3000</td>
<td>✓</td>
<td>82 gsm</td>
<td>84 µm</td>
<td>•••</td>
<td>•••</td>
<td>10 years</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>TF 1075</td>
<td>✓</td>
<td>107 gsm</td>
<td>112 µm</td>
<td>••••</td>
<td>•••</td>
<td>12 years</td>
<td>✓</td>
<td>-</td>
<td>excellent barcode print, 300 dpi resolution</td>
</tr>
<tr>
<td>TM 1075</td>
<td>✓</td>
<td>111 gsm</td>
<td>115 µm</td>
<td>••••</td>
<td>•••</td>
<td>12 years</td>
<td>✓</td>
<td>-</td>
<td>reverse side pigment coat (mat), best reverse side printability, 300 dpi resolution</td>
</tr>
</tbody>
</table>

**Dynamic Sensitivity**
- ••••• = low
- •••• = standard
- ••• = high
- •• = maximum

**Resistance against Environmental Influences / Image Stability**
- •••• = standard
- ••• = good
- •• = very good
- • = excellent

*All grades available with security features, too. Further grades and substances on request.*
Whether you are going to the cinema, attending a concert or a sporting event or visiting an amusement park - you are granted admission based upon the printed ticket in your hand. Such a ticket can be very valuable - for example in the case of a world cup final match. Top protection against forgeries is provided by security features that are integrated in the base paper. Stability and durability are as important, if not more, to make sure that the ticket fulfils its job and remains readable and most of all valid. Even under tough environmental conditions.

The advertising industry has long been using admission tickets as a creative communication channel. While the front of the admission ticket will refer to the latest Hollywood film, the reverse side may be an advertisement for a takeaway restaurant trying to attract hungry cinema goers. Excellent printability is of top priority for admission ticket papers. It has after all become a conveyance of image and advertising. Many attendees keep admission tickets as a souvenir. Another reason you can rely on thermal paper by Mitsubishi HiTec Paper.

Admission.

Allowing for top security

The advertising industry has long been using admission tickets as a creative communication channel. While the front of the admission ticket will refer to the latest Hollywood film, the reverse side may be an advertisement for a takeaway restaurant trying to attract hungry cinema goers. Excellent printability is of top priority for admission ticket papers. It has after all become a conveyance of image and advertising. Many attendees keep admission tickets as a souvenir. Another reason you can rely on thermal paper by Mitsubishi HiTec Paper.

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<th>BP free</th>
<th>P free</th>
<th>Special Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>T 1234</td>
<td>-</td>
<td>126 gsm</td>
<td>135 µm</td>
<td>••••</td>
<td>10 years</td>
<td>✓</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T 1434</td>
<td>-</td>
<td>136 gsm</td>
<td>149 µm</td>
<td>••••</td>
<td>10 years</td>
<td>✓</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T 1734</td>
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<td>173 gsm</td>
<td>189 µm</td>
<td>••••</td>
<td>10 years</td>
<td>✓</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TF 1267</td>
<td>✓</td>
<td>127 gsm</td>
<td>134 µm</td>
<td>••••</td>
<td>12 years</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>top coat with excellent allround properties</td>
</tr>
<tr>
<td>TF 1467</td>
<td>✓</td>
<td>138 gsm</td>
<td>143 µm</td>
<td>••••</td>
<td>12 years</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>top coat with excellent allround properties</td>
</tr>
<tr>
<td>TF 1767</td>
<td>✓</td>
<td>173 gsm</td>
<td>187 µm</td>
<td>••••</td>
<td>12 years</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>top coat with excellent allround properties</td>
</tr>
<tr>
<td>TF 1767 RP</td>
<td>✓</td>
<td>166 gsm</td>
<td>175 µm</td>
<td>••••</td>
<td>10 years</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>base paper 100% FSC® recycled, min. 20% PCW (post consumer waste), top coat with excellent allround properties</td>
</tr>
<tr>
<td>TZ 1767</td>
<td>✓</td>
<td>178 gsm</td>
<td>170 µm</td>
<td>••••</td>
<td>12 years</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>reverse side pigment coat (matt), top coat with excellent allround properties</td>
</tr>
<tr>
<td>TF 2467</td>
<td>✓</td>
<td>224 gsm</td>
<td>255 µm</td>
<td>••••</td>
<td>12 years</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>top coat with excellent allround properties</td>
</tr>
</tbody>
</table>

Dynamic Sensitivity

- low  •••• = high
- standard  •••• = maximum

Resistance against Environmental Influences / Image Stability

- standard  •••• = very good  •••• = excellent

All grades available with security features, too. Further grades and substances on request.
We are living in a mobile world in which we travel by train, plane, ferry or car. People today tend to cover quite a distance, for both business and private purposes. The same is true for our thermal papers. Whether it be as a boarding pass, ATB or baggage tag, a travel ticket for the bus, the train or a ferry, or as a pay and display parking ticket. With integrated security features for top protection against forgery on request.

Whether you require papers with barrier coating for the application of magnetic stripes, papers with particularly good stamping qualities (non-wipeable ink), extra strong resistance against plasticisers (monthly or annual tickets) or particular protection against manipulation through erasure of the printed image – we have the solution for you.

In addition to the grades listed below, we also supply thermal papers for any segment of transport:

- Thin papers for mobile printing
- Heat-resistant papers for pay and display parking tickets
- Papers for baggage tags & baggage labels
- 120 g papers for ATB and wallets
- 170 g papers for monthly and annual tickets
- 380 μm paper for taxi vouchers, ferry and access cards

<table>
<thead>
<tr>
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<th>Top Coat</th>
<th>Substance</th>
<th>Caliper</th>
<th>Dynamic Sensivity</th>
<th>Resistance</th>
<th>Archivability</th>
<th>BP free</th>
<th>P free</th>
<th>Special Features</th>
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</thead>
<tbody>
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<td>-</td>
<td>73 gsm</td>
<td>78 µm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T 1734</td>
<td>-</td>
<td>173 gsm</td>
<td>189 µm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T 2134</td>
<td>-</td>
<td>208 gsm</td>
<td>232 µm</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>TF 1767</td>
<td>✓</td>
<td>173 gsm</td>
<td>187 µm</td>
<td></td>
<td>✓</td>
<td>12 years</td>
<td>✓</td>
<td>✓</td>
<td>top coat with excellent allround properties</td>
</tr>
<tr>
<td>TF 2167</td>
<td>✓</td>
<td>209 gsm</td>
<td>231 µm</td>
<td></td>
<td>✓</td>
<td>12 years</td>
<td>✓</td>
<td>✓</td>
<td>top coat with excellent allround properties</td>
</tr>
<tr>
<td>S 8037 *</td>
<td>-</td>
<td>80 gsm</td>
<td>84 µm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>UV-fluorescent security fibres</td>
</tr>
<tr>
<td>S 1037 *</td>
<td>-</td>
<td>100 gsm</td>
<td>105 µm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>UV-fluorescent security fibres</td>
</tr>
<tr>
<td>S 1237 *</td>
<td>-</td>
<td>120 gsm</td>
<td>127 µm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>UV-fluorescent security fibres</td>
</tr>
<tr>
<td>S 1437 *</td>
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<td>140 gsm</td>
<td>150 µm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>UV-fluorescent security fibres</td>
</tr>
<tr>
<td>T 2437</td>
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<td>234 gsm</td>
<td>265 µm</td>
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<tr>
<td>TF 2467</td>
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<td>224 gsm</td>
<td>255 µm</td>
<td></td>
<td></td>
<td>12 years</td>
<td>✓</td>
<td>✓</td>
<td>top coat with excellent allround properties</td>
</tr>
</tbody>
</table>

Dynamic Sensitivity

- low
- standard
- high
- maximum

Resistance against Environmental Influences / Image Stability

- standard
- good
- very good
- excellent

All grades available with security features, too. Further grades and substances available on request.

* available with protection against erasure of thermal print image (S ..39)
Security.

Ensuring top protection against forgery

Pirated and counterfeit goods are a threat to the health and safety of consumers around the world. Governments, companies and national economies lose tax income, profits and legitimate jobs as a result. It is estimated that this will cause losses of 4.2 trillion US dollars to the global economy by 2022, as well as putting 5.4 million legitimate jobs at risk (source: International Chamber of Commerce). Forgery of paper tickets appears to be a lucrative line of business. The material value tends to be relatively low, however, the resulting financial damage caused by such forgeries can be significant. And this is on top of damage to the corporate image and associated security risks.

Thermal paper is a specialty paper with a composition that, in itself, requires major effort to reproduce. If security features such as coloured centre, coating mark or fluorescent fibres are integrated in the base paper, the paper is virtually forgery-proof. This is an important aspect for many applications.

As experts for thermal papers with integrated security features, we provided admission ticket papers for events like football world cups, Europa League and Champions League finals. It goes without saying that our papers are RFID compatible and can be printed and processed using established security features.

DISTURBING COUNTERFEITING STATISTICS:

- **Gera, February 2020:** arrest for commercial trading of forged tickets for local public transport, damage approx. EUR 200,000.
- **Hamburg, 2019:** according to HVV (Hamburg’s Local Transport Authority) approx. 7% of customers travel without a valid ticket (including fake tickets), damage approx. EUR 63 million / year.
- **Berlin, April 2018:** Ebay officially warns of counterfeit train tickets being offered.
- **Munich, April 2018:** 150 people denied access to the Metallica concert due to fake tickets, leading to unrest and skirmishes outside the Olympic Stadium.

Security.
Combinable Security Features

Combinable security features that can be integrated in the base paper of our thermal papers:

1. Coloured Centre [CF GRADES]
   - Coloured base paper available in green and red (further colours available upon request)
   - Authenticity of the ticket can be verified quickly and without technical devices, simply by tearing
   - Typical applications: Admission tickets

2. Coating Mark [CM GRADES]
   - Markings that are integrated in the coating (markings in the paper that are visible when held against the light), created using a gravure roll
   - Customised markings available (Corporate Design)
   - Typical applications: Transport, lottery and admission tickets, official documents and certificates

3. UV-Fluorescent Fibres [S GRADES]
   - Fluorescent security fibres that are invisible in daylight can be made visible using black light
   - Without optical brighteners
   - Typical applications: Public transport

4. Visible Security Fibres [PLUS GRADES]
   - Coloured fibres that are visible in daylight
   - Verification without any technical devices
   - Typical applications: Public transport

5. Colour Reaction to Special Test Pens [PLUS GRADES]
   - Chemical reagents concealed in the base paper will trigger chemical colour reactions on contact with a special test pen
   - Typical applications: Vouchers, public transport, POS receipts
## Grade Overview

<table>
<thead>
<tr>
<th>Grade</th>
<th>Top Coat</th>
<th>Substance</th>
<th>Caliper</th>
<th>Dynamic Sensivity</th>
<th>Resistance</th>
<th>Archivability</th>
<th>BP free</th>
<th>P free</th>
<th>Special Features</th>
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</thead>
<tbody>
<tr>
<td>CF 18 GR</td>
<td>✓</td>
<td>199 gsm</td>
<td>184 µm</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>10 years</td>
<td>✓ ✓</td>
<td></td>
<td>coloured centre green, reverse side pigment coat</td>
</tr>
<tr>
<td>CF 18 RD</td>
<td>✓</td>
<td>199 gsm</td>
<td>184 µm</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>10 years</td>
<td>✓ ✓</td>
<td></td>
<td>coloured centre red, reverse side pigment coat</td>
</tr>
<tr>
<td>S 8037</td>
<td>-</td>
<td>80 gsm</td>
<td>84 µm</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>25 years</td>
<td>✓ ✓</td>
<td></td>
<td>UV-fluorescent security fibres</td>
</tr>
<tr>
<td>S 1037</td>
<td>-</td>
<td>100 gsm</td>
<td>105 µm</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>25 years</td>
<td>✓ ✓</td>
<td></td>
<td>UV-fluorescent security fibres</td>
</tr>
<tr>
<td>S 1237</td>
<td>-</td>
<td>120 gsm</td>
<td>127 µm</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>25 years</td>
<td>✓ ✓</td>
<td></td>
<td>UV-fluorescent security fibres</td>
</tr>
<tr>
<td>S 1437</td>
<td>-</td>
<td>140 gsm</td>
<td>150 µm</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>25 years</td>
<td>✓ ✓</td>
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<td>UV-fluorescent security fibres</td>
</tr>
<tr>
<td>S 8039</td>
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<td>80 gsm</td>
<td>84 µm</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>25 years</td>
<td>✓ ✓</td>
<td></td>
<td>UV fluorescent security fibres, anti-falsification</td>
</tr>
<tr>
<td>S 8039 PLUS</td>
<td>-</td>
<td>80 gsm</td>
<td>84 µm</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>25 years</td>
<td>✓ ✓</td>
<td></td>
<td>visible security fibres, UV fluorescent security fibres, anti-falsification, coating mark, testpen reaction</td>
</tr>
<tr>
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<td>-</td>
<td>86 gsm</td>
<td>83 µm</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>25 years</td>
<td>✓ ✓</td>
<td></td>
<td>UV fluorescent security fibres, anti-falsification</td>
</tr>
<tr>
<td>S 1139 CM PLUS</td>
<td>-</td>
<td>116 gsm</td>
<td>125 µm</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>25 years</td>
<td>✓ ✓</td>
<td></td>
<td>visible security fibres, UV fluorescent security fibres, anti-falsification, coating mark, testpen reaction</td>
</tr>
<tr>
<td>S 1239</td>
<td>-</td>
<td>120 gsm</td>
<td>127 µm</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>25 years</td>
<td>✓ ✓</td>
<td></td>
<td>UV fluorescent security fibres, anti-falsification</td>
</tr>
<tr>
<td>S 1239 CM</td>
<td>-</td>
<td>129 gsm</td>
<td>145 µm</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>25 years</td>
<td>✓ ✓</td>
<td></td>
<td>UV fluorescent security fibres, anti-falsification</td>
</tr>
<tr>
<td>S 1439</td>
<td>-</td>
<td>140 gsm</td>
<td>150 µm</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>25 years</td>
<td>✓ ✓</td>
<td></td>
<td>UV fluorescent security fibres, anti-falsification</td>
</tr>
<tr>
<td>S 1439 CM PLUS</td>
<td>-</td>
<td>144 gsm</td>
<td>160 µm</td>
<td>● ● ● ●</td>
<td>● ● ● ●</td>
<td>25 years</td>
<td>✓ ✓</td>
<td></td>
<td>visible security fibres, UV fluorescent security fibres, anti-falsification, coating mark, testpen reaction</td>
</tr>
</tbody>
</table>

**Dynamic Sensitivity**
- ● ● ● = low
- ● ● ● = standard
- ● ● ● = high
- ● ● ● = maximum

**Resistance against Environmental Influences / Image Stability**
- ● ● = standard
- ● ● = good
- ● ● = very good
- ● ● = excellent

Most of above mentioned security features can be combined. Further grades and substances on request.
As a responsible manufacturer, we strive to produce and process our products in the most environmentally friendly way and to the highest standards of quality. We take our social responsibility seriously and are active in various environmental associations and organizations. Complying with and conforming to rules and regulations goes without saying. Social commitment is an important part of our corporate culture.

Certifications:
- FSC® Chain-of-Custody
- PEFC™ Chain-of-Custody
- DIN EN ISO 9001:2015
- DIN EN ISO 14001:2015
- DIN EN ISO 50001:2011
- DIN ISO 45001:2018
- INREKA DIN EN 15593:2008

Memberships:
- B.A.U.M.
- ChePap Rhein-Ruhr
- Klimapakt Flensburg
- Ökoprofit® Klub OWL
- Two Sides
- Wirtschaft pro Klima