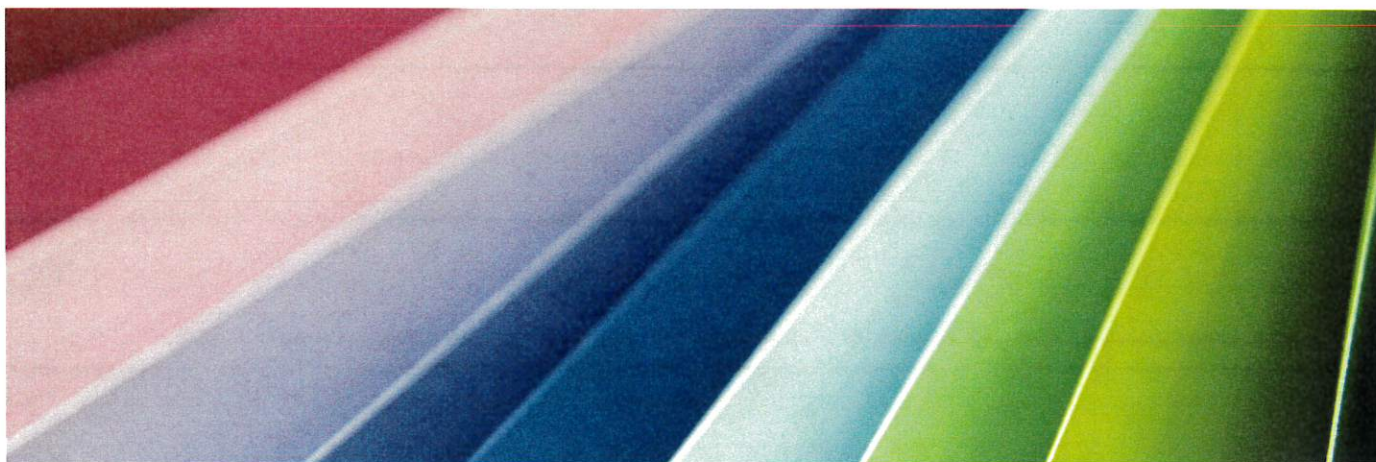


# Commercial Certificate for S3 & S4 Evaluation Report



For HP Indigo 15K / 12000 / 10000 / 7000 series / multi-shot



## Supplier Contact Information

|                                 |                                                          |
|---------------------------------|----------------------------------------------------------|
| Supplier Name                   | Arctic Paper Munkedals AB                                |
| Supplier Address                | Bruksvägen, Munkedal SE-45581                            |
| Supplier Country                | Sweden                                                   |
| Product Name                    | Munken Polar ID                                          |
| Product Category                | Uncoated                                                 |
| Grammage (gsm)/Basis weight (#) | 90 gsm                                                   |
| Microns/Caliper                 | 117 microns                                              |
| Certification Number            | SG7600-22-091                                            |
| Certification Center            | HP Singapore                                             |
| Date of Evaluation              | 5 Jul 2022                                               |
| Evaluated on                    | HP Indigo 7600 multi-shot                                |
| Certified for                   | HP Indigo 15K / 12000 / 10000 / 7000 series / multi-shot |
| Evaluation Process              | Full                                                     |

| Evaluation                   | Measure                                 | Result       | Grade (stars) | Comments      |
|------------------------------|-----------------------------------------|--------------|---------------|---------------|
| <b>Runability</b>            |                                         |              | ***           |               |
| Simplex                      | Number of Jams                          | 0            |               |               |
| Duplex                       | Number of Jams                          | 0            |               |               |
| <b>Fixing</b>                |                                         |              | ***           | See comment + |
| Peeling                      | 100% K in 4 color mode, % ink remaining | Not measured |               |               |
| <b>Photo Peeling</b>         | 290% K in 4 color mode, % ink remaining | -            |               |               |
| <b>Photo Recommended</b>     |                                         | Yes          |               |               |
| <b>White Ink Recommended</b> |                                         |              |               |               |
| <b>Blanket Compatibility</b> |                                         |              | ***           |               |
| <b>Evaluation Result</b>     |                                         | PASS         |               |               |

Comment Detail: Re-certification of RI5500-16-4886.

+ Assumed value.

During the tape peel test, the ink adhered sufficiently to the paper to cause tearing. No data can be obtained from this peel.

## The substrate certification procedure incorporates several processes. This checks for:

### Runability:

The ability of the substrate to run smoothly through the press in various print modes.

### Fixing:

Ink-substrate interaction as determined by the degree of ink adhesion to the substrate for standard and photo-related applications as measured in a tape peel test of the image.

### Blanket Compatibility:

Blanket-substrate interaction as determined by:

- 1) Ink-transferability, which is the quality of ink transfer from the blanket to the substrate as reflected in highlight dots, thin lines, heavy images and image edge integrity;
- 2) Ink-transferability after a self-cleaning procedure "cleaner pages" (intended to clean the blanket's release layer and restore transfer performance) has been performed.

### Approval for Photo and White Ink Applications:

Applications that use white ink and or light cyan/light magenta inks or photo related applications are strongly recommended to use robust media products due to additional ink coverage demands of these applications. This media has been tested and approved to perform well with higher levels of ink coverage, and is therefore recommended for photo-related and/or white ink type applications. However, it is strongly recommended that user acceptance ultimately be evaluated per individual application and finishing requirements, etc. The test results are provided as a guide; assess actual performance to determine suitability for individual use.



**Star Rating**

- ☆☆☆ Best performing substrate: excellent runnability / high ink adhesion / excellent blanket performance with no or very little issues, should generally work well for high coverage and photo applications.
- ☆☆ Recommended substrate: good runnability / good ink adhesion / print cleaners are generally required at a nominal frequency.
- ☆ Good substrate: acceptable runnability / acceptable ink adhesion / print cleaners are generally required more frequently.

|                              |                                                                              | ☆☆☆                                                           | ☆☆                                                                                              | ☆                                                                   |
|------------------------------|------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
|                              | Measurement                                                                  | Best-performing substrate                                     | Recommended substrate                                                                           | Good substrate                                                      |
| <b>Transport</b>             | Runnability                                                                  | No jam and minor issues                                       | 1 jam or minor issues                                                                           | 1 jam and minor issues                                              |
|                              | Peeling: 100% K                                                              | >90%                                                          | >80%                                                                                            | >80% at one hour                                                    |
|                              | Photo peeling: 290% K, 10 or 60 minutes                                      | >80% after 10 or 60 min                                       | N/A                                                                                             | N/A                                                                 |
| <b>Blanket Compatibility</b> | Performance evaluated when utilizing a mature blanket<br>Blanket performance | No transfer defects and no Picking above the limit is allowed | Cleaner pages were able to remove all Transfer defect and reduce the picking to below the limit | After cleaning small transfer defects and picking are still visible |

**Certification Validity**

This substrate is certified for the next two years from the date of evaluation, provided there is no change to the paper properties or production processes. At the end of two years from the original evaluation date, if there have been no changes in paper properties or production processes, the certification can be extended for another two years. After four years from the original certification date, a new certification is required.



# Commercial Certificate for S3 & S4 Evaluation Report



For HP Indigo 15K / 12000 / 10000 / 7000 series / multi-shot



## Supplier Contact Information

|                                 |                                                          |
|---------------------------------|----------------------------------------------------------|
| Supplier Name                   | Arctic Paper Munkedals AB                                |
| Supplier Address                | Bruksvägen, Munkedal SE-45581                            |
| Supplier Country                | Sweden                                                   |
| Product Name                    | Munken Polar ID                                          |
| Product Category                | Uncoated                                                 |
| Grammage (gsm)/Basis weight (#) | 100 gsm                                                  |
| Microns/Caliper                 | 113 microns                                              |
| Certification Number            | SG7600-22-097                                            |
| Certification Center            | HP Singapore                                             |
| Date of Evaluation              | 6 Jul 2022                                               |
| Evaluated on                    | HP Indigo 7600 multi-shot                                |
| Certified for                   | HP Indigo 15K / 12000 / 10000 / 7000 series / multi-shot |
| Evaluation Process              | Interpolation                                            |



| Evaluation                   | Measure                                    | Result | Grade (stars) | Comments |
|------------------------------|--------------------------------------------|--------|---------------|----------|
| <b>Runability</b>            |                                            |        | ***           |          |
| Simplex                      | Number of Jams                             |        |               |          |
| Duplex                       | Number of Jams                             |        |               |          |
| <b>Fixing</b>                |                                            |        | ***           |          |
| Peeling                      | 100% K in 4 color mode,<br>% ink remaining |        |               |          |
| <b>Photo Peeling</b>         | 290% K in 4 color mode,<br>% ink remaining |        |               |          |
| <b>Photo Recommended</b>     |                                            | Yes    |               |          |
| <b>White Ink Recommended</b> |                                            |        |               |          |
| <b>Blanket Compatibility</b> |                                            |        | ***           |          |
| <b>Evaluation Result</b>     |                                            | PASS   |               |          |

Comment Detail: Re-certification of RI5500-16-4887.

Above results by interpolation.

The substrate certification procedure incorporates several processes. This checks for:

**Runability:**

The ability of the substrate to run smoothly through the press in various print modes.

**Fixing:**

Ink-substrate interaction as determined by the degree of ink adhesion to the substrate for standard and photo-related applications as measured in a tape peel test of the image.

**Blanket Compatibility:**

Blanket-substrate interaction as determined by:

- 1) Ink-transferability, which is the quality of ink transfer from the blanket to the substrate as reflected in highlight dots, thin lines, heavy images and image edge integrity;
- 2) Ink-transferability after a self-cleaning procedure "cleaner pages" (intended to clean the blanket's release layer and restore transfer performance) has been performed.

**Approval for Photo and White Ink Applications:**

Applications that use white ink and or light cyan/light magenta inks or photo related applications are strongly recommended to use robust media products due to additional ink coverage demands of these applications. This media has been tested and approved to perform well with higher levels of ink coverage, and is therefore recommended for photo-related and/or white ink type applications. However, it is strongly recommended that user acceptance ultimately be evaluated per individual application and finishing requirements, etc. The test results are provided as a guide; assess actual performance to determine suitability for individual use.

**Star Rating**

- ☆☆☆ Best performing substrate: excellent runnability / high ink adhesion / excellent blanket performance with no or very little issues, should generally work well for high coverage and photo applications.
- ☆☆ Recommended substrate: good runnability / good ink adhesion / print cleaners are generally required at a nominal frequency.
- ☆ Good substrate: acceptable runnability / acceptable ink adhesion / print cleaners are generally required more frequently.

|                              |                                                                              | ☆☆☆                                                           | ☆☆                                                                                              | ☆                                                                   |
|------------------------------|------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
|                              | Measurement                                                                  | Best-performing substrate                                     | Recommended substrate                                                                           | Good substrate                                                      |
| <b>Transport</b>             | Runnability                                                                  | No jam and minor issues                                       | 1 jam or minor issues                                                                           | 1 jam and minor issues                                              |
|                              | Peeling: 100% K                                                              | >90%                                                          | >80%                                                                                            | >80% at one hour                                                    |
|                              | Photo peeling: 290% K, 10 or 60 minutes                                      | >80% after 10 or 60 min                                       | N/A                                                                                             | N/A                                                                 |
| <b>Blanket Compatibility</b> | Performance evaluated when utilizing a mature blanket<br>Blanket performance | No transfer defects and no Picking above the limit is allowed | Cleaner pages were able to remove all Transfer defect and reduce the picking to below the limit | After cleaning small transfer defects and picking are still visible |

**Certification Validity**

This substrate is certified for the next two years from the date of evaluation, provided there is no change to the paper properties or production processes. At the end of two years from the original evaluation date, if there have been no changes in paper properties or production processes, the certification can be extended for another two years. After four years from the original certification date, a new certification is required.





# Commercial Certificate for S3 & S4 Evaluation Report



For HP Indigo 15K / 12000 / 10000 / 7000 series / multi-shot



## Supplier Contact Information

|                                 |                                                          |
|---------------------------------|----------------------------------------------------------|
| Supplier Name                   | Arctic Paper Munkedals AB                                |
| Supplier Address                | Bruksvägen, Munkedal SE-45581                            |
| Supplier Country                | Sweden                                                   |
| Product Name                    | Munken Polar ID                                          |
| Product Category                | Uncoated                                                 |
| Grammage (gsm)/Basis weight (#) | 120 gsm                                                  |
| Microns/Caliper                 | 136 microns                                              |
| Certification Number            | SG7600-22-098                                            |
| Certification Center            | HP Singapore                                             |
| Date of Evaluation              | 6 Jul 2022                                               |
| Evaluated on                    | HP Indigo 7600 multi-shot                                |
| Certified for                   | HP Indigo 15K / 12000 / 10000 / 7000 series / multi-shot |
| Evaluation Process              | Interpolation                                            |

| Evaluation                   | Measure                                    | Result | Grade (stars) | Comments |
|------------------------------|--------------------------------------------|--------|---------------|----------|
| <b>Runability</b>            |                                            |        | ***           |          |
| Simplex                      | Number of Jams                             |        |               |          |
| Duplex                       | Number of Jams                             |        |               |          |
| <b>Fixing</b>                |                                            |        | ***           |          |
| Peeling                      | 100% K in 4 color mode,<br>% ink remaining |        |               |          |
| <b>Photo Peeling</b>         | 290% K in 4 color mode,<br>% ink remaining |        |               |          |
| <b>Photo Recommended</b>     |                                            | Yes    |               |          |
| <b>White Ink Recommended</b> |                                            |        |               |          |
| <b>Blanket Compatibility</b> |                                            |        | ***           |          |
| <b>Evaluation Result</b>     |                                            | PASS   |               |          |

Comment Detail: Re-certification of RI5500-16-4888

Above results by interpolation.

## The substrate certification procedure incorporates several processes. This checks for:

### Runability:

The ability of the substrate to run smoothly through the press in various print modes.

### Fixing:

Ink-substrate interaction as determined by the degree of ink adhesion to the substrate for standard and photo-related applications as measured in a tape peel test of the image.

### Blanket Compatibility:

Blanket-substrate interaction as determined by:

- 1) Ink-transferability, which is the quality of ink transfer from the blanket to the substrate as reflected in highlight dots, thin lines, heavy images and image edge integrity;
- 2) Ink-transferability after a self-cleaning procedure "cleaner pages" (intended to clean the blanket's release layer and restore transfer performance) has been performed.

### Approval for Photo and White Ink Applications:

Applications that use white ink and or light cyan/light magenta inks or photo related applications are strongly recommended to use robust media products due to additional ink coverage demands of these applications. This media has been tested and approved to perform well with higher levels of ink coverage, and is therefore recommended for photo-related and/or white ink type applications. However, it is strongly recommended that user acceptance ultimately be evaluated per individual application and finishing requirements, etc. The test results are provided as a guide; assess actual performance to determine suitability for individual use.



**Star Rating**

- ☆☆☆ Best performing substrate: excellent runnability / high ink adhesion / excellent blanket performance with no or very little issues, should generally work well for high coverage and photo applications.
- ☆☆ Recommended substrate: good runnability / good ink adhesion / print cleaners are generally required at a nominal frequency.
- ☆ Good substrate: acceptable runnability / acceptable ink adhesion / print cleaners are generally required more frequently.

|                              |                                                                              | ☆☆☆                                                           | ☆☆                                                                                              | ☆                                                                   |
|------------------------------|------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
|                              | Measurement                                                                  | Best-performing substrate                                     | Recommended substrate                                                                           | Good substrate                                                      |
| <b>Transport</b>             | Runnability                                                                  | No jam and minor issues                                       | 1 jam or minor issues                                                                           | 1 jam and minor issues                                              |
|                              | Peeling: 100% K                                                              | >90%                                                          | >80%                                                                                            | >80% at one hour                                                    |
|                              | Photo peeling: 290% K, 10 or 60 minutes                                      | >80% after 10 or 60 min                                       | N/A                                                                                             | N/A                                                                 |
| <b>Blanket Compatibility</b> | Performance evaluated when utilizing a mature blanket<br>Blanket performance | No transfer defects and no Picking above the limit is allowed | Cleaner pages were able to remove all Transfer defect and reduce the picking to below the limit | After cleaning small transfer defects and picking are still visible |

**Certification Validity**

This substrate is certified for the next two years from the date of evaluation, provided there is no change to the paper properties or production processes. At the end of two years from the original evaluation date, if there have been no changes in paper properties or production processes, the certification can be extended for another two years. After four years from the original certification date, a new certification is required.



# Commercial Certificate for S3 & S4 Evaluation Report



For HP Indigo 15K / 12000 / 10000 / 7000 series / multi-shot



## Supplier Contact Information

|                                 |                                                          |
|---------------------------------|----------------------------------------------------------|
| Supplier Name                   | Arctic Paper. Munkedals AB                               |
| Supplier Address                | Bruksvägen, Munkedal SE-45581                            |
| Supplier Country                | Sweden                                                   |
| Product Name                    | Munken Polar ID                                          |
| Product Category                | Uncoated                                                 |
| Grammage (gsm)/Basis weight (#) | 130 gsm                                                  |
| Microns/Caliper                 | 147 microns                                              |
| Certification Number            | SG7600-22-099                                            |
| Certification Center            | HP Singapore                                             |
| Date of Evaluation              | 6 Jul 2022                                               |
| Evaluated on                    | HP Indigo 7600 multi-shot                                |
| Certified for                   | HP Indigo 15K / 12000 / 10000 / 7000 series / multi-shot |
| Evaluation Process              | Interpolation                                            |



| Evaluation                   | Measure                                 | Result | Grade (stars) | Comments |
|------------------------------|-----------------------------------------|--------|---------------|----------|
| <b>Runability</b>            |                                         |        | ***           |          |
| Simplex                      | Number of Jams                          |        |               |          |
| Duplex                       | Number of Jams                          |        |               |          |
| <b>Fixing</b>                |                                         |        | ***           |          |
| Peeling                      | 100% K in 4 color mode, % ink remaining |        |               |          |
| <b>Photo Peeling</b>         | 290% K in 4 color mode, % ink remaining |        |               |          |
| <b>Photo Recommended</b>     |                                         | Yes    |               |          |
| <b>White Ink Recommended</b> |                                         |        |               |          |
| <b>Blanket Compatibility</b> |                                         |        | ***           |          |
| <b>Evaluation Result</b>     |                                         | PASS   |               |          |

Comment Detail: Re-certification of RI5500-16-4889

Above results by interpolation.

The substrate certification procedure incorporates several processes. This checks for:

**Runability:**

The ability of the substrate to run smoothly through the press in various print modes.

**Fixing:**

Ink-substrate interaction as determined by the degree of ink adhesion to the substrate for standard and photo-related applications as measured in a tape peel test of the image.

**Blanket Compatibility:**

Blanket-substrate interaction as determined by:

- 1) Ink-transferability, which is the quality of ink transfer from the blanket to the substrate as reflected in highlight dots, thin lines, heavy images and image edge integrity;
- 2) Ink-transferability after a self-cleaning procedure "cleaner pages" (intended to clean the blanket's release layer and restore transfer performance) has been performed.

**Approval for Photo and White Ink Applications:**

Applications that use white ink and or light cyan/light magenta inks or photo related applications are strongly recommended to use robust media products due to additional ink coverage demands of these applications. This media has been tested and approved to perform well with higher levels of ink coverage, and is therefore recommended for photo-related and/or white ink type applications. However, it is strongly recommended that user acceptance ultimately be evaluated per individual application and finishing requirements, etc. The test results are provided as a guide; assess actual performance to determine suitability for individual use.

**Star Rating**

- ☆☆☆ Best performing substrate: excellent runnability / high ink adhesion / excellent blanket performance with no or very little issues, should generally work well for high coverage and photo applications.
- ☆☆ Recommended substrate: good runnability / good ink adhesion / print cleaners are generally required at a nominal frequency.
- ☆ Good substrate: acceptable runnability / acceptable ink adhesion / print cleaners are generally required more frequently.

|                              |                                                                              | ☆☆☆                                                           | ☆☆                                                                                              | ☆                                                                   |
|------------------------------|------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
|                              | Measurement                                                                  | Best-performing substrate                                     | Recommended substrate                                                                           | Good substrate                                                      |
| <b>Transport</b>             | Runnability                                                                  | No jam and minor issues                                       | 1 jam or minor issues                                                                           | 1 jam and minor issues                                              |
|                              | Peeling: 100% K                                                              | >90%                                                          | >80%                                                                                            | >80% at one hour                                                    |
|                              | Photo peeling: 290% K, 10 or 60 minutes                                      | >80% after 10 or 60 min                                       | N/A                                                                                             | N/A                                                                 |
| <b>Blanket Compatibility</b> | Performance evaluated when utilizing a mature blanket<br>Blanket performance | No transfer defects and no Picking above the limit is allowed | Cleaner pages were able to remove all Transfer defect and reduce the picking to below the limit | After cleaning small transfer defects and picking are still visible |

**Certification Validity**

This substrate is certified for the next two years from the date of evaluation, provided there is no change to the paper properties or production processes. At the end of two years from the original evaluation date, if there have been no changes in paper properties or production processes, the certification can be extended for another two years. After four years from the original certification date, a new certification is required.





# Commercial Certificate for S3 & S4 Evaluation Report



For HP Indigo 15K / 12000 / 10000 / 7000 series / multi-shot



## Supplier Contact Information

|                                 |                                                          |
|---------------------------------|----------------------------------------------------------|
| Supplier Name                   | Arctic Paper Munkedals AB                                |
| Supplier Address                | Bruksvägen, Munkedal SE-45581                            |
| Supplier Country                | Sweden                                                   |
| Product Name                    | Munken Polar ID                                          |
| Product Category                | Uncoated                                                 |
| Grammage (gsm)/Basis weight (#) | 150 gsm                                                  |
| Microns/Caliper                 | 170 microns                                              |
| Certification Number            | SG7600-22-092                                            |
| Certification Center            | HP Singapore                                             |
| Date of Evaluation              | 5 Jul 2022                                               |
| Evaluated on                    | HP Indigo 7600 multi-shot                                |
| Certified for                   | HP Indigo 15K / 12000 / 10000 / 7000 series / multi-shot |
| Evaluation Process              | Screen                                                   |

| Evaluation                   | Measure                                 | Result       | Grade (stars) | Comments         |
|------------------------------|-----------------------------------------|--------------|---------------|------------------|
| <b>Runability</b>            |                                         |              | ***           |                  |
| Simplex                      | Number of Jams                          | 0            |               |                  |
| Duplex                       | Number of Jams                          | 0            |               |                  |
| <b>Fixing</b>                |                                         |              | ***           | See comment +    |
| Peeling                      | 100% K in 4 color mode, % ink remaining | Not measured |               |                  |
| <b>Photo Peeling</b>         | 290% K in 4 color mode, % ink remaining | -            |               |                  |
| <b>Photo Recommended</b>     |                                         | Yes          |               |                  |
| <b>White Ink Recommended</b> |                                         |              |               |                  |
| <b>Blanket Compatibility</b> |                                         |              | ***           | By interpolation |
| <b>Evaluation Result</b>     |                                         | PASS         |               |                  |

Comment Detail: Re-certification of SG7600-16-053.

+ Assumed value.

During the tape peel test, the ink adhered sufficiently to the paper to cause tearing. No data can be obtained from this peel.

### The substrate certification procedure incorporates several processes. This checks for:

**Runability:**

The ability of the substrate to run smoothly through the press in various print modes.

**Fixing:**

Ink-substrate interaction as determined by the degree of ink adhesion to the substrate for standard and photo-related applications as measured in a tape peel test of the image.

**Blanket Compatibility:**

Blanket-substrate interaction as determined by:

- 1) Ink-transferability, which is the quality of ink transfer from the blanket to the substrate as reflected in highlight dots, thin lines, heavy images and image edge integrity;
- 2) Ink-transferability after a self-cleaning procedure "cleaner pages" (intended to clean the blanket's release layer and restore transfer performance) has been performed.

**Approval for Photo and White Ink Applications:**

Applications that use white ink and or light cyan/light magenta inks or photo related applications are strongly recommended to use robust media products due to additional ink coverage demands of these applications. This media has been tested and approved to perform well with higher levels of ink coverage, and is therefore recommended for photo-related and/or white ink type applications. However, it is strongly recommended that user acceptance ultimately be evaluated per individual application and finishing requirements, etc. The test results are provided as a guide; assess actual performance to determine suitability for individual use.



**Star Rating**

- ☆☆☆ Best performing substrate: excellent runnability / high ink adhesion / excellent blanket performance with no or very little issues, should generally work well for high coverage and photo applications.
- ☆☆ Recommended substrate: good runnability / good ink adhesion / print cleaners are generally required at a nominal frequency.
- ☆ Good substrate: acceptable runnability / acceptable ink adhesion / print cleaners are generally required more frequently.

|                              |                                                                              | ☆☆☆                                                           | ☆☆                                                                                              | ☆                                                                   |
|------------------------------|------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
|                              | Measurement                                                                  | Best-performing substrate                                     | Recommended substrate                                                                           | Good substrate                                                      |
| <b>Transport</b>             | Runnability                                                                  | No jam and minor issues                                       | 1 jam or minor issues                                                                           | 1 jam and minor issues                                              |
|                              | Peeling: 100% K                                                              | >90%                                                          | >80%                                                                                            | >80% at one hour                                                    |
|                              | Photo peeling: 290% K, 10 or 60 minutes                                      | >80% after 10 or 60 min                                       | N/A                                                                                             | N/A                                                                 |
| <b>Blanket Compatibility</b> | Performance evaluated when utilizing a mature blanket<br>Blanket performance | No transfer defects and no Picking above the limit is allowed | Cleaner pages were able to remove all Transfer defect and reduce the picking to below the limit | After cleaning small transfer defects and picking are still visible |

**Certification Validity**

This substrate is certified for the next two years from the date of evaluation, provided there is no change to the paper properties or production processes. At the end of two years from the original evaluation date, if there have been no changes in paper properties or production processes, the certification can be extended for another two years. After four years from the original certification date, a new certification is required.



# Commercial Certificate for S3 & S4 Evaluation Report



For HP Indigo 15K / 12000 / 10000 / 7000 series / multi-shot



## Supplier Contact Information

|                                 |                                                          |
|---------------------------------|----------------------------------------------------------|
| Supplier Name                   | Arctic Paper Munkedals AB                                |
| Supplier Address                | Bruksvägen, Munkedal SE-45581                            |
| Supplier Country                | Sweden                                                   |
| Product Name                    | Munken Polar ID                                          |
| Product Category                | Uncoated                                                 |
| Grammage (gsm)/Basis weight (#) | 170 gsm                                                  |
| Microns/Caliper                 | 192 microns                                              |
| Certification Number            | SG7600-22-100                                            |
| Certification Center            | HP Singapore                                             |
| Date of Evaluation              | 6 Jul 2022                                               |
| Evaluated on                    | HP Indigo 7600 multi-shot                                |
| Certified for                   | HP Indigo 15K / 12000 / 10000 / 7000 series / multi-shot |
| Evaluation Process              | Interpolation                                            |



| Evaluation                   | Measure                                 | Result | Grade (stars) | Comments |
|------------------------------|-----------------------------------------|--------|---------------|----------|
| <b>Runability</b>            |                                         |        | ***           |          |
| Simplex                      | Number of Jams                          |        |               |          |
| Duplex                       | Number of Jams                          |        |               |          |
| <b>Fixing</b>                |                                         |        | ***           |          |
| Peeling                      | 100% K in 4 color mode, % ink remaining |        |               |          |
| <b>Photo Peeling</b>         | 290% K in 4 color mode, % ink remaining |        |               |          |
| <b>Photo Recommended</b>     |                                         | Yes    |               |          |
| <b>White Ink Recommended</b> |                                         |        |               |          |
| <b>Blanket Compatibility</b> |                                         |        | ***           |          |
| <b>Evaluation Result</b>     |                                         | PASS   |               |          |

Comment Detail: Re-certification of RI5500-16-4890

Above results by interpolation.

The substrate certification procedure incorporates several processes. This checks for:

**Runability:**

The ability of the substrate to run smoothly through the press in various print modes.

**Fixing:**

Ink-substrate interaction as determined by the degree of ink adhesion to the substrate for standard and photo-related applications as measured in a tape peel test of the image.

**Blanket Compatibility:**

Blanket-substrate interaction as determined by:

- 1) Ink-transferability, which is the quality of ink transfer from the blanket to the substrate as reflected in highlight dots, thin lines, heavy images and image edge integrity;
- 2) Ink-transferability after a self-cleaning procedure "cleaner pages" (intended to clean the blanket's release layer and restore transfer performance) has been performed.

**Approval for Photo and White Ink Applications:**

Applications that use white ink and or light cyan/light magenta inks or photo related applications are strongly recommended to use robust media products due to additional ink coverage demands of these applications. This media has been tested and approved to perform well with higher levels of ink coverage, and is therefore recommended for photo-related and/or white ink type applications. However, it is strongly recommended that user acceptance ultimately be evaluated per individual application and finishing requirements, etc. The test results are provided as a guide; assess actual performance to determine suitability for individual use.

**Star Rating**

- ☆☆☆ Best performing substrate: excellent runnability / high ink adhesion / excellent blanket performance with no or very little issues, should generally work well for high coverage and photo applications.
- ☆☆ Recommended substrate: good runnability / good ink adhesion / print cleaners are generally required at a nominal frequency.
- ☆ Good substrate: acceptable runnability / acceptable ink adhesion / print cleaners are generally required more frequently.

|                              |                                                                              | ☆☆☆                                                           | ☆☆                                                                                              | ☆                                                                   |
|------------------------------|------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
|                              | Measurement                                                                  | Best-performing substrate                                     | Recommended substrate                                                                           | Good substrate                                                      |
| <b>Transport</b>             | Runnability                                                                  | No jam and minor issues                                       | 1 jam or minor issues                                                                           | 1 jam and minor issues                                              |
|                              | Peeling: 100% K                                                              | >90%                                                          | >80%                                                                                            | >80% at one hour                                                    |
|                              | Photo peeling: 290% K, 10 or 60 minutes                                      | >80% after 10 or 60 min                                       | N/A                                                                                             | N/A                                                                 |
| <b>Blanket Compatibility</b> | Performance evaluated when utilizing a mature blanket<br>Blanket performance | No transfer defects and no Picking above the limit is allowed | Cleaner pages were able to remove all Transfer defect and reduce the picking to below the limit | After cleaning small transfer defects and picking are still visible |

**Certification Validity**

This substrate is certified for the next two years from the date of evaluation, provided there is no change to the paper properties or production processes. At the end of two years from the original evaluation date, if there have been no changes in paper properties or production processes, the certification can be extended for another two years. After four years from the original certification date, a new certification is required.





# Commercial Certificate for S3 & S4 Evaluation Report



For HP Indigo 15K / 12000 / 10000 / 7000 series / multi-shot



## Supplier Contact Information

|                                 |                                                          |
|---------------------------------|----------------------------------------------------------|
| Supplier Name                   | Arctic Paper Munkedals AB                                |
| Supplier Address                | Bruksvägen, Munkedal SE-45581                            |
| Supplier Country                | Sweden                                                   |
| Product Name                    | Munken Polar ID                                          |
| Product Category                | Uncoated                                                 |
| Grammage (gsm)/Basis weight (#) | 200 gsm                                                  |
| Microns/Caliper                 | 226 microns                                              |
| Certification Number            | SG7600-22-101                                            |
| Certification Center            | HP Singapore                                             |
| Date of Evaluation              | 6 Jul 2022                                               |
| Evaluated on                    | HP Indigo 7600 multi-shot                                |
| Certified for                   | HP Indigo 15K / 12000 / 10000 / 7000 series / multi-shot |
| Evaluation Process              | Interpolation                                            |

| Evaluation                   | Measure                                 | Result | Grade (stars) | Comments |
|------------------------------|-----------------------------------------|--------|---------------|----------|
| <b>Runability</b>            |                                         |        | ***           |          |
| Simplex                      | Number of Jams                          |        |               |          |
| Duplex                       | Number of Jams                          |        |               |          |
| <b>Fixing</b>                |                                         |        | ***           |          |
| Peeling                      | 100% K in 4 color mode, % ink remaining |        |               |          |
| <b>Photo Peeling</b>         | 290% K in 4 color mode, % ink remaining |        |               |          |
| <b>Photo Recommended</b>     |                                         | Yes    |               |          |
| <b>White Ink Recommended</b> |                                         |        |               |          |
| <b>Blanket Compatibility</b> |                                         |        | ***           |          |
| <b>Evaluation Result</b>     |                                         | PASS   |               |          |

Comment Detail: Re-certification of RI5500-16-4891

Above results by interpolation.

The substrate certification procedure incorporates several processes. This checks for:

**Runability:**

The ability of the substrate to run smoothly through the press in various print modes.

**Fixing:**

Ink-substrate interaction as determined by the degree of ink adhesion to the substrate for standard and photo-related applications as measured in a tape peel test of the image.

**Blanket Compatibility:**

Blanket-substrate interaction as determined by:

- 1) Ink-transferability, which is the quality of ink transfer from the blanket to the substrate as reflected in highlight dots, thin lines, heavy images and image edge integrity;
- 2) Ink-transferability after a self-cleaning procedure "cleaner pages" (intended to clean the blanket's release layer and restore transfer performance) has been performed.

**Approval for Photo and White Ink Applications:**

Applications that use white ink and or light cyan/light magenta inks or photo related applications are strongly recommended to use robust media products due to additional ink coverage demands of these applications. This media has been tested and approved to perform well with higher levels of ink coverage, and is therefore recommended for photo-related and/or white ink type applications. However, it is strongly recommended that user acceptance ultimately be evaluated per individual application and finishing requirements, etc. The test results are provided as a guide; assess actual performance to determine suitability for individual use.



**Star Rating**

- ☆☆☆ Best performing substrate: excellent runnability / high ink adhesion / excellent blanket performance with no or very little issues, should generally work well for high coverage and photo applications.
- ☆☆ Recommended substrate: good runnability / good ink adhesion / print cleaners are generally required at a nominal frequency.
- ☆ Good substrate: acceptable runnability / acceptable ink adhesion / print cleaners are generally required more frequently.

|                              |                                                                              | ☆☆☆                                                           | ☆☆                                                                                              | ☆                                                                   |
|------------------------------|------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
|                              | Measurement                                                                  | Best-performing substrate                                     | Recommended substrate                                                                           | Good substrate                                                      |
| <b>Transport</b>             | Runnability                                                                  | No jam and minor issues                                       | 1 jam or minor issues                                                                           | 1 jam and minor issues                                              |
|                              | Peeling: 100% K                                                              | >90%                                                          | >80%                                                                                            | >80% at one hour                                                    |
|                              | Photo peeling: 290% K, 10 or 60 minutes                                      | >80% after 10 or 60 min                                       | N/A                                                                                             | N/A                                                                 |
| <b>Blanket Compatibility</b> | Performance evaluated when utilizing a mature blanket<br>Blanket performance | No transfer defects and no Picking above the limit is allowed | Cleaner pages were able to remove all Transfer defect and reduce the picking to below the limit | After cleaning small transfer defects and picking are still visible |

**Certification Validity**

This substrate is certified for the next two years from the date of evaluation, provided there is no change to the paper properties or production processes. At the end of two years from the original evaluation date, if there have been no changes in paper properties or production processes, the certification can be extended for another two years. After four years from the original certification date, a new certification is required.



# Commercial Certificate for S3 & S4 Evaluation Report



For HP Indigo 15K / 12000 / 10000 / 7000 series / multi-shot



## Supplier Contact Information

|                                 |                                                          |
|---------------------------------|----------------------------------------------------------|
| Supplier Name                   | Arctic Paper Munkedals AB                                |
| Supplier Address                | Bruksvägen, Munkedal SE-45581                            |
| Supplier Country                | Sweden                                                   |
| Product Name                    | Munken Polar ID                                          |
| Product Category                | Uncoated                                                 |
| Grammage (gsm)/Basis weight (#) | 240 gsm                                                  |
| Microns/Caliper                 | 271 microns                                              |
| Certification Number            | SG7600-22-102                                            |
| Certification Center            | HP Singapore                                             |
| Date of Evaluation              | 6 Jul 2022                                               |
| Evaluated on                    | HP Indigo 7600 multi-shot                                |
| Certified for                   | HP Indigo 15K / 12000 / 10000 / 7000 series / multi-shot |
| Evaluation Process              | Interpolation                                            |



| Evaluation                   | Measure                                    | Result | Grade (stars) | Comments |
|------------------------------|--------------------------------------------|--------|---------------|----------|
| <b>Runability</b>            |                                            |        | ***           |          |
| Simplex                      | Number of Jams                             |        |               |          |
| Duplex                       | Number of Jams                             |        |               |          |
| <b>Fixing</b>                |                                            |        | ***           |          |
| Peeling                      | 100% K in 4 color mode,<br>% ink remaining |        |               |          |
| Photo Peeling                | 290% K in 4 color mode,<br>% ink remaining |        |               |          |
| Photo Recommended            |                                            | Yes    |               |          |
| White Ink Recommended        |                                            |        |               |          |
| <b>Blanket Compatibility</b> |                                            |        | ***           |          |
| <b>Evaluation Result</b>     |                                            | PASS   |               |          |

Comment Detail: Re-certification of RI5500-16-4892

Above results by interpolation.

The substrate certification procedure incorporates several processes. This checks for:

**Runability:**

The ability of the substrate to run smoothly through the press in various print modes.

**Fixing:**

Ink-substrate interaction as determined by the degree of ink adhesion to the substrate for standard and photo-related applications as measured in a tape peel test of the image.

**Blanket Compatibility:**

Blanket-substrate interaction as determined by:

- 1) Ink-transferability, which is the quality of ink transfer from the blanket to the substrate as reflected in highlight dots, thin lines, heavy images and image edge integrity;
- 2) Ink-transferability after a self-cleaning procedure "cleaner pages" (intended to clean the blanket's release layer and restore transfer performance) has been performed.

**Approval for Photo and White Ink Applications:**

Applications that use white ink and or light cyan/light magenta inks or photo related applications are strongly recommended to use robust media products due to additional ink coverage demands of these applications. This media has been tested and approved to perform well with higher levels of ink coverage, and is therefore recommended for photo-related and/or white ink type applications. However, it is strongly recommended that user acceptance ultimately be evaluated per individual application and finishing requirements, etc. The test results are provided as a guide; assess actual performance to determine suitability for individual use.

**Star Rating**

- ☆☆☆ Best performing substrate: excellent runnability / high ink adhesion / excellent blanket performance with no or very little issues, should generally work well for high coverage and photo applications.
- ☆☆ Recommended substrate: good runnability / good ink adhesion / print cleaners are generally required at a nominal frequency.
- ☆ Good substrate: acceptable runnability / acceptable ink adhesion / print cleaners are generally required more frequently.

|                              |                                                                              | ☆☆☆                                                           | ☆☆                                                                                              | ☆                                                                   |
|------------------------------|------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
|                              | Measurement                                                                  | Best-performing substrate                                     | Recommended substrate                                                                           | Good substrate                                                      |
| <b>Transport</b>             | Runnability                                                                  | No jam and minor issues                                       | 1 jam or minor issues                                                                           | 1 jam and minor issues                                              |
|                              | Peeling: 100% K                                                              | >90%                                                          | >80%                                                                                            | >80% at one hour                                                    |
|                              | Photo peeling: 290% K, 10 or 60 minutes                                      | >80% after 10 or 60 min                                       | N/A                                                                                             | N/A                                                                 |
| <b>Blanket Compatibility</b> | Performance evaluated when utilizing a mature blanket<br>Blanket performance | No transfer defects and no Picking above the limit is allowed | Cleaner pages were able to remove all Transfer defect and reduce the picking to below the limit | After cleaning small transfer defects and picking are still visible |

**Certification Validity**

This substrate is certified for the next two years from the date of evaluation, provided there is no change to the paper properties or production processes. At the end of two years from the original evaluation date, if there have been no changes in paper properties or production processes, the certification can be extended for another two years. After four years from the original certification date, a new certification is required.





# Commercial Certificate for S3 & S4 Evaluation Report



For HP Indigo 15K / 12000 / 10000 / 7000 series / multi-shot



## Supplier Contact Information

|                                 |                                                          |
|---------------------------------|----------------------------------------------------------|
| Supplier Name                   | Arctic Paper Munkedals AB                                |
| Supplier Address                | Bruksvägen, Munkedal SE-45581                            |
| Supplier Country                | Sweden                                                   |
| Product Name                    | Munken Polar ID                                          |
| Product Category                | Uncoated                                                 |
| Grammage (gsm)/Basis weight (#) | 300 gsm                                                  |
| Microns/Caliper                 | 339 microns                                              |
| Certification Number            | SG7600-22-093                                            |
| Certification Center            | HP Singapore                                             |
| Date of Evaluation              | 6 Jul 2022                                               |
| Evaluated on                    | HP Indigo 7600 multi-shot                                |
| Certified for                   | HP Indigo 15K / 12000 / 10000 / 7000 series / multi-shot |
| Evaluation Process              | Full                                                     |

| Evaluation                   | Measure                                 | Result       | Grade (stars) | Comments      |
|------------------------------|-----------------------------------------|--------------|---------------|---------------|
| <b>Runability</b>            |                                         |              | ***           |               |
| Simplex                      | Number of Jams                          | 0            |               |               |
| Duplex                       | Number of Jams                          | 0            |               |               |
| <b>Fixing</b>                |                                         |              | ***           | See comment + |
| Peeling                      | 100% K in 4 color mode, % ink remaining | Not measured |               |               |
| Photo Peeling                | 290% K in 4 color mode, % ink remaining | -            |               |               |
| Photo Recommended            |                                         | Yes          |               |               |
| White Ink Recommended        |                                         |              |               |               |
| <b>Blanket Compatibility</b> |                                         |              | ***           |               |
| <b>Evaluation Result</b>     |                                         | PASS         |               |               |

Comment Detail: Re-certification of RI5500-16-4893

+ Assumed value.

During the tape peel test, the ink adhered sufficiently to the paper to cause tearing. No data can be obtained from this peel.

The substrate certification procedure incorporates several processes. This checks for:

**Runability:**

The ability of the substrate to run smoothly through the press in various print modes.

**Fixing:**

Ink-substrate interaction as determined by the degree of ink adhesion to the substrate for standard and photo-related applications as measured in a tape peel test of the image.

**Blanket Compatibility:**

Blanket-substrate interaction as determined by:

- 1) Ink-transferability, which is the quality of ink transfer from the blanket to the substrate as reflected in highlight dots, thin lines, heavy images and image edge integrity;
- 2) Ink-transferability after a self-cleaning procedure "cleaner pages" (intended to clean the blanket's release layer and restore transfer performance) has been performed.

**Approval for Photo and White Ink Applications:**

Applications that use white ink and or light cyan/light magenta inks or photo related applications are strongly recommended to use robust media products due to additional ink coverage demands of these applications. This media has been tested and approved to perform well with higher levels of ink coverage, and is therefore recommended for photo-related and/or white ink type applications. However, it is strongly recommended that user acceptance ultimately be evaluated per individual application and finishing requirements, etc. The test results are provided as a guide; assess actual performance to determine suitability for individual use.



**Star Rating**

- ☆☆☆ Best performing substrate: excellent runnability / high ink adhesion / excellent blanket performance with no or very little issues, should generally work well for high coverage and photo applications.
- ☆☆ Recommended substrate: good runnability / good ink adhesion / print cleaners are generally required at a nominal frequency.
- ☆ Good substrate: acceptable runnability / acceptable ink adhesion / print cleaners are generally required more frequently.

|                              |                                                                              | ☆☆☆                                                           | ☆☆                                                                                              | ☆                                                                   |
|------------------------------|------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
|                              | Measurement                                                                  | Best-performing substrate                                     | Recommended substrate                                                                           | Good substrate                                                      |
| <b>Transport</b>             | Runnability                                                                  | No jam and minor issues                                       | 1 jam or minor issues                                                                           | 1 jam and minor issues                                              |
|                              | Peeling: 100% K                                                              | >90%                                                          | >80%                                                                                            | >80% at one hour                                                    |
|                              | Photo peeling: 290% K, 10 or 60 minutes                                      | >80% after 10 or 60 min                                       | N/A                                                                                             | N/A                                                                 |
| <b>Blanket Compatibility</b> | Performance evaluated when utilizing a mature blanket<br>Blanket performance | No transfer defects and no Picking above the limit is allowed | Cleaner pages were able to remove all Transfer defect and reduce the picking to below the limit | After cleaning small transfer defects and picking are still visible |

**Certification Validity**

This substrate is certified for the next two years from the date of evaluation, provided there is no change to the paper properties or production processes. At the end of two years from the original evaluation date, if there have been no changes in paper properties or production processes, the certification can be extended for another two years. After four years from the original certification date, a new certification is required.

