Meemoo: glass plates digitization
GIVE

Request for Quotation *(Openbare procedure voor diensten)*

Background document v1.0

English translation

meemoo
VLAAMS INSTITUUT VOOR HET ARCHIEF

Europese Unie

EFRO
EUROPEES FONDS
VOOR REGIONALE
ONTWIKKELING

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1. Digitization by meemoo

1.1. Vision

Good digitization offers an answer to the classic challenges related to dissemination and conservation. On the one hand, part of the Flemish heritage is threatened by conservation problems such as the physical deterioration of the carriers. If we want to save this part of our heritage, we need to digitize it. On the other hand, digital dissemination of content offers many new possibilities. Therefore, it is necessary that there is sufficient digital content available. Today that content is digital born, but analog content from the past still needs to be digitized. This also counts for large parts of the **Flemish glass plates collections.**

1.2. Meemoo and its partners

Digitization of heritage is a technical and expensive challenge. The influence of both factors can be significantly reduced by centrally coordinating the operation and thus achieving economies of scale. Meemoo takes on this role by bringing different parties together, launching digitization tenders and leading the digitization projects itself.

Meemoo believes that mass digitization can go hand in hand with high quality, and emphasizes the importance of professional and transparent project management and good communication and understanding between all parties involved. The following are the parties involved in meemoo's digitization projects:

- The content partners
- The service provider

1.2.1. The content partners

The curators of the Flemish cultural heritage, the content partners, are - as it were - meemoo's customers. Meemoo offers them digitization, sustainable storage and access. Meemoo also initiates dissemination initiatives with their content, always fully respecting the ownership, copyright, commercial or ethical rights of the materials. Meemoo leads this digitization project for them, but the content providers retain all rights on the material. Meemoo, therefore, takes a commitment and has a responsibility towards them. When choosing a digitization partner (service provider), meemoo will take this responsibility into account by extensively involving the content providers in the decision-making processes and by opting for a high-quality quotation.

This digitization project of glass plates involves **30 content partners** (see Chapter 2.5 for the full list).

1.2.2. The service provider

The executor(s) of the digitization, usually designated via a tendering procedure.

2. The project

2.1. Context of the glass plates project: GIVE

The digitization of the Flemish glass plates, which meemoo will carry out, is part of the **GIVE project**. GIVE stands for *Gecoördineerd Initiatief voor Vlaamse Erfgoeddigitalisering* (Coordinated Initiative for Flemish Heritage Digitization) and concerns the concrete implementation of the resources provided for the digitization of collections within the recovery plan Vlaamse Veerkracht (Flemish Resilience) and is realized with the support of the European Regional Development Fund.

In doing so, meemoo kept various objectives and preconditions in mind:

1. A broad and substantial impact: we involve partners from the broad cultural landscape and ensure that the results of the various processes benefit a broad group of organizations and users.
2. A coordinated approach and implementation: we opt for a limited number of aspects with central coordination to guarantee uniformity and quality. We, naturally, work together with relevant actors from the field and outsource services where possible and opportune.
3. A one-time investment with a long-term impact on collection reuse: the recovery tools provide a one-time acceleration, but the results are aimed at long-term reuse. At the same time, we keep in mind that the current investments do not have too much of an impact on the operating resources in the long term.
4. Realistic and feasible within the stipulated period: we spread the preparation efforts over time and over different partners, we ensure that the scope remains manageable and that the estimated quantities are in line with the available budget.
5. An end-to-end vision: we should not consider the digitization of an item (the conversion of a physical carrier into a digital file) as a one-time, separate action, but as part of a larger chain. The digitization of collections starts with identification, selection, packaging, … but also includes the long-term preservation, metadata and dissemination. Which is why we also foresee actions and solutions for these aspects.

Next to the digitization of glass plates, the GIVE project also focuses on 3 other aspects[1]:

- Digitization of 630.000 newspaper pages
- Digitization of Flemish masterpieces
- Enrichment of metadata via AI

2.2. Scope of the glass plates project

In the context of the GIVE project in which material from the Flemish heritage collections is digitally made available and accessible, this project aims to realize a large-scale **digitization of approximately 170.000 historical glass plates** of 30 different Flemish institutions.

The above mentioned scope must be met within the limits of the budget and timing set by meemoo's Board of Directors and approved within the 'Vlaamse Veerkracht' plan of the Flemish Government. Furthermore, the full agreement and cooperation of the custodians of the carriers, the so-called content partners, is necessary. For this project the group of content partners involved consists of about thirty cultural heritage organizations (cfr. fig. 1).

[1] The three aspects mentioned fall outside the scope of this tender.

2.3. Phases of the project

PHASE 1: PROJECT PREPARATION - June 2021 to January 2022
This phase includes i.a the preparations for the logistical process, the inventorization, the expansion of the tooling, the purchase of packaging materials and research into the digitization specifications.
PHASE 2: TENDER - August 2021 to June 2022
In the second phase the tender procedure takes place to find the suitable digitization partner. In preparation we perform market research, refine the digitization specifications and write the tender documents that will then follow the legal procedures.
PHASE 3: PREPARATION OF THE MATERIAL - January 2022 to March 2023
Next, a final inventory is made up and the content partners start with the registration and packaging of the individual glass plates. This phase begins some months before the start of the digitization so there will always be a sufficiently large amount of material ready for digitization.
PHASE 4: DIGITIZATION & DELIVERY FILES - June 2022 to September 2023
In phase four, we begin the actual digitization and the creation and delivery of the digital files. As always, we start with a test and pilot phase before starting the production phase. Once the production phase is underway, the digital files will be delivered regularly and meemoo will perform quality checks on them. To this end, meemoo will set up a quality control process.
PHASE 5: INGEST, DISSEMINATION, COMMUNICATION - July 2022 to December 2023
In the final phase of the project, the (approved) digital files are ingested into the meemoo storage infrastructure and content partners are given access to the digitized images. This way we prepare for the dissemination and re-use of the materials.

2.4. Description of the collection

In 2021 meemoo conducted an inventorization to focus the scope of this project. This inventorization mainly focussed on numbers. Through several visits to collections, we gained a better understanding of the diversity within the collections.

In general, we understand glass plates to be:

- glass negatives
- glass positives ('glass slide films')
- lantern slides
- stereo plates (negative or positive)

And NOT:

- slide films framed in glass

- leaded windows or comparable non-photographic glass objects

The great diversity in the collections mainly concerns the following aspects:

- Format versions (negative, positive, stereo, lantern slide)
- Color vs. black and white
- Conservation condition
- Dimensions (from 45 x 45 mm to 300 x 400 mm)
- Presence of attached labels
- Packaging method

To give an idea of the diversity in the collections we attach a **Photo guide** to this document (see Annex 2).

2.5. Content partners involved

There are around thirty content partners, spread across Flanders, involved in this project. The number of glass plates per collection presented for the project varies strongly.

The numbers in the list below (Fig.1) are based on the **estimations** made by the curators of the collections and, thus, may deviate slightly from reality.

NAME ORGANISATION	ORGANISATION TYPE	LOCATION / REGION	# GLASS PLATES
ADVN	Archive	Antwerp	4200
Amsab-ISG	Archive	Ghent	10.500
Bakkerijmuseum	Museum	Veurne	10
Cultureel Erfgoed Annuntiaten	Archive	Leuven	202
De Wereld van Kina	Museum	Ghent	8000
Departement Mobiliteit en Openbare Werken (Vlaamse Overheid)	Government	Brussels	7500
Vlaamse Maatschappij voor Sociaal Wonen (Vlaamse Overheid)	Government	Brussels	152
DIVA	Museum	Antwerp	1750
FelixArchief	Archive	Antwerp	8795
FOMU	Museum	Antwerp	11.402
Musea Ieper	Museum	Ypres	4505
IGA Poperinge-Vleteren	Archive	Poperinge	8225
Industriemuseum	Museum	Ghent	2370
Jenevermuseum	Museum	Hasselt	10
Kasteel van Gaasbeek	Museum	Brussels	63

Letterenhuis	Museum	Antwerp	4452
Liberas	Archive	Ghent	347
MAS	Museum	Antwerp	2283
MoMu	Museum	Antwerp	220
Musea Brugge	Museum	Bruges	630
Museum Plantin-Moretus	Museum	Antwerp	1618
NAVIGO-Nationaal Visserijmuseum	Museum	Koksijde	3
Speelgoedmuseum Mechelen	Museum	Mechelen	863
Stadsarchief Brugge	Archive	Bruges	4100
Stadsarchief Ieper	Archive	Ypres	3000
Stadsarchief Kortrijk	Archive	Kortrijk	6500
Stadsarchief Mechelen	Archive	Mechelen	21.571
Universiteitsbibliotheek Gent Bijzondere collecties	Library	Ghent	46.400
Universiteitsbibliotheek Antwerpen Bijzondere collecties	Library	Antwerp	4200
Vlaams Architectuurinstituut	Archive	Antwerp	1499
TOTAL			**165.370**

Fig. 1 – Content partners involved in this tender, with an estimated number of glass plates.

3. Business case: The digitization process from start to finish

Below is outlined how the digitization process should in theory take place from start to finish, to clarify to the candidates in which stages and in what context the work of the tenderer (in this case: service provider) will take place. After the awarding of the contract,this process will be further optimised in consultation with the service provider.

3.1. In situ vs. ex situ digitization

Meemoo wishes to digitize about a third of the material provided in situ, i.e. on-site at the content partners organisation. Around two thirds of the glass plates will be transported to the service provider (by the service provider themself) to be digitized (ex situ). The ratio is as follows:

- in situ: the glass plates of Universiteitsbibliotheek Gent (approx. 46.600 glass plates) and FOMU in Antwerp (approx. 11.402 glass plates)
- ex situ: the remaining approx. 112.000 glass plates, divided over 28 content partners.

It is therefore necessary that, in addition to the digitization infrastructure at the service provider, a mobile digitization studio should also be deployed on-site at two content partners (Ghent and Antwerp). Both cases follow the same timeline (cfr. Chapter 4.9).

Meemoo strives for a process sequence that is as similar as possible for both digitization cases. The steps outlined below apply to both the in situ as well as the ex situ digitization. In case of a deviation from the general process for either type of digitization, this is explicitly mentioned.

3.2. Registration and identification

All carriers to be digitized (in situ and ex situ), are registered and numbered at and by the content partner. In particular, this means that they receive a barcode per individual item, and that per glass plate a number of physical, technical and substantial characteristics are included in the registration database provided by meemoo. The content partner carries out this work, but meemoo facilitates it by providing a registration database, clear instructions, barcodes, etc.

For the larger collections, meemoo offers help in the form of paid interns. Where possible, the registration uses existing data from the collection management system of the content partners and the information collected during the first inventorisation fase.

To ensure the localization and identification of each glass plate happens smoothly, each collection box (a box which contains x number of glass plates) also receives a barcode.

The collected registration data will be delivered to the service provider by meemoo in a structured format at the time when they collect a batch of carriers.

3.3. Packaging

All carriers to be digitized and which are offered for ex situ digitization, will be packaged at and by the content partner in a way which ensures that the carriers can be safely transported. This can, for instance, happen in one of the following ways:

- In at least one four flap folder, polyester cover or acid-free paper per carrier (= primary packaging) and subsequently in a cardboard collection box (= secondary packaging), or;

- cushioned and secured in the original collection box such as e.g. a closed wooden container with partitions in which the glass plates cannot move during transport.

We refer to the photo guide in Annex 2 for a sketch of a number of possible packaging situations.

For the carriers that are to be digitized in situ, and which therefore only need to endure internal transport, the choice of repackaging them lies with the content partner. In any case, these glass plates and their collection boxes must also receive a unique barcode for identification and a basic registration should be mentioned.

3.4. Transport of the carriers to the Service Provider

The various transports and their content are planned by meemoo in collaboration with the content partners and the service provider, this way the content partners are always aware of when the carriers will be picked up, where their carriers are and when they can be expected back. The transport of a number of carriers to the digitization infrastructure, both for the ex situ as well as for the in situ flow, is referred to as a batch. The number of carriers of one content partner within that batch is referred to as a shipment

3.4.1. External transport (ex situ)

The packaged carriers are placed in safe transport containers by the service provider together with the content partner and a meemoo employee and are then loaded onto the means of transport of the service provider.

Within the container, the carriers are also provided with extra protection against sliding and shocks. The material used for this protection, as well as the containers themselves, are provided by the service provider. When the carriers (or the shipment) leave the content partner's storage facilities, the content partner adjusts the status of the shipment in the registration and logistics database.

3.4.2. Internal transport (in situ)

The internal transport in case of in situ digitization is carried out by the content partner, but scheduled in cooperation with meemoo and the service provider to guarantee a constant delivery of materials to be digitized. In this case, we also refer to a batch and a shipment. Here, transport containers are not used, instead the content partner provides the internal transport and the mode of transport to transport the glass plates to and from the digitization studio. When the carriers leave the content partner's storage facilities, the content partner adjusts the status of the shipment in the registration and logistics database.

3.5. Storage of the carriers on-site

Before and after the actual digitization the carriers will be stored in a space suitable for storing these delicate materials.

3.5.1. Storage at the service provider (ex situ)

The glass plates are stored in a specially designated space at the service provider's facilities. This space has a constant climate (18°C / 30-40% RH, with low fluctuations) and is secured in order to prevent unauthorized persons from getting access to the space.

3.5.2. Storage at the content partner (in situ)

The storage of the glass plates which are to be digitized in situ, takes place in the depots of the content partners involved.

3.6. Pretreatment

Each glass plate to be digitized is dusted when dry before the digitization by the service provider. The dusting of the glass plate takes place with the utmost care and attention and is preferably planned in the process right after unpacking the carriers and immediately before the digitization.

Any other pretreatment (such as damp cleaning or repairs) is not asked of the candidate.

3.7. Digitization

When the carriers arrive at the digitization infrastructure, the service provider adjusts their status in meemoo's registration and logistics database accordingly. This goes for both the digitization in situ as well as for the digitization at the service provider's facilities (ex situ).

The service provider digitizes the material according to the agreed standards and formats as stated in the tender. Furthermore, the service provider also creates metadata XML files needed for the logistical follow-up, long-term storage, quality control and dissemination. He, hereby, gains access to the data gathered and recorded about the carriers during registration at and by the content partner, identification is possible through the barcoding.

The space where the digitization takes place must meet the minimum requirements set by meemoo. This in order to guarantee the most qualitative digitization possible.

3.8. Transport of the carriers: way back

3.8.1. External transport (ex situ)

The service provider returns the carriers in the same packaging to the place where they were collected. When the carriers leave the digitization infrastructure, the service provider adjusts the status of the shipment in meemoo's registration and logistics database accordingly. The various transports are planned by meemoo in collaboration with the content partners and the service provider, in order that the content partners are always aware of where their carriers are and when they can be expected back. When the carriers arrive at the content partner's repository, the content partner adjusts their status in the meemoo registration and logistics database accordingly.

The return transport is organised in the same way as the outward transport.

3.8.2. Internal transport (in situ)

The content partner where the digitization takes place is responsible for the internal return transport of the carriers to their storage location. This happens in agreement with the service provider and in the same way as the outward transport.

3.9. Quality control of digital files

The service provider performs a quality control on each of the files created to check if it meets the technical specification imposed by meemoo, and delivers to meemoo the required data. Additionally, the service provider delivers the data of the imposed targets at the beginning of each new workshift, and shots of the requested targets.

Meemoo, in turn, performs a second exhaustive quality control, and delivers the feedback of this to the service provider. This quality control takes place before the actual ingest.

3.10. Transport of the files to meemoo

The service provider delivers to meemoo, providing their approval after the quality control, all files according to the agreed procedure and timing and in the agreed location (both the image files (or essence files) and the XML files). Meemoo initially checks all these files for their presence. The service provider also stores all files on its own servers as a backup for six months. After these six months, the service provider will destroy all backup copies of the files.

In case meemoo notices any mistakes in the digitization during the internal quality control (which cannot be attributed to the present state of the carrier), the digitization is performed again or the file is redelivered correctly. The authority to approve the files always lies with meemoo and happens in agreement with the content partners and the advising partners.

3.11. Ingest of the digital files

Meemoo transfers the files to its own storage infrastructure. The quality control and file validation procedures are performed using the data delivered by the service provider, before the ingest on meemoo's storage infrastructure. After the ingest content partners can consult the digital files themselves in meemoo's archive system.

3.12. Addition of the metadata

During the basic registration, descriptive metadata is optionally included when present or when possible for the content partner to quickly deliver the metadata. This metadata, as well as the technical metadata, completes the whole process up to the ingest in the meemoo infrastructure. After ingest, the digital files can if necessary be further annotated in the provided metadata fields of meemoo's Media Asset Management-system (MAM).

4. General and technical project approach

4.1. Overall project management

4.1.1 Insurance of the carriers

As minimum requirement ME01: the carriers must be insured during these processes against loss and/or damage by his doing. The tenderer must demonstrate an insurance value of at least €10 per carrier, or a total insurance value of €200.000 for the total quantity of carriers from this project that is simultaneously present at the service provider's location. The evidence must be provided per contract.

To clarify VD01, more details must be provided about the insurance and the way in which the carriers are insured against loss and/or damage during the processes.

4.1.2 Project and process management

The tenderer must thoroughly explain in his tender how he wishes to approach the general project management of the digitization project and what quality guarantees he gives in this regard. Since the material may be protected by ethical, commercial and copyright laws, the tenderer must also exercise particular vigilance in this regard.

The applicant should indicate:

- **as minimum requirement ME02**: meemoo can visit the digitization infrastructure during working hours, without prior notice.
- **as minimum requirement ME03**: he has a procedure for urgent requests ('urgent request procedure'), whereby a digitized file of the requested carrier can be delivered via an FTP connection within two working days. Meemoo emphasizes that this procedure will only be invoked in exceptional cases, with a maximum average of 1 time per month, measured over the entire project duration.
- **as minimum requirement ME04:** a one-to-one structure is set up for consultation between the project leaders on both sides. This means that a project manager is appointed on the part of meemoo and the applicant, through whom all communication takes place. Meemoo prefers as few changes between project managers as possible. In case of changes, meemoo must be informed at least two weeks in advance.
- **as minimum requirement ME05**: the project manager at the service provider provides proof of at least three years of experience in project management via strict project methodology, by means of an attached curriculum.

  To clarify VD05, specifications can be given in the answer about how the communication between the project managers will be structured, in particular about the proposed communication channels, consultation rhythm, fixed agenda items and such.

Before the start of the actual digitization, meemoo wishes to thoroughly test all steps in the process in collaboration with the service provider. Therefore, the tenderer must show:

- **as minimum requirement ME06:** a test phase is set up prior to the pilot phase in which a small amount of newspapers successfully goes through each individual step of the process before moving on to the next step. An accompanying, non-binding description of the test and pilot phase can be found in Annex 3. During the test and pilot phase, further agreements between meemoo and the service provider are recorded in a separate document (Project

Agreements Document). These agreements shall detail, but not exceed, the terms of this Request for Quotation. The mutual approval of this document is a precondition for starting the production phase.

- **as minimum requirement ME07**: a pilot phase is set up prior to the production phase of the digitization in which a small number of test carriers successfully complete the process from start to finish, in the same way this will happen during the production phase.
- **as minimum requirement ME08**: he ensures constant monitoring and professional processing of all carriers, with respect for their cultural-historical value.
  To clarify VD08, he must explain how he will do this, and with which (software) systems. Meemoo expresses its preference for a system that is automated and specially developed for this purpose, and where error sensitivity is reduced as much as possible.
- **as minimum requirement ME09**: he will prevent the commercial rights, ethical rights (privacy) and/or copyrights of the content from being violated by allowing the material to be digitized to become public through the digitization process or related processes on his side.

  To clarify VD09, he can indicate how he will prevent this.

Meemoo wishes to remain informed of the progress of the digitization in order to also provide transparency about this to the content partners.

- **As minimum requirement ME10**: the applicant must establish a reporting routine, e.g. via an online accessible spreadsheet system in which he provides a biweekly report on the progress of the digitization. Hereby is asked to at least include the following:
  - The number of digitized carriers (and the delta since the last report)
  - The number of not digitizable carriers (and the delta since the last report)
  - Possible comments

4.1.3 Subcontracting

Meemoo accepts that part of the service may be subcontracted, subject to these minimum requirements:

- **as minimum requirement ME11:** the applicant states with the greatest transparency which part of the contract the applicant intends to subcontract to third parties, including the identity and details of these subcontractors.
- **as minimum requirement ME12:** the main contractor remains solely responsible for guaranteeing the proper execution of the contract and guarantees that the subcontracting does not create any additional obstacles in project management, logistics, quality control or in any aspect of the general project approach.
- **as minimum requirement ME13:** the main contractor always remains the responsible contact person in the communication with meemoo.

4.2. Logistics

4.2.1. Packaging

The content partners will prepare the carriers by packaging them in at least one cover (= primary packaging) per carrier, and subsequently at least one packaged glass plate per collection box (= secondary packaging). We refer to the photo guide in Annex 2 for an insight into the different possible packing situations.

If it is not possible to repackage the glass plate individually in a primary packaging, e.g. because it was delivered in its original packaging such as a wooden box or tray, acid-free flyleaves are placed between the plates during the registration to attach the unique barcodes.

Meemoo will, if necessary, replace the original packaging as present at the content partners. In this way, all packaging should be able to withstand the normal digitization actions by the service provider.

In case the packaging should still be damaged further by the service provider and must be replaced, the service provider should contact meemoo, with a view to recuperate the original packaging (which may have a documentary or artistic value) and the metadata as stated on the original packaging.

As minimum requirement ME14: after digitization the glass plates must be collected and packed in the same manner and in the same packaging as they were delivered.

4.2.2. External transport

The service provider is responsible for the transport of the glass plates from and to the content partners involved. The transport of the glass plates takes place in specially designated transport containers provided with a barcode, which are supplied by the service provider.

The preparation of the transport, specifically the loading of the container, always happens on-site together with an employee of the content partner and under the supervision of a meemoo employee.

Meemoo plans the transport date minimum two weeks in advance in coordination with the content partners and service provider. The service provider is expected to contact meemoo no less than two days before the collection to agree upon the exact hour and place of the collection. After the digitization, the carriers are redelivered to the original location where they were collected, again, at an agreed upon transport date.

The applicant should indicate:

- **as minimum requirement ME15**: that the transport is organized in such a way that the integrity of the carriers is guaranteed. Transport must take place in moisture- and shock-resistant containers according to the tenderer's proposal.

  To clarify VD15, the applicant must explain how and under which modified circumstances he will transport the carriers to the digitization infrastructure and back to where they were collected. In particular, he must provide information on at least the following aspects

  - Which vehicle is used;
  - How a constant climate can be guaranteed in the vehicle (under different weather conditions);
  - Which containers are used for transport (in which glass plates can mostly be stored shock-resistantly vertical);
  - What further measures he takes to secure the carriers and protect them from damage, loss and theft.

Multiple types of packing boxes are possible. Information on the different formats of the glass plates and the boxes can be found in the photo guide in Annex 2.

4.2.3. IIdentifying and arranging the carriers

The content partner will provide each glass plate to be digitized and the box in which the glass plates are located with a barcode, by which the service provider will be able to identify the carriers. Meemoo will also deliver the secondary files (in METS XML format) to the service provider with about twenty characteristics per carrier:

- Administrative: e.g. name of the content partner, PID, barcode of the carrier, barcode of the box, batch ID, ...
- Technical: e.g. type, dimensions, negative/positive, color or black and white, damage features, presence of a label, …

These characteristics support the logistic and digitization processes and are, therefore, of use to both meemoo, the content partners and the service provider. These data must be imported by the service provider and further completed in his follow-up software.

Per glass plate, a METS XML file is delivered by meemoo to the service provider. The naming of this XML is based on the PID (*Persistent Identifier*) of the registered glass plate; the service provider must copy this naming and keep it. The data in this list can be updated up to the moment of transport of the carriers to the service provider.

As minimum requirement ME16: the candidate is able to work in accordance with the above specified procedure (METS XML, identification via PID, etc.).

As minimum requirement ME17: the candidate respects the order of the batches and the internal order of the carriers within their boxes as delivered for digitization (on number), barring agreed upon exceptions, for the replacement and returning of the carriers after digitization.

4.3. Pretreatment

The service provider must, in a dry and safe manner, remove all dust and surface dirt for each glass plate that is to be digitized. The glass plates must always be manipulated with gloves, which preferably do not contain any rubber or latex and are also not made of cotton because of a lack of grip.

To prevent the carrier from again becoming tainted in between the dusting and the digitization, meemoo expresses a preference to perform this pretreatment and the actual digitization in immediately consecutive order.

As minimum requirement ME18: the tenderer will perform the dusting of the glass plates in accordance with the above mentioned method and with respect to the condition of the glass plate. The chosen method may not affect or jeopardise the integrity of the carrier.

To clarify VD18, the tenderer indicates the manner in which he wishes to handle this and in which step of the process this pretreatment would be carried out.

4.4. Digitization

4.4.1 General process

Meemoo attaches great importance to transparency towards its content partners and therefore strives for the clearest possible general process management within this project.

Therefore, as minimum requirement ME19: the digitization workflow and timing must be transparent.

To clarify VD19, the tenderer must indicate how long one carrier would typically take to complete the entire digitization workflow - from entering to finishing the actual digitization.

The tenderer must calculate the amount of equipment and manpower it wishes to deploy as follows. Of the approximately 170,000 glass plates to be digitized:

1. A third, originating from two different content partners (namely FOMU Antwerp and Universiteitsbibliotheek Gent Bijzondere collecties), digitized on site at the respective institutions, using a mobile digitization studio (in situ).
2. The remaining two thirds of glass plates presented for digitization to be digitized at the service provider's location (ex situ);

The service provider must therefore set up two digitization lines at the same time:

1. A digitization line that will be set up first at Universiteitsbibliotheek Gent and then at FOMU, or vice versa, for the remaining glass plates.
2. A digitization line where the glass plates of 28 content partners will be transported to the location of the service provider for digitization;

The tenderer must demonstrate:

- **as minimum requirement ME20:** that it can facilitate both in situ and ex situ digitization, also in the period when the two lines have to run simultaneously, and can deploy sufficient equipment and manpower to achieve the project goals.

  To clarify VD20, the tenderer must indicate how he wishes to deal with this, in accordance with the proposed timeline in Chapter 4.9. Timeline of the digitization project.

4.4.2 Digitization infrastructure and work environment

Meemoo imposes a number of requirements on the infrastructure used and on the layout of the space for the digitization of the glass plates.

The tenderer must take into account for all proposed equipment and layout:

- the fragility of the carrier
- different formats (dimensions) of the carrier
- different version types: negative, positive, lantern slide, stereo slide (negative or positive)
- differences in color and black and white
- any damage to the original
- labels that are attached to the carriers and need to be digitized along with it

As far as is known, this information is provided in the METS XML that is provided to the service provider in advance (see also chapter 4.7. Reporting).

As minimum requirement ME21: that the tenderer provides **digitization equipment** that meets the following criteria:

- The camera must be able to realize the minimum required resolution in one capture (minimum image in 14 bit RAW format);
- The camera must be equipped with a fixed focal length macro lens;

- The camera must be mirrorless or have mirror lock up using electronic shutter or leaf shutter to avoid mirror vibration;
- Repro mode must be used for making the shots;
- The camera should be set up parallel to the film plane;
- The object to be digitized must be perpendicular below the sensor and the objective.

To clarify VD21, the tenderer must state which camera he intends to use (brand and type).

As minimum requirement ME22: that the tenderer furnishes the **working environment** in such a way that it meets the following criteria:

- Darkened setup to prevent reflection from the camera system, the repro mode and/or the environment on the glass plate;
- Equipped with vibration-free environment;
- Avoiding heating of the glass plate, e.g. by light source;
- Equipped with a flicker-free light source (constant lighting).

4.4.3 Actual digitization

Output format

Each glass plate, independent of its physical characteristics, must be converted into a **complex object**, consisting of two image files and secondary XMLs. The creation of the complex object is discussed in more detail in Chapter 4.8. Delivery and Backup Files, and the delivery of the XMLs is described in Chapter 4.7. Reporting.

The image files (or essence files) requested are the following:

- a reproduction in **Digital Negative** as the archive master
- a conversion to **uncompressed Baseline TIFF 6.0** (16bit) as a mezzanine file

For further documentation on the file format, reference is made to the attached profiles in Annex 7 (TIFF) and Annex 8 (DNG), and to chapter 4.8.1. Delivery of the Files.

As minimum requirement ME23: the tenderer can digitize the carriers according to the **output formats and specifications** requested above (and in the annexes).

Output resolution

Given the diversity in the dimensions of the material, the service provider will have to take into account three different resolutions:

ppi	Original dimensions (range)
Min. 600	Greater than or equal to 165 x 215 mm
Min. 1200	Between 165 x 215 mm and 85 x 105 mm
Min. 1800	Less than or equal to 85 x 105 mm

Because meemoo does not yet have an overview of all possible formats that will occur when these documents are published, we have based ourselves here on a number of standard formats. In practice, some glass plates will have dimensions that do not fall within the above range. At that point, the service provider must calculate that the result should always be able to produce **at least an A3 print of at least 300 dpi,** choosing the closest of the resolutions listed above. This calculation model is further elaborated during the test phase and in the Project Agreements Document (PAD).

As minimum requirement ME24: the tenderer can digitize the carriers according to the **output resolutions** requested above.

Technical specifications

The service provider must take into account a number of general guidelines during the digitization of the glass plates. Here we list the most important **general guidelines**:

- Capture of the entire object, including edges.
- Capture in RAW with (if necessary - depending on equipment used) conversion to DNG with embedding of software settings in the DNG file itself.
- Export to uncompressed Baseline TIFF 6.0 for the creation of the mezzanine file.
- Capture at base iso.
- Fixed aperture (f/8), shutter speed dependent on the brightness of the light source.
- Control the focus on the image at (at least) 100% zoom.
- Creation of an LCC or Flatfield correction capture for each ppi standard defined within the project and its application to each capture within the specific ppi requirement (see further Chapter 4.5. Quality Control).
- Linear curve.
- Correct white balance based on technical target (see also Chapter 4.5. Quality Control).
- Exposure is determined by technical reference target with correct tonal scale (see further Chapter 4.5. Quality Control).
- For the focus, the difference in thickness between the technical target and the glass plates to be photographed is taken into account (target is on film and must always be flat).
- Validation scale, sampling efficiency, sampling frequency according to parameters.
- Minimize flare by covering the area around the object on the light box with black opaque material.
- Orient image correctly: the image is indicative for the correct orientation and not any text or labels.

As minimum requirement ME25: the tenderer can digitize the carriers according to the **general guidelines** listed above.

In addition to these general guidelines, the service provider must also take into account a number of **specific guidelines**, depending on the format version of the carrier (glass negative versus glass positive). We list these below for both format versions.

Glass negative:

- <u>General preparation and setup:</u>
  - Create a Flat Field Correction or Lens Cast Correction file and apply it to all files recorded at the same ppi;
  - Place the **ISA Film Target** (6x6 cm minimum size) in the center of the image;
  - Focus on the ISA Film Target and shoot with a fixed aperture (f/8);
  - Check the shutter speed using ISA Filmtarget analysis;

- Set saturation to 0 ;
- Check the contrast curve to obtain a correct tonal scale;
- Analysis of the file: Tone Scale (OECF curve), Resolution (Sampling Frequency and Efficiency), ppi.

- Preparation at the start of each shift or when camera height is adjusted:
  - Capture of ISA Filmtarget with settings prior to each session (part of the day/staff) with analysis and when the height of the camera is adjusted;
  - In the case of using target format 6x6 cm, and glass plates larger than or equal to format 4x5 inch: photograph the ISA Film Target both placed in the center and in the 4 corners (5 shots in total);
  - In the case of using a 4x5 inch target, and glass plates larger than or equal to 8x12 inch size, shoot the ISA Film Target both placed in the center and in the 4 corners (5 shots in total).

- Reproduction itself:
  - Capture with only transmitted light;
  - Adjustment of the height of the camera in function of the difference in thickness between film target and glass plate to be photographed;
  - Shoot according to settings validated on the basis of ISA Film Target;
  - Emulsion side faces the camera before shooting (the glass plate must NOT be on the emulsion side to avoid damage to the emulsion layer).

Glass positive and lantern slide:

- General preparation and setup:
  - Lighting and light source:
    - Main light source is the light box for transparancies. Color profile based on IT8 target is applied.
    - Additional lighting by means of 2 extra light sources (surface) arranged at 45° with respect to the object.
    - Both light sources provide an even illumination (same strength), without reflection on the glass plate.
    - The correct exposure is determined.
    - The light intensity is reduced by 1.5 stops (underexposure) from correct exposure.
    - All light sources have the same color temperature.
    - Capture of the glass slide is done in one shot with both transparent and front lighting.
  - Create a Flat Field Correction or Lens Cast Correction file and apply it to all files reproduced at the same ppi, see list for ppi to apply in chapter 'Output Resolution' here above;
  - Place the **IT8 target** in the center of the image;
  - Focus on the film target and shoot with a fixed aperture (f/8);
  - Determine the shutter speed based on IT8 target;
  - Check the internal color profile based on an IT8 target with measured reference values and correct white balance;
  - Analyze the IT8 target in function of tonal scale and color reproduction;
  - If necessary, correct the contrast curve to obtain a correct tonal scale;
  - Shoot the black and white **Film Target**;
  - Analysis of this file in terms of Resolution (Sampling Frequency and Efficiency), ppi.

- Preparation at the start of each shift or when camera height is adjusted:
  - Capture of a Flat Field Correction or Lens Cast Correction file and apply it to all files

recorded at the same ppi;
    - Capture of both film targets with correct settings;
    - In the case of using target size 6x6 cm, and glass plates larger than or equal to size 4x5 inch, shoot the film target both placed in the center and in the 4 corners (5 shots in total);
    - In the case of using a 4x5 inch target, and glass plates larger than or equal to 8x12 inch size, shoot the film target both placed in the center and in the 4 corners (5 shots in total).

- Reproduction itself:
    - Capture according to set-up with multiple licht sources;
    - Adjust the height of the camera in function of the difference in thickness between target and glass plate to be reproduced;
    - Capture according to settings validated using targets.

As minimum requirement ME26: the tenderer can digitize the carriers according to the **specific guidelines** listed above.

Damaged and incomplete glass plates

Given the fragility and age of the carriers, damaged and incomplete glass plates will also occur. We refer to the photo guide in Annex 2 for indicative figures on the damage present in the glass plate collections.

As minimum requirement ME27: the tenderer considers the following guidelines in the case of damaged and incomplete glass plates:

- Cracked glass plates: integral reproduction of the glass plate including the cracks.
- Broken glass plates (positive and negative): reconstruction of the various pieces (max. approx. 5 pieces) into a coherent whole in order to make the reproduction.
- Incomplete glass plates: reproduction of what is provided by the content partner.

Triage

As becomes clear above, the tenderer must take into account the diversity of the physical carriers offered when setting up his workflow. It will therefore be necessary to build into the general process a triage step to separate certain formats and format versions and assign them to the workflow that is set up for that type.

As minimum requirement ME28: the tenderer must incorporate this triage step in order to make the digitization process as efficient as possible.

To clarify VD28, the tenderer must explain how he will go about this, taking into account the requested output formats, resolution and specifications.

4.4.4. Post-processing

The only post-processing allowed is on the **mezzanine file** (uncompressed Baseline TIFF 6.0), and is the following, taking into account the format version of the physical medium:

Glass negative:

- Mirroring (*flip*).
- Conversion to positive.
- Cropping: this is done around the object, not inside the object, a black border between 4 and a maximum of 10%, with the object directly in the frame and the black border being the same size on all sides.
- Straightening the image (rotate): if necessary, in the correct direction of the image (not the label.
- Software settings are embedded in the DNG (master)file.
- Export to TIFF, 16bit, **Gray Gamma 2.2.**
- Auto Contrast: to compensate for over- or under-exposure of the image.

Glass positive and lantern slide:

- Cropping: this is done around the object, not in the object, a white border (positives) between 4 and a maximum of 10% with the object directly in the frame, and the white border is the same size on all sides.
- Straightening the image (rotate): if necessary, in the correct direction of the image (not the label.
- Software settings are embedded in DNG file
- Export to uncompressed Baseline TIFF 6.0, 16bit, **eciRGB.**

As minimum requirement ME29: the tenderer always uses the settings that lead to the most faithful representation of the image recorded on the carrier for the digitization, taking into account the difference in format version (negative versus positive) of the physical carrier.

4.5. Quality Control

The tenderer is expected to check the files supplied by him for completeness and quality on the basis of the requested technical requirements (see above Chapter 4.4.3. Actual digitization), and also delivers certain data that will allow meemoo to set up a quality control process.

The quality control process at meemoo will be set up in the test phase, and carried out during the production phase even before the ingest of the files on meemoo's storage infrastructure. The service provider must adjust its quality control process accordingly.

The quality control carried out by meemoo is situated in several areas:

Control of	Manner	Tool	Frequency
Completeness of supplied files	Automatically, via delivery of METS XML in registration database meemoo (see further 4.7.2.)	Registration database (AMS) meemoo	Per batch, upon import.
Visual check	Manual check of correct cropping, rotation, autocontrast, conversion pos/neg, mirroring…	Photoshop or similar	Random samples, some files per batch.
Validation SIP	Automatically, via	MAM meemoo	Per batch, upon ingest.

	Media Asset Management system		
Output format	Validation TIFF-profile, manually.	DPF manager for profile validation: **uncompressed Baseline TIFF 6.0**	Random samples, some files per batch.
Output resolution	EXIF metadata, per PID, supplied as XML in the pid.complex (see further 4.7.1.)	(XML)	Random samples, some files per batch.
Technical specifications	Based on targets (**Film target** and **IT8 target**) provided by the service provider, via shared spreadsheet.	Open Dice[2] to read the measured values.	Daily.
Evenness of lighting (and dirt on sensor)	Photo that serves as a basis for the calculation of the LCC or Flat field correction.	Photoshop or similar.	Daily.

As minimum requirement ME30: the service provider performs a quality check on every digital file created.

To clarify VD30 he must explain how he will handle this, including which software he intends to use.

As minimum requirement ME31: the service provider provides the requested targets and technical data, and that he includes in the embedded metadata of the essence files and in the captures of the test targets the date, the time and the camera (brand, type and serial number).

As minimum requirement ME32: if it is determined that the result of the digitization remains below the quality requirements defined above, the carrier(s) in question must be digitized again until the quality requirements are met. Meemoo can demand such a free redigitization up to a maximum of 6 months after the end of the project.

4.6. Equipment Maintenance

Meemoo recognizes the importance of a good condition of the digitization equipment and the consequences this has for the result of the digitization. The tenderer must be responsible for the maintenance of the equipment that he will use.

As minimum requirement ME33: the candidate provides for proper preventive maintenance of the digitization equipment he uses.

To clarify VD33, the answer should provide more details on how he provides for the preventive maintenance of the digitization equipment he uses.

[2] In the Project Agreements Document (PAD) will be agreed on the version used.

4.7. Reporting

Meemoo wants to provide high-quality digitization for its content partners and therefore wishes that clear and detailed information is kept on carrier level about how the digitization and associated activities are progressing. This information is collected as follows:

1. Just before the (internal or external) transport of the carriers to the digitization infrastructure, meemoo provides the service provider with a METS XML file per carrier with data from the registration.
2. The service provider uploads the data from this file into its own monitoring system.
3. During the digitization, the service provider further supplements the data for each carrier, with data about the process steps and the results of the pre-treatment and digitization. This is done in the fields and required terminology suggested by meemoo. For this we base ourselves on the PREMIS standard.
4. After the digitization, the service provider returns this data (in the form of supplemented METS XML in PREMIS files) to meemoo.

The tenderer must provide this information to meemoo after completion of the batch in two ways:

- per carrier for ingest: see further chapter 4.7.1. Carrier level reporting
- per batch for an update of the registration database of meemoo: see also chapter 4.7.2. Batch level reporting

The tenderer must take the implementation of this report into account in its tender. Meemoo assumes that approximately 10 man-days will be needed to enable and fine-tune this reporting.

4.7.1. Carrier level reporting

For each carrier, the service provider supplements a METS XML file with metadata from the digitization. After digitization, this METS XML file, together with the created essence files, is delivered to meemoo. The service provider starts from the METS XML file that has already been partially filled in by the content partner with content and technical carrier-specific metadata.

As a guiding, but non-binding example, the file 'METS XML after registration' is attached as Annex 4 with:

- fields filled in with sample data from the registration.
- empty fields provided for entering reporting data.

The service provider then completes this METS XML file for each carrier.

The tenderer must, as minimum requirement ME34, collect the following technical metadata of the created files in the METS XML provided by meemoo (see <mets:fileSec> in Annex 5):

- Filename (with extension)
- MD5 checksum

The tenderer must, as minimum requirement ME35, collect the following preservation metadata per carrier in the METS XML supplied by meemoo (according to the PREMIS standard):

- Identification: date, result and possible comments (positive/negative, color/black and white).
- Inspection: date, result and possible comments.
- Cleaning: date, result and possible comments.
- Digitization: date and time, result and possible comments.
- Digitization Equipment (camera): make, model and serial number.
- Transcoding: date, result and possible comments.
- Validation: date, result and possible comments.
- Quality control: date, result, performed by and possible comments.

To clarify VD35, it must be indicated in which way the tenderer will produce the METS XML in PREMIS and on which additional parameters he can still report.

It is important that meemoo and the content partners thus gain a clear view of the processing and digitization and all the attempts that have been made, **even for the carriers whose digitization has not been successful (e.g. out-of-scope carriers)**.

By way of a guiding, but non-binding example, the file 'METS XML after digitization' has been added as Annex 5 with:

- fields filled in with sample data from the registration.
- fields filled with reporting data from the service provider.

In summary, the tenderer must, **as minimum requirement ME36,** provide meemoo with one METS XML file per carrier containing:

- the data provided in advance by meemoo from the registration.
- the technical metadata as stated above.
- the preservation metadata as mentioned above.

The tenderer must, as minimum requirement ME37, in addition to the METS XML, also collect embedded EXIF metadata per carrier in a separate XML document.

4.7.2. Batch level reporting

In addition to the METS XML files that are provided per carrier in the SIP, meemoo must also receive the METS XML files at batch level in order to update the registration database.

As minimum requirement ME38, the tenderer must provide meemoo (by e-mail) with one ZIP file per batch containing all the separate METS XML files of the carriers belonging to that batch. Meemoo also needs an enriched METS XML for the glass plates that could not be digitized, with data from the digitization process.

4.8. Delivery and Backup File

4.8.1 Delivery of the files

Meemoo requests that the above report (METS XML and EXIF XML), together with the essence files, be supplied by the service provider in a so-called **Submission Information Package (SIP)**. All files belonging to this SIP are packaged in a complex object (or a zip file). Meemoo requests one complex

object per supplied glass plate that has been successfully digitized and that contains the following information:

Complex object	First level	Content folders	Explanation
pid.complex			zipped file package with extension .complex
	pid_mets.xml		in the **root** of the pid.complex
	/dng		folder or directory of files related to the master file
		pid_dng.dng	master file without post-processing
	/tiff		folder or directory of files related to the mezzanine file
		pid_tiff.tiff	mezzanine file with post-processing
		pid_tiff_exif.xml	XML file with EXIF data export

The tenderer must supply, as minimum requirement ME39, per carrier, of which the digitization is successful, the above SIP or pid.complex.

After the digitization, the digital files (i.e. the SIP) must be delivered to the **meemoo FTP server**. Meemoo has set up a special routine for this. Meemoo will upload the files (after quality control) in its own storage infrastructure and store them sustainably via its management system and make them available to the content partners.

The delivery of the files on the FTP server of meemoo is performed by the service provider, in the folder structure set up by meemoo for this purpose. The details of this will be discussed during the test phase and will be included in the Project Agreements Document (PAD).

As minimum requirement ME40: the tenderer can work in accordance with the above method.

4.8.2 Temporary backup of the files

For security reasons, meemoo asks the service provider to keep a backup copy of all files for a certain period of time, starting from the delivery of the files to meemoo.

After digitization, the tenderer must:

- **as minimum requirement ME41:** save a backup copy of all files for six months from the submission of the files to meemoo. After these six months, the tenderer will destroy all backup copies of the files.

- **as minimum requirement ME42:** this backup copy can be delivered to the meemoo FTP server at no cost to meemoo within four business days of requesting meemoo. Any necessary changes to the metadata cannot be a reason for meemoo to pay additional costs.

4.9. Timeline of the digitization project

As an indication, the planned timing that meemoo wishes to adhere to is given below:

13.06.2022: Initial consultation with service provider.

14.06.2022: start of the test phase (ex situ).

11.07.2022: start of the pilot phase (ex situ).

25.07.2022: start of the production phase (ex situ).

19.09.2022: start of the test phase (in situ).

03.10.2022: start of the pilot phase (in situ).

17.10.2022: start of the production phase (in situ)

30.09.2023: end of the production phase (in situ and ex situ).

As minimum requirement ME43: the tenderer can terminate the assignment within the set time limits and subject to force or delays caused by meemoo.

The service provider is allowed to propose a faster schedule, but meemoo clearly states that this can only be accepted on the condition that the pace of the registration at the content partners, the availability of the rooms and the staff at FOMU and Universiteitsbibliotheek Gent for the in situ digitization and the budget planning of meemoo allow this.