



Guidelines for Measuring the Weight of Industrial Roundwood

Publisher and owner >

FHP Cooperation Platform Forest Wood Paper

A -1030 Vienna > Marxergasse 2/4 floor > www.forstholzpapier.at

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Approved by: FHP Working Group “Factory Receipt of Industrial Roundwood” Date: 31 Oct. 2014

Published: 10 Nov. 2014

Effective: 01 Jan. 2015

Graphics >

www.creativstudios.at



Printed on PEFC certified paper. PEFC provides evidence that the raw materials used come from sustainably managed forests.
www.pefc.at - Printing: Print Alliance HAV Produktions GmbH

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1 Scope

This FHP Guidelines regulate the procedure for determining the billing measure of industrial roundwood by weight in Austria. These replace the FPP Guidelines from 1994 and are legally valid as of 1/1/2015.

2 Reference Documents

The following reference documents are essential for the application of these guidelines and are valid in the current applicable version:

ÖHU	Austrian Timber Trade Practices
MEG	Weights and Measures Act

3 Terms and Abbreviations

Gross weight: mass of the timber in the state of delivery including vehicle or railway wagon mass

Tare weight: mass of the empty vehicle or railway wagon

Net weight (G_{netto}): mass of the timber in the state of delivery without vehicle or railway wagon mass

ATRO weight (G_{atro}): mass of the bone-dry wood of a load

Dry content (TG): percentage of bone-dry wood in the chip sample after completing the drying process

Mass constancy: dry content (%) of a sample must not change by more than 0.2% when heated for a further 120 minutes (drying cabinet) or 5 minutes (hot air oven) at $103^{\circ}\text{C} \pm 2^{\circ}\text{C}$ beyond the selected minimum drying time.

Delivery vehicle: lorry, trailer, semi-trailer, railway wagon

Long wood: according to ÖHU (industrial wood)

Short wood: according to ÖHU (industrial wood)

FMM: cubic metres, delivered with bark, measured and invoiced with bark

FMO: cubic metres, delivered with bark, measured and invoiced without bark

FOO: cubic metres, delivered without bark, measured and invoiced without bark

AMM: ATRO weight, delivered with bark, measured and invoiced with bark

AOO: ATRO weight, delivered without bark, measured and invoiced without bark

Ballast (B): non-wood mass (e.g. snow, coal, stones, metal, etc.)

4 General Requirements

4.1 Receiving Staff

The independent receipt of industrial wood must be carried out without exception by staff who have passed a positive examination at an inspection body accredited for these guidelines.

After these guidelines have entered into force, new staff members must attend a seminar for weighers at the competent State Office of Weights and Measures for determining the gross and tare weights in-house. Provided that these people are exclusively entrusted with weighing, no additional verification by the accredited inspection body is required.

The responsibilities defined above shall be documented within the company and the associated certificates of competence shall be archived for inspection by the controlling body.

4.2 Scales

4.2.1 Weighbridge

Determining the gross and tare weights may be carried out within the company on a non-automatic static or dynamic scale, provided that at least the following requirements are met:

- valid calibration
- accuracy class III
- calibration value $[s] \leq 50 \text{ kg}$

With regard to the use, it should also be noted:

- the scale must always be kept clean and clear of snow
- the scale must swing freely

- the tare setting must be checked before anything is weighed
- the delivery vehicle must be positioned completely and as centrally as possible on the scale

All the above requirements shall be ensured in the same way as in the case of **off-site weighing** on a non-public scale. If, on the other hand, off-site weighing is carried out by a public weighing institution, it is sufficient to provide evidence that the defined requirements regarding calibration obligation, accuracy class and calibration value are met.

4.2.2 Analytical Scales

For determining the dry content, analytical scales shall be used which must fulfil the following requirements:

- valid calibration
- accuracy class II
- calibration value [s] ≤ 0.1 g

With regard to use, it should also be noted:

- the scale should be installed horizontally
- low-vibration base
- the zero point should be checked before each weighing

4.3 Devices for Taking Samples

Either motorised chain saws or chain milling machines can be used to remove the chip samples.

The saw chain must be sharp and tensioned evenly, with priority being given to the manufacturer's instructions for use concerning the type of tension.

A chip catcher shall be permanently and stably attached to the sampling device. The collection device must be

designed in such a way that the largest possible proportion of the chips can be collected, regardless of the cutting angle.

The maximum reachable depth of the cut, based on the blade length and type of chip catcher, must be sufficient to cut all accepted logs to the pith compliantly¹.

¹ The maximum diameter up to which logs are accepted using these guidelines is to be defined by the respective factory. This diameter shall be disclosed to the seller as well as to the supervising body.

4.4 Drying Equipment

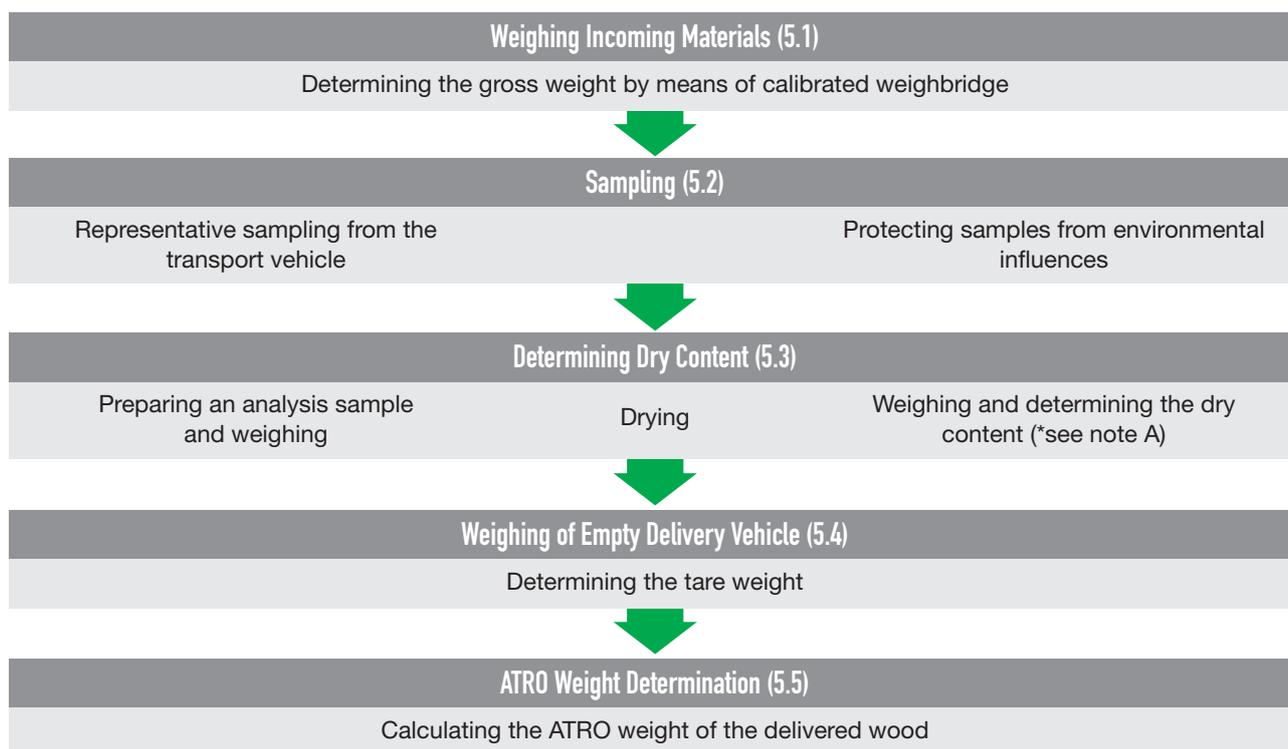
Drying shall be carried out in accordance with EN 13183-1 (2004) using a drying cabinet with free internal air circulation in which a constant temperature of $103\text{ °C} \pm 2\text{ °C}$ can be maintained. Drying containers made of corrosion-resistant and heat-resistant material must be used.

As an alternative to the drying cabinet (reference method), a hot air drying oven can be used. During this process, a chip sample is dried in the unit at a constant temperature of $103\text{ °C} \pm 2\text{ °C}$ by means of hot air flow in a closed metal container.

Adherence to the temperature limits must be checked daily during operation using a maximum thermometer and the results must be documented. If not used for a longer period of time, the drying cabinet or the hot air drying oven needs to be checked before using it again.

Aside from the two methods mentioned above, other methods of drying may also be used, provided that the receiving factory can demonstrate to the accrediting inspection body that these methods have a comparable accuracy.

5 Weight Measurement Procedure



> **Note A:** Weighing and determining the dry content, as shown in the diagram, only takes place before weighing the empty delivery vehicle (5.4) if drying is carried out by means of a rapid dryer (e.g. hot air dryer). In the case of drying by means of a drying cabinet, weighing the empty delivery vehicle always takes place before the analytical sample is weighed out and the dry content is determined.

> **Note B:** If there are deliveries from more than one supplier on a delivery vehicle, the weight measurement process steps shall be carried out separately for each of these deliveries.

5.1 Weighing Incoming Materials

Weighing incoming materials is used to determine the gross weight. The requirements according to 4.1 and 4.2.1 must be observed here.

The following is also to be observed:

- the same persons must be in the vehicle for weighing incoming materials and the unloaded delivery vehicle.
- larger snow accumulations are to be mostly removed before weighing
- snow accumulations that cannot be removed are to be estimated by the receiving staff (stated in cubic metres) and taken into account in accordance with 5.5 when determining the gross weight.

5.2 Sampling

Samples can be taken either **directly** from the delivery vehicle or **after unloading**. If the type of loading does not allow sampling from the delivery vehicle in accordance

with the guidelines, the samples shall be taken after unloading.

5.2.1 Selection of Sample Logs

5.2.1.1 Taking samples from delivery vehicle

The cut can be made on one or both sides of the pile (on the side or on the top of closed freight wagons). If only one pile side of the delivery vehicle is to be sampled the vehicle side selected for this purpose shall be the same for all piles to be sampled. If the delivery vehicle is to be sampled on both sides, all piles to be sampled shall be sampled on both sides in accordance with the requirements described below.

The cutting area, in which all logs without exception are to be cut according to 5.2.2, comprises at least 2/3 of the pile height in the case of one-sided sampling, and at least half the pile height in the case of two-sided sampling.

The minimum number of piles to be sampled for delivery by **lorry** is:

Longwood: with 2 – 4 piles, at least 2 piles

Short wood ^{1, 2}: every second pile of a delivery

The minimum number of piles to be sampled for delivery by **railway wagons** is ^{1, 2, 3}

(per railway wagon):

with 3 – 5 piles, at least 3 piles

with 6 piles, at least 4 piles

¹ If the number of piles is odd, round up.

² Piles are to be cut alternately (if possible in accordance with the guidelines).

³ The regulation applies to short and long wood.

5.2.1.2 Taking Samples After Unloading

When taking samples after unloading, at least 10 logs from each pile of a delivery shall be sampled for long wood deliveries. For short logs, at least 15 logs shall be sampled from every second pile of a delivery ^{1, 2}.

¹ If the number of piles is odd, round up.

² Piles are to be cut alternately (if possible in accordance with the guidelines).

5.2.2 Cutting Line

The individual cuts are to be made along a line in the longitudinal centre of the wood pile. In this regard, logs in the cutting area may not be omitted unless a cut that adheres to the guidelines is not possible.

If a central cut is not feasible, a minimum distance of 50 cm (long logs) or 25 cm (short logs) from the end of the log must be maintained.

The cutting area must be free of ice or snow.

The above regulation also applies in the same way for taking samples after unloading.

5.2.3 Cutting the Sample Logs

Half log cross-section using motorised chain saw (standard method)

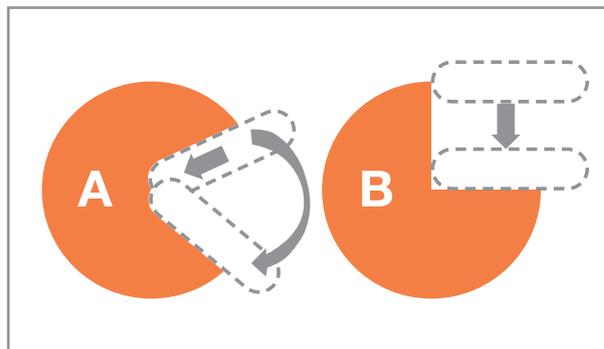
- Cut into half of the log cross-section to the pith
- Scope of application: standard method for removal using a motorised chain saw

Cutting in sections using a motorised chain saw

- Possibilities for carrying out a sectoral cut:
 - **Pierce** to the pith and pull downwards (A) (= circular segment) or

- **Make** the cut from above and remove one quarter (B)

- Scope of application: permissible for logs with a diameter of more than 30 cm



> Cutting in sections

Cutting in sections using a chain milling machine (standard method)

- section-shaped piercing using a chain milling machine to the pith
- Scope of application: standard method for removal using a chain milling machine

As an alternative to the standard method, logs, e.g. those with very small diameters, can also be cut completely.

In the case of deliveries with very different log diameters, all of the above variants can be applied, whereby the standard method should preferably be used.

5.2.4 Handling Samples

The sample must be immediately protected from drying out, becoming moist or contaminated and labelled in such a way that it can be clearly assigned to the transport vehicle, supplier and delivery note.

Checks going beyond this (retention samples) require a separate agreement. Proper handling and storage of the retention samples by the supplier must be ensured.

5.3 Determining Dry Content

Preparing samples: the fresh weight determination (g_w) of the sample has to be done immediately after sampling. The entire sample of each delivery is to be mixed well.

Weighing incoming materials: at least 100 g of chips shall be taken from this mixed sample and weighed. It is to be ensured that the sample cannot be increased or decreased once the fresh weight has been determined.

Drying: the drying process should be started as soon as possible, at the latest by the end of the working day. The sample shall be dried at $103\text{ °C} \pm 2\text{ °C}$ until mass constancy. However, a minimum drying time of 8 hours in the case of a drying cabinet or 10 minutes in the case of a hot air drying oven must be observed in any case.

Weighing the dried samples: the chip samples are to be taken from the hot drying cabinet/hot air drying oven in order to determine the dry weight (g_o). Samples should not be allowed to cool before weighing them.

It has to be ensured that the weighing cup does not falsify the measurement result.

Determining dry content: the dry content (TG) is calculated with the following formula:

$$TG = \frac{g_o}{g_u} \times 100$$

TG	... Dry content [%]
g_o	... Dry weight (weight of dried samples) [g]
g_u	... Fresh weight (weight of incoming materials) [g]

5.4 Weighing of Empty Delivery Vehicle

The weight of the empty vehicle is used to determine the tare weight. The requirements according to 5.1 and 5.2.1 must be observed here. As well as this, the receiving staff must be sure that the delivery vehicle has been completely emptied.

5.5 Determining the ATRO Weight

The ATRO weight of a wood delivery is calculated according to the following formula:

$$G_{atro} = \frac{(G_{net} - B) \times TG}{100}$$

G_{atro}	... ATRO weight [kg]
G_{net}	... Net weight [kg]
B	... Ballast (non-wood mass such as snow ¹ , coal, etc.) [kg]
TG	... Dry content [%]

¹ Conversion factor for the estimated snow volume: 400 kg/m³

6 Record of Wood Receipt

The following information shall be provided to the seller in a record (e.g. wood receipt certificate) for each wood delivery that has been received and accepted:

- Date of receipt
- Company name
- FHP - receipt system number
- Place of weighing (only in case of exceptional external weighing)
- Date and time of weighing
- Supplier and freight forwarder
- Gross weight, tare weight, net weight, ATRO weight (specified in tonnes to 3 decimal places or in kilograms)
- Dry content (specified in percent to 2 decimal places)
- Estimated distribution of wood types as a percentage of the volume (specified as a percentage without decimal places)
- Estimated product range distribution as a percentage of volume (specified as a percentage without decimal places)
- Notes on manual inputs

- Type and weight of ballast (specified in tonnes to three decimal places)
- AMM or AOO for each wood and product type (specified in tonnes to three decimal places; optional indication of partial debarking).
- When converting to FMO, conversion factors deviating from the guidelines (Annex A4) shall be indicated.

The measured values of weighing incoming materials and the empty delivery vehicle determined by the calibrated weighbridge as well as the net and gross weight derived from this shall be transferred directly to the receipt record. If this is not possible for technical reasons, the manually entered values shall be clearly marked as such.

Further information on a delivery may be conveyed, provided that it cannot be confused with the mandatory information in the receipt record.

Customary market standards are available for the electronic transmission of further information.

The receipt record of each delivery as well as the corresponding record concerning the determination of the dry content shall be kept by the receiving plant for the limitation period of the supplier's claim.

7 Inspection Regulations

7.1 Inspection Service

The inspection of the factories with regard to compliance with the requirements of these guidelines shall take place three times per year, unannounced, by an inspection body accredited in Austria. The factory undergoing inspection shall assist the inspection body in any way necessary.

A report shall be drawn up on the results of the inspection, indicating any deficiencies. This report is made available to the factory undergoing inspection as well as to the FHP contractors.

7.2 Seller's Right to Inspection

The seller or its agent or statutory representative shall be entitled to inspect the compliance with these guidelines.

At the request of the seller, the receiving factory shall allow the seller access to the current inspection report.

Annex A

The annex regulates any procedures that go beyond the actual weight measurement.

A1 Estimation of the Product Range Distribution

When estimating the proportion of industrial wood products, the industrial wood definitions according to ÖHU apply. If the factory applies different regulations,

these shall be agreed with the supplier. Moreover, these must be available for review at the receiving point in the latest valid form.

A2 Conversion – ATRO Weight to Cubic Metre

If invoicing between the contractual parties is based on cubic metres, the conversion factors according to A3 shall be applied, unless otherwise agreed.

The conversion from ATRO weight to cubic metres must be carried out according to the following example:

Net weight	Dry content	ATRO weight
24,000 kg	55 %	13,200 kg

	Type of tree	
	Spruce	Pine
Wood type proportion ¹	60 %	40 %
Conversion factors ²	475 kg/m ³ [FMO]	570 kg/m ³ [FMO]

¹ Estimation of the wood type and the product range proportions of a delivery as a percentage of the volume by trained receiving staff

² Delivery at FMO in the example → corresponding conversion factors see Annex A, Chapter A3

The quantity of wood delivered for each tree type is determined as follows on the basis of the above-mentioned data:

$$0.6 \times 475 \text{ kg/m}^3 \text{ [FMO]} + 0.4 \times 570 \text{ kg/m}^3 \text{ [FMO]} = 513 \text{ kg/m}^3 \text{ [FMO]}$$

$$\frac{13.200 \text{ kg}}{513 \text{ kg/m}^3 \text{ [FMO]}} = 25.73 \text{ m}^3 \text{ [FMO]}$$

The total amount of wood delivered is 25.73 m³ [FMO]. According to the estimated tree type proportion of 60 % for spruce and 40 % for pine, the calculated delivery

volume is 15.44 m³ [FMO] for spruce and 10.29 m³ [FMO] for pine.

A3 Partial Debarking

Partially debarked logs are those that show damage to the outer bark. If partial debarking is detected (e.g. in the case of harvester wood, beetle wood), its manual

handling shall be agreed separately between the buyer and seller.

A4 Conversion Factors

Conversion factors of common wood types for industrial wood from ATRO weight to volume according to ÖHU (2006).

Wood type	kg/[FOO]	kg/[FMO]
Spruce/Fir	427	475
Pine	510	570
Larch	545	625
Copper beech	650	707
Maple	570	633
Oak/Robinia	630	741
Birch	515	585
Ash	650	755
Alder	460	541
Willow	425	500
Hornbeam	680	739
Poplar	350	402
European aspen	422	479
Linden	383	445