

		Densities and supplements	
		Compartment angle ≤ 30°	Compartment angle > 30° till vertical
Blow in closed compartments	Insulation thickness		
	≤ 15cm	39kg/m³	41kg/m³
	> 15 and ≤ 30cm	41kg/m³	45kg/m³
	> 30 and ≤ 45cm	43kg/m³	46kg/m³
	Supplement for compartments where the front and / or back cover is made of a very smooth material (e.g. wood-based panels with a glazed layer as bakelised panel). For other wood-based panels (Celit, OSB, MDF, multiplex) and strips: no supplement required.	0	2kg/m³ (by face concerned)
	Supplement for use of membranes (see also instructions overleaf).	Calculation of the density and the amount of insulating material required should be done by considering a compensation for the predictable bulge of the membranes and by increasing the nominal thickness by 2 cm (for each face defined by a membrane).	
	Supplement for compartments with a net width > 60cm.	2kg/m³	
Blow open	The density depends on the blowing technique.	Density after stabilization for thicknesses up to 45cm: ± 30kg/m³	

For blowing in closed compartments with an inclination of > 60 °, the maximum net height of the compartments is as follows:

- thickness ≤ 10cm: no limitation;
- thickness ≤ 20cm: 4m: 6m with a supplement of 3kg/m³;
- thickness > 20cm: 3m: 4m with a supplement of 3kg/m³.

Any questions ? Contact ISOPROC : +32 15 62 19 35.

For a good decompaction of the material:

- always use at least 30m of rough insufflation hose;
- always use enough air (see overleaf for more information);
- preferably use the sliding hatch to regulate material input rather than reducing the speed of the paddlewheel.

Additional remarks : see overleaf

■ OVERVIEW

Given the wide variety of machines, accessories, techniques and compartments, it is not possible to cover all situations in this document. It remains the responsibility of the contractor to make the right choices, based on his experience and training. Don't hesitate to contact us for any advice.

■ DECOMPACTION OF THE CELLULOSE FIBERS

It is important to decompact the flakes sufficiently to obtain a good resistance to settlement and an optimum λ value. Insufflated fibers can no longer contain visible or palpable compressed pieces of cellulose.

For this purpose, the following rules must be taken into account:

- Always work with a minimum of 30m of insufflation hose (rough inside).
- Ensure the fluidity of the flow of material at high speed in the insufflation hose. On the one hand to make use of the impact with the rough insufflation hoses which will improve the decompaction effect and on the other hand for a good distribution of cellulose fibers in the compartments. In case of a congestion in the hose, the material will be compacted again, which is negative. To avoid this, remove the insufflation hose or needle before the flow of material stops or remove the hose or needle far enough after the flow of material has stopped so that the material can circulate again at high speed.
- Permanently, ensure sufficient air supply: use the necessary fans, possibly consider a reinforcement station, position the air control sufficiently high, ...
- The density can be adjusted using the material feed configuration, first with the sliding trap. For machines where the speed of the airlock wheel can be set between 1 and 10, the minimum setting is 7. A lower speed can cause an irregular flow of material.

■ MINIMUM DENSITIES: 3 CRITERIA

1. The values on the front are always the minimum average densities that, with properly de-compacted flakes, must be achieved in each compartment.
2. With sloping and vertical compartments (31° to 90°), there must be an area at every height where the minimum density is achieved. To the left and right of this area, the density may be lower, but never below 35 kg/m³.
3. For horizontal compartments (0-30°), there must be an area along the entire length of the compartment where the minimum density is achieved over the entire compartment height (thickness). To the left and right of this area, the density may be lower, but never below 35 kg/m³.
4. For compartments with a net width greater than 60 cm, these rules apply for any 'column' less than 60 cm.

To achieve this, the following blow-in techniques are recommended:

- For voluminous horizontal compartments (e.g. wider than 60 cm and/or thicker than 30 cm), it is usually easier to fill the compartment correctly by using an insulating needle with piercing head. It is also advisable to use a sufficiently powerful machine (e.g. X-Floc EM320).
- For compartments that communicate with each other, the use of multiple blow-in hoses or the insulating needle with piercing head is recommended. Compartments that communicate with each other mean that when one compartment is filled, the cellulose flows through to the adjacent compartments.

The correct filling of the compartments must be checked. The following methods are recommended.

- If possible, carry out a **visual check**. Be especially attentive to the corners of the compartments.
- **Average density control** count the number of bags used per building part and compare with the theoretical quantity required. Caution: although the average weight of the bags is at least 12.5kg, the real weight per bag may vary.
- **Spot check of the density** : perform coring with a suitable metal cylinder. This method makes it possible to check the density locally.

■ COMPARTMENTS DELIMITED ON ONE OR MORE SIDES BY FLEXIBLE FILMS

For compartments with one or more faces formed by a film or membrane that could bulge, the following additional rules apply:

- Use only the manufacturer's authorized membrane for this application that do not expand after insufflation of the insulation. Strain \geq 250N/5cm; tear resistance \geq 200N; strain elongation \leq 20%; (all these values in both longitudinal and transverse directions). All pro clima reinforced membranes are suitable.
- The membrane should be stretched to limit bulging: no more than 4 cm during and after insufflation.
- Increase the nominal thickness of the compartment by 2cm (per flexible film face) both to determine the target density and to calculate the amount of insulating material needed. This additional thickness is independent of the calculation of the R or U value of the part of the envelope.
- Prior to insufflation of insulation, place sufficiently strong slats to support membranes.
 - **Recommended method** : horizontal slats with a net gap \leq 50cm. Between the film/membrane and the slats, there may be a gap \leq 5mm, for example when using hardboard-strips as film fixations.
 - **Permitted variant**: slats with a net gap \leq 30cm. An example of this application is the installation of floating counter-slats in inclined roofs where an under-roof membrane is used.

■ OVERSIZE IN THE CASE OF OPEN BLOWING

By applying this technique, the insulation will settle down after laying. The density obtained in the case of open blowing is very dependent on the installation equipment and the blowing technique. When the cellulose is optimally decompacted when blowing open, the density after stabilization will normally be \leq 30kg/m³.

Therefore, if correctly decompacted, for thicknesses up to 45cm, it is sufficient to blow open 2.4 bags/m³, in which de number of m³ = surface x thickness after setting.

For more information about installation, certification and technical details: www.iQ3-tech.eu