

Cooler box modification for transporting plant samples in dry ice



Transporting plant samples in dry ice requires a specific conditioning and the survey of their temperature changes.

Here are the modifications to bring to the cooler :

- Add an electronic thermometer equipped with probe and alarm to constantly verify the samples temperature.
- Use polystyrene to improve the insulation.
- Encase the cooler with a reflective coating to limit heat absorption.
- The dry ice evaporation in a sealed space increases the internal pressure level. To avoid explosion, the correct venting of the cooler compartment must be realized.

Cooler features once changes done :

Capacity and internal dimensions of the compartment :

H x W x D (cm) = 23,5 x 31,5 x 13 = 9623,25 cm³ soit 9,623 liters.

H x W x D (in) = 9,25 x 12,4 x 5,12

Weight (empty) :

≈ 3,6 Kg

Few rules to keep in mind :

When cutting and sanding polystyrene :

- Wear a dust mask and protective glasses, the dust can irritate the lungs, eyes, throat and skin.
- If heat is used to cut polystyrene, use appropriate mask filters (emission of harmful gases).

Precautions when handling dry ice :

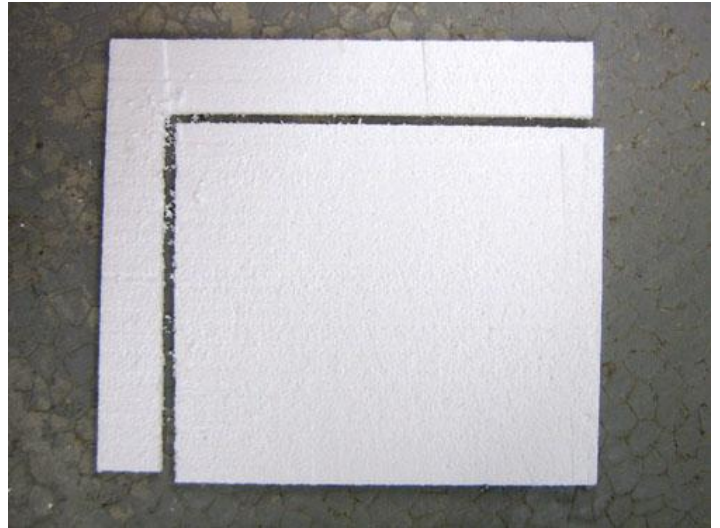
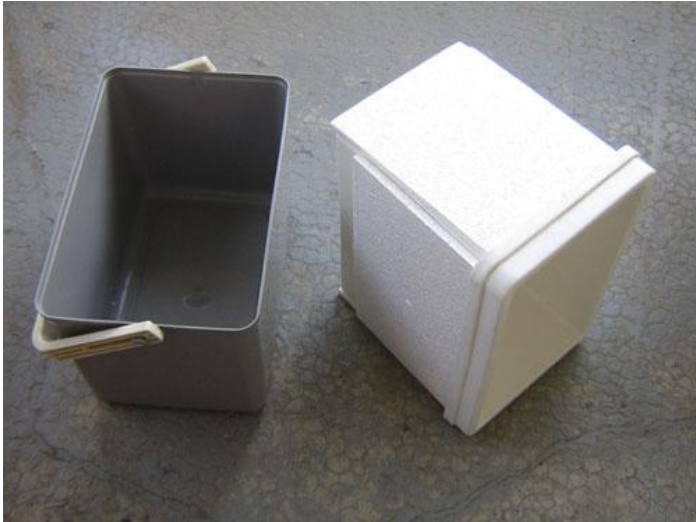
- Avoid direct contact with skin or eyes : risk of cold burns (-78 °C).
- Wear appropriate gloves.
- Ensure a correct venting of the cooler environment during transport.

Equipment needed :

- Cooler.
- Electronic thermometer with probe (ex: Inovalley DOIN-T05 -50°C à +70°C).
- Polystyrene sheets.
- Aluminum foil tape.
- Pipe or any other rigid hose.
- Scissors / Cutter.
- Set-square, marker.
- Sandpaper.
- Drill.
- Dust mask and protective glasses.



1 - Improving the existing insulation.



2 – Additional insulation of the cooler compartment.



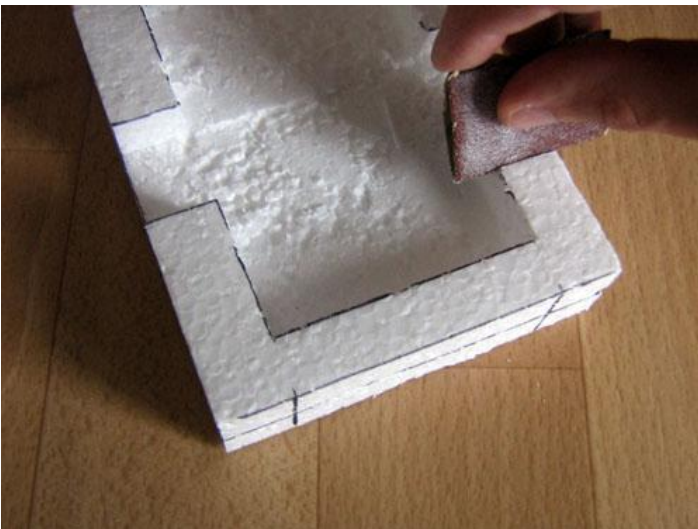
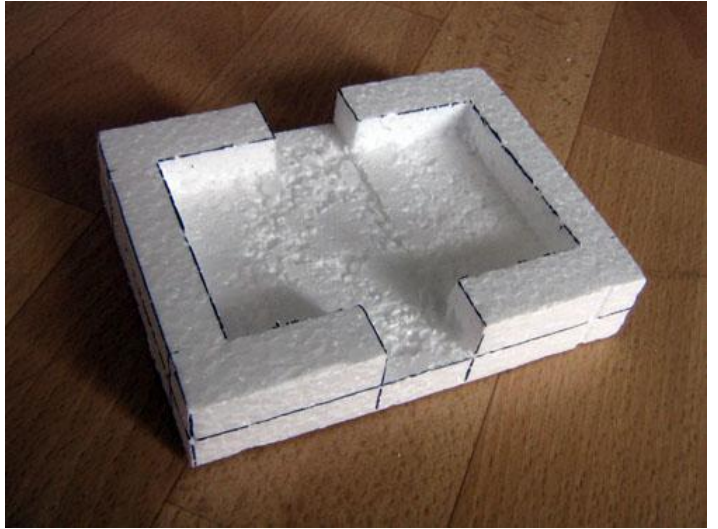
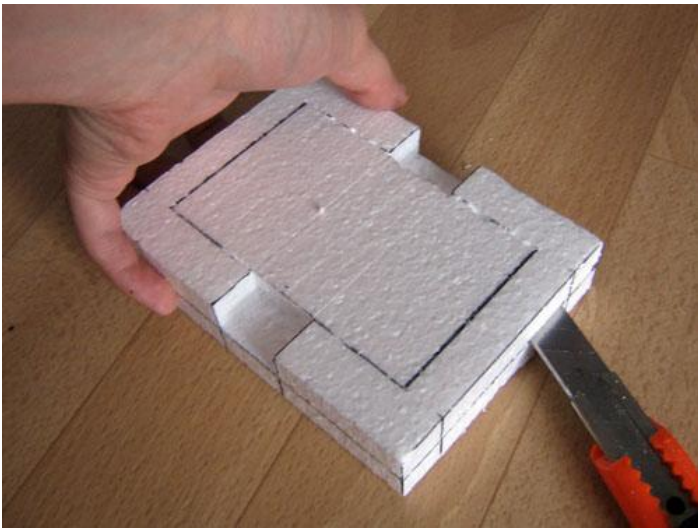
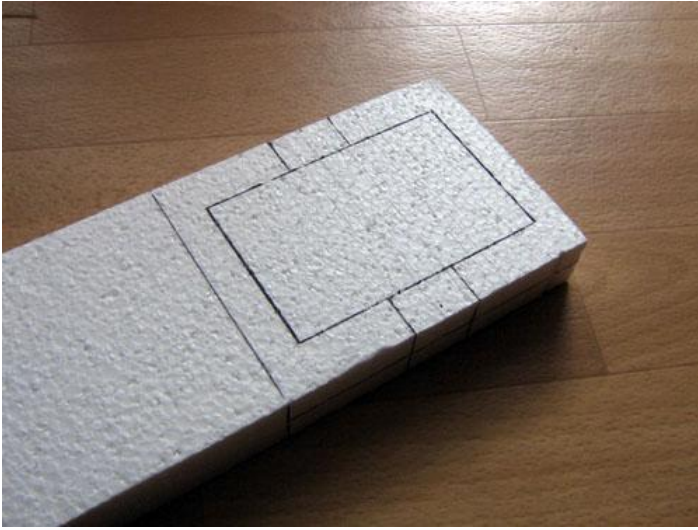
3 – Aluminum coating of the cooler external faces.



4 – Coating the internal compartment.



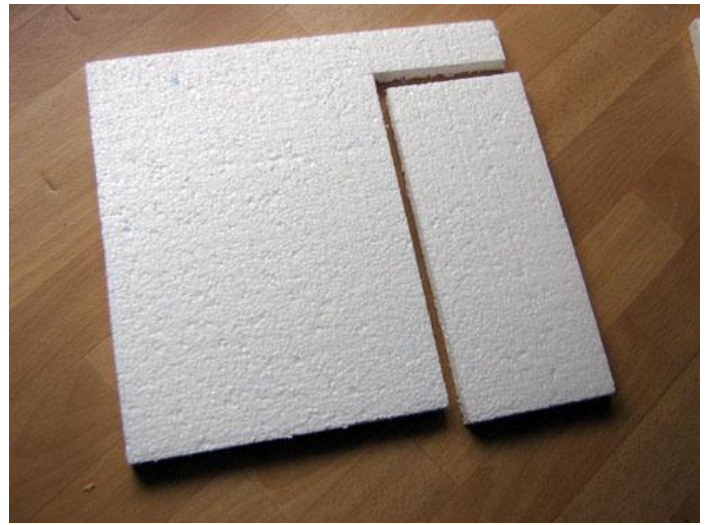
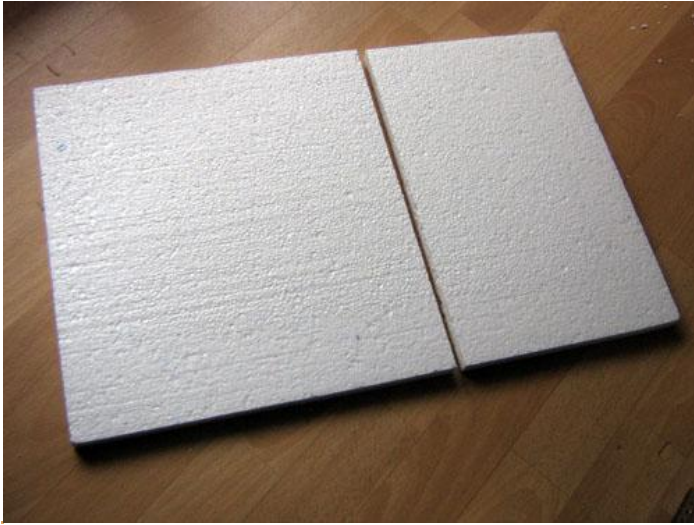
5 – Electronic thermometer holder.



6 – Box lid drilling for air venting.



7 – Lid insulation.



8 – Thermometer probe and air venting pipe installation.



9 – Lid coating.



