

## Chapter 6

### CLASS 4 – FLAMMABLE SOLIDS; SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION; SUBSTANCES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES

#### 6.1 GENERAL REQUIREMENTS FOR SELF-REACTIVE SUBSTANCES

Packagings for self-reactive substances must conform to the requirements of 6;1, 6;2, 6;3 and 6;4 and must meet the test requirements of 6;4 for Packing Group II.

#### 6.2 PACKING INSTRUCTIONS

##### Packing Instructions Y440 – Y443

Limited quantities  
Passenger and cargo aircraft

##### General requirements

Part 4, Chapter 1 requirements must be met (except that 4;1.1.2, 1.1.9 c), 1.1.9 e), 1.1.16, 1.1.18 and 1.1.20 do not apply), including:

##### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.
- Metal packagings must be corrosion resistant or be protected against corrosion for substances with a Class 8 subsidiary hazard.

##### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

##### 3) Limited quantity requirements

- Part 3, Chapter 4 requirements must be met, including:
  - the capability of the package to pass a 1.2 m drop test; and
  - a 24-hour stacking test.

| Packing Instructions Y440 – Y443 |                  |                                |                                                 |                                  |                                    |                      |
|----------------------------------|------------------|--------------------------------|-------------------------------------------------|----------------------------------|------------------------------------|----------------------|
| COMBINATION PACKAGINGS           |                  |                                |                                                 |                                  |                                    | SINGLE<br>PACKAGINGS |
| Packing<br>instruction           | Packing<br>group | Inner packaging<br>(see 6;3.2) | Inner packaging<br>quantity (per<br>receptacle) | Total<br>quantity<br>per package | Total gross<br>mass<br>per package |                      |
| Y440                             | II               | Glass                          | 0.5 kg                                          | 1 kg                             | 30 kg                              | No                   |
|                                  |                  | Plastics                       | 0.5 kg                                          |                                  |                                    |                      |
|                                  |                  | Metal                          | 0.5 kg                                          |                                  |                                    |                      |
|                                  |                  | Plastic bag                    | 0.5 kg                                          |                                  |                                    |                      |
| Y441                             | II               | Glass                          | 0.5 kg                                          | 5 kg                             |                                    | No                   |
|                                  |                  | Plastics                       | 0.5 kg                                          |                                  |                                    |                      |
|                                  |                  | Metal                          | 0.5 kg                                          |                                  |                                    |                      |
|                                  |                  | Plastic bag                    | 0.5 kg                                          |                                  |                                    |                      |
| Y442                             | III              | Glass                          | 1.0 kg                                          | 5 kg                             |                                    | No                   |
|                                  |                  | Plastics                       | 1.0 kg                                          |                                  |                                    |                      |
|                                  |                  | Metal                          | 1.0 kg                                          |                                  |                                    |                      |
|                                  |                  | Plastic bag                    | 1.0 kg                                          |                                  |                                    |                      |
| Y443                             | III              | Glass                          | 1.0 kg                                          | 10 kg                            |                                    | No                   |
|                                  |                  | Plastics                       | 1.0 kg                                          |                                  |                                    |                      |
|                                  |                  | Metal                          | 1.0 kg                                          |                                  |                                    |                      |
|                                  |                  | Plastic bag                    | 1.0 kg                                          |                                  |                                    |                      |

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Aluminium  
Fibreboard  
Natural wood  
Other metal  
Plastics  
Plywood  
Reconstituted wood  
Steel

Drums

Aluminium  
Fibre  
Plastics  
Plywood  
Other metal  
Steel

Jerricans

Aluminium  
Plastics  
Steel

## Packing Instructions 445 – 446

Passenger aircraft

### General requirements

Part 4, Chapter 1 requirements must be met, including:

#### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.
- Metal packagings must be corrosion resistant or be protected against corrosion for substances with a Class 8 subsidiary hazard.

#### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

| COMBINATION PACKAGINGS |               |                                                                                  |                                           |                            | SINGLE PACKAGINGS |
|------------------------|---------------|----------------------------------------------------------------------------------|-------------------------------------------|----------------------------|-------------------|
| Packing instruction    | Packing group | Inner packaging (see 6;3.2)                                                      | Inner packaging quantity (per receptacle) | Total quantity per package |                   |
| —                      | I             | Forbidden<br>(only permitted for wetted explosives, see Packing Instruction 451) |                                           |                            |                   |
| 445                    | II            | Glass                                                                            | 1.0 kg                                    | 15 kg                      | No                |
|                        |               | Plastics                                                                         | 2.5 kg                                    |                            |                   |
|                        |               | Metal                                                                            | 2.5 kg                                    |                            |                   |
|                        |               | Plastic bag                                                                      | 1.0 kg                                    |                            |                   |
| 446                    | III           | Glass                                                                            | 5.0 kg                                    | 25 kg                      | No                |
|                        |               | Plastics                                                                         | 10.0 kg                                   |                            |                   |
|                        |               | Metal                                                                            | 10.0 kg                                   |                            |                   |
|                        |               | Plastic bag                                                                      | 5.0 kg                                    |                            |                   |

### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

#### Packing Group III

- Packagings must meet the Packing Group II performance requirements.

### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

#### Boxes

Aluminium (4B)  
Fibreboard (4G)  
Natural wood (4C1, 4C2)  
Other metal (4N)  
Plastics (4H1, 4H2)  
Plywood (4D)  
Reconstituted wood (4F)  
Steel (4A)

#### Drums

Aluminium (1B1, 1B2)  
Fibre (1G)  
Other metal (1N1, 1N2)  
Plastics (1H1, 1H2)  
Plywood (1D)  
Steel (1A1, 1A2)

#### Jerricans

Aluminium (3B1, 3B2)  
Plastics (3H1, 3H2)  
Steel (3A1, 3A2)

## Packing Instructions 448 – 449

Cargo aircraft only

### General requirements

Part 4, Chapter 1 requirements must be met, including:

#### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.
- Metal packagings must be corrosion resistant or be protected against corrosion for substances with a Class 8 subsidiary hazard.

#### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

| COMBINATION PACKAGINGS |               |                                                                                  |                                           |                            | SINGLE PACKAGINGS |
|------------------------|---------------|----------------------------------------------------------------------------------|-------------------------------------------|----------------------------|-------------------|
| Packing instruction    | Packing group | Inner packaging (see 6;3.2)                                                      | Inner packaging quantity (per receptacle) | Total quantity per package |                   |
| —                      | I             | Forbidden<br>(only permitted for wetted explosives, see Packing Instruction 451) |                                           |                            |                   |
| 448                    | II            | Glass                                                                            | 2.5 kg                                    | 50 kg                      | 50 kg             |
|                        |               | Plastics                                                                         | 5.0 kg                                    |                            |                   |
|                        |               | Metal                                                                            | 5.0 kg                                    |                            |                   |
|                        |               | Plastic bag                                                                      | 2.5 kg                                    |                            |                   |
| 449                    | III           | Glass                                                                            | 5.0 kg                                    | 100 kg                     | 100 kg            |
|                        |               | Plastics                                                                         | 10.0 kg                                   |                            |                   |
|                        |               | Metal                                                                            | 10.0 kg                                   |                            |                   |
|                        |               | Plastic bag                                                                      | 5.0 kg                                    |                            |                   |

### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

#### Packing Group III

- Packagings must meet the Packing Group II performance requirements.

#### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

##### Boxes

Aluminium (4B)  
Fibreboard (4G)  
Natural wood (4C1, 4C2)  
Other metal (4N)  
Plastics (4H1, 4H2)  
Plywood (4D)  
Reconstituted wood (4F)  
Steel (4A)

##### Drums

Aluminium (1B1, 1B2)  
Fibre (1G)  
Other metal (1N1, 1N2)  
Plastics (1H1, 1H2)  
Plywood (1D)  
Steel (1A1, 1A2)

##### Jerricans

Aluminium (3B1, 3B2)  
Plastics (3H1, 3H2)  
Steel (3A1, 3A2)

### ADDITIONAL PACKING REQUIREMENTS FOR SINGLE PACKAGINGS

#### Packing Group III

- Packagings must meet the Packing Group II performance requirements.
- Fibre, fibreboard, wood and plywood single packagings must be fitted with a suitable liner.

## Packing Instructions 448 – 449

### SINGLE PACKAGINGS

| <i>Boxes</i>                                                                                                                                           | <i>Composites</i>  | <i>Cylinders</i> | <i>Drums</i>                                                                                                            | <i>Jerricans</i>                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| Aluminium (4B)<br>Fibreboard (4G)<br>Natural wood (4C2)<br>Other metal (4N)<br>Plywood (4D)<br>Plastics (4H2)<br>Reconstituted wood (4F)<br>Steel (4A) | All (see 6;3.1.18) | See 4;2.7        | Aluminium (1B1, 1B2)<br>Fibre (1G)<br>Other metal (1N1, 1N2)<br>Plastics (1H1, 1H2)<br>Plywood (1D)<br>Steel (1A1, 1A2) | Aluminium (3B1, 3B2)<br>Plastics (3H1, 3H2)<br>Steel (3A1, 3A2) |

## Packing Instruction 450

Passenger and cargo aircraft for UN 3527 (Packing Group II or III) only

### General requirements

Part 4, Chapter 1 requirements must be met, including:

#### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.
- Metal packagings must be corrosion resistant or be protected against corrosion for substances with a Class 8 subsidiary hazard.

#### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

| COMBINATION PACKAGINGS                          |                                    |                                                                            |                                                                         |                                                                        |                                   | SINGLE PACKAGINGS |
|-------------------------------------------------|------------------------------------|----------------------------------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------------------------------------|-----------------------------------|-------------------|
| <i>Packing conditions</i>                       | <i>Inner packaging (see 6;3.2)</i> | <i>Inner packaging quantity (per receptacle) – for solid base material</i> | <i>Inner packaging quantity (per receptacle) – for liquid activator</i> | <i>Inner packaging quantity (per receptacle) – for solid activator</i> | <i>Total quantity per package</i> |                   |
| Activator (Organic peroxide)                    | Plastics*                          | n/a                                                                        | 125 mL                                                                  | 500 g                                                                  | 5 kg                              | No                |
|                                                 | Metal*                             | n/a                                                                        | 125 mL                                                                  | 500 g                                                                  |                                   |                   |
| Base material<br>Division 4.1 Packing Group II  | Glass                              | 1.0 kg                                                                     | n/a                                                                     | n/a                                                                    |                                   |                   |
|                                                 | Plastics                           | 5.0 kg                                                                     | n/a                                                                     | n/a                                                                    | 10 kg                             | No                |
|                                                 | Metal                              | 5.0 kg                                                                     | n/a                                                                     | n/a                                                                    |                                   |                   |
| Activator (Organic peroxide)                    | Plastics*                          | n/a                                                                        | 125 mL                                                                  | 500 g                                                                  |                                   |                   |
|                                                 | Metal*                             | n/a                                                                        | 125 mL                                                                  | 500 g                                                                  |                                   |                   |
| Base material<br>Division 4.1 Packing Group III | Glass                              | 2.5 kg                                                                     | n/a                                                                     | n/a                                                                    |                                   |                   |
|                                                 | Plastics                           | 10.0 kg                                                                    | n/a                                                                     | n/a                                                                    |                                   |                   |
|                                                 | Metal                              | 10.0 kg                                                                    | n/a                                                                     | n/a                                                                    |                                   |                   |

\*Including tubes.

The total quantity of kits per package is to be calculated on a one-to-one basis of their volume, that is, 1 L equal to 1 kg.

## Packing Instruction 450

### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

The components may be placed in the same outer packaging provided that they will not interact dangerously in the event of leakage (see 4;1.1.7).

### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

| <i>Boxes</i>            | <i>Drums</i>           | <i>Jerricans</i>     |
|-------------------------|------------------------|----------------------|
| Aluminium (4A, 4B)      | Aluminium (1B1, 1B2)   | Aluminium (3B1, 3B2) |
| Fibreboard (4G)         | Fibre (1G)             | Plastics (3H1, 3H2)  |
| Natural wood (4C1, 4C2) | Other metal (1N1, 1N2) | Steel (3A1, 3A2)     |
| Other metal (4N)        | Plastics (1H1, 1H2)    |                      |
| Plastics (4H1, 4H2)     | Plywood (1D)           |                      |
| Plywood (4D)            | Steel (1A1, 1A2)       |                      |
| Reconstituted wood (4F) |                        |                      |
| Steel (4A)              |                        |                      |

## Packing Instruction Y450

Limited quantities

Passenger and cargo aircraft for UN 3527 (Packing Group II or III) only

### General requirements

Part 4, Chapter 1 requirements must be met (except that 4;1.1.2, 1.1.9 c), 1.1.9 e), 1.1.16, 1.1.18 and 1.1.20 do not apply), including:

#### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.
- Metal packagings must be corrosion resistant or be protected against corrosion for substances with a Class 8 subsidiary hazard.

#### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

#### 3) Limited quantity requirements

- Part 3, Chapter 4 requirements must be met, including:
  - the capability of the package to pass a 1.2 m drop test;
  - a 24-hour stacking test; and
  - inner packagings for liquids must be capable of passing a pressure differential test (4;1.1.6).

| Packing Instruction Y450                                                                                                                         |                             |                                                                     |                                                                  |                                                                 |                            |                              |                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------------------------------------------------------------|------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------|------------------------------|-------------------|
| COMBINATION PACKAGINGS                                                                                                                           |                             |                                                                     |                                                                  |                                                                 |                            |                              | SINGLE PACKAGINGS |
| Packing conditions                                                                                                                               | Inner packaging (see 6;3.2) | Inner packaging quantity (per receptacle) – for solid base material | Inner packaging quantity (per receptacle) – for liquid activator | Inner packaging quantity (per receptacle) – for solid activator | Total quantity per package | Total gross mass per package |                   |
| Activator (Organic peroxide)                                                                                                                     | Plastics*                   | n/a                                                                 | 30 mL                                                            | 100 g                                                           | 1 kg                       | 30 kg                        | No                |
|                                                                                                                                                  | Metal*                      | n/a                                                                 | 30 mL                                                            | 100 g                                                           |                            |                              |                   |
| Base material Division 4.1 Packing Group II                                                                                                      | Glass                       | 1.0 kg                                                              | n/a                                                              | n/a                                                             |                            |                              |                   |
|                                                                                                                                                  | Plastics                    | 1.0 kg                                                              | n/a                                                              | n/a                                                             |                            |                              |                   |
|                                                                                                                                                  | Metal                       | 1.0 kg                                                              | n/a                                                              | n/a                                                             |                            |                              |                   |
| Activator (Organic peroxide)                                                                                                                     | Plastics*                   | n/a                                                                 | 30 mL                                                            | 100 g                                                           | 5 kg                       |                              |                   |
|                                                                                                                                                  | Metal*                      | n/a                                                                 | 30 mL                                                            | 100 g                                                           |                            |                              |                   |
| Base material Division 4.1 Packing Group III                                                                                                     | Glass                       | 2.5 kg                                                              | n/a                                                              | n/a                                                             |                            |                              |                   |
|                                                                                                                                                  | Plastics                    | 5.0 kg                                                              | n/a                                                              | n/a                                                             |                            |                              |                   |
|                                                                                                                                                  | Metal                       | 5.0 kg                                                              | n/a                                                              | n/a                                                             |                            |                              |                   |
| *Including tubes.                                                                                                                                |                             |                                                                     |                                                                  |                                                                 |                            |                              |                   |
| The total quantity of kits per package is to be calculated on a one-to-one basis of their volume, that is, 1 L equal to 1 kg.                    |                             |                                                                     |                                                                  |                                                                 |                            |                              |                   |
| ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS                                                                                       |                             |                                                                     |                                                                  |                                                                 |                            |                              |                   |
| The components may be placed in the same outer packaging provided that they will not interact dangerously in the event of leakage (see 4;1.1.7). |                             |                                                                     |                                                                  |                                                                 |                            |                              |                   |
| OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)                                                                                           |                             |                                                                     |                                                                  |                                                                 |                            |                              |                   |
| Boxes                                                                                                                                            |                             | Drums                                                               |                                                                  | Jerricans                                                       |                            |                              |                   |
| Aluminium                                                                                                                                        |                             | Aluminium                                                           |                                                                  | Aluminium                                                       |                            |                              |                   |
| Fibreboard                                                                                                                                       |                             | Fibre                                                               |                                                                  | Plastics                                                        |                            |                              |                   |
| Natural wood                                                                                                                                     |                             | Other metal                                                         |                                                                  | Steel                                                           |                            |                              |                   |
| Other metal                                                                                                                                      |                             | Plastics                                                            |                                                                  |                                                                 |                            |                              |                   |
| Plastics                                                                                                                                         |                             | Plywood                                                             |                                                                  |                                                                 |                            |                              |                   |
| Plywood                                                                                                                                          |                             | Steel                                                               |                                                                  |                                                                 |                            |                              |                   |
| Reconstituted wood                                                                                                                               |                             |                                                                     |                                                                  |                                                                 |                            |                              |                   |
| Steel                                                                                                                                            |                             |                                                                     |                                                                  |                                                                 |                            |                              |                   |

| Packing Instruction 451                                                                                                                                                                                                                                                |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Passenger and cargo aircraft – wetted explosives (Packing Group I)                                                                                                                                                                                                     |  |
| <b>General requirements</b><br><br>Part 4, Chapter 1 requirements must be met, including:                                                                                                                                                                              |  |
| 1) <b>Compatibility requirements</b>                                                                                                                                                                                                                                   |  |
| <ul style="list-style-type: none"> <li>Substances must be compatible with their packagings as required by 4;1.1.3.</li> <li>Metal packagings must be corrosion resistant or be protected against corrosion for substances with a Class 8 subsidiary hazard.</li> </ul> |  |
| 2) <b>Closure requirements</b>                                                                                                                                                                                                                                         |  |
| <ul style="list-style-type: none"> <li>Closures must meet the requirements of 4;1.1.4.</li> </ul>                                                                                                                                                                      |  |

### Packing Instruction 451

| COMBINATION PACKAGINGS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                           |                                                 |                                                 |                                             | SINGLE<br>PACKAGINGS |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------------------------------------------------|-------------------------------------------------|---------------------------------------------|----------------------|
| UN number and proper shipping name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Inner<br>packaging<br>(see 6.3.2)         | Inner packaging<br>quantity (per<br>receptacle) | Total quantity<br>per<br>package –<br>passenger | Total<br>quantity per<br>package –<br>cargo |                      |
| UN 1354 <b>Trinitrobenzene, wetted</b><br>UN 1355 <b>Trinitrobenzoic acid, wetted</b><br>UN 1356 <b>Trinitrotoluene, wetted</b> or<br><b>TNT, wetted</b><br>UN 3364 <b>Picric acid, wetted</b> or<br><b>Trinitrophenol, wetted</b> , with<br>not less than 10% water, by<br>mass<br>UN 3365 <b>Picryl chloride, wetted</b> or<br><b>Trinitrochlorobenzene,</b><br><b>wetted</b><br>UN 3366 <b>Trinitrotoluene, wetted</b> or<br><b>TNT, wetted</b><br>UN 3367 <b>Trinitrobenzene, wetted</b><br>UN 3368 <b>Trinitrobenzoic acid, wetted</b><br>UN 3369 <b>Sodium dinitro-o-cresolate,</b><br><b>wetted</b><br>UN 3370 <b>Urea nitrate, wetted</b> | Glass<br>Plastics<br>Metal<br>Plastic bag | 0.5 kg                                          | 0.5 kg                                          | 0.5 kg                                      | No                   |
| UN 1336 <b>Nitroguanidine, wetted</b> or<br><b>Picrite, wetted</b><br>UN 1337 <b>Nitrostarch, wetted</b><br>UN 1357 <b>Urea nitrate, wetted</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Glass<br>Plastics<br>Metal<br>Plastic bag | 0.5 kg                                          | 1 kg                                            | 15 kg                                       | No                   |
| UN 1310 <b>Ammonium picrate, wetted</b><br><br><i>See Note 1 below.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Glass<br>Plastics<br>Metal<br>Plastic bag | 0.5 kg                                          | 0.5 kg                                          | 0.5 kg                                      | No                   |
| UN 1349 <b>Sodium picramate, wetted</b><br><br><i>See Note 1 below.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Glass<br>Plastics<br>Metal<br>Plastic bag | 0.5 kg                                          | Forbidden                                       | 15 kg                                       | No                   |
| UN 1320 <b>Dinitrophenol, wetted</b><br>UN 1321 <b>Dinitrophenolates, wetted</b><br>UN 1322 <b>Dinitroresorcinol, wetted</b><br>UN 1344 <b>Picric acid, wetted</b> or<br><b>Trinitrophenol, wetted</b> , with<br>not less than 30% water, by<br>mass<br>UN 1348 <b>Sodium dinitro-o-cresolate,</b><br><b>wetted</b><br>UN 1517 <b>Zirconium picramate, wetted</b><br>UN 3317 <b>2-Amino-4,6-dinitrophenol,</b><br><b>wetted</b><br><br><i>See Note 1 below.</i>                                                                                                                                                                                   | Glass<br>Plastics<br>Metal<br>Plastic bag | 0.5 kg                                          | 1 kg                                            | 15 kg                                       | No                   |
| UN 1571 <b>Barium azide, wetted</b><br>UN 2852 <b>Dipicryl sulphide, wetted</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Glass<br>Plastics                         | 0.25 kg                                         | Forbidden                                       | 0.5 kg                                      | No                   |
| UN 3474 <b>1-Hydroxybenzotriazole<br/>monohydrate</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Glass<br>Plastics                         | 0.5 kg                                          | 0.5 kg                                          | 0.5 kg                                      | No                   |

Note 1.— These substances must be in lead free packagings.

## Packing Instruction 451

### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

- Packagings must be designed and constructed to prevent the loss of water or alcohol content or the content of the phlegmatizer.
- Packagings must be so constructed and closed so as to avoid an explosive over pressure or pressure build-up of more than 300 kPa (3 bar).
- The type of packaging and maximum permitted quantity per packaging are limited by the provisions of Part 2;1.5.2 and may be less than the limits shown above.
- Plastic or glass inner packagings must be packed in tightly closed metal or rigid plastic receptacles before packing in outer packagings. Inner packagings must be packed with absorbent material in sufficient quantity to absorb the contents in the event of leakage.

*For UN 3474*

Metal packagings must not be used. Packagings of other material with a small amount of metal, for example metal closures or other metal fittings such as those mentioned in 6;3, are not considered metal packagings.

### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

#### *Boxes*

Aluminium (4B)  
Fibreboard (4G)  
Natural wood (4C1, 4C2)  
Other metal (4N)  
Plastics (4H1, 4H2)  
Plywood (4D)  
Reconstituted wood (4F)  
Steel (4A)

#### *Drums*

Aluminium (1B2)  
Fibre (1G)  
Other metal (1N2)  
Plastics (1H1, 1H2)  
Plywood (1D)  
Steel (1A2)

#### *Jerricans*

Aluminium (3B2)  
Other metal (3N2)  
Plastics (3H1, 3H2)  
Steel (3A2)

### Packing Instruction 452

Passenger aircraft for UN 2555, 2556 and 2557 only

#### General requirements

Part 4, Chapter 1 requirements must be met, including:

##### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.

##### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

| COMBINATION PACKAGINGS                                                                                                                                                                                                                                   |                                   |                                                 |                               | SINGLE<br>PACKAGINGS |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------------------------------------|-------------------------------|----------------------|
| UN number and proper shipping name                                                                                                                                                                                                                       | Inner<br>packaging<br>(see 6;3.2) | Inner packaging<br>quantity<br>(per receptacle) | Total quantity<br>per package |                      |
| UN 2555 Nitrocellulose with water                                                                                                                                                                                                                        | Glass                             | 1.0 kg                                          | 15 kg                         | No                   |
|                                                                                                                                                                                                                                                          | Plastics                          | 1.0 kg                                          |                               |                      |
|                                                                                                                                                                                                                                                          | Metal                             | 1.0 kg                                          |                               |                      |
|                                                                                                                                                                                                                                                          | Plastic bag                       | 1.0 kg                                          |                               |                      |
| UN 2556 Nitrocellulose with alcohol                                                                                                                                                                                                                      | Glass                             | 1.0 kg                                          | 1 kg                          | No                   |
|                                                                                                                                                                                                                                                          | Plastics                          | 1.0 kg                                          |                               |                      |
|                                                                                                                                                                                                                                                          | Metal                             | 1.0 kg                                          |                               |                      |
|                                                                                                                                                                                                                                                          | Plastic bag                       | 1.0 kg                                          |                               |                      |
| UN 2557 Nitrocellulose, mixture without plasticizer, without pigment or Nitrocellulose, mixture without plasticizer, with pigment or Nitrocellulose, mixture with plasticizer, without pigment or Nitrocellulose, mixture with plasticizer, with pigment | Glass                             | 1.0 kg                                          | 1 kg                          | No                   |
|                                                                                                                                                                                                                                                          | Plastics                          | 1.0 kg                                          |                               |                      |
|                                                                                                                                                                                                                                                          | Metal                             | 1.0 kg                                          |                               |                      |
|                                                                                                                                                                                                                                                          | Plastic bag                       | 1.0 kg                                          |                               |                      |

#### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

- Packagings must be designed and constructed to prevent the loss of water or alcohol content or the content of the phlegmatizer.
- Packagings must be so constructed and closed so as to avoid an explosive over pressure or pressure build-up of more than 300 kPa (3 bar).

#### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

##### Boxes

Aluminium (4B)  
Fibreboard (4G)  
Natural wood (4C1, 4C2)  
Other metal (4N)  
Plastics (4H1, 4H2)  
Plywood (4D)  
Reconstituted wood (4F)  
Steel (4A)

##### Drums

Aluminium (1B2)  
Fibre (1G)  
Other metal (1N2)  
Plastics (1H1, 1H2)  
Plywood (1D)

##### Jerricans

Aluminium (3B2)  
Other metal (3N2)  
Plastics (3H1, 3H2)  
Steel (3A2)

### Packing Instruction 453

Cargo aircraft only for UN 2555, 2556 and 2557 only

#### General requirements

Part 4, Chapter 1 requirements must be met, including:

##### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.

##### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

| COMBINATION PACKAGINGS                                                                                                                                                                                                                               |                                   |                                                 |                               | SINGLE<br>PACKAGINGS |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------------------------------------|-------------------------------|----------------------|
| UN number and proper shipping name                                                                                                                                                                                                                   | Inner<br>packaging<br>(see 6;3.2) | Inner packaging<br>quantity<br>(per receptacle) | Total quantity<br>per package |                      |
| UN 2555 Nitrocellulose with water                                                                                                                                                                                                                    | Glass                             | 1.0 kg                                          | 50 kg                         | 50 kg                |
|                                                                                                                                                                                                                                                      | Plastics                          | 1.0 kg                                          |                               |                      |
|                                                                                                                                                                                                                                                      | Metal                             | 1.0 kg                                          |                               |                      |
|                                                                                                                                                                                                                                                      | Plastic bag                       | 1.0 kg                                          |                               |                      |
| UN 2556 Nitrocellulose with alcohol                                                                                                                                                                                                                  | Glass                             | 1.0 kg                                          | 15 kg                         | 15 kg                |
|                                                                                                                                                                                                                                                      | Plastics                          | 1.0 kg                                          |                               |                      |
|                                                                                                                                                                                                                                                      | Metal                             | 1.0 kg                                          |                               |                      |
|                                                                                                                                                                                                                                                      | Plastic bag                       | 1.0 kg                                          |                               |                      |
| UN 2557 Nitrocellulose mixture without plasticizer, without pigment or Nitrocellulose mixture without plasticizer, with pigment or Nitrocellulose mixture with plasticizer, without pigment or Nitrocellulose mixture with plasticizer, with pigment | Glass                             | 1.0 kg                                          | 15 kg                         | 15 kg                |
|                                                                                                                                                                                                                                                      | Plastics                          | 1.0 kg                                          |                               |                      |
|                                                                                                                                                                                                                                                      | Metal                             | 1.0 kg                                          |                               |                      |
|                                                                                                                                                                                                                                                      | Plastic bag                       | 1.0 kg                                          |                               |                      |

#### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

- Packagings must be designed and constructed to prevent the loss of water or alcohol content or the content of the phlegmatizer.
- Packagings must be so constructed and closed so as to avoid an explosive over pressure or pressure build-up of more than 300 kPa (3 bar).

#### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

##### Boxes

Aluminium (4B)  
Fibreboard (4G)  
Natural wood (4C1, 4C2)  
Other metal (4N)  
Plastics (4H1, 4H2)  
Plywood (4D)  
Reconstituted wood (4F)  
Steel (4A)

##### Drums

Aluminium (1B2)  
Fibre (1G)  
Other metal (1N2)  
Plastics (1H1, 1H2)  
Plywood (1D)

##### Jerricans

Aluminium (3B2)  
Other metal (3N2)  
Plastics (3H1, 3H2)  
Steel (3A2)

### Packing Instruction 453

#### ADDITIONAL PACKING REQUIREMENTS FOR SINGLE PACKAGINGS

- Packagings must be designed and constructed to prevent the loss of water or alcohol content or the content of the phlegmatizer.
- Packagings must be so constructed and closed so as to avoid an explosive over pressure or pressure build-up of more than 300 kPa (3 bar).
- Fibre, fibreboard, wood and plywood single packagings must be fitted with a suitable liner.

#### SINGLE PACKAGINGS

| <i>Boxes</i>                                                                                                                            | <i>Composites</i>  | <i>Cylinders</i> | <i>Drums</i>                                                                                                            | <i>Jerricans</i>                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| Aluminium (4B)<br>Fibreboard (4G)<br>Natural wood (4C1, 4C2)<br>Plastics (4H2)<br>Plywood (4D)<br>Reconstituted wood (4F)<br>Steel (4A) | All (see 6;3.1.18) | See 4;2.7        | Aluminium (1B1, 1B2)<br>Fibre (1G)<br>Other metal (1N1, 1N2)<br>Plastics (1H1, 1H2)<br>Plywood (1D)<br>Steel (1A1, 1A2) | Aluminium (3B1, 3B2)<br>Plastics (3H1, 3H2)<br>Steel (3A1, 3A2) |

### Packing Instruction 454

Passenger and cargo aircraft for UN 1324 only

#### General requirements

Part 4, Chapter 1 requirements must be met, including:

##### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.

##### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

| COMBINATION PACKAGINGS                    |                                                       |                                                   | SINGLE<br>PACKAGINGS |
|-------------------------------------------|-------------------------------------------------------|---------------------------------------------------|----------------------|
| <i>UN number and proper shipping name</i> | <i>Total quantity<br/>per package –<br/>passenger</i> | <i>Total quantity<br/>per package –<br/>cargo</i> |                      |
| UN 1324 Films, nitrocellulose base        | 25 kg                                                 | 100 kg                                            | No                   |

#### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

- Packagings must meet the Packing Group II performance requirements.
- Each reel must be placed in a tightly closed metal can or strong cardboard or fibreboard inner packaging with cover held in place by adhesive tape or paper.

### Packing Instruction 454

#### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

##### Boxes

Aluminium (4B)  
Fibreboard (4G)\*  
Natural wood (4C1, 4C2)  
Other metal (4N)  
Plastics (4H1, 4H2)\*  
Plywood (4D)  
Reconstituted wood (4F)  
Steel (4A)

##### Drums

Aluminium (1B1, 1B2)  
Fibre (1G)\*  
Other metal (1N1, 1N2)  
Plastics (1H1, 1H2)\*  
Plywood (1D)  
Steel (1A1, 1A2)

##### Jerricans

Aluminium (3B1, 3B2)  
Plastics (3H1, 3H2)\*  
Steel (3A1, 3A2)

\*These packagings are permitted only for a maximum of 600 m of film.

### Packing Instruction Y454

Limited quantities  
Passenger and cargo aircraft for UN 1324 only

#### General requirements

Part 4, Chapter 1 requirements must be met (except that 4;1.1.2, 1.1.9 c), 1.1.9 e), 1.1.16, 1.1.18 and 1.1.20 do not apply), including:

##### 1) Compatibility requirements

— Substances must be compatible with their packagings as required by 4;1.1.3.

##### 2) Closure requirements

— Closures must meet the requirements of 4;1.1.4.

##### 3) Limited quantity requirements

— Part 3, Chapter 4 requirements must be met, including:  
— the capability of the package to pass a 1.2 m drop test; and  
— a 24-hour stacking test.

| COMBINATION PACKAGINGS             |                                                     |                               |                                    | SINGLE<br>PACKAGINGS |
|------------------------------------|-----------------------------------------------------|-------------------------------|------------------------------------|----------------------|
| UN number and proper shipping name | Total quantity<br>of film per<br>inner<br>packaging | Total quantity<br>per package | Total gross<br>mass per<br>package |                      |
| UN 1324 Films, nitrocellulose base | 1 kg                                                | 10 kg                         | 30 kg                              | No                   |

#### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

— Each reel must be placed in a tightly closed metal can or strong cardboard or fibreboard inner packaging with cover held in place by adhesive tape or paper.

| Packing Instruction Y454                                                                                                            |              |                  |
|-------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------|
| OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)                                                                              |              |                  |
| <i>Boxes</i>                                                                                                                        | <i>Drums</i> | <i>Jerricans</i> |
| Aluminium                                                                                                                           | Aluminium    | Aluminium        |
| Fibreboard*                                                                                                                         | Fibre*       | Plastics*        |
| Natural wood                                                                                                                        | Other metal  | Steel            |
| Other metal                                                                                                                         | Plastics*    |                  |
| Plywood                                                                                                                             | Steel        |                  |
| Reconstituted wood                                                                                                                  |              |                  |
| Solid plastic*                                                                                                                      |              |                  |
| Steel                                                                                                                               |              |                  |
| *These packagings are permitted only for a maximum of 600 m or 1 kg (whichever is more restrictive) of film in one outer packaging. |              |                  |

## Packing Instruction 455

Passenger and cargo aircraft for UN 1944 and 1945 only

### General requirements

Part 4, Chapter 1 requirements must be met, including:

#### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.

#### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

| COMBINATION PACKAGINGS                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                              |                                          | SINGLE<br>PACKAGINGS |
|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|------------------------------------------|----------------------|
| UN number and<br>proper shipping name                                 | Packing conditions                                                                                                                                                                                                                                                                                                                                                                                                                          | Total quantity<br>per package<br>– passenger | Total quantity<br>per package<br>– cargo |                      |
| UN 1944 <b>Matches, safety</b><br>UN 1945 <b>Matches, wax ‘vesta’</b> | <p>Packaging as set out in the list of outer packagings below may be used.</p> <p><b>For a maximum of 50 books</b></p> <p>The following packaging is permitted:</p> <p>Strong fibreboard carton, which is made of straw board covered with kraft paper, having a securely glued inside lining consisting of aluminium foil, at least 0.01 mm thick, the carton to have a full depth lid with all joints secured with gummed paper tape.</p> | 25 kg                                        | 100 kg                                   | No                   |

### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

- Matches, safety (book card or strike on box) must be of a type that will not ignite spontaneously under normal conditions of air transport and can be readily ignited by friction only by striking on the manufacturer’s box, book or card.
- Matches must be tightly packed to prevent movement within the package and ignition by rubbing against an adjoining box, book or card.
- Matches must be securely wrapped in paper or foil or packed in tightly closed inner packagings.
- No more than 50 books of matches may be packed in one inner packaging.
- Packagings must meet the Packing Group II performance requirements.

### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

#### Boxes

Aluminium (4B)  
Fibreboard (4G)  
Natural wood (4C1, 4C2)  
Other metal (4N)  
Plastics (4H1, 4H2)  
Plywood (4D)  
Reconstituted wood (4F)  
Steel (4A)

#### Drums

Aluminium (1B1, 1B2)  
Fibre (1G)  
Other metal (1N1, 1N2)  
Plastics (1H1, 1H2)  
Steel (1A1, 1A2)

#### Jerricans

Aluminium (3B1, 3B2)  
Plastics (3H1, 3H2)  
Steel (3A1, 3A2)

## Packing Instruction Y455

Limited quantities  
Passenger and cargo aircraft for UN 1944 and 1945 only

### General requirements

Part 4, Chapter 1 requirements must be met (except that 4;1.1.2, 1.1.9 c), 1.1.9 e), 1.1.16, 1.1.18 and 1.1.20 do not apply), including:

#### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.

#### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

#### 3) Limited quantity requirements

- Part 3, Chapter 4 requirements must be met, including:
  - the capability of the package to pass a 1.2 m drop test; and
  - a 24-hour stacking test.

| COMBINATION PACKAGINGS                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                  |                                    | SINGLE<br>PACKAGINGS |
|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|------------------------------------|----------------------|
| UN number and<br>proper shipping name                                 | Packing conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Total<br>quantity<br>per package | Total gross<br>mass<br>per package |                      |
| UN 1944 <b>Matches, safety</b><br>UN 1945 <b>Matches, wax 'vesta'</b> | Packaging as set out in the list of<br>outer packagings below may be<br>used.<br><br><b>For a maximum of 50 books</b><br><br>The following packaging is<br>permitted:<br><br>Strong fibreboard carton, which is<br>made of straw board covered with<br>kraft paper, having a securely glued<br>inside lining consisting of aluminium<br>foil, at least 0.01 mm thick, the<br>carton to have a full depth lid with<br>all joints secured with gummed<br>paper tape. | 10 kg                            | 30 kg                              | No                   |

### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

- Matches, safety (book card or strike on box) must be of a type that will not ignite spontaneously under normal conditions of air transport and can be readily ignited by friction only by striking on the manufacturer's box, book or card.
- Matches must be tightly packed to prevent movement within the package and ignition by rubbing against an adjoining box, book or card.
- Matches must be securely wrapped in paper or foil or packed in tightly closed inner packagings.
- No more than 50 books of matches may be packed in one inner packaging.

### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

#### Boxes

Aluminium  
Fibreboard  
Natural wood  
Other metal  
Plastics  
Plywood  
Reconstituted wood  
Steel

#### Drums

Aluminium  
Fibre  
Other metal  
Plastics  
Steel

#### Jerricans

Aluminium  
Plastics  
Steel

### Packing Instruction 456

Passenger and cargo aircraft for UN 2000 only

#### General requirements

Part 4, Chapter 1 requirements must be met.

| <i>UN number and proper shipping name</i> | <i>Total quantity per package – passenger</i> | <i>Total quantity per package – cargo</i> |
|-------------------------------------------|-----------------------------------------------|-------------------------------------------|
| UN 2000 <b>Celluloid</b>                  | 25 kg                                         | 100 kg                                    |

### Packing Instruction 457

Passenger and cargo aircraft for UN 3241 only

#### General requirements

Part 4, Chapter 1 requirements must be met, including:

##### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.

##### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

| COMBINATION PACKAGINGS                         |                                    |                                                  |                                               |                                           | SINGLE PACKAGINGS |              |
|------------------------------------------------|------------------------------------|--------------------------------------------------|-----------------------------------------------|-------------------------------------------|-------------------|--------------|
| <i>UN number and proper shipping name</i>      | <i>Inner packaging (see 6;3.2)</i> | <i>Inner packaging quantity (per receptacle)</i> | <i>Total quantity per package – passenger</i> | <i>Total quantity per package – cargo</i> | <i>Passenger</i>  | <i>Cargo</i> |
| UN 3241 <b>2-Bromo-2-nitropropane-1,3-diol</b> | Glass                              | 0.5 kg                                           | 25 kg                                         | 50 kg                                     | 25 kg             | 50 kg        |
|                                                | Plastics                           | 1.0 kg                                           |                                               |                                           |                   |              |
|                                                | Plastic bag                        | 1.0 kg                                           |                                               |                                           |                   |              |

#### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

- Packagings must meet the Packing Group II performance requirements.

#### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

##### Boxes

Fibreboard (4G)  
Natural wood (4C1, 4C2)  
Plastics (4H1, 4H2)  
Plywood (4D)  
Reconstituted wood (4F)

##### Drums

Fibre (1G)  
Plastics (1H1, 1H2)  
Plywood (1D)

##### Jerricans

Plastics (3H1, 3H2)

#### ADDITIONAL PACKING REQUIREMENTS FOR SINGLE PACKAGINGS

- Packagings must meet the Packing Group II performance requirements.

### Packing Instruction 457

#### SINGLE PACKAGINGS

##### *Composites*

Plastic receptacle with  
outer wooden box (6HC)  
Plastic receptacle with  
outer plywood drum  
(6HD1)  
Plastic receptacle with  
outer plywood box  
(6HD2)  
Plastic receptacle with  
outer fibre drum (6HG1)  
Plastic receptacle with  
outer fibreboard box  
(6HG2)  
Plastic receptacle with  
outer plastic drum  
(6HH1)  
Plastic receptacle with  
outer solid plastic box  
(6HH2)

##### *Drums*

Plastics (1H1, 1H2)

##### *Jerricans*

Plastics (3H1, 3H2)

Packing Instruction Y457

Limited quantities

Passenger and cargo aircraft for UN 3241 only

General requirements

Part 4, Chapter 1 requirements must be met (except that 4;1.1.2, 1.1.9 c), 1.1.9 e), 1.1.16, 1.1.18 and 1.1.20 do not apply), including:

1) Compatibility requirements

— Substances must be compatible with their packagings as required by 4;1.1.3.

2) Closure requirements

— Closures must meet the requirements of 4;1.1.4.

3) Limited quantity requirements

— Part 3, Chapter 4 requirements must be met, including:

— the capability of the package to pass a 1.2 m drop test; and

— a 24-hour stacking test.

| COMBINATION PACKAGINGS                  |                             |                                           |                            |                              | SINGLE PACKAGINGS |
|-----------------------------------------|-----------------------------|-------------------------------------------|----------------------------|------------------------------|-------------------|
| UN number and proper shipping name      | Inner packaging (see 6;3.2) | Inner packaging quantity (per receptacle) | Total quantity per package | Total gross mass per package |                   |
| UN 3241 2-Bromo-2-nitropropane-1,3-diol | Glass                       | 0.5 kg                                    | 10 kg                      | 30 kg                        | No                |
|                                         | Plastics                    | 0.5 kg                                    |                            |                              |                   |
|                                         | Plastic bag                 | 0.5 kg                                    |                            |                              |                   |

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Fibreboard

Natural wood

Plastics

Plywood

Reconstituted wood

Drums

Fibre

Plastics

Jerricans

Plastics

Packing Instruction 458

Passenger and cargo aircraft for UN 3270 only

General requirements

Part 4, Chapter 1 requirements must be met, including:

1) Compatibility requirements

— Substances must be compatible with their packagings as required by 4;1.1.3.

2) Closure requirements

— Closures must meet the requirements of 4;1.1.4.

| COMBINATION PACKAGINGS                             |                                                                                                                                                     |                                                       |                                                   | SINGLE<br>PACKAGINGS |
|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------|----------------------|
| <i>UN number and proper<br/>shipping name</i>      | <i>Packing conditions</i>                                                                                                                           | <i>Total quantity<br/>per package<br/>– passenger</i> | <i>Total quantity<br/>per package<br/>– cargo</i> |                      |
| UN 3270 <b>Nitrocellulose<br/>membrane filters</b> | Any packaging from the list of<br>outer packagings below<br>provided that explosion is not<br>possible by reason of<br>increased internal pressure. | 1 kg                                                  | 15 kg                                             | No                   |

ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

— Packagings must meet the Packing Group II performance requirements.

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

*Boxes*

Aluminium (4B)  
Fibreboard (4G)  
Natural wood (4C1, 4C2)  
Other metal (4N)  
Plastics (4H1, 4H2)  
Plywood (4D)  
Reconstituted wood (4F)  
Steel (4A)

*Drums*

Aluminium (1B2)  
Fibre (1G)  
Other metal (1N2)  
Plastics (1H2)  
Steel (1A2)

*Jerricans*

Aluminium (3B2)  
Plastics (3H2)  
Steel (3A2)

## Packing Instruction Y458

Limited quantities  
Passenger and cargo aircraft for UN 3270 only

### General requirements

Part 4, Chapter 1 requirements must be met (except that 4;1.1.2, 1.1.9 c), 1.1.9 e), 1.1.16, 1.1.18 and 1.1.20 do not apply), including:

#### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.

#### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

#### 3) Limited quantity requirements

- Part 3, Chapter 4 requirements must be met, including:
  - the capability of the package to pass a 1.2 m drop test; and
  - a 24-hour stacking test.

| COMBINATION PACKAGINGS                         |                                                                                                                                         |                                   |                                     | SINGLE<br>PACKAGINGS |
|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------------------------|----------------------|
| <i>UN number and proper shipping name</i>      | <i>Packing conditions</i>                                                                                                               | <i>Total quantity per package</i> | <i>Total gross mass per package</i> |                      |
| UN 3270 <b>Nitrocellulose membrane filters</b> | Any packaging from the list of outer packagings below provided that explosion is not possible by reason of increased internal pressure. | 1 kg                              | 30 kg                               | No                   |

### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

#### Boxes

Aluminium  
Fibreboard  
Natural wood  
Other metal  
Plastics  
Plywood  
Reconstituted wood  
Steel

#### Drums

Aluminium  
Fibre  
Other metal  
Plastics  
Steel

#### Jerricans

Aluminium  
Plastics  
Steel

## Packing Instruction 459

Passenger and cargo aircraft – self-reactive substances and polymerizing substances

### General requirements

Part 4, Chapter 1 requirements must be met, including:

#### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.

#### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

| COMBINATION PACKAGINGS             |                                                     |                                                       |                                        |                                                   |                                    |       | SINGLE<br>PACKAGINGS |
|------------------------------------|-----------------------------------------------------|-------------------------------------------------------|----------------------------------------|---------------------------------------------------|------------------------------------|-------|----------------------|
| UN number and proper shipping name | Inner packaging (see 6;3.2)                         | Inner packaging quantity (per receptacle) – passenger | Total quantity per package – passenger | Inner packaging quantity (per receptacle) – cargo | Total quantity per package – cargo |       |                      |
| Liquids                            |                                                     |                                                       |                                        |                                                   |                                    |       | No                   |
| UN 3223                            | Self-reactive liquid type C                         | Plastics                                              | 0.5 L                                  | 5 L                                               | 1.0 L                              | 10 L  |                      |
| UN 3225                            | Self-reactive liquid type D                         | Plastics                                              | 0.5 L                                  | 5 L                                               | 1.0 L                              | 10 L  |                      |
| UN 3227                            | Self-reactive liquid type E                         | Plastics                                              | 1.0 L                                  | 10 L                                              | 2.5 L                              | 25 L  |                      |
| UN 3229                            | Self-reactive liquid type F                         | Plastics                                              | 1.0 L                                  | 10 L                                              | 2.5 L                              | 25 L  |                      |
| UN 3532                            | Polymerizing substance, liquid, stabilized, n.o.s.* | Plastics                                              | 1.0 L                                  | 10 L                                              | 2.5 L                              | 25 L  |                      |
| Solids                             |                                                     |                                                       |                                        |                                                   |                                    |       | No                   |
| UN 3224                            | Self-reactive solid type C                          | Plastics                                              | 0.5 kg                                 | 5 kg                                              | 1.0 kg                             | 10 kg |                      |
|                                    |                                                     | Plastic bag                                           | 0.5 kg                                 | 5 kg                                              | 1.0 kg                             | 10 kg |                      |
| UN 3226                            | Self-reactive solid type D                          | Plastics                                              | 0.5 kg                                 | 5 kg                                              | 1.0 kg                             | 10 kg |                      |
|                                    |                                                     | Plastic bag                                           | 0.5 kg                                 | 5 kg                                              | 1.0 kg                             | 10 kg |                      |
| UN 3228                            | Self-reactive solid type E                          | Plastics                                              | 1.0 kg                                 | 10 kg                                             | 2.5 kg                             | 25 kg |                      |
|                                    |                                                     | Plastic bag                                           | 1.0 kg                                 | 10 kg                                             | 2.5 kg                             | 25 kg |                      |
| UN 3230                            | Self-reactive solid type F                          | Plastics                                              | 1.0 kg                                 | 10 kg                                             | 2.5 kg                             | 25 kg |                      |
|                                    |                                                     | Plastic bag                                           | 1.0 kg                                 | 10 kg                                             | 2.5 kg                             | 25 kg |                      |
| UN 3531                            | Polymerizing substance, solid, stabilized, n.o.s.*  | Plastics                                              | 1.0 kg                                 | 10 kg                                             | 2.5 kg                             | 25 kg |                      |
|                                    |                                                     | Plastic bag                                           | 1.0 kg                                 | 10 kg                                             | 2.5 kg                             | 25 kg |                      |

### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

- Cushioning materials must not be readily combustible.
- Packagings must meet the Packing Group II performance requirements.

UN 3223 or UN3224

Energetic samples classified in accordance with Part 2, Introductory Chapter, paragraph 5.4 may be carried under UN 3223 or UN 3224, as appropriate, provided that:

1. The quantity per individual inner cavity does not exceed 0.01 g for solids or 0.01 mL for liquids and the maximum net quantity per outer packaging does not exceed 20 g for solids or 20 mL for liquids, or in the case of mixed packing the sum of grams and millilitres does not exceed 20:

| Packing Instruction 459                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                 |                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|-----------------------------------------------------|
| <div><div><div>a) the samples are carried in microtiter plates or multi-titer plates made of plastics, glass, porcelain or stoneware as an inner packaging;</div><div>b) only combination packaging with outer packaging comprising boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1 and 4H2) are permitted; or</div></div><div>2. The maximum content of each inner packaging does not exceed 1 g for solids or 1 mL for liquids and the maximum net quantity per outer packaging does not exceed 56 g for solids or 56 mL for liquids, or in the case of mixed packing the sum of grams and millilitres does not exceed 56:</div><div><div>a) The individual substance is contained in an inner packaging of glass or plastics of maximum capacity of 30 mL placed in an expandable polyethylene foam matrix of at least 130 mm thickness having a density of 18 ±1 g/L;</div><div>b) Within the foam carrier, inner packagings are segregated from each other by a minimum distance of 40 mm and from the wall of the outer packaging by a minimum distance of 70 mm. The package may contain up to two layers of such foam matrices, each carrying up to twenty-eight inner packagings;</div><div>c) The outer packaging consists only of corrugated fibreboard boxes (4G) having minimum dimensions of 60 cm (length) by 40.5 cm (width) by 30 cm (height) and minimum wall thickness of 1.3 cm.</div></div><div>When dry ice or liquid nitrogen is optionally used as a coolant for quality control measures, all applicable requirements of these Instructions must be met. Interior supports must be provided to secure the inner packagings in the original position after the ice or dry ice has dissipated. If ice is used, the outside packaging or overpack must be leakproof. If dry ice is used, the requirements in Packing Instruction 954 must be met. The inner and outer packagings must maintain their integrity at the temperature of the refrigerant used as well as the temperatures and the pressures which could result if refrigeration were lost.</div></div> |                                                                                 |                                                     |
| OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                 |                                                     |
| <div>Boxes</div> <div>Fibreboard (4G)<br/>Natural wood (4C1, 4C2)<br/>Plastics (4H1, 4H2)<br/>Plywood (4D)<br/>Reconstituted wood (4F)</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <div>Drums</div> <div>Fibre (1G)<br/>Plastics (1H1, 1H2)<br/>Plywood (1D)</div> | <div>Jerricans</div> <div>Plastics (3H1, 3H2)</div> |

## Packing Instructions 462 – 463

Passenger aircraft

### General requirements

Part 4, Chapter 1 requirements must be met, including:

#### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.
- Metal packagings must be corrosion resistant or be protected against corrosion for substances with a Class 8 subsidiary hazard.

#### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

| COMBINATION PACKAGINGS |               |                             |                                           |                            | SINGLE<br>PACKAGINGS |
|------------------------|---------------|-----------------------------|-------------------------------------------|----------------------------|----------------------|
| Packing instruction    | Packing group | Inner packaging (see 6;3.2) | Inner packaging quantity (per receptacle) | Total quantity per package |                      |
| —                      | I             | Forbidden                   |                                           |                            |                      |
| 462                    | II            | Glass                       | 1.0 L                                     | 1 L                        | No                   |
|                        |               | Plastics                    | 1.0 L                                     |                            |                      |
|                        |               | Metal                       | 1.0 L                                     |                            |                      |
| 463                    | III           | Glass                       | 2.5 L                                     | 5 L                        | 5 L                  |
|                        |               | Plastics                    | 2.5 L                                     |                            |                      |
|                        |               | Metal                       | 5.0 L                                     |                            |                      |

### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

Packing Group III

- Packagings must meet the Packing Group II performance requirements.

### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

#### Boxes

Aluminium (4B)  
Fibreboard (4G)  
Natural wood (4C1, 4C2)  
Other metal (4N)  
Plastics (4H1, 4H2)  
Plywood (4D)  
Reconstituted wood (4F)  
Steel (4A)

#### Drums

Aluminium (1B1, 1B2)  
Fibre (1G)  
Other metal (1N1, 1N2)  
Plastics (1H1, 1H2)  
Plywood (1D)  
Steel (1A1, 1A2)

#### Jerricans

Aluminium (3B1, 3B2)  
Plastics (3H1, 3H2)  
Steel (3A1, 3A2)

### ADDITIONAL PACKING REQUIREMENTS FOR SINGLE PACKAGINGS

Packing Group III

- Packagings must meet the Packing Group II performance requirements.

### SINGLE PACKAGINGS FOR PACKING GROUP III ONLY (PI 463)

#### Composites

All (see 6;3.1.18)

#### Cylinders

See 4;2.7

#### Drums

Aluminium (1B1, 1B2)  
Other metal (1N1, 1N2)  
Plastics (1H1, 1H2)  
Steel (1A1, 1A2)

#### Jerricans

Aluminium (3B1, 3B2)  
Plastics (3H1, 3H2)  
Steel (3A1, 3A2)

## Packing Instructions 464 – 465

Cargo aircraft only

### General requirements

Part 4, Chapter 1 requirements must be met, including:

#### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.
- Metal packagings must be corrosion resistant or be protected against corrosion for substances with a Class 8 subsidiary hazard.

#### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

| COMBINATION PACKAGINGS |               |                             |                                           |                            | SINGLE<br>PACKAGINGS |
|------------------------|---------------|-----------------------------|-------------------------------------------|----------------------------|----------------------|
| Packing instruction    | Packing group | Inner packaging (see 6;3.2) | Inner packaging quantity (per receptacle) | Total quantity per package |                      |
| —                      | I             | Forbidden                   |                                           |                            |                      |
| 464                    | II            | Glass                       | 2.5 L                                     | 5 L                        | No                   |
|                        |               | Plastics                    | 2.5 L                                     |                            |                      |
|                        |               | Metal                       | 5.0 L                                     |                            |                      |
| 465                    | III           | Glass                       | 5.0 L                                     | 60 L                       | 60 L                 |
|                        |               | Plastics                    | 5.0 L                                     |                            |                      |
|                        |               | Metal                       | 10.0 L                                    |                            |                      |

### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

#### Packing Group III

- Packagings must meet the Packing Group II performance requirements.

#### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

##### Boxes

Aluminium (4B)  
Fibreboard (4G)  
Natural wood (4C1, 4C2)  
Other metal (4N)  
Plastics (4H1, 4H2)  
Plywood (4D)  
Reconstituted wood (4F)  
Steel (4A)

##### Drums

Aluminium (1B1, 1B2)  
Fibre (1G)  
Other metal (1N1, 1N2)  
Plastics (1H1, 1H2)  
Plywood (1D)  
Steel (1A1, 1A2)

##### Jerricans

Aluminium (3B1, 3B2)  
Plastics (3H1, 3H2)  
Steel (3A1, 3A2)

### ADDITIONAL PACKING REQUIREMENTS FOR SINGLE PACKAGINGS

#### Packing Group III

- Packagings must meet the Packing Group II performance requirements.

#### SINGLE PACKAGINGS FOR PACKING GROUP III ONLY (PI 465)

##### Composites

All (see 6;3.1.18)

##### Cylinders

See 4;2.7

##### Drums

Aluminium (1B1, 1B2)  
Other metal (1N1, 1N2)  
Plastics (1H1, 1H2)  
Steel (1A1, 1A2)

##### Jerricans

Aluminium (3B1, 3B2)  
Plastics (3H1, 3H2)  
Steel (3A1, 3A2)

## Packing Instructions 466 – 469

Passenger aircraft

### General requirements

Part 4, Chapter 1 requirements must be met, including:

#### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.
- Metal packagings must be corrosion resistant or be protected against corrosion for substances with a Class 8 subsidiary hazard.

#### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

| COMBINATION PACKAGINGS |               |                             |                                           |                            | SINGLE<br>PACKAGINGS |
|------------------------|---------------|-----------------------------|-------------------------------------------|----------------------------|----------------------|
| Packing instruction    | Packing group | Inner packaging (see 6;3.2) | Inner packaging quantity (per receptacle) | Total quantity per package |                      |
| —                      | I             | Forbidden                   |                                           |                            |                      |
| 466                    | II            | Glass                       | 1.0 kg                                    | 15 kg                      | No                   |
|                        |               | Plastics                    | 1.0 kg                                    |                            |                      |
|                        |               | Metal                       | 1.0 kg                                    |                            |                      |
| 467                    | II            | Glass                       | 1.0 kg                                    | 15 kg                      | No                   |
|                        |               | Plastics                    | 2.5 kg                                    |                            |                      |
|                        |               | Metal                       | 2.5 kg                                    |                            |                      |
|                        |               | Plastic bag                 | 1.0 kg                                    |                            |                      |
| 468                    | III           | Glass                       | 2.5 kg                                    | 25 kg                      | No                   |
|                        |               | Plastics                    | 2.5 kg                                    |                            |                      |
|                        |               | Metal                       | 5.0 kg                                    |                            |                      |
| 469                    | III           | Glass                       | 5.0 kg                                    | 25 kg                      | No                   |
|                        |               | Plastics                    | 10.0 kg                                   |                            |                      |
|                        |               | Metal                       | 10.0 kg                                   |                            |                      |
|                        |               | Plastic bag                 | 5.0 kg                                    |                            |                      |

### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

#### Packing Group III

- Packagings must meet the Packing Group II performance requirements.

### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

#### Boxes

Aluminium (4B)  
Fibreboard (4G)  
Natural wood (4C1, 4C2)  
Other metal (4N)  
Plastics (4H1, 4H2)  
Plywood (4D)  
Reconstituted wood (4F)  
Steel (4A)

#### Drums

Aluminium (1B1, 1B2)  
Fibre (1G)  
Other metal (1N1, 1N2)  
Plastics (1H1, 1H2)  
Plywood (1D)  
Steel (1A1, 1A2)

#### Jerricans

Aluminium (3B1, 3B2)  
Plastics (3H1, 3H2)  
Steel (3A1, 3A2)

## Packing Instructions 470 – 471

Cargo aircraft only

### General requirements

Part 4, Chapter 1 requirements must be met, including:

#### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.
- Metal packagings must be corrosion resistant or be protected against corrosion for substances with a Class 8 subsidiary hazard.

#### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

| COMBINATION PACKAGINGS |               |                             |                                           |                            | SINGLE<br>PACKAGINGS |
|------------------------|---------------|-----------------------------|-------------------------------------------|----------------------------|----------------------|
| Packing instruction    | Packing group | Inner packaging (see 6;3.2) | Inner packaging quantity (per receptacle) | Total quantity per package |                      |
| —                      | I             | Forbidden                   |                                           |                            |                      |
| 470                    | II            | Glass                       | 2.5 kg                                    | 50 kg                      | 50 kg                |
|                        |               | Plastics                    | 5.0 kg                                    |                            |                      |
|                        |               | Metal                       | 5.0 kg                                    |                            |                      |
|                        |               | Plastic bag                 | 2.5 kg                                    |                            |                      |
| 471                    | III           | Glass                       | 5.0 kg                                    | 100 kg                     | 100 kg               |
|                        |               | Plastics                    | 10.0 kg                                   |                            |                      |
|                        |               | Metal                       | 10.0 kg                                   |                            |                      |
|                        |               | Plastic bag                 | 5.0 kg                                    |                            |                      |

### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

#### Packing Group III

- Packagings must meet the Packing Group II performance requirements.

#### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

##### Boxes

Aluminium (4B)  
Fibreboard (4G)  
Natural wood (4C1, 4C2)  
Other metal (4N)  
Plastics (4H1, 4H2)  
Plywood (4D)  
Reconstituted wood (4F)  
Steel (4A)

##### Drums

Aluminium (1B1, 1B2)  
Fibre (1G)  
Other metal (1N1, 1N2)  
Plastics (1H1, 1H2)  
Plywood (1D)  
Steel (1A1, 1A2)

##### Jerricans

Aluminium (3B1, 3B2)  
Plastics (3H1, 3H2)  
Steel (3A1, 3A2)

### ADDITIONAL PACKING REQUIREMENTS FOR SINGLE PACKAGINGS

#### Packing Group III

- Packagings must meet the Packing Group II performance requirements.
- Fibreboard, fibre, wood and plywood single packagings must be fitted with a suitable liner.

### Packing Instruction 470 – 471

#### SINGLE PACKAGINGS

| <i>Boxes</i>                                                                                                                                           | <i>Composites</i>  | <i>Cylinders</i> | <i>Drums</i>                                                                                                            | <i>Jerricans</i>                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| Aluminium (4B)<br>Fibreboard (4G)<br>Natural wood (4C2)<br>Other metal (4N)<br>Plastics (4H2)<br>Plywood (4D)<br>Reconstituted wood (4F)<br>Steel (4A) | All (see 6;3.1.18) | See 4;2.7        | Aluminium (1B1, 1B2)<br>Other metal (1N1, 1N2)<br>Fibre (1G)<br>Plastics (1H1, 1H2)<br>Plywood (1D)<br>Steel (1A1, 1A2) | Aluminium (3B1, 3B2)<br>Plastics (3H1, 3H2)<br>Steel (3A1, 3A2) |

### Packing Instruction 472

Passenger and cargo aircraft for UN 1362 only

#### General requirements

Part 4, Chapter 1 requirements must be met, including:

##### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.

##### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

| COMBINATION PACKAGINGS                        |                                            |                                                          |                                       | SINGLE<br>PACKAGINGS |
|-----------------------------------------------|--------------------------------------------|----------------------------------------------------------|---------------------------------------|----------------------|
| <i>UN number and proper<br/>shipping name</i> | <i>Inner<br/>packaging<br/>(see 6;3.2)</i> | <i>Inner packaging<br/>quantity (per<br/>receptacle)</i> | <i>Total quantity<br/>per package</i> |                      |
| UN 1362 <b>Carbon, activated</b>              | Plastics                                   | 0.1 kg                                                   | 0.5 kg                                | No                   |

#### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

| <i>Boxes</i>                 | <i>Drums</i>                             | <i>Jerricans</i>                         |
|------------------------------|------------------------------------------|------------------------------------------|
| Aluminium (4B)<br>Steel (4A) | Aluminium (1B1, 1B2)<br>Steel (1A1, 1A2) | Aluminium (3B1, 3B2)<br>Steel (3A1, 3A2) |

### Packing Instruction 473

Passenger and cargo aircraft – for UN 1378 and UN 2881 only

#### General requirements

Part 4, Chapter 1 requirements must be met, including:

- 1) Compatibility requirements
  - Substances must be compatible with their packagings as required by 4;1.1.3.
- 2) Closure requirements
  - Closures must meet the requirements of 4;1.1.4.

| COMBINATION PACKAGINGS                    |                      |                                    |                                                              |                                               |                                                          |                                           | SINGLE PACKAGINGS |              |
|-------------------------------------------|----------------------|------------------------------------|--------------------------------------------------------------|-----------------------------------------------|----------------------------------------------------------|-------------------------------------------|-------------------|--------------|
| <i>UN number and proper shipping name</i> | <i>Packing group</i> | <i>Inner packaging (see 6;3.2)</i> | <i>Inner packaging quantity (per receptacle) – passenger</i> | <i>Total quantity per package – passenger</i> | <i>Inner packaging quantity (per receptacle) – cargo</i> | <i>Total quantity per package – cargo</i> | <i>Passenger</i>  | <i>Cargo</i> |
| UN 1378 <b>Metal catalyst, wetted</b>     | II                   | Glass                              | Forbidden                                                    |                                               | 1.0 kg                                                   | 50 kg                                     | No                | No           |
|                                           |                      | Metal                              |                                                              |                                               | 1.0 kg                                                   |                                           |                   |              |
| UN 2881 <b>Metal catalyst, dry</b>        | I                    |                                    | Forbidden                                                    |                                               | Forbidden                                                |                                           | No                | No           |
|                                           |                      |                                    |                                                              |                                               |                                                          |                                           |                   |              |
|                                           | II                   | Glass                              | Forbidden                                                    |                                               | 1.0 kg                                                   | 50 kg                                     | No                | No           |
|                                           |                      | Metal                              |                                                              |                                               | 1.0 kg                                                   |                                           |                   |              |
|                                           | III                  | Glass                              | 1.0 kg                                                       | 25 kg                                         | 2.5 kg                                                   | 100 kg                                    | No                | 100 kg       |
|                                           |                      | Metal                              | 1.0 kg                                                       | 25 kg                                         | 5.0 kg                                                   | 100 kg                                    |                   |              |

#### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

##### Packing Group III

- Packagings must meet the Packing Group II performance requirements.

#### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

##### Boxes

Aluminium (4B)  
Fibreboard (4G)  
Natural wood (4C1, 4C2)  
Other metal (4N)  
Plastics (4H1, 4H2)  
Plywood (4D)  
Reconstituted wood (4F)  
Steel (4A)

##### Drums

Aluminium (1B1, 1B2)  
Fibre (1G)  
Other metal (1N1, 1N2)  
Plastics (1H1, 1H2)  
Steel (1A1, 1A2)

##### Jerricans

Aluminium (3B1, 3B2)  
Plastics (3H1, 3H2)  
Steel (3A1, 3A2)

#### ADDITIONAL PACKING REQUIREMENTS FOR SINGLE PACKAGINGS

##### Packing Group III

- Packagings must meet the Packing Group II performance requirements.

#### SINGLE PACKAGINGS FOR PACKING GROUP III ONLY

##### Cylinders

See 4;2.7

##### Drums

Steel (1A1, 1A2)

##### Jerricans

Steel (3A1, 3A2)

## Packing Instructions Y474 – Y477

Limited quantities  
Passenger and cargo aircraft

### General requirements

Part 4, Chapter 1 requirements must be met (except that 4;1.1.2, 1.1.9 c), 1.1.9 e), 1.1.16, 1.1.18 and 1.1.20 do not apply), including:

#### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.
- Metal packagings must be corrosion resistant or be protected against corrosion.

#### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

#### 3) Limited quantity requirements

- Part 3, Chapter 4 requirements must be met, including:
  - the capability of the package to pass a 1.2 m drop test; and
  - a 24-hour stacking test.

| COMBINATION PACKAGINGS |                  |                                |                                                 |                                  |                                    | SINGLE<br>PACKAGINGS |
|------------------------|------------------|--------------------------------|-------------------------------------------------|----------------------------------|------------------------------------|----------------------|
| Packing<br>instruction | Packing<br>group | Inner packaging<br>(see 6;3.2) | Inner packaging<br>quantity (per<br>receptacle) | Total<br>quantity per<br>package | Total gross<br>mass per<br>package |                      |
| Y474                   | II               | Glass                          | 0.5 kg                                          | 1 kg                             | 30 kg                              | No                   |
|                        |                  | Plastics                       | 0.5 kg                                          |                                  |                                    |                      |
|                        |                  | Metal                          | 0.5 kg                                          |                                  |                                    |                      |
|                        |                  | Plastic bag                    | 0.5 kg                                          |                                  |                                    |                      |
| Y475                   | II               | Glass                          | 0.5 kg                                          | 5 kg                             |                                    | No                   |
|                        |                  | Plastics                       | 0.5 kg                                          |                                  |                                    |                      |
|                        |                  | Metal                          | 0.5 kg                                          |                                  |                                    |                      |
|                        |                  | Plastic bag                    | 0.5 kg                                          |                                  |                                    |                      |
| Y476                   | III              | Glass                          | 1.0 kg                                          | 5 kg                             |                                    | No                   |
|                        |                  | Plastics                       | 1.0 kg                                          |                                  |                                    |                      |
|                        |                  | Metal                          | 1.0 kg                                          |                                  |                                    |                      |
|                        |                  | Plastic bag                    | 1.0 kg                                          |                                  |                                    |                      |
| Y477                   | III              | Glass                          | 1.0 kg                                          | 10 kg                            |                                    | No                   |
|                        |                  | Plastics                       | 1.0 kg                                          |                                  |                                    |                      |
|                        |                  | Metal                          | 1.0 kg                                          |                                  |                                    |                      |
|                        |                  | Plastic bag                    | 1.0 kg                                          |                                  |                                    |                      |

### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

#### Packing Groups II and III

- For wetted substances where the outer packaging is not leakproof, a leakproof liner or equally effective means of intermediate containment must be provided.

### Packing Instructions Y474 – Y477

#### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

##### Boxes

Aluminium  
Fibreboard  
Natural wood  
Other metal  
Plastics  
Plywood  
Reconstituted wood  
Steel

##### Drums

Aluminium  
Fibre  
Other metal  
Plastics  
Steel

##### Jerricans

Aluminium  
Plastics  
Steel

### Packing Instructions 478 – 479

Passenger aircraft

#### General requirements

Part 4, Chapter 1 requirements must be met, including:

##### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.
- Metal packagings must be corrosion resistant or be protected against corrosion for substances with a Class 8 subsidiary hazard.

##### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

| COMBINATION PACKAGINGS |               |                             |                                           |                            | SINGLE<br>PACKAGINGS |
|------------------------|---------------|-----------------------------|-------------------------------------------|----------------------------|----------------------|
| Packing instruction    | Packing group | Inner packaging (see 6;3.2) | Inner packaging quantity (per receptacle) | Total quantity per package |                      |
| —                      | I             | Forbidden                   |                                           |                            |                      |
| 478                    | II            | Glass                       | 1.0 L                                     | 1 L                        | No                   |
|                        |               | Plastics                    | 1.0 L                                     |                            |                      |
|                        |               | Metal                       | 1.0 L                                     |                            |                      |
| 479                    | III           | Glass                       | 2.5 L                                     | 5 L                        | 5 L                  |
|                        |               | Plastics                    | 2.5 L                                     |                            |                      |
|                        |               | Metal                       | 5.0 L                                     |                            |                      |

#### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

##### Packing Group II

- Inner packagings must have threaded enclosures and must be surrounded in inert cushioning and absorbent material in a quantity sufficient to absorb the entire contents and enclosed in a leakproof liner, plastic bag or other equally effective means of intermediate leakproof containment.

##### Packing Group III

- Packagings must meet the Packing Group II performance requirements.

| Packing Instructions 478 – 479                                        |                        |                        |                      |
|-----------------------------------------------------------------------|------------------------|------------------------|----------------------|
| <b>OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)</b>         |                        |                        |                      |
| <i>Boxes</i>                                                          | <i>Drums</i>           | <i>Jerricans</i>       |                      |
| Aluminium (4B)                                                        | Aluminium (1B1, 1B2)   | Aluminium (3B1, 3B2)   |                      |
| Fibreboard (4G)                                                       | Fibre (1G)             | Plastics (3H1, 3H2)    |                      |
| Natural wood (4C1, 4C2)                                               | Other metal (1N1, 1N2) | Steel (3A1, 3A2)       |                      |
| Other metal (4N)                                                      | Plastics (1H1, 1H2)    |                        |                      |
| Plastics (4H1, 4H2)                                                   | Plywood (1D)           |                        |                      |
| Plywood (4D)                                                          | Steel (1A1, 1A2)       |                        |                      |
| Reconstituted wood (4F)                                               |                        |                        |                      |
| Steel (4A)                                                            |                        |                        |                      |
| <b>ADDITIONAL PACKING REQUIREMENTS FOR SINGLE PACKAGINGS</b>          |                        |                        |                      |
| <i>Packing Group III</i>                                              |                        |                        |                      |
| — Packagings must meet the Packing Group II performance requirements. |                        |                        |                      |
| <b>SINGLE PACKAGINGS FOR PACKING GROUP III (PI 479 only)</b>          |                        |                        |                      |
| <i>Composites</i>                                                     | <i>Cylinders</i>       | <i>Drums</i>           | <i>Jerricans</i>     |
| All (see 6;3.1.18)                                                    | See 4;2.7              | Aluminium (1B1, 1B2)   | Aluminium (3B1, 3B2) |
|                                                                       |                        | Other metal (1N1, 1N2) | Plastics (3H1, 3H2)  |
|                                                                       |                        | Plastics (1H1, 1H2)    | Steel (3A1, 3A2)     |
|                                                                       |                        | Steel (1A1, 1A2)       |                      |

## Packing Instructions 480 – 482

Cargo aircraft only

### General requirements

Part 4, Chapter 1 requirements must be met, including:

#### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.
- Metal packagings must be corrosion resistant or be protected against corrosion for substances with a Class 8 subsidiary hazard.

#### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

| COMBINATION PACKAGINGS |               |                             |                                           |                            | SINGLE<br>PACKAGINGS |
|------------------------|---------------|-----------------------------|-------------------------------------------|----------------------------|----------------------|
| Packing instruction    | Packing group | Inner packaging (see 6;3.2) | Inner packaging quantity (per receptacle) | Total quantity per package |                      |
| 480                    | I             | Glass                       | 1.0 L                                     | 1 L                        | No                   |
|                        |               | Plastics                    | Forbidden                                 |                            |                      |
|                        |               | Metal                       | 1.0 L                                     |                            |                      |
| 481                    | II            | Glass                       | 2.5 L                                     | 5 L                        | No                   |
|                        |               | Plastics                    | 2.5 L                                     |                            |                      |
|                        |               | Metal                       | 5.0 L                                     |                            |                      |
| 482                    | III           | Glass                       | 5.0 L                                     | 60 L                       | 60 L                 |
|                        |               | Plastics                    | 5.0 L                                     |                            |                      |
|                        |               | Metal                       | 10.0 L                                    |                            |                      |

### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

#### Packing Group I

- Inner packagings must have threaded enclosures and must be surrounded in inert cushioning and absorbent material in a quantity sufficient to absorb the entire contents and enclosed in a leakproof liner, plastic bag or other equally effective means of intermediate leakproof containment.

#### Packing Group II

- Inner packagings must have threaded enclosures and must be surrounded in inert cushioning and absorbent material in a quantity sufficient to absorb the entire contents.

#### Packing Group III

- Packagings must meet the Packing Group II performance requirements.

### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

#### Boxes

Aluminium (4B)  
Fibreboard (4G)  
Natural wood (4C1, 4C2)  
Other metal (4N)  
Plastics (4H1, 4H2)  
Plywood (4D)  
Reconstituted wood (4F)  
Steel (4A)

#### Drums

Aluminium (1B1, 1B2)  
Fibre (1G)  
Other metal (1N1, 1N2)  
Plastics (1H1, 1H2)  
Plywood (1D)  
Steel (1A1, 1A2)

#### Jerricans

Aluminium (3B1, 3B2)  
Plastics (3H1, 3H2)  
Steel (3A1, 3A2)

| Packing Instructions 480 – 482                                                                                                                                                                                                                                                                                                                                |                  |                                                                                          |                                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| <b>ADDITIONAL PACKING REQUIREMENTS FOR SINGLE PACKAGINGS</b>                                                                                                                                                                                                                                                                                                  |                  |                                                                                          |                                                                 |
| <i>Packing Group III</i>                                                                                                                                                                                                                                                                                                                                      |                  |                                                                                          |                                                                 |
| — Packagings must meet the Packing Group II performance requirements.                                                                                                                                                                                                                                                                                         |                  |                                                                                          |                                                                 |
| <b>SINGLE PACKAGINGS FOR PACKING GROUPS I AND II</b>                                                                                                                                                                                                                                                                                                          |                  |                                                                                          |                                                                 |
| Cylinders, provided that the general provisions of 4;2.7 are met. Cylinders must be made of steel and subjected to an initial test and period tests every ten years at a pressure of not less than 0.6 Mpa (6 bar) (gauge pressure). During transport, the liquid must be under a layer of inert gas with a gauge pressure of not less than 20 kPa (0.2 bar). |                  |                                                                                          |                                                                 |
| <b>SINGLE PACKAGINGS FOR PACKING GROUP III ONLY (PI 482)</b>                                                                                                                                                                                                                                                                                                  |                  |                                                                                          |                                                                 |
| <i>Composites</i>                                                                                                                                                                                                                                                                                                                                             | <i>Cylinders</i> | <i>Drums</i>                                                                             | <i>Jerricans</i>                                                |
| All (see 6;3.1.18)                                                                                                                                                                                                                                                                                                                                            | See 4;2.7        | Aluminium (1B1, 1B2)<br>Other metal (1N1, 1N2)<br>Plastics (1H1, 1H2)<br>Steel (1A1,1A2) | Aluminium (3B1, 3B2)<br>Plastics (3H1, 3H2)<br>Steel (3A1, 3A2) |

## Packing Instructions 483 – 486

Passenger aircraft

### General requirements

Part 4, Chapter 1 requirements must be met, including:

#### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.
- Metal packagings must be corrosion resistant or be protected against corrosion for substances with a Class 8 subsidiary hazard.

#### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

| COMBINATION PACKAGINGS |                  |                                |                                                 |                               | SINGLE<br>PACKAGINGS |
|------------------------|------------------|--------------------------------|-------------------------------------------------|-------------------------------|----------------------|
| Packing<br>instruction | Packing<br>group | Inner packaging<br>(see 6;3.2) | Inner packaging<br>quantity (per<br>receptacle) | Total quantity<br>per package |                      |
| —                      | I                | Forbidden                      |                                                 |                               |                      |
| 483                    | II               | Glass                          | 1.0 kg                                          | 15 kg                         | No                   |
|                        |                  | Plastics                       | 1.0 kg                                          |                               |                      |
|                        |                  | Metal                          | 1.0 kg                                          |                               |                      |
| 484                    | II               | Glass                          | 1.0 kg                                          | 15 kg                         | No                   |
|                        |                  | Plastics                       | 2.5 kg                                          |                               |                      |
|                        |                  | Metal                          | 2.5 kg                                          |                               |                      |
|                        |                  | Plastic bag                    | 1.0 kg                                          |                               |                      |
| 485                    | III              | Glass                          | 2.5 kg                                          | 25 kg                         | No                   |
|                        |                  | Plastics                       | 2.5 kg                                          |                               |                      |
|                        |                  | Metal                          | 5.0 kg                                          |                               |                      |
| 486                    | III              | Glass                          | 5.0 kg                                          | 25 kg                         | No                   |
|                        |                  | Plastics                       | 10.0 kg                                         |                               |                      |
|                        |                  | Metal                          | 10.0 kg                                         |                               |                      |
|                        |                  | Plastic bag                    | 5.0 kg                                          |                               |                      |

### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

#### Packing Group III

- Packagings must meet the Packing Group II performance requirements.
- For wetted substances where the outer packaging is not leakproof, a leakproof liner or equally effective means of intermediate containment must be provided.

### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

#### Boxes

Aluminium (4B)  
Fibreboard (4G)  
Natural wood (4C1, 4C2)  
Other metal (4N)  
Plastics (4H1, 4H2)  
Plywood (4D)  
Reconstituted wood (4F)  
Steel (4A)

#### Drums

Aluminium (1B1, 1B2)  
Fibre (1G)  
Other metal (1N1, 1N2)  
Plastics (1H1, 1H2)  
Plywood (1D)  
Steel (1A1, 1A2)

#### Jerricans

Aluminium (3B1, 3B2)  
Plastics (3H1, 3H2)  
Steel (3A1, 3A2)

## Packing Instructions 487 – 491

Cargo aircraft only

### General requirements

Part 4, Chapter 1 requirements must be met, including:

#### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.
- Metal packagings must be corrosion resistant or be protected against corrosion for substances with a Class 8 subsidiary hazard.

#### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

| COMBINATION PACKAGINGS |                  |                                |                                                 |                               | SINGLE<br>PACKAGINGS |
|------------------------|------------------|--------------------------------|-------------------------------------------------|-------------------------------|----------------------|
| Packing<br>instruction | Packing<br>group | Inner packaging<br>(see 6;3.2) | Inner packaging<br>quantity (per<br>receptacle) | Total quantity<br>per package |                      |
| 487                    | I                | Glass                          | 1.0 kg                                          | 15 kg                         | 15 kg                |
|                        |                  | Plastics                       | 1.0 kg                                          |                               |                      |
|                        |                  | Metal                          | 1.0 kg                                          |                               |                      |
| 488                    | I                | Glass                          | 1.0 kg                                          | 15 kg                         | 15 kg                |
|                        |                  | Plastics                       | 2.5 kg                                          |                               |                      |
|                        |                  | Metal                          | 2.5 kg                                          |                               |                      |
|                        |                  | Plastic bag                    | 2.5 kg                                          |                               |                      |
| 489                    | II               | Glass                          | 2.5 kg                                          | 50 kg                         | 50 kg                |
|                        |                  | Plastics                       | 2.5 kg                                          |                               |                      |
|                        |                  | Metal                          | 5.0 kg                                          |                               |                      |
| 490                    | II               | Glass                          | 2.5 kg                                          | 50 kg                         | 50 kg                |
|                        |                  | Plastics                       | 5.0 kg                                          |                               |                      |
|                        |                  | Metal                          | 5.0 kg                                          |                               |                      |
|                        |                  | Plastic bag                    | 2.5 kg                                          |                               |                      |
| 491                    | III              | Glass                          | 5.0 kg                                          | 100 kg                        | 100 kg               |
|                        |                  | Plastics                       | 10.0 kg                                         |                               |                      |
|                        |                  | Metal                          | 10.0 kg                                         |                               |                      |
|                        |                  | Plastic bag                    | 5.0 kg                                          |                               |                      |

### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

#### Packing Group I

- Inner packagings must be hermetically sealed, such as by taping or by threaded closures.

#### Packing Groups I and II

- For wetted substances where the outer packaging is not leakproof, a leakproof liner or equally effective means of intermediate containment must be provided.

#### Packing Group III

- Packagings must meet the Packing Group II performance requirements.
- For wetted substances where the outer packaging is not leakproof, a leakproof liner or equally effective means of intermediate containment must be provided.

## Packing Instructions 487 – 491

### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

#### *Boxes*

Aluminium (4B)  
Fibreboard (4G)  
Natural wood (4C1, 4C2)  
Other metal (4N)  
Plastics (4H1, 4H2)  
Plywood (4D)  
Reconstituted wood (4F)  
Steel (4A)

#### *Drums*

Aluminium (1B1, 1B2)  
Fibre (1G)  
Other metal (1N1, 1N2)  
Plastics (1H1, 1H2)  
Plywood (1D)  
Steel (1A1, 1A2)

#### *Jerricans*

Aluminium (3B1, 3B2)  
Plastics (3H1, 3H2)  
Steel (3A1, 3A2)

### ADDITIONAL PACKING REQUIREMENTS FOR SINGLE PACKAGINGS

— Fibreboard, fibre, wood and plywood single packagings must be fitted with a suitable liner.

#### *Packing Group III*

— Packagings must meet the Packing Group II performance requirements.

### SINGLE PACKAGINGS FOR PACKING GROUP I

#### *Composites*

All (see 6;3.1.18)

#### *Cylinders*

See 4;2.7

#### *Drums*

Aluminium (1B1, 1B2)  
Other metal (1N1, 1N2)  
Plastics (1H1, 1H2)  
Steel (1A1, 1A2)

#### *Jerricans*

Aluminium (3B1, 3B2)  
Plastics (3H1, 3H2)  
Steel (3A1, 3A2)

### SINGLE PACKAGINGS FOR PACKING GROUPS II AND III ONLY

#### *Boxes*

Aluminium (4B)  
Fibreboard (4G)  
Natural wood (4C2)  
Other metal (4N)  
Plastics (4H2)  
Plywood (4D)  
Reconstituted wood (4F)  
Steel (4A)

#### *Composites*

All (see 6;3.1.18)

#### *Cylinders*

See 4;2.7

#### *Drums*

Aluminium (1B1, 1B2)  
Fibre (1G)  
Other metal (1N1, 1N2)  
Plastics (1H1, 1H2)  
Plywood (1D)  
Steel (1A1, 1A2)

#### *Jerricans*

Aluminium (3B1, 3B2)  
Plastics (3H1, 3H2)  
Steel (3A1, 3A2)

## Packing Instruction 492

Passenger and cargo aircraft for UN 3292 only

### General requirements

Part 4, Chapter 1 requirements must be met, including:

- Compatibility requirements**
  - Substances must be compatible with their packagings as required by 4;1.1.3.
  - Metal packagings must be corrosion resistant or be protected against corrosion.
- Closure requirements**
  - Closures must meet the requirements of 4;1.1.4.

| <i>UN number and proper shipping name</i>                            | <i>Packing conditions</i>                                                                                                                                                                                                                              | <i>Total quantity per package – passenger</i> | <i>Total quantity per package – cargo</i> |
|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-------------------------------------------|
| UN 3292 <b>Batteries, containing metallic sodium or sodium alloy</b> | Batteries may be offered for transport and transported unpacked or in protective enclosures such as fully enclosed or wooden slatted crates that are not subject to the requirements of Part 6 of these Instructions.                                  | Forbidden                                     | No limit                                  |
| UN 3292 <b>Cells, containing metallic sodium or sodium alloy</b>     | There must be sufficient cushioning material to prevent contact between cells and between cells and the internal surfaces of the outer packaging and to ensure that no dangerous movement of the cells within the outer packaging occurs in transport. | 25 kg                                         | 400 kg                                    |

### ADDITIONAL PACKING REQUIREMENTS

- Packagings for cells must meet the Packing Group II performance requirements.
- Cells and batteries must be protected against short circuit and must be isolated in such a manner as to prevent short circuits.

### PACKAGINGS

| <i>Boxes</i>                                                                                                                                                     | <i>Drums</i>                                                                                        | <i>Jerricans</i>                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------|
| Aluminium (4B)<br>Fibreboard (4G)<br>Natural wood (4C1, 4C2)<br>Other metal (4N)<br>Plastics (4H1, 4H2)<br>Plywood (4D)<br>Reconstituted wood (4F)<br>Steel (4A) | Aluminium (1B2)<br>Fibre (1G)<br>Other metal (1N2)<br>Plastics (1H2)<br>Plywood (1D)<br>Steel (1A2) | Aluminium (3B2)<br>Plastics (3H2)<br>Steel (3A2) |

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### Packing Instruction 493

Passenger aircraft for UN 3399 only

#### General requirements

Part 4, Chapter 1 requirements must be met, including:

##### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.

##### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

| COMBINATION PACKAGINGS                                                                 |                  |                                                                         |                                                    |                               | SINGLE<br>PACKAGINGS |
|----------------------------------------------------------------------------------------|------------------|-------------------------------------------------------------------------|----------------------------------------------------|-------------------------------|----------------------|
| UN number and<br>proper shipping name                                                  | Packing<br>group | Inner<br>packaging<br>(see 6;3.2)                                       | Inner<br>packaging<br>quantity (per<br>receptacle) | Total quantity<br>per package |                      |
| UN 3399 <b>Organometallic<br/>substance, liquid,<br/>water reactive,<br/>flammable</b> | I                | Forbidden                                                               |                                                    |                               |                      |
|                                                                                        | II               | Glass<br>(see 6;3.2)                                                    | 1.0 L                                              | 1 L                           | No                   |
|                                                                                        |                  | Appropriate<br>cylinders or<br>other pressure<br>vessels<br>(see 4;2.7) | 1.0 L                                              | 1 L                           | No                   |
|                                                                                        | III              | Glass<br>(see 6;3.2)                                                    | 5.0 L                                              | 5 L                           | No                   |
|                                                                                        |                  | Appropriate<br>cylinders or<br>other pressure<br>vessels<br>(see 4;2.7) | 5.0 L                                              | 5 L                           | No                   |

#### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

- Glass containers must be packed with sufficient absorbent material to absorb the entire contents of the inner packagings and placed in a rigid leakproof receptacle before packing in outer packagings.
- Packagings must meet the Packing Group II performance requirements.

#### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

##### Boxes

Aluminium (4B)  
Fibreboard (4G)  
Natural wood (4C1, 4C2)  
Other metal (4N)  
Plastics (4H1, 4H2)  
Plywood (4D)  
Reconstituted wood (4F)  
Steel (4A)

##### Drums

Aluminium (1B1, 1B2)  
Fibre (1G)  
Other metal (1N1, 1N2)  
Plastics (1H1, 1H2)  
Steel (1A1, 1A2)

##### Jerricans

Aluminium (3B1, 3B2)  
Plastics (3H1, 3H2)  
Steel (3A1, 3A2)

## Packing Instruction 494

Cargo aircraft only for UN 3399

### General requirements

Part 4, Chapter 1 requirements must be met, including:

#### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.
- Metal packagings must be corrosion resistant or be protected against corrosion for substances with a Class 8 subsidiary hazard.

#### 2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

| COMBINATION PACKAGINGS                                                                 |                  |                                                                         |                                                    |                               | SINGLE<br>PACKAGINGS |
|----------------------------------------------------------------------------------------|------------------|-------------------------------------------------------------------------|----------------------------------------------------|-------------------------------|----------------------|
| UN number and proper<br>shipping name                                                  | Packing<br>group | Inner<br>packaging<br>(see 6;3.2)                                       | Inner<br>packaging<br>quantity (per<br>receptacle) | Total quantity<br>per package |                      |
| UN 3399 <b>Organometallic<br/>substance, liquid,<br/>water reactive,<br/>flammable</b> | I                | Glass<br>(see 6;3.2)                                                    | 1.0 L                                              | 1.0 L                         | No                   |
|                                                                                        |                  | Appropriate<br>cylinders or<br>other pressure<br>vessels<br>(see 4;2.7) | 1.0 L                                              | 1.0 L                         | No                   |
|                                                                                        | II               | Glass<br>(see 6;3.2)                                                    | 2.5 L                                              | 5 L                           | No                   |
|                                                                                        |                  | Appropriate<br>cylinders or<br>other pressure<br>vessels<br>(see 4;2.7) | 2.5 L                                              | 5 L                           | No                   |
|                                                                                        | III              | Glass<br>(see 6;3.2)                                                    | 5.0 L                                              | 60 L                          | 60 L                 |
|                                                                                        |                  | Appropriate<br>cylinders or<br>other pressure<br>vessels<br>(see 4;2.7) | 5.0 L                                              | 60 L                          | 60 L                 |

### ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

#### Packing Group I

- Inner packagings must have threaded enclosures and must be surrounded in inert cushioning and absorbent material in a quantity sufficient to absorb the entire contents and enclosed in a leakproof liner, plastic bag or other equally effective means of intermediate leakproof containment.

#### Packing Group II

- Glass inner packagings must be packed with sufficient absorbent material to absorb the entire contents of the inner packagings and enclosed in a leakproof liner, plastic bag or other equally effective means of intermediate leakproof containment.

#### Packing Group III

- Packagings must meet the Packing Group II performance requirements.

### Packing Instruction 494

#### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

##### Boxes

Aluminium (4B)  
Fibreboard (4G)  
Natural wood (4C1, 4C2)  
Other metal (4N)  
Plastics (4H1, 4H2)  
Plywood (4D)  
Reconstituted wood (4F)  
Steel (4A)

##### Drums

Aluminium (1B1, 1B2)  
Fibre (1G)  
Other metal (1N1, 1N2)  
Plastics (1H1, 1H2)  
Steel (1A1, 1A2)

##### Jerricans

Aluminium (3B1, 3B2)  
Plastics (3H1, 3H2)  
Steel (3A1, 3A2)

#### SINGLE PACKAGINGS FOR PACKING GROUP III ONLY

Appropriate cylinders or pressure vessels as permitted by 4;2.7.

### Packing Instruction 495

Passenger and cargo aircraft for UN 3476 only

#### General requirements

Part 4;1.1.1, 1.1.2 and 1.1.8 requirements must be met, including:

##### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.

| <i>UN number and name</i>                                                  | <i>Quantity – passenger</i>  | <i>Quantity – cargo</i>       |
|----------------------------------------------------------------------------|------------------------------|-------------------------------|
| UN 3476 <b>Fuel cell cartridges</b> , containing water-reactive substances | 5 kg of fuel cell cartridges | 50 kg of fuel cell cartridges |

#### ADDITIONAL PACKING REQUIREMENTS

- Fuel cell cartridges must be securely cushioned in the outer packagings.
- The mass of each fuel cell cartridge must not exceed 1 kg.
- Packagings must meet the Packing Group II performance requirements.

#### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

##### Boxes

Aluminium(4B)  
Fibreboard (4G)  
Natural wood (4C1, 4C2)  
Other metal (4N)  
Plastics (4H2)  
Plywood (4D)  
Reconstituted wood (4F)  
Steel (4A)

##### Drums

Aluminium(1B2)  
Fibre (1G)  
Other metal (1N2)  
Plastics (1H2)  
Plywood (1D)  
Steel (1A2)

##### Jerricans

Aluminium (3B2)  
Plastics (3H2)  
Steel (3A2)

## Packing Instruction Y495

Limited quantities for UN 3476 only

### General requirements

Part 3;4 requirements must be met.

Single packagings are not permitted for limited quantities.

For the purpose of this packing instruction, a fuel cell cartridge is considered an inner packaging.

Fuel cell cartridges containing liquid water reactive fuels are not permitted in limited quantities.

### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.

| <i>UN number and name</i>                                                  | <i>Maximum quantity per package</i> |
|----------------------------------------------------------------------------|-------------------------------------|
| UN 3476 <b>Fuel cell cartridges</b> , containing water-reactive substances | 2.5 kg of fuel cell cartridges      |

### ADDITIONAL PACKING REQUIREMENTS

- Fuel cell cartridges must be securely cushioned in the outer packagings.
- Fuel cell cartridges containing solid water reactive fuels must not exceed 0.2 kg solid water reactive fuel per cartridge.

### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

#### *Boxes*

Aluminium  
Fibreboard  
Natural wood  
Other metal  
Plastics  
Plywood  
Reconstituted wood  
Steel

#### *Drums*

Aluminium  
Fibre  
Other metal  
Plastics  
Plywood  
Steel

#### *Jerricans*

Aluminium  
Plastics  
Steel

### Packing Instruction 496

Passenger and cargo aircraft for UN 3476 (contained in equipment) only

#### General requirements

Part 4;1.1.1 and 1.1.8 requirements must be met, including:

#### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.

| <i>UN number and name</i>                                                                         | <i>Quantity – passenger</i>  | <i>Quantity – cargo</i>       |
|---------------------------------------------------------------------------------------------------|------------------------------|-------------------------------|
| UN 3476 <b>Fuel cell cartridges contained in equipment</b> , containing water-reactive substances | 5 kg of fuel cell cartridges | 50 kg of fuel cell cartridges |

#### ADDITIONAL PACKING REQUIREMENTS

- Fuel cell cartridges that are contained in equipment must be protected against short circuit and the equipment must be protected against inadvertent operation.
- Equipment must be securely cushioned in the outer packagings.
- The mass of each fuel cell cartridge must not exceed 1 kg.
- Fuel cell systems must not charge batteries during transport.
- On passenger aircraft, each fuel cell system and each fuel cell cartridge must conform to IEC 62282-6-100 Ed. 1, including Amendment 1, or a standard approved by the appropriate authority of the State of Origin.

#### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

*Boxes*

*Drums*

*Jerricans*

Strong outer packagings

### Packing Instruction 497

Passenger and cargo aircraft for UN 3476 (packed with equipment) only

#### General requirements

Part 4;1.1.1 and 1.1.8 requirements must be met, including:

#### 1) Compatibility requirements

- Substances must be compatible with their packagings as required by 4;1.1.3.

| <i>UN number and name</i>                                                                        | <i>Quantity – passenger</i>  | <i>Quantity – cargo</i>       |
|--------------------------------------------------------------------------------------------------|------------------------------|-------------------------------|
| UN 3476 <b>Fuel cell cartridges packed with equipment</b> , containing water-reactive substances | 5 kg of fuel cell cartridges | 50 kg of fuel cell cartridges |

#### ADDITIONAL PACKING REQUIREMENTS

- When fuel cell cartridges are packed with equipment, they must be packed in intermediate packagings together with the equipment they are capable of powering.
- The maximum number of fuel cell cartridges in the intermediate packaging must be the minimum number required to power the equipment, plus two spares.
- The fuel cell cartridges and the equipment must be packed with cushioning material or divider(s) or inner packaging so that the fuel cell cartridges are protected against damage that may be caused by the movement or placement of the equipment and the cartridges within the packaging.
- The mass of each fuel cell cartridge must not exceed 1 kg.

#### OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

*Boxes*

*Drums*

*Jerricans*

Strong outer packagings

### Packing Instruction 499

Only packagings which are approved by the appropriate national authority for these substances may be used (see 4;2.8). A copy of this approval must accompany each consignment or an annotation that it has been granted must be included with the transport document.