

**FINABEL Agreement No. A.20.A (20.A.5)**  
**Pneumatic Combat Tyres**  
**Date of Issue February 1997**

**Translated from the French (See French copy for definitive conditions)**

**1. Preamble**

1.1. Object of the Agreement.

A combat tyre must permit, despite penetrations of the tyre, to continue a mission for a predetermined period without the need to change the wheel. It also permits the need to carry a spare wheel on the vehicle.

1.2 Definitions.

The term “Pneumatic Combat Tyre” (“Combat Tyre”) includes the tyre case, a tyre combined with an inner tube, or a runflat insert fitted on the wheel inside the tyre.

The term “wheel” includes the wheel itself, the centre disc, on which the Pneumatic Combat Tyre is fitted.

The term VPG (variation de pression de gonflage ) (Central Tyre Inflation, or CTI) covers the system fitted to the vehicle that permits changes in tyre pressure while the vehicle is stationary or moving without a member of the crew having to leave the vehicle.

**2. Military Characteristics.**

2.1 In General.

The Combat Tyre must have the qualities as close as possible of a pneumatic radial tyre with an all terrain tread pattern and, at the same time, have as many characteristics as possible as set out in the FINABEL Agreement.

It must permit, after penetration of the tyre, to maintain the mobility of the vehicle to the level that the vehicle can continue a mission under the conditions set out in this agreement.

It is not permitted to place inside the Combat Tyre any material that can lead to the premature breakdown of the tyre during travel on or off road.

2.2 Characteristics Before Penetration.

2.2.1. The Combat Tyre must meet the tyre specification recommended for the vehicle to which it is fitted.

2.2.2. It is desirable that the mass (weight) of the wheel fitted with the Combat Tyre is as light as possible.

2.2.3. It is desirable the Combat Tyre in normal use can be repaired at battalion level under the same conditions as for radial tyres.

2.3 Performance After Penetration.

2.3.1. The term penetration includes all causes of damage that the vehicle tyres are likely to be subjected to in combat and after which the vehicle must be able to continue in the manner set out below.

2.3.2. The runflat performance must be effective as described below on a four wheel vehicle when one front and one driving wheel and one steering wheel are penetrated.

If a vehicle is fitted with more than four wheels, it is desirable that the runflat performance described below can be maintained when all the tyres on one side of the vehicle have been penetrated.

2.3.2. The vehicle having one or two tyre penetrated must **either:**

a) cover a course of a total distance of 100 km without the tyre dismounting from the wheel or starting to catch fire and with no serious effect on steering, manoeuvrability, stability, braking and maintenance of speed under the following conditions:

- 3 km @ maximum escape speed to a maximum of 90 km/hr;
- 22 km @ 50 km/hr;
- 75 km @ 25 km/hr;

b) travel off road for 2 hours at a speed of approximately 30 km/hr without the tyre leaving the wheel rim or starting to catch fire.

If the vehicle is fitted with a CTI system the trial will be carried out without using the CTI system.

The runflat FINABEL runflat conditions apply equally to retreaded tyres.

The test vehicle must, as far as possible, be capable of traversing obstacle freely (slopes, obstacles, ditches.

2.3.4. The runflat trial outlined at para 2.3.3. must have no detrimental affect on the inflated tyres on the vehicle.

### 3. Additions.

#### 3.1. Dimensions.

While the FINABEL standard does not specify tyre dimensions, it is desirable that the tyres chosen are of radial construction with all terrain tread pattern and meet the Geneva Agreement 20-03-58.

#### 3.2 Standardisation.

It is desirable that wheels equipped with Combat Tyres can be fitted to the same model of combat vehicle and that the wheel mounting studs are standard studs.

### 3.3 Qualification.

To qualify as Combat Tyres the trial must be carried out in accordance with the general conditions of this agreement.

### 4. Conditions of FINABEL Trial.

The road and off road trials will be carried out separately with two different sets of perforated tyres.

Before carrying out the trial, the difference in weights and moment of inertia between the standard wheel/tyre assembly and the ones fitted with the runflat system is to be determined to establish the likely long term mechanical effect on the vehicles fitted with the runflat systems. Before the trial proof marks will be placed on the tyre and wheel to establish the degree of tyre rotation on the wheel during the trial.

Note. Rotation of the tyre on the wheel during the trial is permitted but the degree of rotation should be established and such rotation should not prevent completion of the trial.

#### 4.1 On Road Trial

The trial route will be a circuit in a form of figure of 8, corresponding to a normal made up tarred road or concrete road with curves with radii of between 25 and 100 metres. The vehicle must travel the circuit under the following conditions:-

- 3 km at maximum escape speed (to a limit of 90 km/hr).
- 22 km @ 50 km/hr,
- 75 km @ 25 km/hr

#### 4.2 Off Road Trial.

4.2.1. The off road trial will be carried out on a winding off road circuit with obstacles associated with open terrain, such as slopes, ditches and tree trucks.

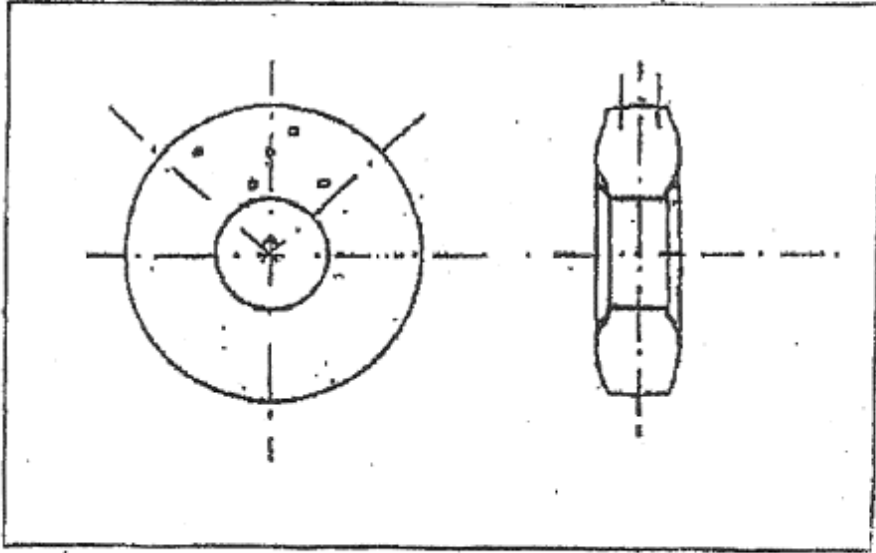
4.2.2. The vehicle must travel over the trial route for two hours at a speed of about 30 km/hr.

#### 4.4. Acceptance.

A trial will be judged to have succeeded if the trial vehicle completes above trial without the tyre dismounting from the wheel or starting to catch fire. After the trial the only tyres left unusable must be the penetrated tyres.

**ANNEX****1. PUNCTURING OF THE TYRE**

Puncturing is to be achieved by means of a 7.62 mm round fired from a range of 50 metres: 5 rounds will be fired into the tyre wall and 2 into the tread in accordance with the arrangement illustrated below.



Page 2 of 2

**ANNEXE****1. Penetration of Trial Tyre.**

The penetrations will be made by standard 7.62 mm ball rounds fired from a distance of 50 metres. 5 rounds will be fired into the side wall and 2 into the tyre tread according to the pattern set out above. Aiming marks should be attached to the tyre

**2. Conditions of Trial.**

2.1 The shooting trial will be carried out on the runflat equipped wheels when fitted to the vehicle to which they are normally fitted. All the trial tyres must be new approved or approved retreaded tyres.

2.2. For 4 x 4 vehicles, one of the penetrated tyres will be mounted on one of the steering wheels and one on the rear position. With vehicles having more than 4 wheels, all the tyres on one side of the vehicle will be penetrated.

2.3. With power assisted vehicles, the trial wheels will be positioned in the worst case positions.

-0-0-0-0-0-0-0-0-0-

