

UNECE R64 : RFT & RFWS

Tyre Industry position

Tyre Industry's concern over R64

- Tyre Industry expresses its concern that the proposed UNECE regulation R64 may lead European Tyre Manufacturers to infringe on Directive 2001/95 EC on general product safety.

Article 2 (b): 'safe product' shall mean any product which, under normal or reasonably foreseeable conditions of use ... high level of protection for the safety and health of persons, taking into account the following points in particular:

- (i) the characteristics of the product, ...;
- (ii) the effect on other products, where it is reasonably foreseeable that it will be used with other products

Introduction

- Run-flat tyres (RFT) are appreciated for the additional safety they provide, thanks to their capability of being driven after a puncture.
- Since drivers might not perceive a pressure loss on such tyres by themselves, the tyre industry calls for implementing an efficient run-flat warning system (RFWS) together with a RFT.

Specifications for RFT

- The flat-running capability of a RFT is limited :
- Technical prescriptions in UNECE regulation **R30** :
 - "Run flat system" or "Extended mobility system" - describes an assembly of specified functionally dependant components, including a tyre, which together provide the specified performance granting the vehicle with the **basic tyre functions**, at least, **at a speed of 80 km/h (50mph) and a distance of 80 km when operating in flat tyre running mode**
 - Flat tyre running mode" - describes the state of the tyre, essentially **maintaining its structural integrity**, while operating at an inflation **pressure between 0 and 70 kPa**
 - Annex 7 describes the tyre **test method**, from **ISO 16992** : **zero pressure**, 65% of load index, 38°C, test drum,...

Limitations of RFT

- But the time during which a RFT can remain functional in the flat-running mode decreases rapidly with increasing speed above the 80 km/h maximum speed :

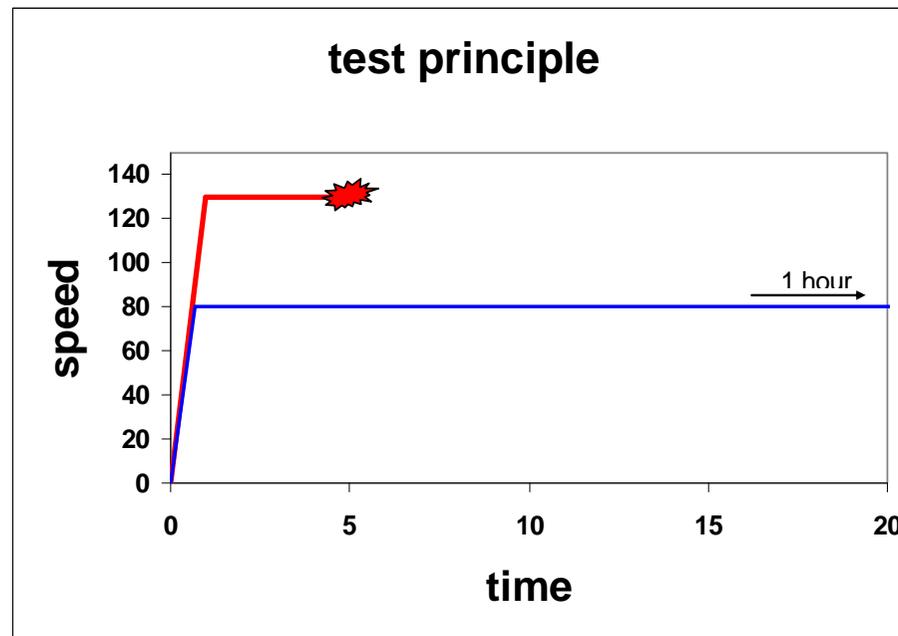
for instance, a flat RFT may support the load only a few minutes at 130 km/h.

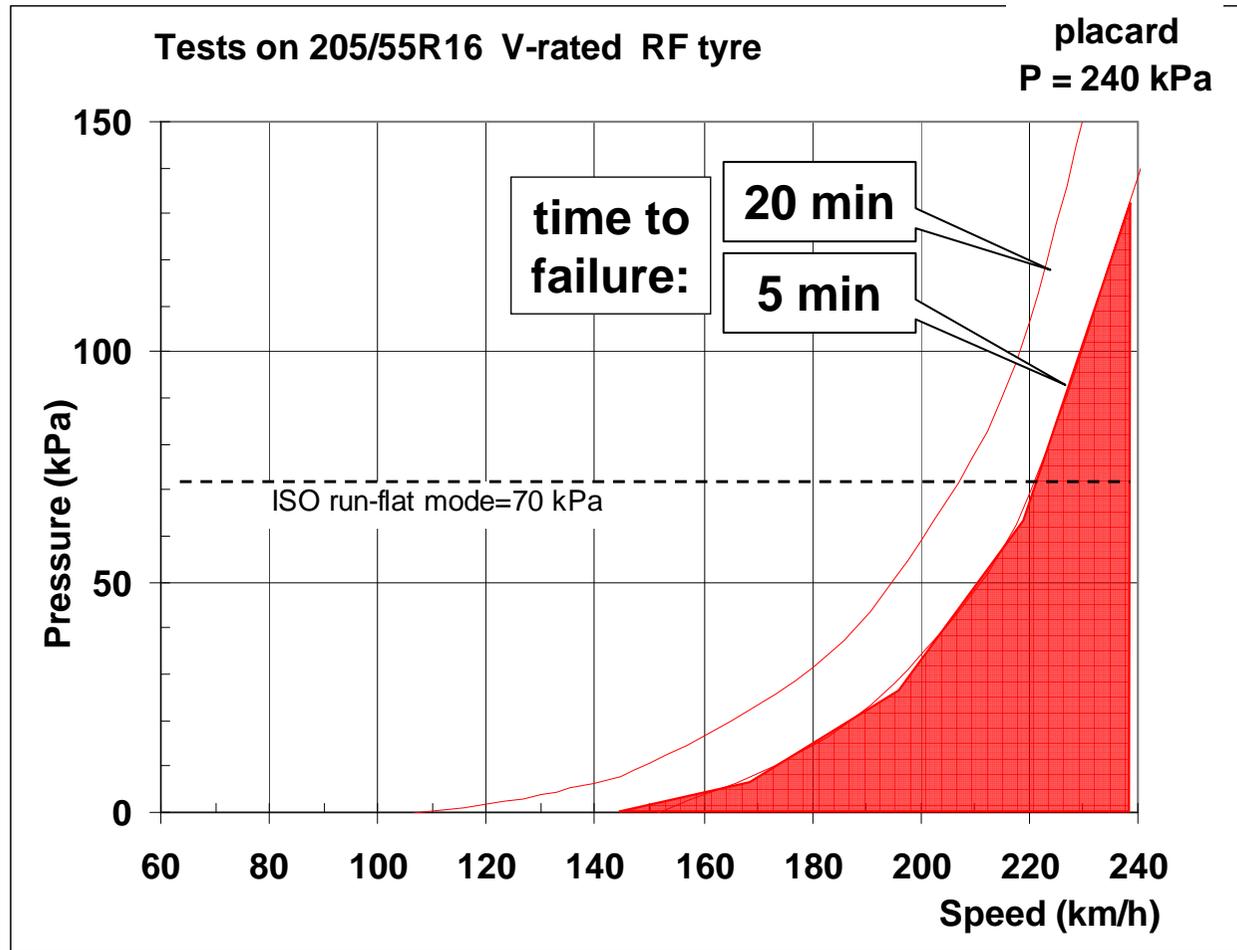
RF-tyre “low endurance zone”

- Tyre Makers can measure tyre endurance and draw a “speed – pressure – endurance time” diagram, which delineates the domain of driving conditions where a RF tyre loses its functionality in less than 5 min.

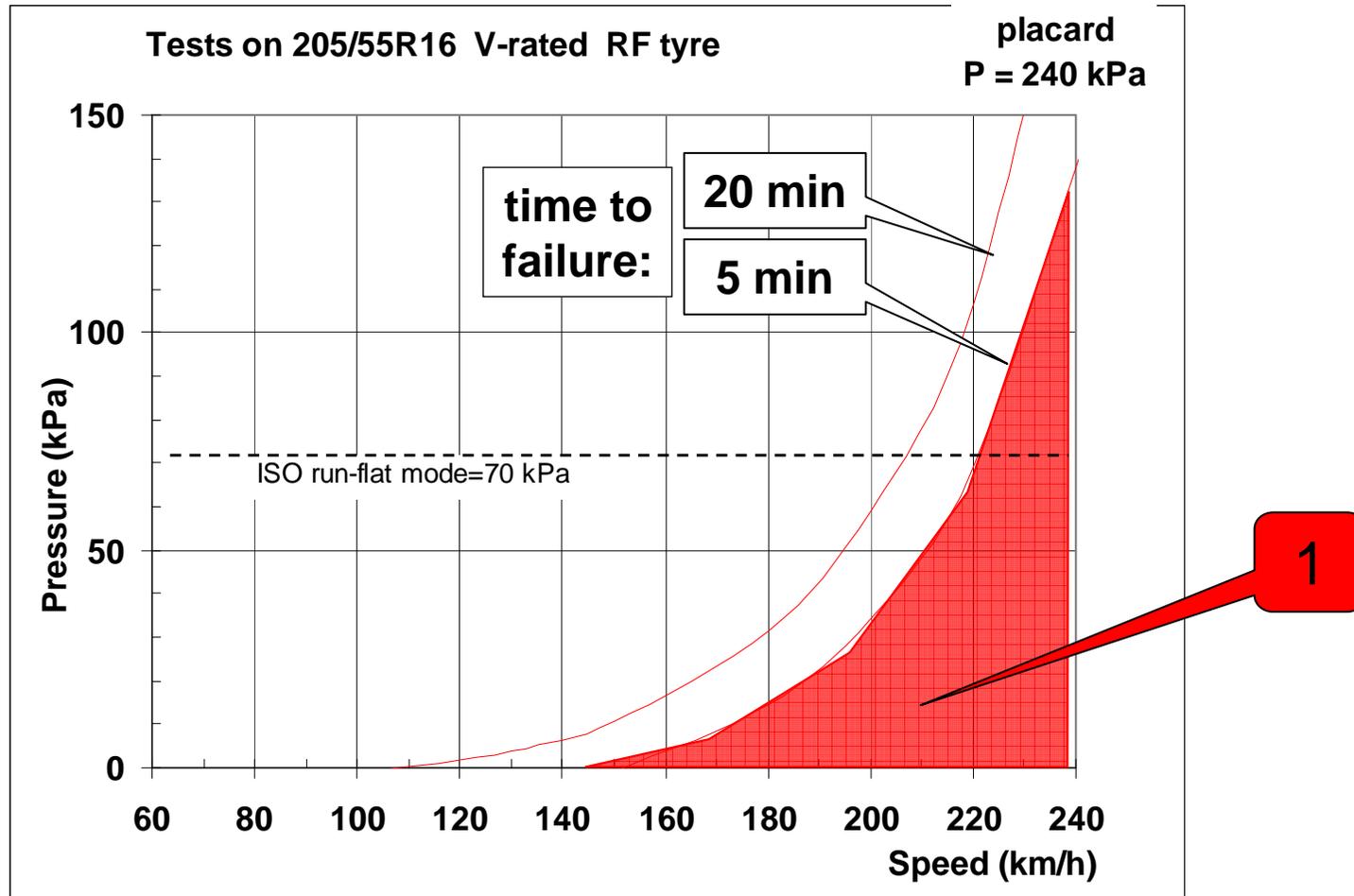
Test to check :

set pressure, set speed,
measure time to failure

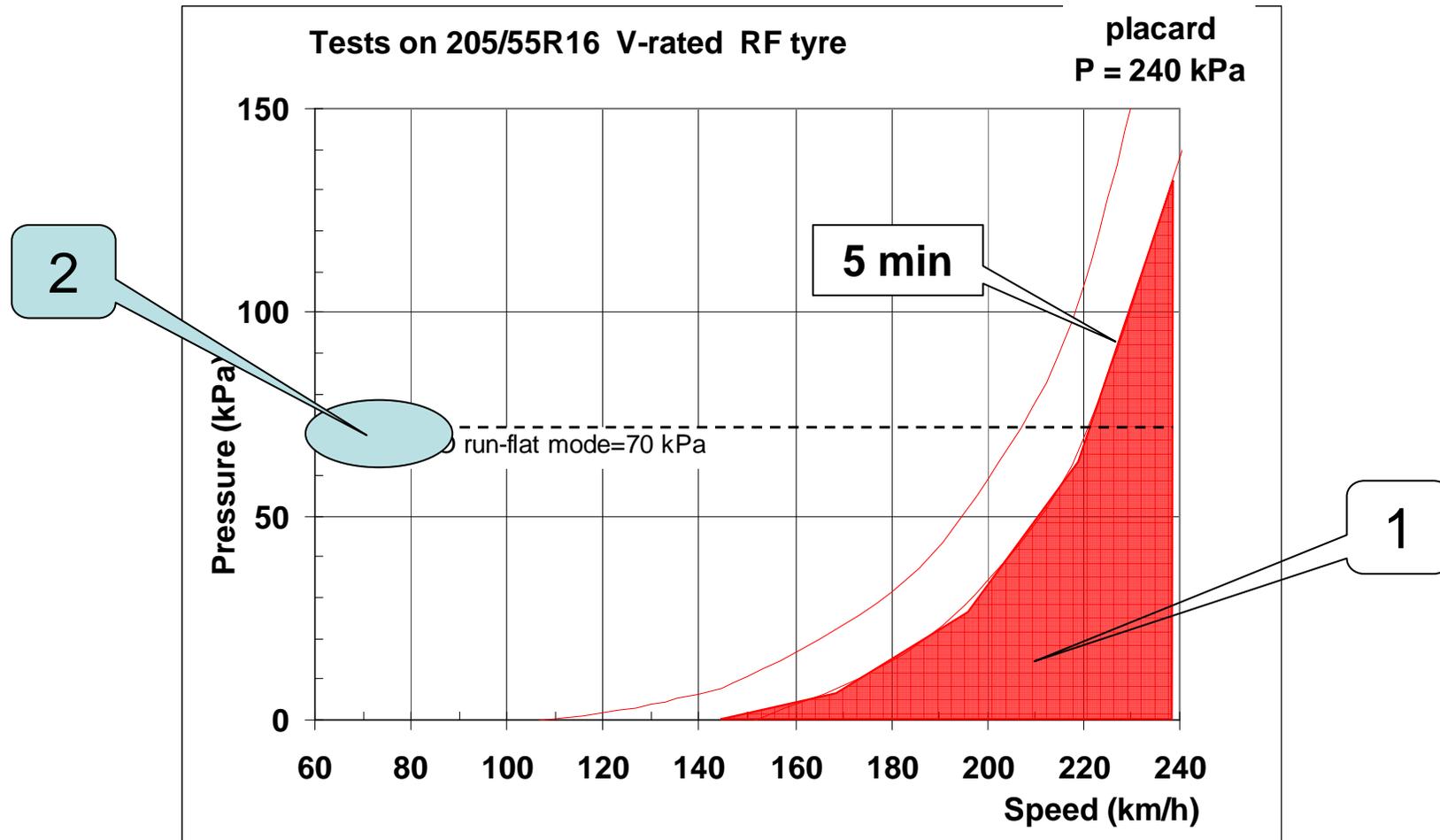




- To comply with Dir 2001/95 EC on general product safety, Tyre Makers insist on the following :
 - the RFWS must assure that the “low endurance zone” cannot be entered by a RFT
 - the homologation procedure of RFWS must be consistent with this need.

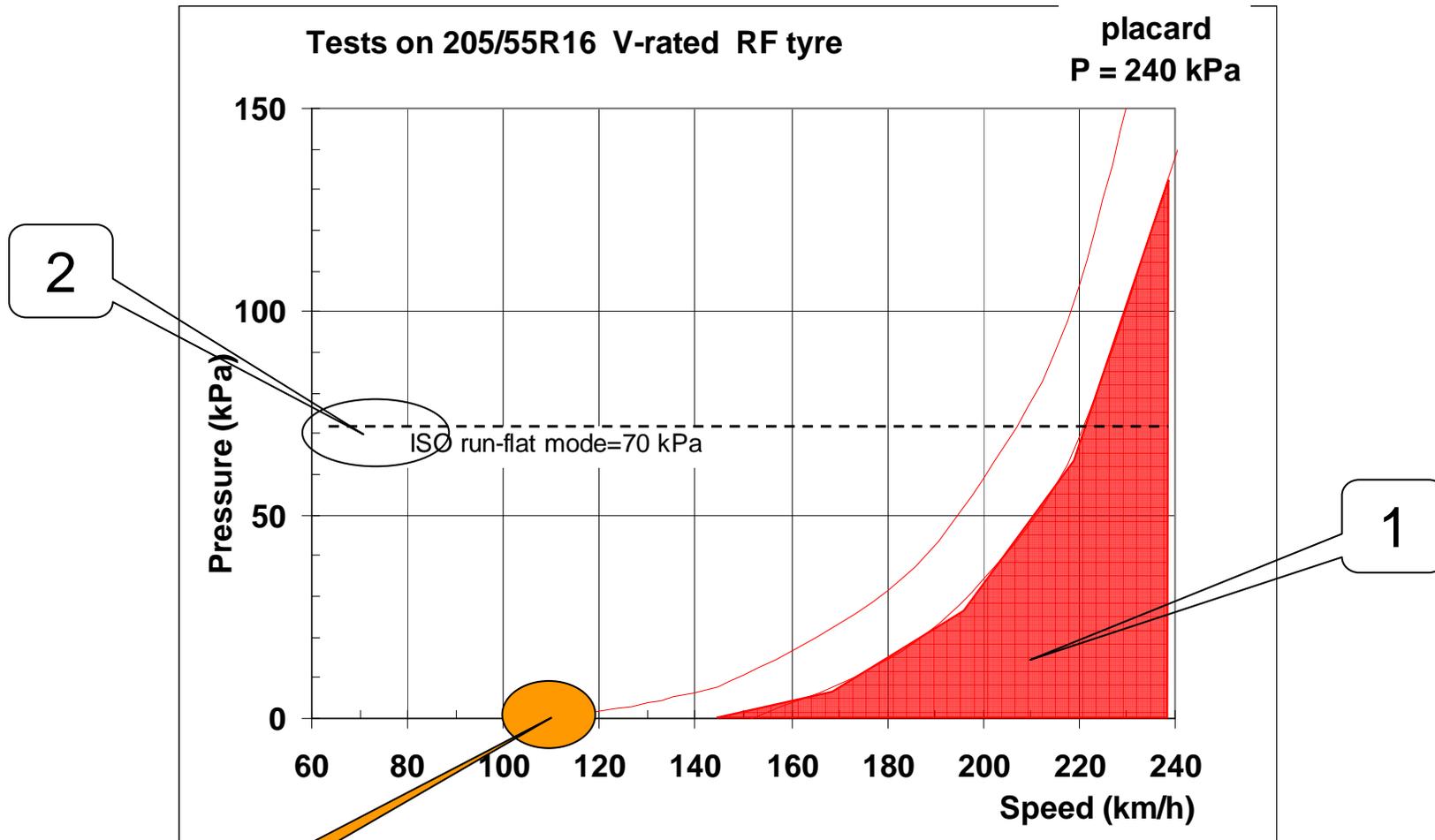


The RFWS must prevent the RF-tyre from entering zone 1



Present test method proposed to WP29 :

set tyre pressure at 70 kPa ; drive at around 70 km/h ; the RFWS has 20 min to respond ; malfunction diagnostic also in 20 min.



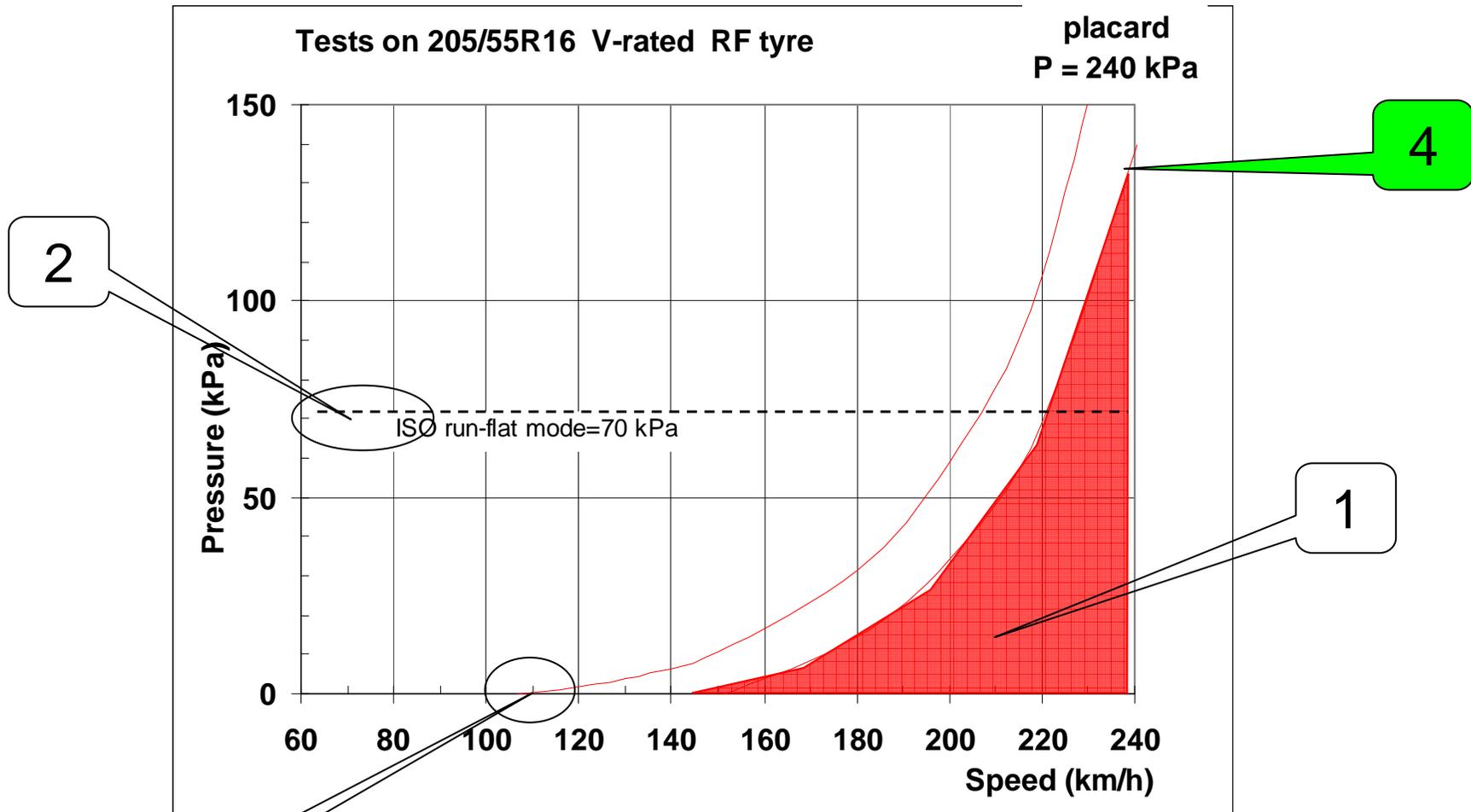
3 This method will allow homologation of “slow” RFWS.
Incidents corresponding to point 3 may not be prevented

This is not academics...

- In early 2006 in the USA, NHTSA's Office of Defects Investigations recorded numerous complaints from users of cars equipped with RFT and "slow" RFWS, who encountered various difficulties while driving at speeds lower than 115 km/h.
- A thorough analysis of NHTSA's ODI complaints on *cars from two different OEM* reveals a *common pattern* : a RFT goes flat, the RFWS does not detect the pressure loss in time, and a sidewall of the run-flat tyre fails, at speeds less than 115 km/h.

Excerpts from ODI files:

- “The low tire pressure warning system failed to notify ... until the tire started to disintegrate ... felt the vehicle start to pull to the right” (ODI# 10 151 462);
- “we almost lost control of the car” (765 743);
- “I managed to control the car without flipping” (10142434);
- “blow-out causing \$2226 damage to car. Pressure warning system did not work” (10 141 601);
- “the vehicle went into a ditch” (10 173 572);
- “cross over lanes and almost hitting other vehicles” (10147366);
- “no warning light came on despite low tire pressure” (10182149);
- “tire blew out and literally lifted the car” (10143744);
- “tire went into flames” (10 131 560);
- “one tire had failed spontaneously without triggering the low-pressure warning system” (10 149 835)



3 **How to homologate only adequate RFWS ?**

Tyre Industry proposed to GRRF to base the test method on ISO 21750

Tyre Industry proposal to GRRF

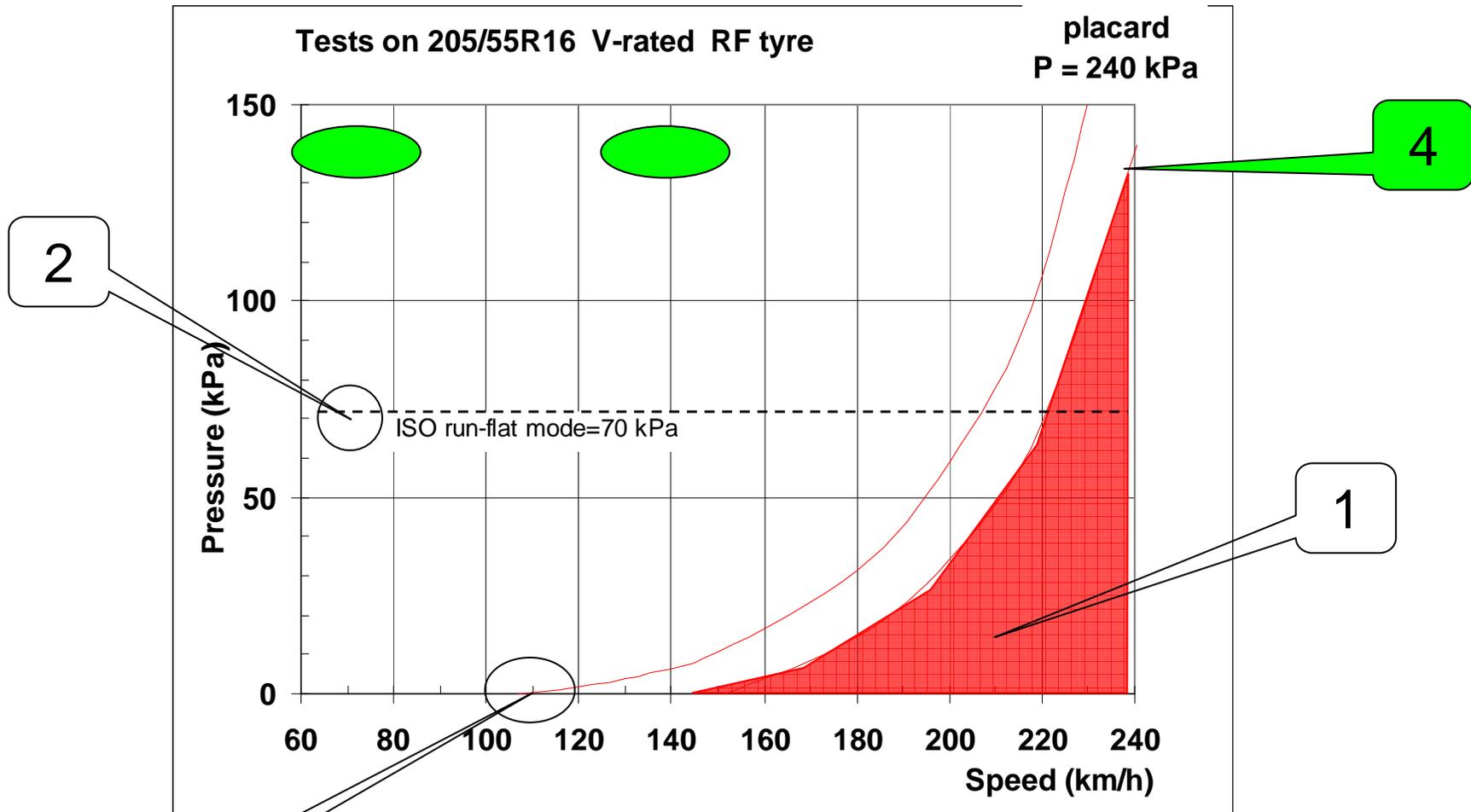
§ 5.1.6.5.1. Using a vehicle the tyres of which are correctly inflated at the recommended cold inflation pressure, produce on one tyre a **gradual pressure loss between 10 kPa/min and 20 kPa/min** and check while driving **at any speed above 25 km/h** that the system delivers an alert **at the latest for a pressure drop of 100 kPa.**

§ 5.1.6.5.2. (*alternative, next slide*)

§ 5.1.6.6. The self-diagnostic function of the system shall be able to deliver information within **5 minutes** in driving conditions exceeding 25 km/h in case of malfunction

Tyre Industry proposal

- § 5.1.6.5.2. (*alternative for § 5.1.6.5.1*) Using a vehicle the tyres of which are correctly inflated at the recommended cold inflation pressure, and while the vehicle is stationary, adjust one tyre at a pressure **100 kPa below the recommended cold** inflation pressure. The system shall deliver an alert within **5 min**.
- § 5.1.6.5.3. The test shall be performed at **two different speed levels** at least. One shall be **130 km/h or higher**. Another shall be within the range 25 to 70 km/h.



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Tyre Industry proposal for RFWS alert conditions guarantees that zone 1 cannot be entered

Conclusion

- The amendment presently proposed to WP29 vote is not consistent with Dir 2001/95 EC, since it will not be able to guarantee the safety of European users in some reasonably foreseeable conditions of use.
- Tyre Industry urges to replace those homologation test conditions by the ETRTO proposal to GRRF.

“TPMS - Involvement of European tyre industry in developing a suitable international standard.”

- Two suitable international Standards already exist :
 - ISO 21750 : 2006
 - ISO 16992 : 2006
- Rules also exist :
 - UNECE R64 (final amendment pending)
 - FMVSS 138 (USA)
- But others should be considered :
 - Dir 1992/23 EC
 - UNECE R30
 - Dir 2001/95 EC

Observations on TPMS Standards & Rules

- ISO 21750 : 2006
 - needs editorial corrections
 - differences between TPWS, TPAS, TLAS may need clarification
 - information on tyres “limits” is missing
 - importance of HMI should be stressed
- ISO 16992 : 2006
 - “flat-running mode” should be redefined

Thank you for your attention