

PROPOSAL TO DEFINE AND INCLUDE TYRES WITH ADDITIONAL SIDEWALL PROTECTION
FOR RETREADED TYRES IN UNECE REGULATION No. 109

Explanatory information to ECE/TRANS/WP.29/GRRF/2006/26
regarding Additional Sidewall Protection (ASP).

Introduction:

The long time industry practice of applying ASP(s)-Additional Sidewall Protection-enhance safety and durability of special tyres in urban use is adding a significant value to the user at the same time as it reduces waste through increased retreading of casings.

When ECE Regulation No. 109 was created, unfortunately this common practice of applying ASP (s) for special tyres in urban use was not considered. When this Regulation now becomes mandatory in EU, as a result, many highly suitable casings can no longer be retreaded with ASP (s) because they do not meet the actual section width tolerances for this regulation.

Technical description-ASP.

ASP's are applied in the retread process to existing casings, in order to provide additional abrasion protection of the sidewall in aggressive urban usage, with repetitive scrubbing against pavement corner stones. If not used, the tyre typically wears out faster on the sidewall than on the tread, with increased risk of tyre failure through sidewall breakouts and loss of mileage performance. Considering the usage of such tyres in highly populated urban areas, using tyres with no sidewall protection is not wishful.

ASP can be applied on one sidewall or on both sidewalls depending on the user conditions, who are mainly city bus, waste hauling or other in city start and stop operations.

Depending on the retreading system, ASP's are either pre-cured -vulcanized rubber profiles – that are applied to the sidewall with a special bonding rubber - or non-vulcanized rubber positioned in a mold that shapes the ASP onto the sidewall during the curing process. Independent of the system, the casings that will receive ASP (s) require a very thorough inspection and preparation (buffing) of the sidewall. Only first grade casings will be object for this treatment.

ASP's are today used commonly across Europe and have up to this point never presented any known technical issues in terms of usage or fitting on vehicles.

Technical issues.

1. Section width exceeds existing max tolerances:

Modern truck tyres are already close to the limit or slightly over ECE Regulations Nos. 54 and 109 width tolerance. To cover natural growth of the section width in the tyres first life, the industry have asked an additional increase of allowed section width of 1,5 % for retreaded tyres. (ETRTO-GRRF-59-8) . When applying ASP's, one adds typically 6-8 mm additional sidewall rubber per sidewall of the tyre.

ETRTO recommend a minimum dual spacing value, with objective to eliminate “kissing” of the tyre sidewalls.

Example: 315/80R22,5 mounted on 9.00” rim should have a dual spacing of 351 mm. The new tyre maximum section width tolerance is 318 mm, which leaves a space of (351-318 = 33 mm) for the tyre to

use for flexing movements of the sidewall. Applying one ASP would reduce this value with 8 mm (25 %), applying two with 16 mm (50%).

Practical experiences made over the years show that when one single ASP is applied inwards in dual fitting, kissing does not occur. It seems that the tolerance built in the Minimal Dual Spacing as defined by ETRTO allows this usage. If two ASP's are placed inwards, there is a risk of kissing, depending on the casing original section width and the actual wheel disk offset. In practice, this second situation rarely occurs, since tyres designated for use in dual fitment are typically only fitted with one ASP, and by definition, rarely mounted inwards.

BIPAVÉR recommends that any tyre for usage in dual fitment will only be fitted with a single ASP. By default these ASP's will be mounted outwards of the vehicle, and there will be no effect on the free space in dual spacing. This practice works successfully since many years. Tyres with dual ASP's are typically used mainly on front tyres in waste operations only.

Since user recommendations of products are generally not part of ECE Regulations, BIPAVÉR is of the opinion that maintaining current user recommendations will suffice for safe usage of the ASP's.

2. Speed resistance – endurance testing.

By adding additional rubber of sidewall protection, a slight alteration of the casing endurance capacity might occur. The retreader is responsible for assuring that the retreaded tyre with ASP(s) meet the endurance requirements set out in ECE Regulation No. 109. There are no differences of these tyres compared to tyres with no ASP.

ECE Regulation No. 109 has been in usage for several years depending on country. During this period a quantity of tyres with ASP (s) has been submitted for regular endurance testing with no specific problems or observations.

BIPAVÉR has on top of this conducted some additional tests during the spring 2006 to re- evaluate the endurance suitability of tyres with ASP (s).

We have reviewed in total 25 tests using 7 different tyre sizes. Two speed ratings were used J (100 km/h) and K (110 km/h). Out of this population of tyres, only one tyre presented a problem (breaker blow out) that we judge is not related to the additional ASP.

BIPAVÉR suggests that the endurance capacity of tyres with ASP's is similar to regular retreads for the speed ratings J and K. However, since on the user level, a speed rating of J is typically maximum required, to take all precautions possible for the future, BIPAVÉR have introduced in their proposal GRRF-60-xx a speed limitation of max J speed (100 km/h) for all tyres fitted with ASP(s).

3. Sidewall inspection- risk for covering hidden damages

In the normal retreading process, the tyres sidewalls are typically visually inspected, and to a minor extent inspected with non-destructive inspection devices.

In the case of adding ASP's, the sidewall would need an additional treatment, preparing the surface structure to receive the bonding rubber. Thus the sidewall will in this case be inspected even more thorough, before and after surface treatment, and this will result in a higher detection rate of hidden defects, compared with a traditional retreading process.

In both situations, in case a sidewall defect is discovered, it can normally be repaired using conventional repair materials adapted to the size of the defect.

Industry Recommendation.

Adding ASP's on retreaded tyres contribute to significant safety, environmental and economic gains. With the mandatory introduction of ECE Regulation No. 109, usage of such tyres will in many circumstances no longer be permitted, caused by the overall width exceeding the limit values.

Logic impose that ECE Regulation No. 109 is modified to take into account this already existing practice, to avoid that transport and retread industry will be penalized

It is proposed to amend ECE Regulation .No. 109, in order to allow usage of radial retreaded tyres with ASP's, with an additional allowance of max 8 mm per protected sidewall over the maximum authorized overall width for the same tyre in Regulation No. 54 (see ECE/TRANS/WP.29/GRRF/2006/26).

It should be noted that this modification will actually not change the overall width of tyres in the market, but simply regularizes a pre-existing but unrecognized condition.
