

SUBJECT: INFORMATION LETTER ON SUBJECT OF TIRE SCUFFING OF NEW ASPHALT PAVEMENTS AND NEW SEALCOAT JOBS.

The problem of automobile and truck tires leaving scuff marks on new asphalt pavement or new sealcoat jobs is a problem that crops up every summer, most particularly during long stretches of hot humid weather and, from time to time, Asphalt Institute engineers are asked to comment on the causes and seriousness of this problem. Here is there website for more information (www.asphaltinstitute.org)

New Asphalt

The following comments are offered for the purposes of providing general information on the subject of tire scuffing for new asphalt surfaces and it is in no way to be construed as an advisory, recommendation or conclusion on the quality of a specific pavement (particularly those with serious instability or raveling problems). In any serious case of poor performance, the quality should be determined by appropriate tests (for thickness, aggregate gradation, asphalt content, and degree of compaction or density) conducted by competent testing laboratories in accord with standard ASTM and AASHTO tests.

The following comments are also based on the assumption that the asphalt mixes being discussed are dense graded asphalt mixtures, mixed and placed hot, utilizing asphalt cement as the binder, and meet established criteria for the Marshall Method of mix design, as recommended by the Asphalt Institute and/or established mixes used in highway practice by state highway departments. It is also assumed the mixes have been thoroughly compacted with a sufficient number and weight of rollers to match the amount of mix being placed.

The problem is generally of a temporary and superficial nature. Tire scuffing generally only affects the top 1/16" to 3/16" of the pavement surface. It is always caused by a fairly concentrated maneuver or rotation of a tire in a stationary or braking mode.

Sealcoat

The following comments are offered for the purposes of providing general information. Sealcoat should be manufactured under Asphalt Sealcoat Manufacturing Association guidelines. (www.sealcoatmfg.org). Most asphalt sealcoats should show some type of tire scuffing; otherwise the sealcoat is too hard. Sealcoats are made to be flexible. Tire scuffing on sealcoat project usually takes about two to three months before it is minimized or goes away. Hot weather will make the tire scuffing show right away.

New Asphalt / Sealcoat

There are several conditions under which the degree of tire scuffing will vary. They are as follows:

1. THE AGE OF THE PAVEMENT – The newer the pavement, the softer the asphalt binder which holds the aggregate together. As the pavement ages with time (generally within two years) the asphalt binder near the surface becomes harder and practically resists all tire scuffing about two years after being placed. The initial softness (within limits) is a good property for the pavement to have as this aids in the overall durability of the pavement.

2. THE TIME OF THE YEAR – The scuffing on a pavement that is placed in

the fall of the year (September on) which doesn't have the opportunity to become very hot and susceptible to scuffing will tend to harden more over the winter months and be less susceptible to scuffing than a pavement that is placed in the early spring (late March to mid June) where the asphalt cement is newer and has not had a chance yet to age harden under the severe winter conditions as much as those placed in the fall.

3. HEAT INTENSITY AND WEATHER CONDITIONS – Under sustained periods of sunshine, which heats the pavement to a range of 140° to 160°, combined with very humid weather, the asphalt cement in a new pavement will become almost fluid. Again, as this pavement hardens with age, the condition will decrease.

4. VEHICULAR WEIGHT – The weight of a vehicle will determine how much weight is on each tire. This can be substantial, whether considering small cars with small tires or big trucks with big tires, however, these combinations can sometimes develop very high pressure intensity on the pavement.

5. TIRES – The type of tire can significantly affect the scuffing, as well. Steel belted radial tires will scuff more than standard bias ply tires. The tread design can also affect it. A coarse cleat design in the tire tread with significant spaces between tread lines can provide the opportunity to get a firm grip on a new pavement. Aggressive tire tread patterns (off road tires) on trucks, SUV's and other heavy vehicles will make significant marks.

6. VEHICULAR OPERATION – Probably the most significant factor affecting tire scuffing is the mode of operation that the vehicle user places on the pavement. Stationary 180° turns with a heavy or light vehicle that has power steering, can make a substantial scuff on a new pavement. A sharp turning maneuver, at the same time braking is occurring, can do significant scuffing as well. Once again, trucks, SUV's and other heavy and long-wheel-base vehicles make significant marks.

7. TRUCK TERMINALS - Heavy trucks that have power steering (allowing sharp turns) and coarse tread design would probably scuff a new pavement substantially and owners of such facilities should be advised that overt maneuvers, as described above, should be avoided until the pavement has had a chance to age.

8. ASPHALT CONCRETE TYPE – Architects and engineers, designing parking facilities for trucks and passenger vehicles, vary widely in their practices of choosing mix types (that is whether or not they use fine mixes or coarse mixes). The major problem in this area is that architects tend to specify not only pavements that are too thin, but in an effort to get very smooth fine looking surfaces, they select gradations that are too often on the fine side. A coarser mix for a surface course is generally preferred as the coarser the mix,

the less susceptible it will be to tire scuffing. Also, other problems come into play, such as driveway contractors complaining that coarse mixes are too difficult to handle. If the project is large enough for paving machines to be used, the coarser mix should always be chosen. If placed by hand, finer mixes will most likely be used and somewhat more scuffing must be expected due to the sealcoats inability to be worked into the surface.

9. OPENING TO TRAFFIC - The longer the parking lot is closed after paving or sealcoating will help prevent tire scuffing. Tire scuffing will still occur but the impact will be less.

CONCLUSION - Tire scuffing on new asphalt pavements or after sealcoating is generally minor, and while it looks very severe on a brand new pavement or sealcoat, one would have a difficult time actually finding these locations one year into the life of the pavement, and a little understanding of what contributed to this problem and some care and concern to avoid its occurrence will go a long way to minimizing it, or eliminating it altogether. The new asphalt or sealcoat must go through hot and cold weather before the tire scuffing will disappear. Remember all new asphalt and sealcoat surfaces in most cases should scuff in some way otherwise the material is too hard. If you are still unclear about tire scuffing, please contact your local contractor.

Footnote: Author of this article unknown