The "Yellow Guideline"

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As you will have seen, yellow lines on pavement surfaces are used to guide the traffic at dangerous spots and areas. For example yellow lines are used in construction work zones to lead the traffic, because they overrule the standard white markings.
Yellow lines are also used on airports to give information to the pilot in his aircraft on where to go when taxiing.

All the applications of yellow lines have some unique parameters in common when the right materials are used

 # they are clearly visible in daytime and at night by the headlights
 # they are easy to identify
 # they do not conflict with any other marking
 # they stay in place for the intended time of use
 # they provide very good retro-reflectivity
 # they are removable quickly, easily and completely if necessary
 # they do not leave durable residual marks after removal
 # they do not damage the pavement surface during use or removal

The material we recommend is tape which we produce in different forms. Two typical materials of 3M´s pavement marking producs portfolio are the Scotch-Lane 5381 as a non-removable aluminium based foil and Scotch-Lane 651 as a scrim supported rubber-based and PU-top coated removable tape.
The advantage of these products is that they always have the same standard as they are, not as other pavement marking materials produced in the plants under the same conditions and under tight quality control.
The tape delivered is bright yellow for good day-time visibility. Tiny little glass beads are embeded in the top coat and create a good night visibility. These beads retro-reflect the incoming light in a cone back to the light source and so back to the driver in the car or the pilot in the aircraft.
Our tapes have proven their good performance in long lasting construction work zones on freeways as well as when used for aircraft-taxiway lines on different airports. The major difference between these two application is the durability. Durability is defined by the time the tapes show a very good road presence and remain bright yellow during day-time as well as retroreflective yellow when lit by the headlights during night-time. Basing on the number of encroachments (high number of cars on freeways compared to the few aircrafts taxiing on airports) these two versions of the pavement marking tapes show very good performance for the duration of a normal construction season on freeways but last even longer when used for aircraft-taxiway marking. However, the durability of the pavement marking installation also depends on the climatic region and on where the tape is used on the road (long lines, edge lines, gore markings) as well as on the surface of the road itself. It also will be influenced by strong winter conditions e.g. the use of studded tires will create fast wear-through . Snowplows might also damage the pavement markings.
Fact is that an aluminum foil based pavement marking material such as

Scotch-Lane 5381 cannot resist as many encroachments (tirehits) as a thick tape made with a wear- resistant polyurethane top layer on a rubber based conformance layer as Scotch-Lane 651. For example German authorities only accept pavement marking materials when they passed a test on a wear simulator installed at BAST (turn table test). In this test the aluminum foil based tape passes 0.1mio tire hits and the polyurethane/rubber based tape 0.4mio tire hits, thus approving both materials for use in long lasting construction work zones but in different areas of installation.

The application of these tapes is pretty easy but one has to follow the recommended steps in order to get the expected good result

- because we are talking here concrete block pavements we also have to talk about the calcium chloride layer on top of these.
  This layer has to be removed by wire brushing, sand blasting or grinding. Based on its poor bond to the concrete itself it would be the weak point in the application because all adhesion we are requesting is focused to the top layer of the substrate we stick the tape onto.

The next steps are independent from pavement surface but one should follow certain general rules

- the pavement surface must be clean and dry
- the air and pavement temperature should be at least 10° C and rising
- do not overlap tape, use butt splices
- do not allow traffic to drive through primed areas
- do not apply tape on longitudinal seams or joints
- do not apply tape on detoriating pavement surfaces

The application procedure details are

- clean the road surface by sweeping or high pressure air whrere tape will be applied
- pre-mark the road where the tape will be applied
- apply primer P59 or P48 using a Scotchliner primer spray cart PSC or rolling it on by using a solvent resistant long nap roller.
  The coating of the pavement preparation adhesive P59 or P48 (for more durable applications) on the pavement should be at least 20 to 25 mm wider than the perimeter of where the marking is to be laid.
  Apply a thin layer of primer and allow it to dry in order to prevent the pavement marking from sliding after application and to create a good bond of the tape to the road surface.
- apply the tape by hand, with the Scotchliner manual tape applicator MHTA or with the Scotchliner trailer applicator HTA
- do not overlap material, use butt splices
- tamp the tape with the Scotchliner roller tamper cart RTC with a minimum of 90kg load.

Tamping is of utmost importance to the success of the application!

- do not twist or turn the RTC on the tape
- make 3 passes back and forth over each part of the marking
- make sure all edges are firmly adhered

As soon as all steps of the application are finished 3M recommends to open the area to the traffic as soon as possible.

When all work in a road construction is finished or the taxi way on the airport has to be changed the scrim-supported tape can be removed very easy. Just simply lift it from the pavement with little effort at an angel of about 90°. There will be some visible marks remaining on the pavement which are caused by removing the adhesive coated tape together with the dirt from the road and so "cleaning" the surface underneath. However, these residual marks will disappear in a time depending on the amount of traffic. The more traffic the shorter the time will be.
The removed tape Stamark 651 can be disposed by land-filling based on its "clean" chemistry.

Both product versions are available in yellow as detailed in this report but they are also available in white, the 651 construction even in red-orange and black.

The application procedure is the same for all 3M pavement marking products for long line and low to medium ADT intersection applications, including multi-colored symbols.

* Scotch-Lane is a Trade Mark of 3M

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