



## Alpine Canada Alpin Memo on Dye Preparation and Application Downhill, Super G and Giant Slalom



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### ***Introduction***

Application of dye to delineate the course perimeter and terrain is a requirement at all levels of racing in Canada for Downhill and Super G. Dye is utilized to enhance the racer's ability to identify course direction and terrain features. Discretionary dye application is utilized for Giant Slalom and Kombi events. The words "dye" and "paint" are interchangeable.

### ***Dye***

Dye is prepared using a combination of water, windshield washer fluid and a dark blue colouring agent. The colouring agent most often cited is blue liquid food colouring, although other water soluble dye in liquid or powder form is also used. The colouring agent must be able to emulsify in both water and alcohol. (**NOTE:** This dye mixture **CANNOT** be used to dye mark gates. Marking gates requires a mixture of water and dye only. A glycol mix will cause gates to loosen immediately.)



### ***Application Method***

Dye is applied utilizing industrial back pack style garden sprayers. The SP Systems Sealed Piston Backpack Sprayer — 4 Gallon, 180 PSI, Model# 01SPO504-1 is a popular model.

### ***When to Apply***

#### ***Pre-Inspection***

Dye is mixed and applied prior to course inspection. Initial application of dye pre-inspection can be limited to course perimeter and to horizontal cross hatch lines at jumps only. Care should be taken to prepare the dye line so that a uniform distance is maintained between lines on skiers right and left. It is essential that the majority of skilled athletes will ski within the marked perimeter.

#### ***Post-Inspection***

Final dye should be applied immediately following inspection and any pre-race course slipping. Course perimeter and cross hatching must be completed in advance of race start.

#### ***During the Race***

Dye should be reapplied during the race on as required basis as determined by the Jury and Jury Advisors. Application should be done between intervals in very short course section lengths. There is seldom any need to have a course maintenance hold solely for a dye program.

### ***Logistics and People***

For any DH or SG a minimum of 3 dye packs are required. Two are for the outside lines and one for the cross hatches. At major events such as Lake Louise Winterstart World Cup 10 people are integral for the dye program to be successful. Two people without dye packs slip the outside lines to ensure that loose snow is removed from the dye line. Four people with dye packs apply the outside lines and four more prepare the cross hatches. Dyeing is perhaps the most physically and mentally demanding course crew assignment. The work is intense, requiring stamina, strength and an acute sense of "where you are in the race". The outside lines require the steadiest hands, strongest skiing ability, a confident knowledge

of the race line, and race management knowledge. Cross hatches require strength, quickness, agility and sharp edges.



### **Clothing**

Dress light and in old clothes. The dye mixture will wash out of clothes and off skin if addressed with enthusiasm. Leakage will permeate all textures to the skin. This is warm work so dress light.

### **Dye Recipe**

A base mixture of water and glycol is used. Glycol percentage can range from 100% to 50%, weather dependant. On very cold days 100% glycol is required to ensure that the mixture does not freeze in the spray nozzle or the tubing mechanisms. On warmer days glycol should still be used as a base to ensure that the applied paint adheres to the snow surface and does not “crumble”. Parsimonious

ROC’s that encourage a water based mixture only are seeking a mediocre and ineffective result.



### **Quantities and Mixture**

Industrial dye packs hold 12 – 15 liters of fluid. The full pack weighs close to 25Kg. If you use Chefmaster concentrated gel you will need 60% of a bottle for each dye pack. A good rule of thumb is that each bottle has 4 good squeezes to be almost empty. The residual from the four squeezes can be flushed with glycol for 1 additional measure. So each bottle yields 5 measures (4 squeezes and a flush). Two colours of Chefmaster colour can be used – Royal Blue and Violet. For sunny days use all Royal Blue. For overcast and snowy days use 2/3 Royal Blue and 1/3 Violet. It doesn’t matter what colour glycol is used. The mixture should be very dark in the tank.

Chefmaster colour can be purchased at bakery supply houses and in bulk costs \$7.00 per bottle. Be sure to order early as there is not a great demand for blue concentrate food colouring in Canada other than for this purpose.

For initial application in DH, expect to use up to 5 L of fluid per 100 M of vertical. More is required for SG and GS. The dye and glycol has no expiry date so ensure that a good inventory is acquired at every opportunity.

### **Application of Outside Lines**

First application of outsides should be done in a medium speed snow plow where possible. Try to keep a continuous and consistent flow to ensure a smooth line that rounds out each turn. Keep the nozzle approximately 15 cm off the snow to generate a 25 cm wide line. On extreme steeps use a slow speed side slip to generate a straight wide line.

Second application of outsides should be done at slower speed to ensure a rich consistent texture to the colour.

Expect to use 1 tank for every 15 - 20 minutes of initial dyeing. During the race you will utilize 1 to 1 ½ packs depending on weather.



### ***Application of Cross Hatches***

There are three types of cross hatches - partial, full, and double.

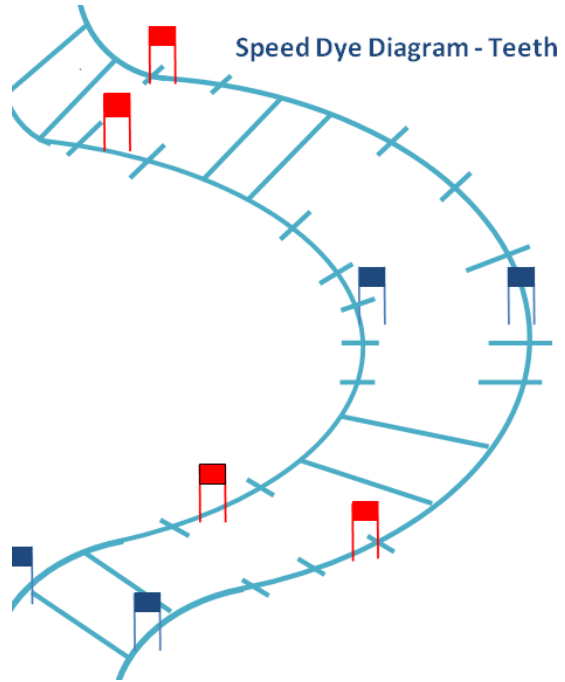
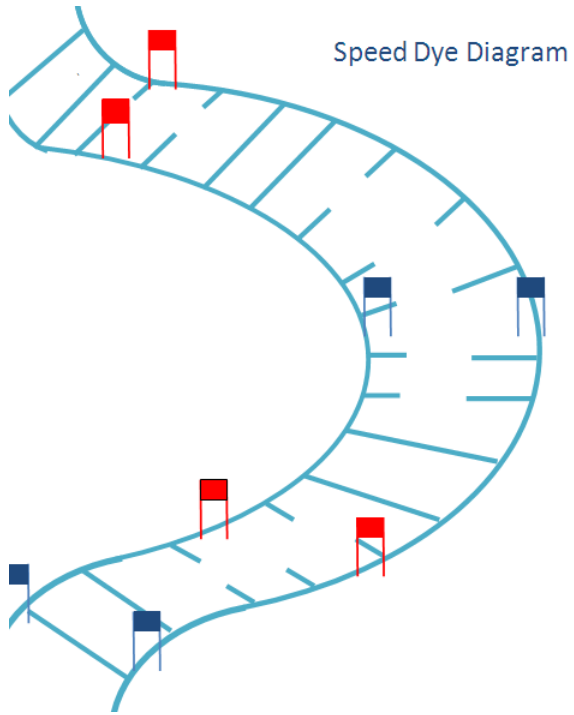
Partial lines are most common and are used at turning gates from 5 m above the gate to 5 m below. The lines on the turning pole are 1 to 1.5 m in length. The outside gates are longer at 2 – 2.5 meters. This method leaves 5 – 6 m of clear snow on the race line. In awkward snow conditions (i.e. fresh snow) use “teeth” to provide a fuller visual for the racer that is outside line.



Full lines are used on the pitches and are 5 m apart. Double lines mark jumps with one line at the jump and a second line 1 m uphill.



**Sample Diagrams – DH, SG, and GS and SL**



Dye Diagram GS

