

# CARE AND FEEDING OF "RAPIDOGRAPH" TYPE DRAWING PENS

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The notes presented below are guidelines for the neophyte drawing pen user. The first words of each paragraph describe a situation, and the text that follows discusses suggested procedures for obtaining top performance.

## 1. Ink doesn't flow

This is the problem which is most frequently encountered. Do as follows :

A. Put the cap back on and shake; note whether the movement of the weight attached to the cleaning rod can be felt by its rattle. If it isn't moving :

B. Don't take the pen apart yet. Go to a massive solid surface such as a masonry windowsill ashore or a ship deck plate near a beam. A desk top or wood floor is *not* a massive object. Grasp the pen in hand and swing it into endwise striking contact; as it hits, release it but guide it loosely within the hand. Make it strike sharply endwise on the surface so that it gets a stinging vibration. Do this to both ends of the capped pen a half dozen or so times. Let it bounce on the striking surface. This procedure is faster than it takes to tell about it and often succeeds in getting a stuck cleaning rod loose and ink flowing again.

C. If the above fails and disassembly is required : remove the point from the pen barrel but don't dump the ink supply and don't take apart the rest of the pen. Set the barrel aside upright so as not to spill its ink. Go to a utility sink and run cold water at a slow trickle. Work in the bottom of the sink to avoid spattering clothing. Holding the pen point under the trickle, carefully work the cleaning rod loose by combination rotating and push-pull. When the water runs clear and most of the congealed ink has been loosened, it is adequate to regard the point as clean. It is not necessary to take the cleaning rod out of the point. Cleaning chemicals or special solvents are not used; they don't work well anyway. (More comments on this are included below under "ink"). Dry with a paper towel or tissue and scew the point back into the pen barrel. Other

than refilling with ink, the pen barrel and filler seldom if ever require attention.

## **2. Point delivers too much ink**

A. Try refilling the pen, as the pen will deliver too much ink when the ink supply gets low. If this doesn't help :

B. It may be a spiral slot problem. Looking at the threaded sector of a penpoint, the users will notice a slot machined through the threading. Understanding the purpose of this slot will help the user learn why the frustrating droplet formation develops at the pen tip; and will give him strength for a systematic approach toward satisfactory results. The ink is suspended in the pen barrel by a simple and very ingenious use of both partial vacuum and capillary attraction. From a vacuum standpoint, the way the ink stays in the barrel is something like the way the fluid stays in a mercury barometer. From a capillary standpoint, the spiral groove serves the purpose of a labyrinth. Violent shaking of the pen with the cap off can result in ink spillage, because the momentum of the liquid can overcome capillarity and vacuum temporarily. Blocking of the spiral groove with congealed ink can influence its design parameters. With no opportunity for the ink column to move down the groove, and with rising temperature of the hand-held barrel from room to body temperature, the contents of the pen barrel expand. The vacuum disappears and becomes pressure; and ink forms droplets at the pen point in a very frustrating way. The solution to all this is to remove the point and inspect the groove for blockage. Clear it with a toothbrush or pencil tip.

## **3. Flows at times but not at other times; same work conditions, and point is clean**

Probably a manufactured defect. Discard the point and try another from a different batch. The cheap dollar point is better than the five-dollar "jewel point" in this situation as it is more expedient for replacement. There definitely is such a thing as a defective point.

## **4. Flows on scratch paper but flows intermittently on drafting film**

A. Surficial foreign material such as body oils. Try a little "pounce", a powdery substance that comes in a small sprinkler container. This material usually takes care of little problems and it works fast. An alternative method which gets the surface chemically clean is to use a specialty white vinyl drafting film eraser such as Koh-I-Noor "Koh-I-Lar No. 286" (Bloomsbury, New Jersey, U.S.A.). Scrub the surface with the eraser using a small drop of water followed with a wiping tissue. If now the ink refuses to flow on drafting film, it is :

B. The drafting film itself. To double-check, take a knife and scrape into the drafting film, removing a patch of matte surface. This procedure

exposes fresh surface that is chemically free of foreign substance. If the ink refuses to flow on this spot but still does on scratch paper, it conclusively is a problem with the drafting film. Evidently the manufacturers require a better quality control program than they now have with their drafting film, and much of their product gets on the market that contains oily substance and refuses to take ink. This oiliness ranges widely from a mere nuisance that can be compensated with "pounce" to some specimens that cannot be inked.

#### 5. **Penpoint wear on drafting film**

Much faster than on paper; with large sheets using No. 00 size pen, the user may plan on one or more penpoints per sheet. Special points such as the "jewel tip", a point incorporating a form of wear-resistant glass, will last longer. Costwise it is a moot topic whether to spend five-fold more for a point that lasts longer, or to live with the cheaper penpoint. Drafting film causes rapid wear because it is abrasive; indeed scraps of it are handy for sharpening pencils.

#### 6. **Pens that don't ever clog**

Quite a claim to make. The author achieved this with a complete set of pens from triple zero to No. 60 brush. At the time of this writing the modified pens have been operating for more than two years without requiring cleaning. Inactivity has been as long as one year, and when taken off the shelf, they work within the first one or two wiggle strokes. The secret to it all is complete immersion of the entire end of the pen in ink. This includes the lip end of the pen barrel and the penpoint spiral groove. One manufacturer has advocated humidity environment storage which at one period was a piece of sponge material inside the pen cap. This practice has been found to help prolong useful life between cleaning sessions, but the pen always gummed up eventually. Immersion storage in my examples was accomplished by taking a bottle of "Pelikan" ink, drilling out the centre of the cap, and bonding it to the pen barrel. Regrettably the large size of the bottle cap made the pen awkward to grasp and limited its use to letterguide template work. As an academic topic nevertheless, immersion does keep a point working freely, and no other method can make that claim. Perhaps a member of the reading audience would be encouraged to search for a more practical way of embodying the concept of immersion.

#### 7. **Ink**

Black India ink uses water as its solvent. The manufacturers don't say much about what their inks are made of, but their products do resemble the gelatin that used to be used in gold leaf store window lettering. Water dissolves gelatin the first time but once dry again neither water nor any other solvent will easily re-dissolve it; it must be scraped off. An eraser

dipped in water will scrub off ink from drafting film, but other than that it must be scraped off, as no solvent will touch it either. In removing ink during cleaning of a pen point, just plain cold water does as well or better than commercial pen point cleaners.

#### **8. Wear observation**

Pen point wear can be monitored by measuring ink line width. The textile industry has a favorite terminology — thread count. Number of threads per unit length is a basis for rating fabric. Measurement for thread count is done with a special magnifying lens with a built-in minuscule measuring scale. The user just looks through the ten-power lens and counts threads. Optical supply houses have these items for roughly \$ 25. The version the author uses has a measuring scale ten millimetres long and subdivided into increments of one-tenth of a millimetre (0.1 mm). This little instrument conclusively shows whether the line made by a pen point under observation is a narrow one or a wide one for the rated line width that point is supposed to make.