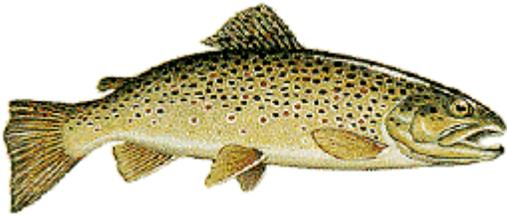


# FISHING FLIES WITH SUBSTANTIALLY INCREASED LIFE AND DURABILITY PRODUCED BY VITEK COMPANY

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Background Fly fishing is a leisure sport which uses dedicated equipment to catch certain type of fish, by enticing them with fishing flies- that are lures which are constructed to resemble the fish`s typical food: insects, small fish, etc.

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## DRY FLY



**There are two large classes of fishing flies:**

1. the first class of flies are named Dry Flies because they are made to purposely float on the water surface and to imitate certain kind of insects which tend to float. The dry flies are constructed to imitate as much as possible the shape of this kind of insects and especially to achieve the longest possible flotation life, by tying together pieces of various natural products, such as feathers from certain birds (e.g. hackle from chicken, pheasant) or fur hairs from certain animals. (e.g. elk, deer).
2. the second class are underwater flies, mostly known under the general name "wet flies", which are intended to imitate aquatic species that are the desired food for certain type of fish. They are also constructed from components of special type of feathers or animal hairs and are designed with such shapes as to sink quickly and stay under water. The most typical examples are: the Streamers- which imitate small bait fish, the Nymphs- which imitate the nymph stage of the some mayflies and the Wet flies which represent the "swimming stage" of some mayflies.

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**The currently available fishing flies have many shortcomings which result in a relatively short useful life, for example:**

1. -the desired flotation of the currently available dry type of fishing flies is not a permanent condition and their useful life is rather short because their hackle or fur components absorb water, lose their buoyancy and begin to sink.
2. For instance in laboratory tests, the typical chicken hackle based flies sink after only 1-2 immersions in water (few seconds each) and float for less than half an hour, while the elk hair based caddis shaped flies sink after 3-6 immersions and less than 1 hour's flotation.
3. -the dry flies become unusable when they come in contact with a mucus material originated from fish (slime) which tends to make the fly's components sticky and lose their floatability.
4. -both the dry and the underwater type of fishing flies are not very durable since they have low resistance to the physical strains that typically occur during the fishing process: friction of the lure in the air during casting, slapping of the lure on the water surface, fish biting, hitting rocks and other objects, etc.
5. -if left damp after fishing, both dry and wet type of flies will lose their usefulness because their metal hooks will tend to rust and their component hackle or hair fibers or filaments will tend to become compacted (matted) and mold.

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**Currently there are few current state-of-the-art techniques which are intended only to extend the floating of the "dry" type of fishing flies. They can be classified in two basic approaches:**

1. Some use chemical floatants which are based on either LIQUID materials (typically silicone oils) or on SOLID materials (typically waxes). The application techniques require that the user (the fisherman) apply the liquid floatants by dipping, rubbing or spraying them on the flies or by rubbing or dipping the flies into the powdered wax followed by a heating process (at 100 deg.F or higher) in order to melt the wax and make it flow onto the fly's structure.
2. Another technique advises the use of special chemicals which are intended to absorb the moisture from a dry fly which has become unusable after sinking in water. It requires the fisherman to shake the fly while leaving it in contact with special drying chemicals (typically desiccants based on carbonates or silica) for a period of time until it loses its absorbed moisture.

**These currently available techniques have numerous shortcomings:**

1. -they require difficult and even unpleasant methods that tend to be messy and even impractical especially for a fisherman which is standing in a fast moving stream.
2. -due to their high consistency, the liquid and melted waxy solid floatants can not penetrate between the individual fibers, filaments and hairs of the flies structure, thereby will tend to bridge over, compact and matt them and therefore will affect negatively the flies original shapes, their attractiveness to fish, their buoyancy and finally will shorten their useful life.
3. -they are not efficient in improving the floatability of the dry flies. For instance in laboratory tests that simulate floating on water, dry flies made from chicken hackle that were treated with these type of floatants sank after only few quick immersions in water.
4. -their effect is temporary and require to retreat the flies oftenly -they do not improve the durability of either wet or dry type of flies since they do not improve their resistance to physical strains which are common during the fishing -since their effect is temporary, they do not help the damp flies against the rust resistance of the flies hooks, their hair matting and their resistance to molding
5. -the currently available floatants are not permanently bonded to the flies structures, therefore they will tend to be washed off in the streams and will affect negatively the environment.
6. -the drying type of chemicals do not extend the floating life of the dry flies, are very impractical to be used during fishing, require a rather extensive period of drying time and needs to be repeated every time the dry flies start to sink

In contrast to the current state-of-the-art which uses drying chemicals or floatant treatments based on LIQUID OR SOLID materials, the Vitek Corporation uses newly developed proprietary techniques that treat or encapsulate the fishing flies with special processes and materials. These coatings encapsulate every microdetail of the outer surface of the fishing flies with a conformal, transparent, pin-hole free layer with predefined properties and thickness.

**The main accomplishments of the techniques and materials employed by Vitek on fishing flies are:**

1. To extend the floating life and increase the durability of the "dry" type of fishing flies.
2. To improve the durability and to render the surface of "underwater" type of flies Hydrophilic (attracted to water) and speed-up their sinking after being cast in the water.

**Compared to the current state-of-the-art, this proposed invention offers the following benefits:**

- it will render the "dry" type of flies waterproof and extend substantially their useful life by treating or coating them with a very thin pin-hole free layer which becomes a barrier to the penetration of the water. For instance in laboratory tests that simulate the flotation on water, when compared to original flies as well as compared to similar flies treated with the currently available liquid or solid/waxy floatants, the floating life of the similar dry flies which were coated with our techniques has increased by a factor of at least 100 times and sometimes by more than 250 times even after numerous immersions in water.
- the coating will preserve the original intended design, shape and color of all types of fishing flies since it is transparent and covers conformally each minor detail of the original shape of the fly and encapsulates every pattern of each individual filament, fiber and hair component without compacting or matting them.
- it will improve the buoyancy of the "dry" flies since it covers the structure of the fly with a hydrophobic (water repellent) layer which has very low surface tension and very low coefficient of friction.
- it renders the flies repellent to the mucus material that originates from fish (slime) which makes the dry flies sticky and nonreusable, The slime can be easily removed from the coated flies by washing in the stream.
- it extends the useful life of both "dry" and "underwater" type of flies by improving their durability and increasing their resistance to the physical strains that may occur during casting and fishing.
- in contrast with the current state-of-the-art in floatants, the treatment and the coating processes occur at the location of the Coating company and therefore it does not require the fishermen to handle any oily liquids or waxy substances which tend to be messy to handle and difficult to apply.
- it provides additional protection to the flies which are left wet or damp by providing rusting protection to the metal hooks and protection against matting and molding to the filament, fiber or hair components.

- this invention also makes possible to develop special coatings whose properties can be customized to fit special requirements:
  - -for instance a specially developed coating can imitate the "rising nymphs" type of flies, by rendering the flies glittering and therefore more attractive to fish. The coating is developed in such a way as to be clear, shiny and hydrophobic with the capability to entrap small glittering air bubbles on the surface of their component fibers, filaments and hairs.
  - -another example is a specially developed coating applied over flies which are supposed to stay underwater. Since some of these flies tend to float for a while instead to sink quickly when casted in the water, this special coating is made of hydrophilic material (attracted to water) with high surface tension, in order to increase the speed with which these flies sink.
  - in contrast with the temporary effect of the currently available liquid or solid floatants, our treatments and coatings are permanent, do not wash off in streams and are environmentally friendly.
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