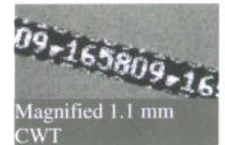


AutoFish System

A new approach to fish handling

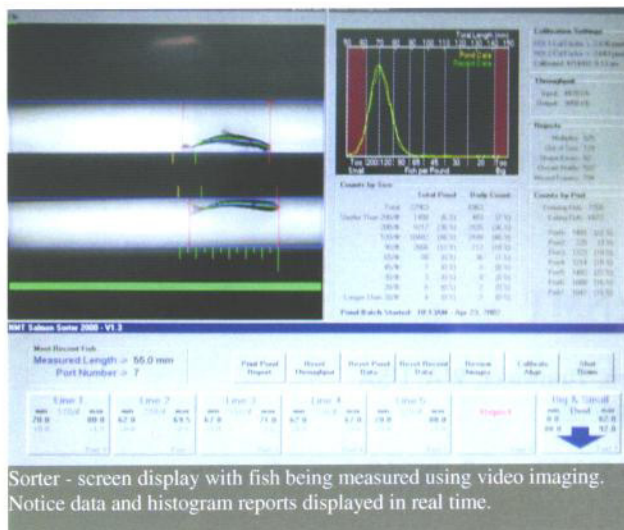
The NMT AutoFish System uses advanced technology to sort and process salmonids in a hatchery or fish farm. The AutoFish System is a cost effective way to handle juvenile fish rapidly and without anesthetic or human contact. This system can be customized to perform any combination of:

- Sorting within 1 mm accuracy
- Clipping of adipose fins (marks)
- Injecting coded wire tags (CWT) in snouts (tags)
- Vaccinating into body cavity (2005)



The natural instincts of fish to move in water currents guide them through the AutoFish System with minimal stress and trauma. Already, the System is revolutionizing the way salmonids are handled at hatcheries in Washington, Oregon, and Idaho. Although current units are designed for juvenile salmonids, preliminary experiments indicate considerable scope for deployment with other major aquaculture species, for example cod (*Gadus*) and yellow-tail (*Seriola*).

One model currently in full-scale use is the **SCT5** (SCT = sort, clip, tag) which sorts, and/or marks and/or tags 57 mm to 142 mm salmonids. Formerly called the NMT Marking and Tagging System (MATS), this technology has been in use for over four years with over fifty million fish sorted and/or marked and/or tagged. This highly efficient and mobile system incorporates five marking and tagging lines with the demonstrated benefit of low mortality (<0.1%), exceptionally reliable adipose fin clipping (>99%), and high CWT retention (>98%). Each line has integrated quality control that rejects fish which are not properly sorted, marked or tagged and notifies the control system. The overall system is economical to operate with one trained operator and an assistant. All of the AutoFish Systems demonstrate sorting, and/or marking and/or tagging superior to that achievable by other available methods.

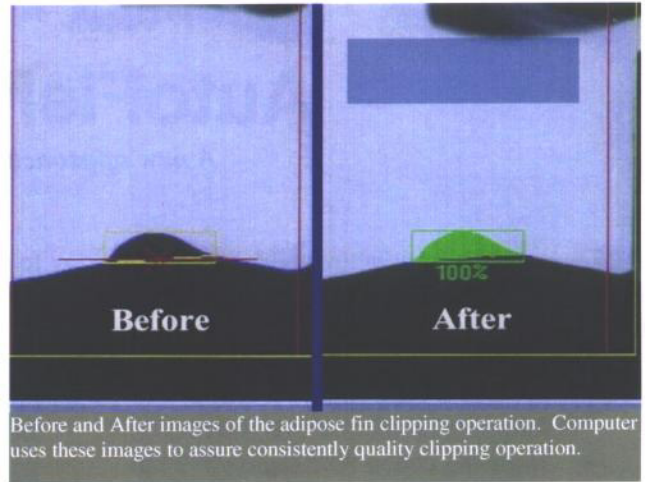


Here is an overview of how the system works:

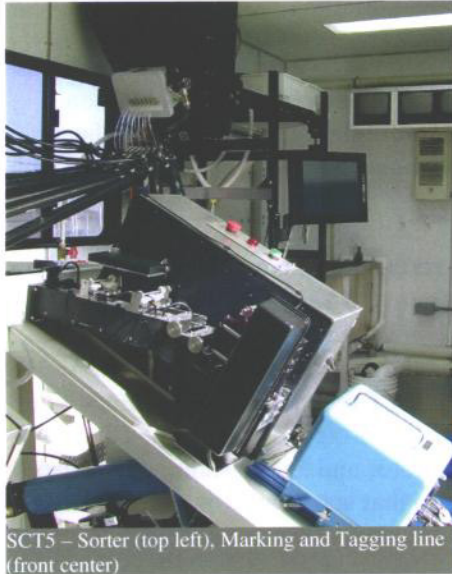
- Fish are brought into a holding trough.
- Fish are lifted into the sorter which uses a state-of-the-art optical system to sort and distribute them by total length to the appropriate clipping and/or tagging and/or vaccinating systems.
- NMT's patented Volitional Entry device (VE) collects and directs the fish sorted to the processing line.
- Within the processing line, the fish are controlled using a series of gates, infrared sensors, and foam padded clamps.
- The fish are clipped and/or tagged and/or vaccinated within 2.2 seconds on each line.



- The control system verifies the process was completed within set tolerances.
- Fish are released into the appropriate pond or holding container while the control system compiles statistics on the number of fish processed in each category (size, function, success, failure) and constantly updates frequency histogram of fish length.



Before and After images of the adipose fin clipping operation. Computer uses these images to assure consistently quality clipping operation.



SCT5 – Sorter (top left), Marking and Tagging line (front center)

The sorter can process up to 6,500 fish per hour. Overall rates of 4,500 fish per hour are typical for the SCT5 while the SC6 will process over 7,000 fish per hour with an enhanced sorter. Processing rates for the vaccination system are expected to be at least 7,000 fish per hour. No pre-grading of fish is required.

NMT offers several models that can be adapted to meet individual needs. Current models are designed for use with salmonids of 57–142 mm in length. In 2005, NMT will offer the ability to vaccinate individual fish (98–210 mm total length) through precisely controlled body cavity injections. We expect the first major use of the vaccination system will be for farmed Atlantic salmon. The models available are:

SCT5 - One sorter and five automated marking and tagging lines

ST5 - One sorter and five automated tagging lines

SC5 - One dual line sorter and five automated marking lines (2004)

Further information is available on our web site: www.nmt.us

Contacting NMT

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