INDIAN TEA ASSOCIATION 

**IRON FILINGS IN TEA : PREVENTION 20th April 2012**

**--- A Paper by Mr Atul Asthana, Chairman, Technical Sub Committee**

Iron filings are mostly found in the CTC variety of tea and not much in the Orthodox variety. Listed below is a GUIDE for various possible areas of finding the iron filings and ways to prevent the same :

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **LOCATION** | | **PROBLEM CAUSED** | **PREVENTION** | |
| **1** | **LEAF HOUSE** | | | | |
|  | i  ii  iii | **In the withering troughs**  If not properly maintained the welded mesh break into bits/pieces which in turn are swept along with the withered leaf being taken for processing.  The angle iron supports of the withering troughs or MS sheets at the bottom of the troughs require to be welded from time to time for maintenance. Many a time the welding rod electrode ends are left behind which eventually find their way into the processing area along with the withered leaf.  Many a time nails/nuts and bolts are found in the troughs. These are added to the green leaf by the plucker to increase the weight of the green leaf while weighment. | These pieces of welded mesh are soft metal and can pass through the CTC rollers also without getting detected. This not only damages the CTC rollers but finds its way right up to the packing stage.  -do-  -do- | a  b  c | Install leaf sifting machines with a small blower at the bottom and a bag which collects almost all foreign materials.  Install a high powered magnet on the top/across the leaf sifter to detect and trap the iron particle of any kind mixed with the withered leaf. The strength of the magnet installed at this point should be in the region of 3500 to 3800 gauss.  The Most Important thing is to install an iron filing collection bag at the site whenever the magnet has been installed. An hourly clearing (of magnet) chart should be maintained at this point – properly installed by a responsible person whose job would be to clean the magnet at hourly intervals and deposit the collection in the bag. At the end of each shift the shift supervisor should clean the bag and keep it ready for the next shift. He should also record the total weight of iron collected in the shift. |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **LOCATION** | | **PROBLEM CAUSED** | **PREVENTION** | |
| **2** | **ROLLING ROOM** | | | | |
|  | i  ii | **Wooden platforms for feeding withered leaf to the Rotor Vanes**  The planks are fixed by nails which is a problem area as many a time these nails find their way into the Rotor Vane and subsequently to the CTC Rollers.  **CTC Rollers**   1. Poor quality segments used. 2. Proper percentage of Ni & Fe not present. 3. Improper roller Sharpening   and   1. Improper meshing of rollers. | These nails/screws etc can pass through the CTC Rollers also without getting detected. This not only damages the CTC rollers but finds its way right up to the packing stage.  More wear and tear and chances of more iron filings going into the tea.  Improper hardness will also result in poor sharpening giving chances of more iron filings.  Both will result in unnecessary metal to metal contact with the two rollers giving chances of iron filings being generated due to excessive friction. | a  b  c | To install magnets across all the conveyors of 3 cuts (or 4 cuts) of the CTC machine. Install a magnet across the conveyor carrying the tea to the CFM. Install a magnet across the conveyor taking the fermented tea to the drier. Install a magnet across the dried tea from the drier to the sorting room hopper. Install a number of magnets in the hopper – fixed on all the four sides and roller magnets on the mouth/ discharge point of the hopper. These magnets can be of the strengths between 5000 to 8500 gauss and to be installed approx at a 2” height above the conveyor.  At each point wherever a magnet has been installed, it is imperative to install an iron collection bag, hourly cleaning chart. If magnets are installed and this exercise is not undertaken then the entire effort of installing magnets will be futile.  To use good quality segments: Recommended Heat Resistant Standard Steel (AISI1959) AISI type 201 having the following composition:  Carbon: 0.15 (max)  Manganese–7.50 (b) (max)  Silicon – 1.0 (max). Chromium – 16 to 18  Nickel – 3.50 to 5.50. Others – 0.25Max N  Brittle Hardness – Below BH 210 |
| **3** | **DRYING ROOM** | | | | |
|  | i  ii | **Conventional Driers**  The friction between the chain and the runner produces lot of iron scrapings/filings which find their way into tea.  The pins holding the chain links and the holes of the chain links get worn off and if not attended, results in shearing action which may result in iron filings being produced. | Due to friction, the chances of iron filings being generated increase which in turn find its way into made tea.  -do- | a  b | To open the chains and angle iron runner every year during the cold weather and check each and every chain link and pin for elongation. To check the angle iron runner and ensure that the surface is properly leveled and smooth.  During weekly maintenance, a system of proper lubrication should be introduced. The best lubricant in this instance is Graphite Powder. |
| **4** | **SORTING ROOM & PACKING** | | | | |
|  | i | As all sorting machines (be it Fibrex, Pennvault or Java) are hopper fed machines – chances of iron filings finding its way to these hopper cannot be eliminated and same applies to the packing hopper also. | Iron filings can find their way into Packet Tea. | Install magnets in all the hoppers of the sorting machines as well as the packing hopper.  **Magnet Strengths**  Withering : 3500 – 3800 gauss  Rolling + Drying & Sorting :4 000 – 4500 gauss  Packing : 6000 – 8000 gauss. | |