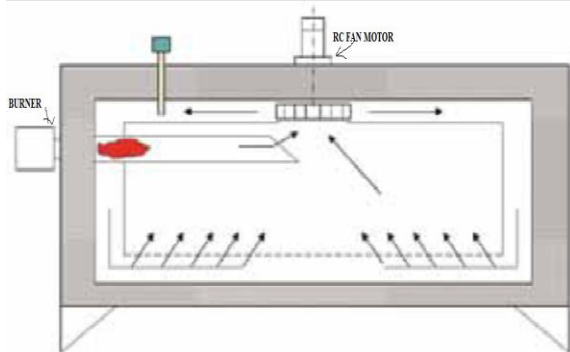




channels also to prevent sagging. High speed convection blower distributes a large volume of hot air flow through the Lehr chambers to bring about the desired temperature in hot zones efficiently & economically.



**Figure 2:** (Location of burner & RC Fan Motor)

### 3. Magnetic Material Fuel Saver (MMFS)

A magnetic material fuel saver is a device which is used to alter atomic construction and organize fuel molecules (fuel quality) so that proper combustion happens in "Annealing Lehr". As magnetic field is applied to ionizing fuel feed to combustion chamber (BURNER) which enhance combustion process and gives out lower emission and improved the fuel gas efficiency. Magnetic field applied to fuel line atomizes fuel gas properties which get adheres to more oxygen molecules and enhances fuel air mixture. This provides peak magnetic pipe performance while extending burner maintenance and filters change intervals thus reducing harmful emissions and carbon deposits & also we can ensure more complete combustion.

Basic concept of magnetize fuel gas: In 1989, Hans Dehmelt of university of Washington awarded noble prize in physics for his great contribution in fundamental properties of electrons. According to that electrons having ability to store up energy within itself similar to flywheel called spin. When it provides small amount of magnetic field, it absorb the energy and properties will change which is based on the below theories i.e.

1. Chemistry theory – Covalent bond,
2. Physics theory – Barnett effect,
3. Math's theory – Quantum mechanics.

#### Chemistry Theory

Particles are made up of number of atoms. An atom having equals number of Proton & electron in neutral charge, if greater number of electrons is there then -ve charge is obtained & if reversed then +ve charge is obtained. We are familiar with construction of fuel molecule (C-H bond). Each electron has two movements 1) Spin & 2) orbital movement which results in mixing of fuels. shows molecules of fuel has nucleus at it center around which electrons are orbiting, which having tendency to attract towards nucleus, due to which intermolecular force of attraction increases & thus fuel particle are not actively interlocked with oxygen during combustion & some un-burn fuel goes into exhaust & thereby causing incomplete combustion .

When we apply magnetic field around fuel inlet lines, due to magnetization we reduces intermolecular attraction of fuel molecule, which results in better combustion of fuel.

#### Physics theory:

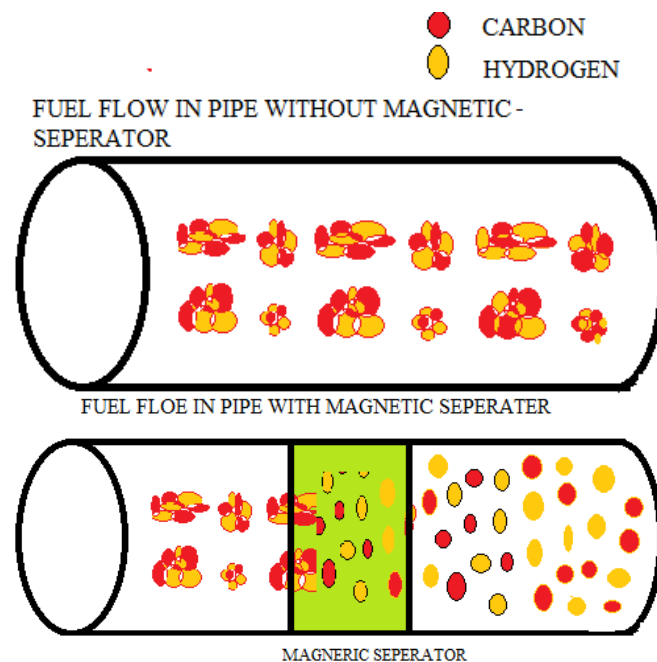
Due to Magnetic effect on molecules, spinning electrons will absorb the energy and finally flip into alignment. Because of that cluster structure of fuel breaks i.e. bonds will break into fine particles. Now, this fine particles (C and H) having magnetic influence, which tend to adhere more oxygen electrons i.e. extra oxidation is done and ultimately complete combustion at its optimum value is obtained , hence pollution will be reduced.

#### Math's theory:

Quantum (Math's) theory is used for analyzing the above effects which are occurred in covalent bond & Barnett theory. Experimental Investigation of Magnetic Fuel Separator (MFS)

#### Test Location

Properties of MMSF Device: The ferrite magnets (Magnetic flux density is from 1000-1800) are most cost effective & withstand with the temperature of burner inlet line for treating the fuel. Annealing Lehr burner, horizontal Lehr, R.c Fan motor for heat circulation and other parameter shown in figure.



**Figure 3:** (Without and with used of Magnetic fuel separator)

### 4. Calculation

Ultimately the fuel saving is 450-391 = 59 m3 per day  
 That means (59\*30\*12) = 21240 m3 fuel save per year  
 So per year saving fuel gas is 54375 kg.  
 Means total cost saving is (43200\*156.2) = 84.82 lakh/ year saving

**Table 1:** (Observation table for the consumption of fuel in different zone without Magnet)

Date	Time	Job Weight (Gms)	M/CSpeed (BPM)	LehrSpeed (Hz) 490 mm/min	Zone-1 (550)	Zone-2 (555)	Zone-3 (505)	FlowMeter Reading for fuel consumption
28-02-15	7:30 AM	58	393.5	483	546	559	507	692
28-Feb-15	8:30 AM	58	393.2	516				712
Difference in fuel consumption								20
28-Feb-15	9:30 AM	58	281.8	483	556	560	502	731
28-Feb-15	10:30 AM	58	281.8	493				750
Difference in fuel consumption								19
28-Feb-15	12:30 PM	58	281.8	533	552	554	506	789
28-Feb-15	1:30 PM	58	282	523				809
Difference in fuel consumption								20
Total consumption of fuel per day								450

Here the shown table gives the temperature of different zone of glass chamber and the last column shows the fuel consumption of a burner.

**Table 2:** (Observation table for the consumption of fuel in different zone with Magnet)

Date	Time	Job Weight(Gms)	M/C Speed (BPM)	Lehr Speed (Hz) 490 mm/min	Zone-1 (550)	Zone-2 (555)	Zone-3 (505)	Flow Meter Reading for fuel consumption
10-Mar-15	9:30 AM	58	393.7	381	550	558	504	136
10-Mar-15	10:30 AM	58	393.2	381	545	556	507	152
Difference in fuel consumption								16
10-Mar-15	11:30 AM	58	393.7	381	553	551	508	170
10-Mar-15	12:30 PM	58	393.7	365	555	551	502	186
Difference in fuel consumption								16
10-Mar-15	1:30 PM	58	393.3	344	550	550	503	203.00
10-Mar-15	2:30 PM	58	393.2	371	550	551	505	220
Difference in fuel consumption								17
<b>Total consumption of fuel per day</b>								<b>391</b>

## 5. Conclusion

By establishing correct fuel burning parameters through proper magnetic means MMFS increases the internal energy of a fuel gas to cause specific changes at a molecular level which obtained easier combustion. The resultant fuel burn more completely, producing higher engine output, better fuel economy, more power & most importantly reduces the amount of HC, CO, NOx in the exhaust. & therefore control the emission at low cost. In short the summary of the conclusion includes: MFS increases 3-4% efficiency of fuel gas, Reduction in HC emission & other pollutants, Avoid clogging problems in fuel gas burner, Cost saving, Eco friendly, Reduce maintenance of Through magnetic fuel saver there are huge saving of fossil fuel in terms of Natural gas and also decrease investment cost and ultimately increase the profit of the company. Annealing burner most importantly does not require any design modification & finally COST SAVING.

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