



July | 14

TOPS from Fykeys Engineering Pvt

Totally automates monitoring and control of Furnace temperature, excess oxygen in the flue gas and furnace pressure to achieve dramatic reduction of fuel consumption and losses due to scaling and also prevents surface decarburization.

FYKAYS ENGINEERING PVT. LTD.

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THE CURRENT SCENARIO:

India is expected to produce above 100 MT by the year 2015 and to 200 MT by the year 2020. This entire production is by means of rolling and forging industry. India is the FIFTH largest steel producer in the World. It is disappointing to note that operations in India are NEITHER energy efficient NOR conducive to scale losses. A glance at the table below will show how far away India is from the World Standards:

<u>Factor</u>	<u>World figures</u>	<u>Indian Figures</u>
Fuel consumption Oil/ tonne	25 - 28 L / Tonne	38 - 55 L / tonne
Fuel consumption Coal/tonne	70- 80 kg / Tonne	140- 150 kg / Tonne
Scale losses	0.2 - 0.5 %	1.5 - 3.5 %

With even a conservative low figure of 2.0 %, India is losing annually a mind boggling ONE MILLION TONNE OF STEEL IN THE FORM OF SCALE LOSSES and further OVER CONSUMING 700 MILLION LITRES OF FURNACE OIL OR 100 MILLION TONNES OF COAL.

At Fykays, we have, due to our deep understanding and vast experience of the Metallurgical industry and of the issues and problems faced within, developed a system that helps address the burning issues of excessive fuel consumption and scale loss.

FYKAYS - TEMPERATURE, OXYGEN AND PRESSURE SYSTEM (TOPS)

TOPS from Fykays, is a **S**ystem developed to monitor and control **T**emperature, **O**xygen and **P**ressure in re-heating furnaces for dramatic reduction in fuel consumption and losses caused by scaling. Fykays TOPS can reduce fuel consumption by as much as 10 litres of oil or 50 kg of coal per ton and scale loss by as much as 1%. (These are approximate figures. Actual achievement will vary depending upon size of furnace, conditions prevailing at the site, processes being adopted, etc.)

WHAT IS TOPS?

TOPS is a system that FULLY AUTOMATES monitoring and control of Furnace temperature, excess oxygen in the flue gas and furnace pressure to realize hitherto considered impossible achievements.

HOW DOES IT WORK?

1. Temperature monitoring and control is the primary loop, sensing soaking zone temperature and regulating the air and fuel control valves by means of a PID controller, which can be either pneumatically or electrically actuated. The air : fuel ratio is built into the controller software. One of the noteworthy features of the temperature loop is the special facility provided for manual intervention – on occurrence of a mill breakdown, the furnace temperature can be turned down to pre-determined levels simply at the click of a button.
2. The second loop - Oxygen measurement and control: This is done by a highly sensitive probe positioned at the furnace exhaust. The signal from the probe is



fed to a precise oxygen controller. This in turn injects a trim signal to vary the air : fuel ratio built into the temperature control loop.

3. The third loop – Pressure control is an independent loop and is achieved by precise furnace pressure sensing and the controller actuating the furnace damper so as to maintain the desired furnace pressure. Here again the actuation can be either electrical or pneumatic.

WHAT DOES TOPS MEAN TO YOU?

1. **Savings** - This is something that cannot be overstated. A one-time investment will ensure savings year after year to the tune of crores of rupees. Depending on the size of the furnace and the tonnage of steel rolled, it can be appreciated that the pay back period can be as low as a few weeks to a maximum of a couple months EVEN IF THE COMPOSITE PACKAGE IS installed at one go.
2. **Dramatically reduced surface de-carburization**, thereby enabling you to assure the quality of your products.
3. **Virtually no maintenance:** Our instruments are developed with a view to keeping maintenance costs down. No special maintenance of the system is required, beyond the routine, preventive maintenance recommended by us. Buy it, commission it, forget it! In the unlikely eventuality of a major problem, we have a team of qualified service engineers who can visit your site at short notice and provide effective solutions.

WHY BUY TOPS?

1. **Modular installation:** FYKAYS have designed the system in a manner that enables us to manufacture and install the TOPS system in a modular fashion. **This means that, you can stagger your investment.** Typically, the total instrumentation and control package TOPS may cost in the range of Rs 20 – 35.00 lacs depending on the size of the furnace. In case you do wish to stagger the implementation of the program, we recommend the following:
 - I. Precise temperature control system (the **T** of TOPS) depending on the size of the furnace in the range of 10 to 12 lacs.
 - II. Oxygen measurement system (the **O** of TOPS) (irrespective of the furnace size but dependent upon the level of automation required) at around 7 – 12 lacs
 - III. Precise furnace pressure control (the **P** of TOPS) depending on the size of the furnace in the range of 5 – 7 lacs
 - IV. Data acquisition and logging, computerized facility (irrespective of the furnace size) – 5 lacs
2. **Experienced and qualified team:** The Fykays instrumentation and design team comprises a set of highly qualified, dedicated and experienced people. Team members will visit your plant, understand your specific needs and tailor the system to suit your specific requirements. We can also provide the services of a panel of furnace specialists who can advice corrections in the existing set up and wherever possible supervision too.
3. **Evolved training and handover process:** The equipment is extremely simple to use and operate and is very well within the purview of good electrical and



mechanical engineers. We offer to train such personnel at our works before dispatch of the equipment and involve them during erection and commissioning, so that they get hands-on experience to be qualified to operate and maintain the system.

In the unlikely event of any problems, our field engineers are always at your service.

IMPLICATIONS FOR YOUR ORGANIZATION:

1. To fully enjoy the benefits of Fykays TOPS some changes in operating practices are called for like:
 - a. Minimizing manual over-riding of the system
 - b. Cultivating the practice of avoiding opening and closing charging and discharging doors. If possible, mechanize the operation of these doors and install suitable interlocks
2. Training of operating personnel, which is absolutely necessary to achieve optimum performance.

To Summarize, TOPS from Fykays is a system that is a “MUST-HAVE” for every rolling mill / forging furnace in our country. The short cost recovery period, low maintenance costs, and Fykays’ experience and understanding of the dynamics of the metallurgical industry and back up make TOPS a necessity for a progressive organization.