



certified partner
eurokiln group

ALLAN SMITHTM ENGINEERING PVT. LTD.

WHERE EXCELLENCE IS SECOND NATURE



Proven Quality & Credibility.

Where Excellence is Second Nature
Specialized Kiln Services

Innovation & Implementation.

ABOUT US

Allan Smith Engineering Pvt. Ltd. is a reputed name in Rotary Kiln Industries for providing reliable engineering solutions. We offer's specialized maintenance services for Kiln Alignment (Hot and Cold), diagnostic maintenance, and assistance (with surgical precision) in repairs on rotary Kiln. We are driven by excellence and aim's to emerge as a principal name in service provider industry. Our mission is to exceeds expectation of our customers. To set new benchmarks in industry through our high quality services, well-designed and customized solutions. Our company is renowned for its expertise in troubleshooting typical and recurring problems thus ensuring complete and reliable operations.

In order to provide high quality and best services, at par with international standard, we are being supported by "EUROKILN", an organization based in Europe. The European office also act as knowledge centre and engage in developing new instruments, procedure to provide better service to clients. Our engineering services are designed keeping the current industry trends and developments in mind, enables us to fetch results. We have earned trust of our clients, globally, through our ethical business policies and professional attitude.

We are located in city of Mumbai, Maharashtra. Allan Smith Engineering came into being in 2009 and incorporated in 2011. Mr. Laxmi Narayan, owner of the company has been presented with the National Award (India) for Innovations applied to plant maintenance, by Govt. of India.

Our Specialty

Our core competency lies in designing effective engineering solutions. We focus on troubleshooting and rectification of recurring problems observed in the machine, thus ensure reliable machine operation. We are well-versed with all make of the machines to offer customised and reliable services.

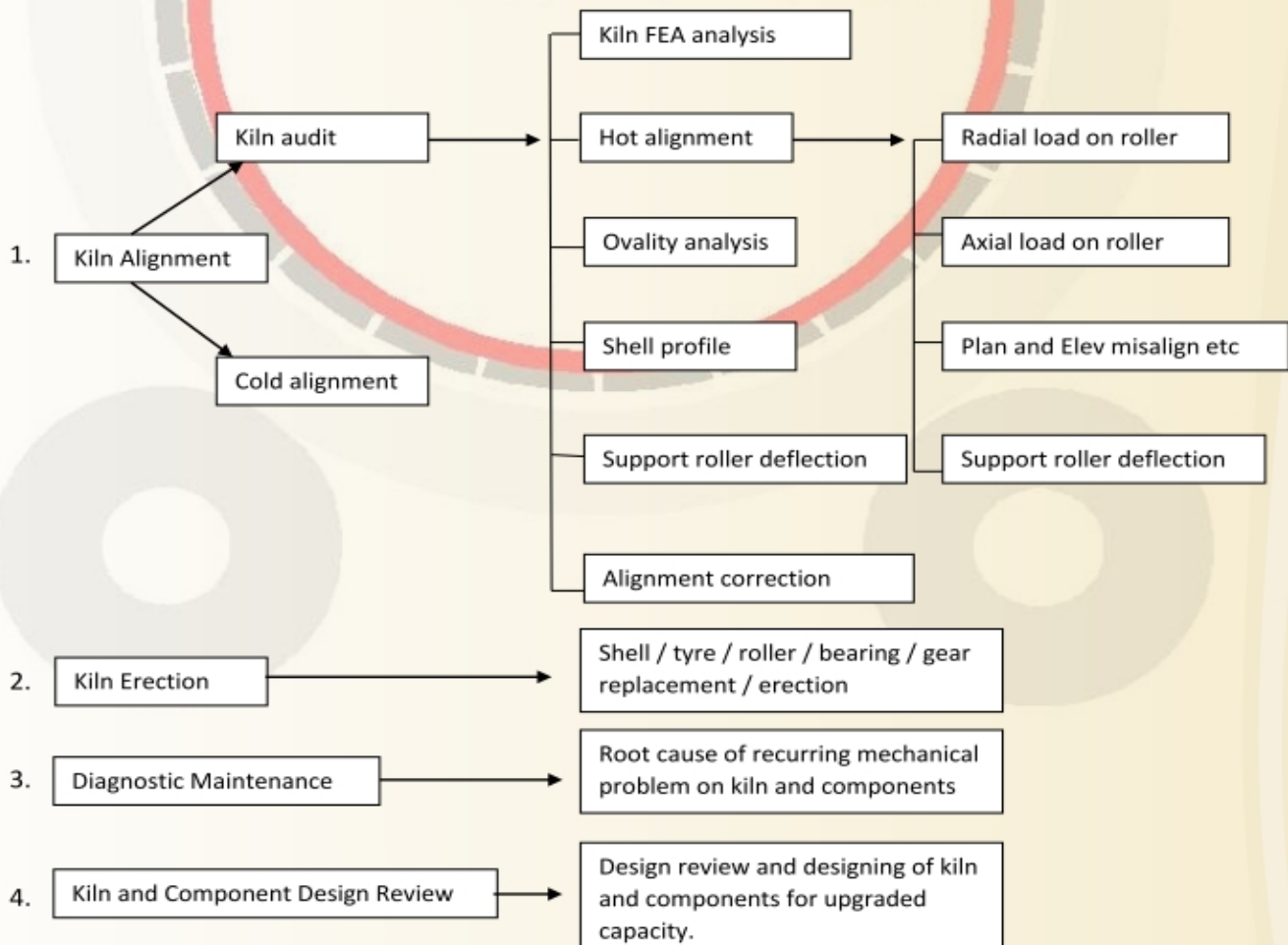
Team

We believe, our competent and resourceful team is the asset of our organization. Our team comprises of qualified and experienced mechanical engineers, supervisors, technicians and quality management personnel to mention a few. The team is working cohesively and single minded, dedicated towards the customer satisfaction.

Customer Satisfaction

Customer Satisfaction is a major yardstick with which we evaluate our company's performance and growth (instead of INR turnover). We take every effort to exceed expectations of our clients. We designs and plan our services after considering the requirements and specifications put forward by the clients. Our Services:

Our Services



OUR SERVICES

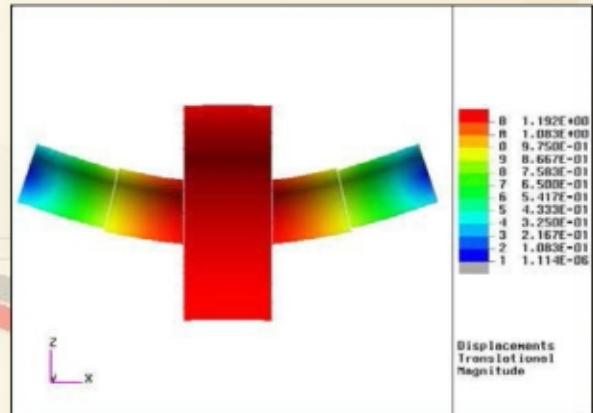
KILN AND COMPONENTS F.E.A. ANALYSIS

F.E.A Analysis (Kiln and Components):

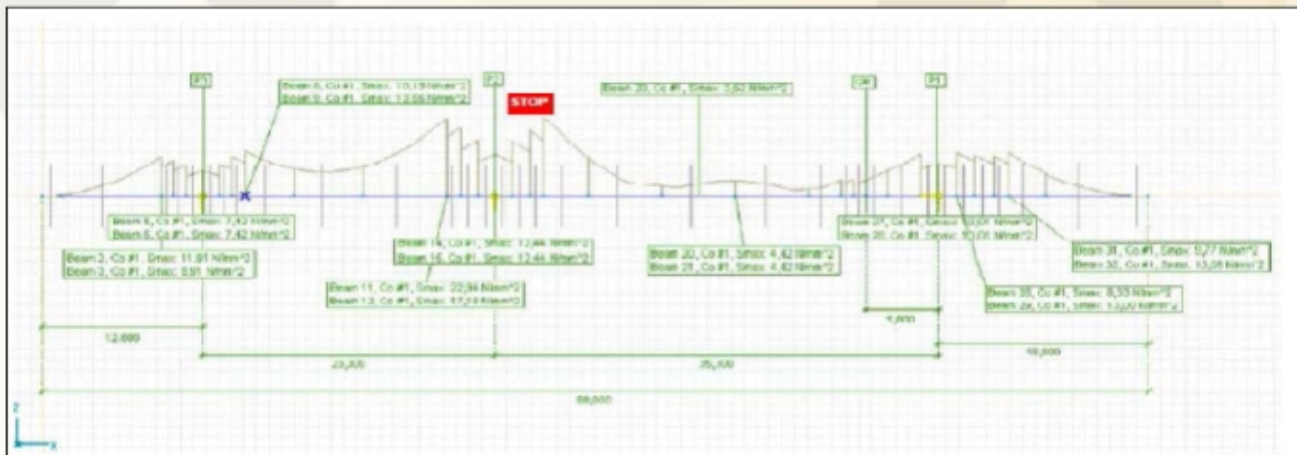
Now a day's Finite Element Analysis is being used to analyze failure analysis. FEA finds extensive application of FEA is in aerospace, automotive industry as well. In FEA, exact virtual model of machine element has been tested under practical conditions. Depending upon the test results, machine element can modify for its best performance in practice. We use FEA to carry out design review of kiln and components under normal operation. The Review and corrections ensures reliable and dependable operation.

Recently we had carried out F.E.A. analysis to establish root cause of cement kiln support roller shaft shearing.

Typical bending stress and bending moment diagram drawn for KILN audit.



Typical bending stress and bending moment diagram drawn for KILN audit.



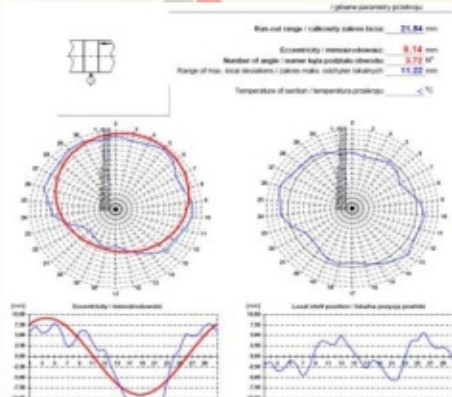
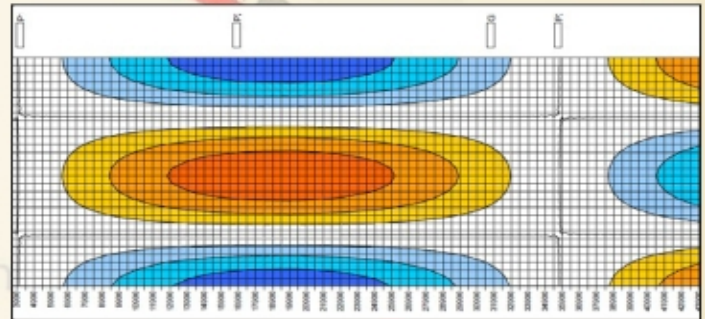
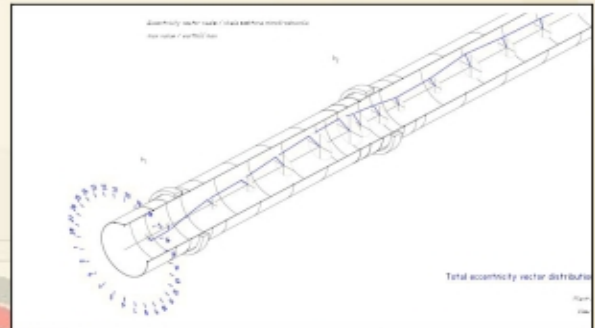
SHELL PROFILE MEASUREMENT

Kiln Shell Analysis:

Kiln shell bend predominantly affect kiln operation, mechanically and usually result in high variation of current drawn by the main motor. The bent also influence in bearing temperatures, tyre roller contact, girth gear pinion contact etc.

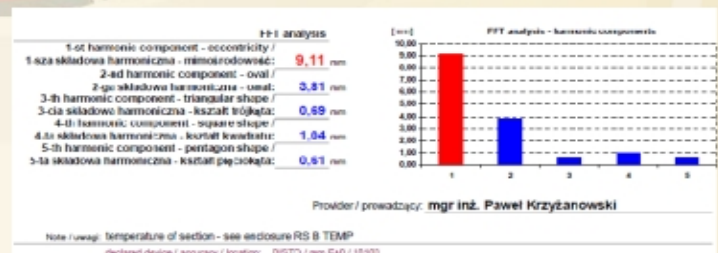
Determination of Kiln Shell Profile concluded upon the measurement using laser in complete shell length @ 2-3 meter span. And, conclusion drawn of shape of the kiln shell includes bent, hidden bent, dog leg situation in the shell. The data analyzed and presents as polar diagram for eccentricity and local deformations.

Additionally, we take reference of roller shaft deflection to conclude hidden cranks of the shell at support roller position. Also, we reverse calculate the shell bent causing shaft deflection and consider this in the real final shell axis shape.



Polar and liner graph of the shell drawn using laser data collected at a position

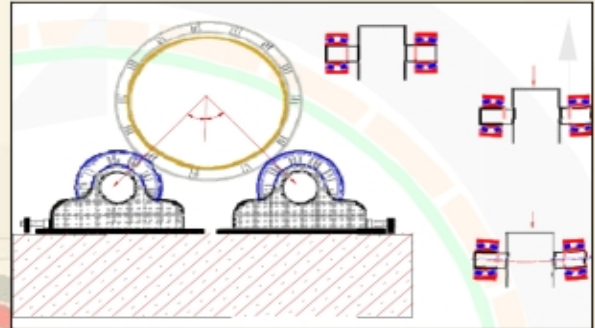
FFT analysis carried out of the above collected data.



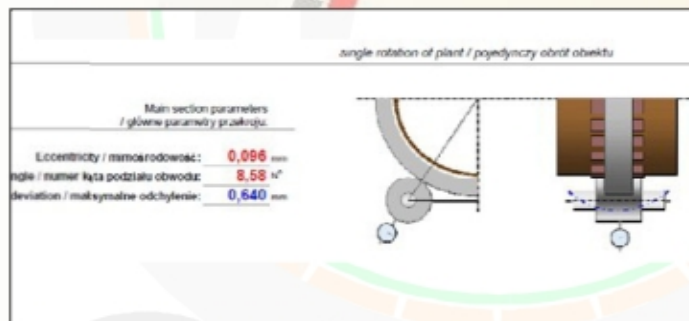
SUPPORT ROLLER DEFLECTION

Support roller deflection

We carry out support roller Air g deflection measurement, a dynamic deflection during normal Kiln operation. Data recorded for complete rotation of kiln using high accuracy digital dial gauge of accuracy 0.001mm. The deflection indicate "hidden ben shell", support roller strength under operation load, etc.



Shell runout / eccentricity and hidden crank induce cyclical shaft deflection and leads to incipient fatigue crack in the shaft. Static deflection of the shaft is higher but will this we can't measure; we can measure only the variation in deflection during operation. The static deflection can only be measured during shutdown. The value of dynamic deflection of support rollers is determined in reference to designed support roller dimensions. The data then compare to the measured value to conclude existence of any discrepancy.



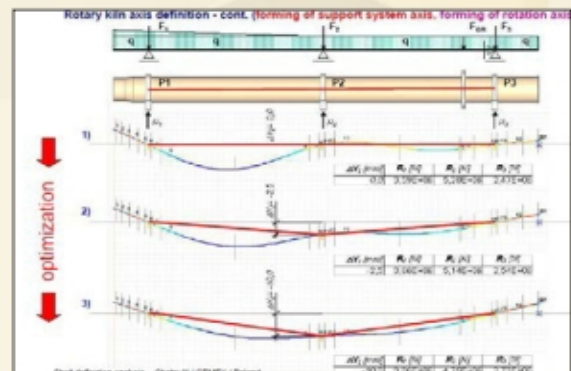
HOT KILN ALIGNMENT

Hot Kiln Alignment (Optimization of kiln axis):

Kiln alignment is undertaken to ensure parallelism of center axis of kiln and all the support rollers. Measurements are carried out on kiln and support rollers to locate the existing axis. Depending upon analyzed result, correction can be taken up to ensure parallelism in plan and elevation view.

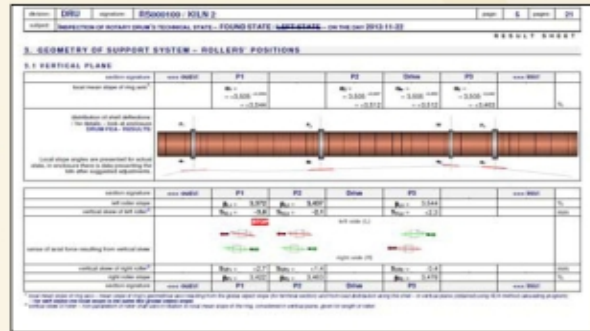
Kiln misalignment influences on load distribution on the rollers. Possibility of load variation exists because of some or other reason like one roller has higher diameter than another Roller, rollers with different elevation difference etc. Optimization of kiln load on the rollers helps to reduces differential loading between rollers at same pier.

Problem like hot bearings, overturning of bearings, excessive wear on support rollers, and excessive wear on thrust rollers can be eliminated. Proper kiln alignment ensures proper load sharing on the support rollers.



Added features:

- As a standard procedure, we are carrying out FEA analysis to check the kiln stiffness. The stiffness helps to conclude the kiln is "stiff" or "flexible".
- We evaluate local slopes of each tire (as shown below) - USP
- We optimize loading on the piers, depends upon stresses in the shell. Unique accuracy of our measurements is related to the possibility of access the support roller shaft end during operation.
- Our precision of the measurement is upto fraction of millimeter. What we can see during rollers adjustment when moving



HOT KILN ADJUSTMENT

Hot Kiln Adjustments:

We will be supervising the Hot Kiln Adjustments for the kiln alignment and skew adjustments immediately after light up. We will ensure normal kiln floatation, If possible. Kiln will be moving uphill with a gauge pressure (on hydraulic thrust roller) of around 60 bars (or as recommended by OEM) and return to its position at downhill when applied hydraulic pressure is reduced.

MECHANICAL BALANCING OF KILNS

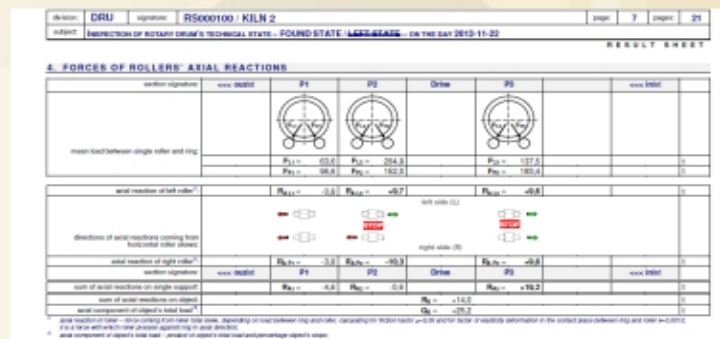
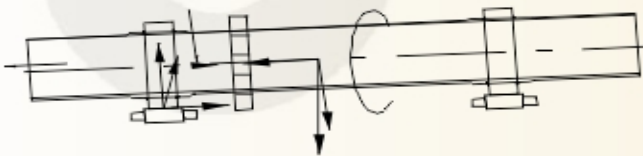
Mechanical Balancing of Kiln:

We had an expertise to measure precisely support skewing of support roller rollers axial thrust in elevation as well in plain view. The measurement is concluded in "mm" and "ton" and accordingly the correction carried out to optimize the axial loading on the support air gap roller. Kiln excessive travel may consequence in:

- Damaging thrust roller/ thrust face of thrust tire.
- Partly damaging kiln end seals because of excessive axial load on faceplates.
- Result in hot bearings / damaging of bearings of support rollers.
- Excessive wear and tear on the support roller and tires surfaces.

Benefits

Optimum balancing of kiln axial load may help to reduce / eliminate the above- mentioned problem/s.



Further:

We can also support with repair technology (developed by eurokiln and implemented successfully on rotary drum), preparation for the shell straightening by cutting and resetting, replacement / alignment of girth gear and tires, chair pad replacement, chairpad shimming for reduction of kiln shell stresses (tyre migration) and adjustment kiln support roller for alignment correction.

KILN SHELL OVALITY

Support roller deflection

Kiln shell ovality is an important parameter to assess kiln health and the monitoring become mandatory upon recurring refractory problem. Ovality, is defined as difference of shell diameter in horizontal and vertical axis. The difference arises because of flexing in kiln shell during operation, thermal, material loading, etc attributed for the difference.

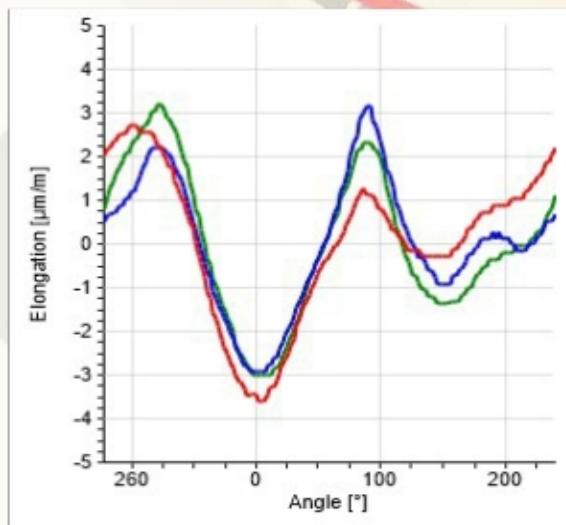
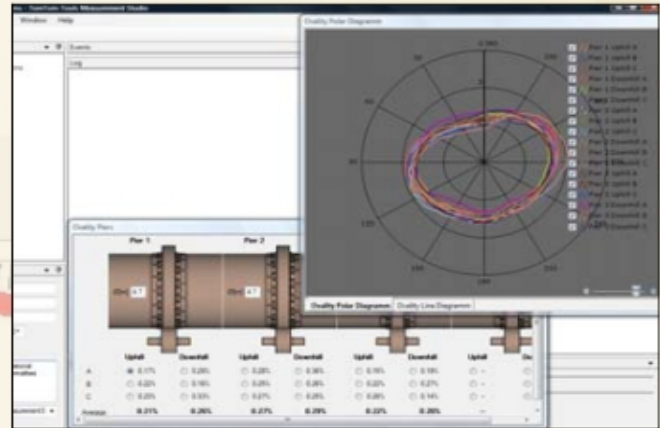
The shell flexing is governed by following factors:

1. beam strength of tyre
2. kiln shell thickness
3. kiln shell and tyre temperatures
4. kiln shell misalignment
5. air gap between tyre ID & chairpad OD
6. thermal and material loading
7. high run-out of kiln shell close to support stations, etc

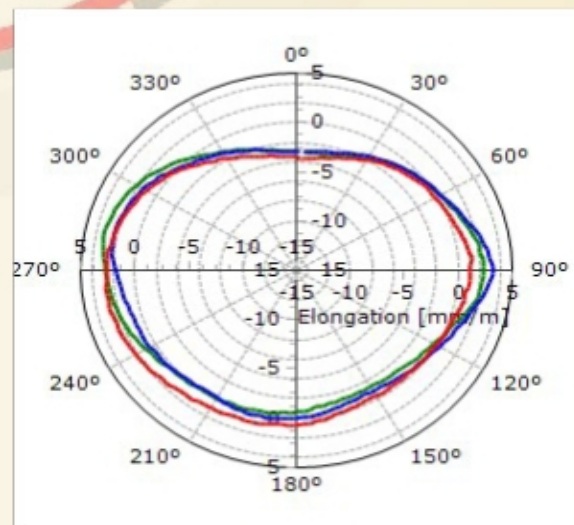
Variation in any of above factors influence shell ovality and has a detrimental effect upon the exceedance. Higher ovality has influence over refractory failure under / close by tyre section, undue stress on kiln shell and tyre section. If higher stresses are allowed for extended period, premature failure of refractory / mechanical element may results.

The measurement (services) is being carried out using high resolution beam, by directly mounting the sensor on shell during normal operation. The sensor measure and record the shell flexing using strain gauge (instead of dial gauge), during operation for the analysis. Manual / transfer error is eliminated by continuously transfer of collected data from the sensor directly to data logger (laptop) during the operation using blue tooth data transfer technology.

The graph generates represent behavior of a point on kiln shell during rotation. Typical graph appended below.



LINEAR GRAPH



LINEAR GRAPH

Contact Us



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