



SANGHAVI

PRE-PROCESSING & CO-PROCESSING of

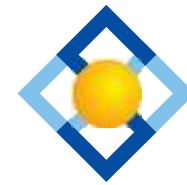
AFR



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MOVING INTO THE NEXT GENERATION

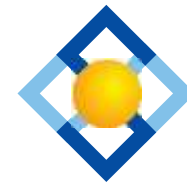
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About us

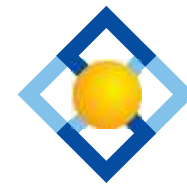
- **Part of Sanghavi Group established in 1960**
- **Sanghavi Engineering Pvt Ltd is a renowned Engineering Company Located in Hyderabad**
- **Emerged as preferred supplier of Cement silos, Flyash silos, Bulk Loading, Combustion systems with several repeat orders.**
- **Undertakes Design, Engineering & Manufacture of Various Systems on Turnkey Basis.**
- **Have good and efficient team of Engineers in Design, Production, Erection & Trouble Shooting.**



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Alternative Fuels & Raw Material (Solid AFR)

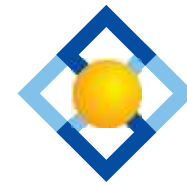
- Fuel may vary from Liquid, Semi solid or Solid from Biomass, Paint sludge, MSW, Tyre chips, Pharmaceutical wastes etc. which are having sufficient heat value.
- AFR used in Cement industry serves both purpose of saving fossil fuel and proper disposal of waste thus helping the society.
- AFR feeding in kiln or calciner is on rise in Indian cement plants and specialized equipment / solutions are need of the hour.



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Solid AFR Handling & Pre-processing

- **Pre-processing is art of change of waste in to AFR.**
- **Pre-processing can include Shredding, Segregation, Impregnation, Foreign body removal etc.**
- **AFR needs specialized handling system depending upon the fuel properties and variety of fuel to be handled.**
- **Equipment selection needs to be specific depending on the material's physical & chemical characteristics.**



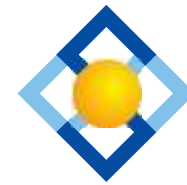
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Pre – Processing – How?

Size reduction
Shredding

Separation
(Scalping, Screening, Filtering)
Metal Separation
(Ferrous / Non ferrous)
Gravity Separation
(Air classification)

Mixing
(Impregnation/Solid mixing)
Blending
Homogenising



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Solid AFR Solutions by Sanghavi

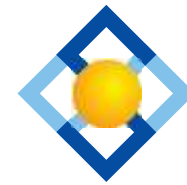
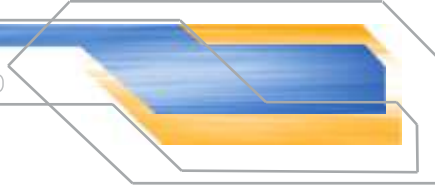
Pre Processing

- Primary Shredding
- Magnetic Separation
- Primary Screening
(with close circuit scheme)
- Secondary Shredding
- Secondary Screening
- Storage
- Packing / Bulk Loading

Co Processing

- Reception
- Storage
- Controlled Extraction
- Conveying
- Metering
- Feeding System

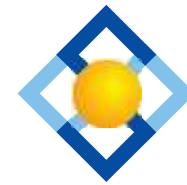
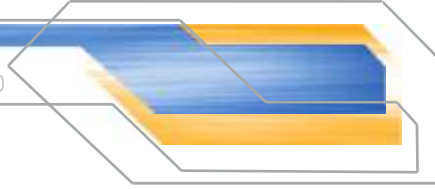
Material Properties of Pharma Waste



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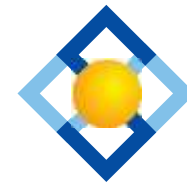
Material	Bulk Density (t/m ³)	Calorific Value	Grain Size	Physical Prop.	Chemical Prop.	Moisture (%)
Spent Carbon	0.62- 0.9	2600-5000	Fine Powder	Solid Black powder and white powder	Reactive with water (fumes)	5
ETP Sludge	2.2-2.6	<2500	Wet Cake Max 500mm	Solid Brownish Green	Reactive with water (fumes)	30
Organic residue semi solid	1.1-1.6	2500-6000	Tarry	Semi Solid Dark brown	Reactive with water (fumes)	5
Process organic residue	1.1-1.6	2500-6000	Wet Cake and Slurry Max 580mm	Semi Solid Many Colors	Reactive with water (fumes)	5

Material Properties of Pharma Waste



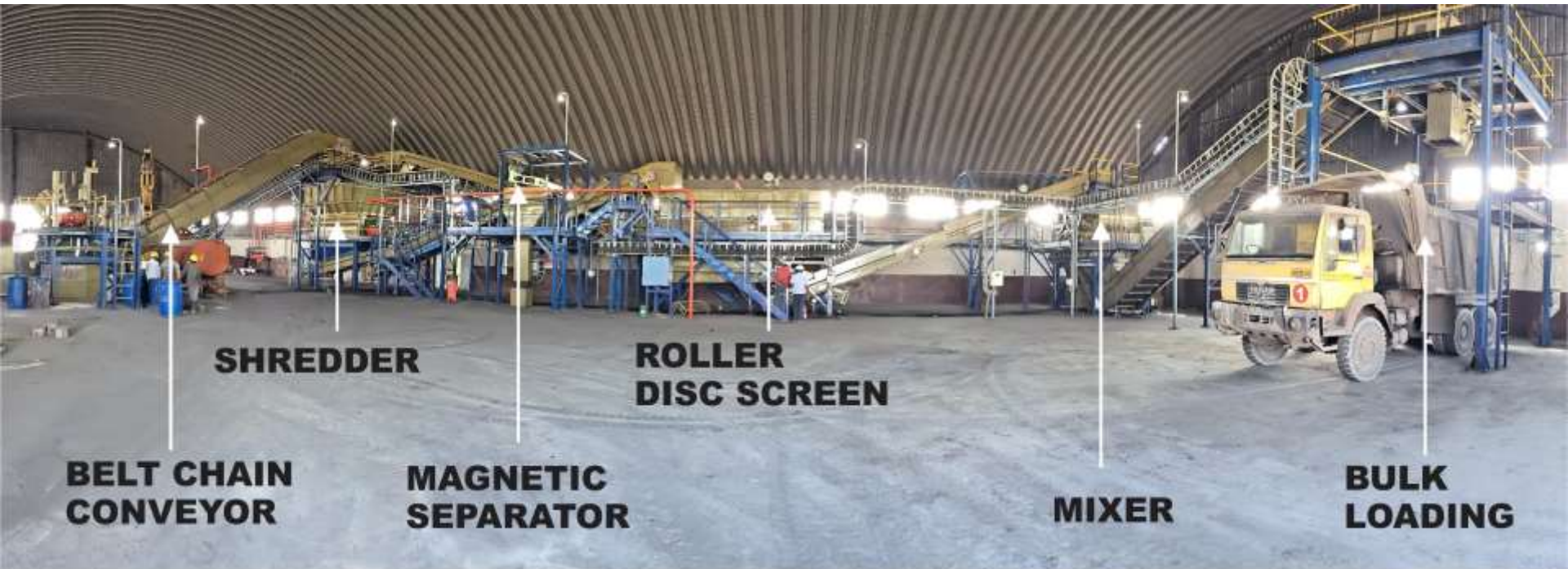
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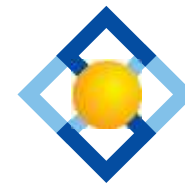
Material	Bulk Density (t/m ³)	Calorific Value	Grain Size	Physical Prop.	Chemical Prop.	Moisture (%)
Distillation bottom residue	1.1-1.6	2500-6000	Wet Cake and Slurry Max 580mm	Semi Solid White and Brown	Reactive with water (fumes)	<5
Organic residue and salts	1.0-2.5	1800-4500	Wet Cake and Powder Max 580mm	Solid Mixed Colors	Reactive with water (fumes)	<10
Still Bottom residue	1.1-1.6	2500-6000	Wet Cake and Slurry Max 580mm	Semi Solid White and Brown	Reactive with water (fumes)	<5



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Pre Processing along with Impregnation



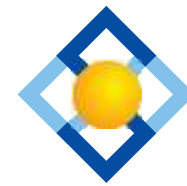


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Solid AFR Pre Processing Solutions by Sanghavi

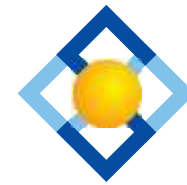
- **Primary shredder (200Kw x 2Nos Drives)**
- **Magnetic Separator**
- **Star / Disc Screen**
- **Secondary Shredder**
- **Air Sifter with cyclone**
- **Impregnation Mixer**

Primary Shredder with Hydraulic Drive (200Kw x 2Nos Drives)



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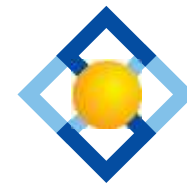




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Primary Shredder Components

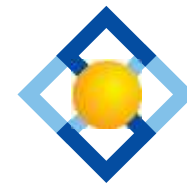




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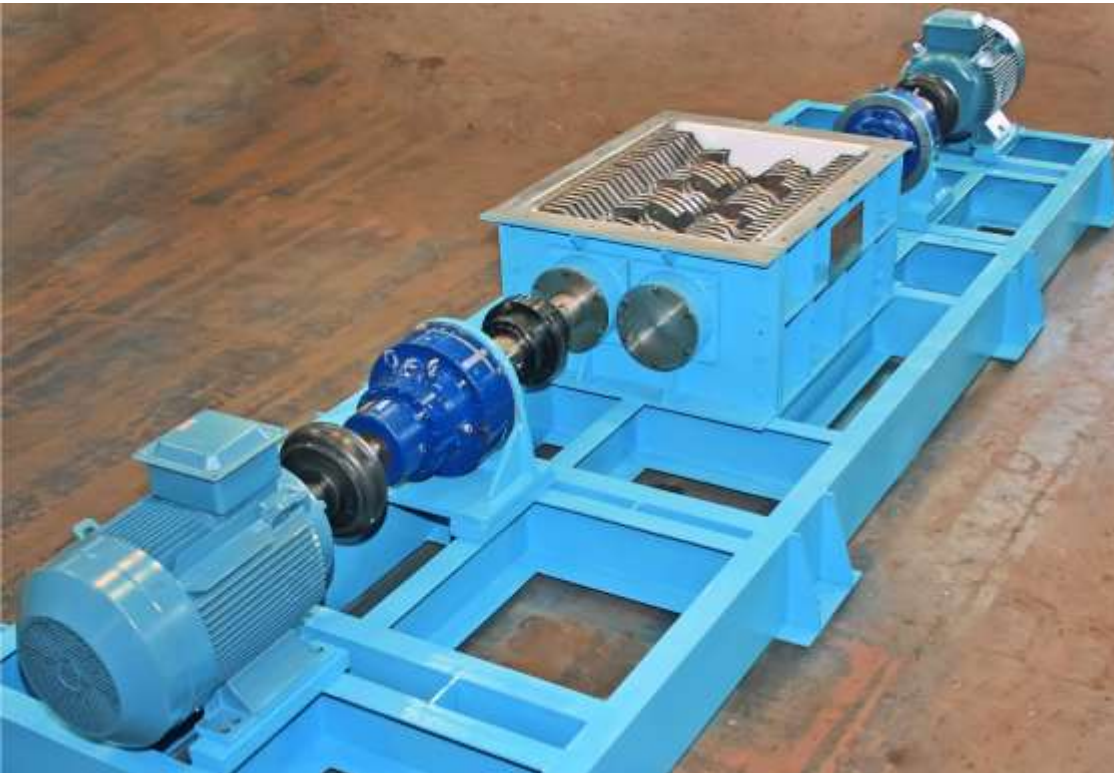
Primary Shredder Components

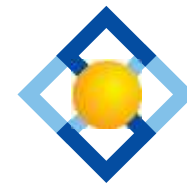




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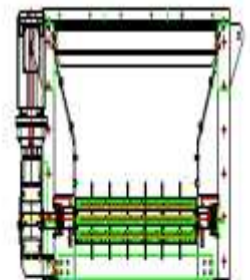
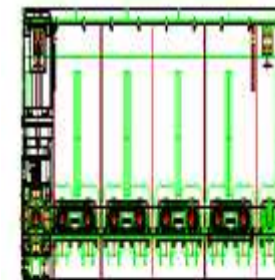
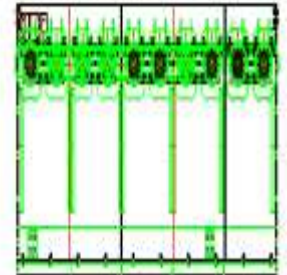
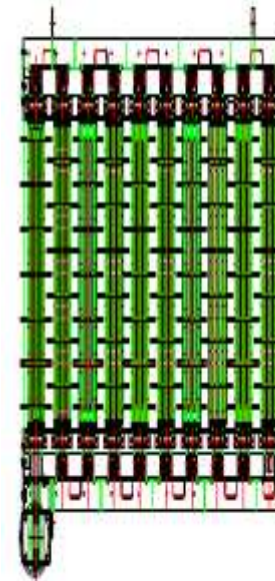
Small Capacity Shredder

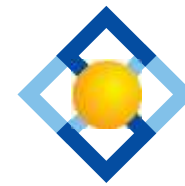




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Disc Screen



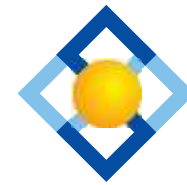


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Mixer

- ❑ Twin Shaft Mixer for Impregnation / Blending of Various fuels.
- ❑ Batch Operation.
- ❑ Pneumatically Operated Bottom Discharge arrangement.
- ❑ Hydraulic/ Electric Driven.

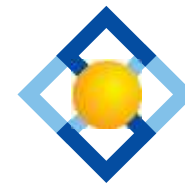




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Pre Processing System Commissioning M/s. Bharathi Cements Ltd., Cuddapah





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AFR Co-processing System Storage, Screening, Conveying & Feeding Solutions

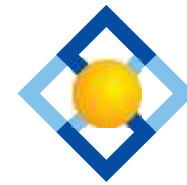
- **Reception**
 - Live Bottom Screw Docking Station
 - Truck Unloading Station

- **Storage with controlled discharge**
 - Push / Live Bottom Floor – Hydraulically operated

- **Conveying**
 - Chain Belt Conveyor
 - Side Wall Cleated Conveyor
 - Skip Hoist
 - Belt Conveyor
 - Blow through Rotary Feeder (for pneumatic conveying)

- **Feeding**
 - Flap Damper
 - Rotary Air Lock
 - Pneumatic Shut-off Gate



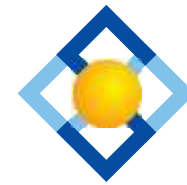


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Live Bottom Screw for Agro Waste

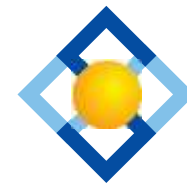


Shaft less Screw Extractor for Pharma Waste



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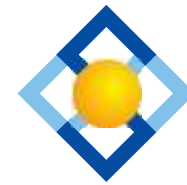




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Push Floor Extractor



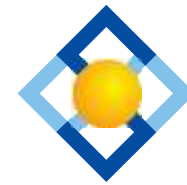


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Side Wall Conveyor



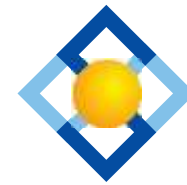
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Chain Belt Conveyor



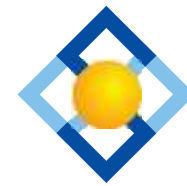
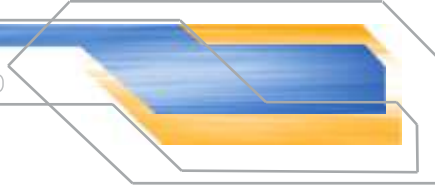


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Blow Through RAL

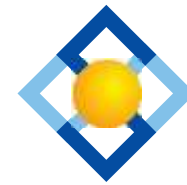


References



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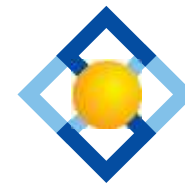
S.No	Customer Name / Project	Description	Capacity	Material Handled	Status
1	M/s. Ultra Tech Cements Ltd., APCW Works	Alternative Fuel Feeding System	15 TPH	MSW, RDF, Agro Waste, Sludges, Shredded Distillation Residues / Salts, Plastics, Thermocole, Expired wastes, Shredded Tyres	Under Execution
2	M/s. Ultra Tech Cements Ltd., Shambhupura Works	Liquid + Semi Solid Alternative Fuel Feeding System	2m3/hr	Liquid / Sludges from Chemical / Pharmaceuticals / Pesticide / Agro-Chemical / Petroleum Industries	Under Execution
3	M/s. Sanghi Cements Ltd., Sanghipuram, Gujarat.	Alternative Fuel Feeding System	10 TPH	Shredded Plastic, Tyre Waste, Rubber	Under Execution
4	M/s. Bharati Cement Corp. Ltd., Kadapa Plant	Pre Processing System including Shredding, Mixing System	10 TPH	Liquid / Semi Solids and Solids of Pharma Waste	Commissioned
5	M/s. Birla Corp. Ltd., Satna Cement Works	Co Processing plant including storage, controlled extraction, Conveying and feeding to calciner	15 TPH	Rice Husk / Musturd Husk / Husk of Chana, Soyabin, Moong & Mutter, Paddy Straw, Maize cob./ Wood chips, saw dust, tree prunes, wood bark. Plastic, Polythene, Leather & rubber, Synthetic textile, paint sludge, tyre chips. RDF Leafy matter, paper product, cotton and jute product	Commissioned
6	M/s. Birla Corp. Ltd., Birla Vikas Cement Works	Co Processing plant including storage, controlled extraction, Conveying and feeding to calciner	15 TPH	Rice Husk / Musturd Husk / Husk of Chana, Soyabin, Moong & Mutter, Paddy Straw, Maize cob./ Wood chips, saw dust, tree prunes, wood bark. Plastic, Polythene, Leather & rubber, Synthetic textile, paint sludge, tyre chips. RDF Leafy matter, paper product, cotton and jute product	Commissioned
7	M/s. Birla Corp. Ltd., New Chanderia Cement Works	Co Processing plant including storage, controlled extraction, Conveying and feeding to calciner	15 TPH	Shredded Tyres / Mustard Husk / Rubber Dust / Imported Saw Dust / Impregnated Saw Dust	Commissioned
8	M/s. Kalburgi Cement Pvt. Ltd., (Formerly Vicat Sagar Cement Pvt. Ltd.) Chatrasala, Karnataka	Hydraulic Operated Push Feeder extractor with controlled extraction	10 TPH	Rice Husk/ Pharma Waste	Commissioned
9	M/s. ACC LIMITED, Bargarh Cement Works.	Mechanical Handling System & Pneumatic Conveying to Calciner	6 TPH	Rice Husk	Commissioned



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Few Points to Ponder for AFR

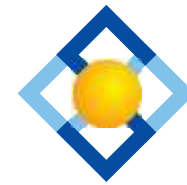
- **AFR is different.**
 - **AFR has mostly non standard material properties. Specially designed equipment need to handle it.**
- **Flexibility is the key**
 - **Changing waste markets and AFR properties call for handling installations with high versatility**
- **Be Safe - Fire is the Greatest Enemy of AFR**
 - **Fire detection & protection system as well as water sprinkler system at correct locations should be installed as precautionary measures for safe handling.**



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Fuels Not Suitable for Cement Kiln

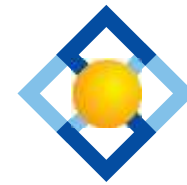
- **Electronic Wastes**
- **Whole Batteries**
- **Bio Active Medical Waste**
- **Mineral acids and corrosives**
- **Explosives**
- **Asbestos**
- **Radioactive Waste**
- **Unsorted Garbage**



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Liquid AFR System

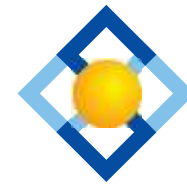
- **Liquid Alternate Fuels.**
 - **Spent Solvents**
 - **Pharmaceutical**
 - **Agro Chemical**
 - **Waste Oils**
 - **Emulsions**
 - **Waste Water**
 - **Depleted Pesticides**



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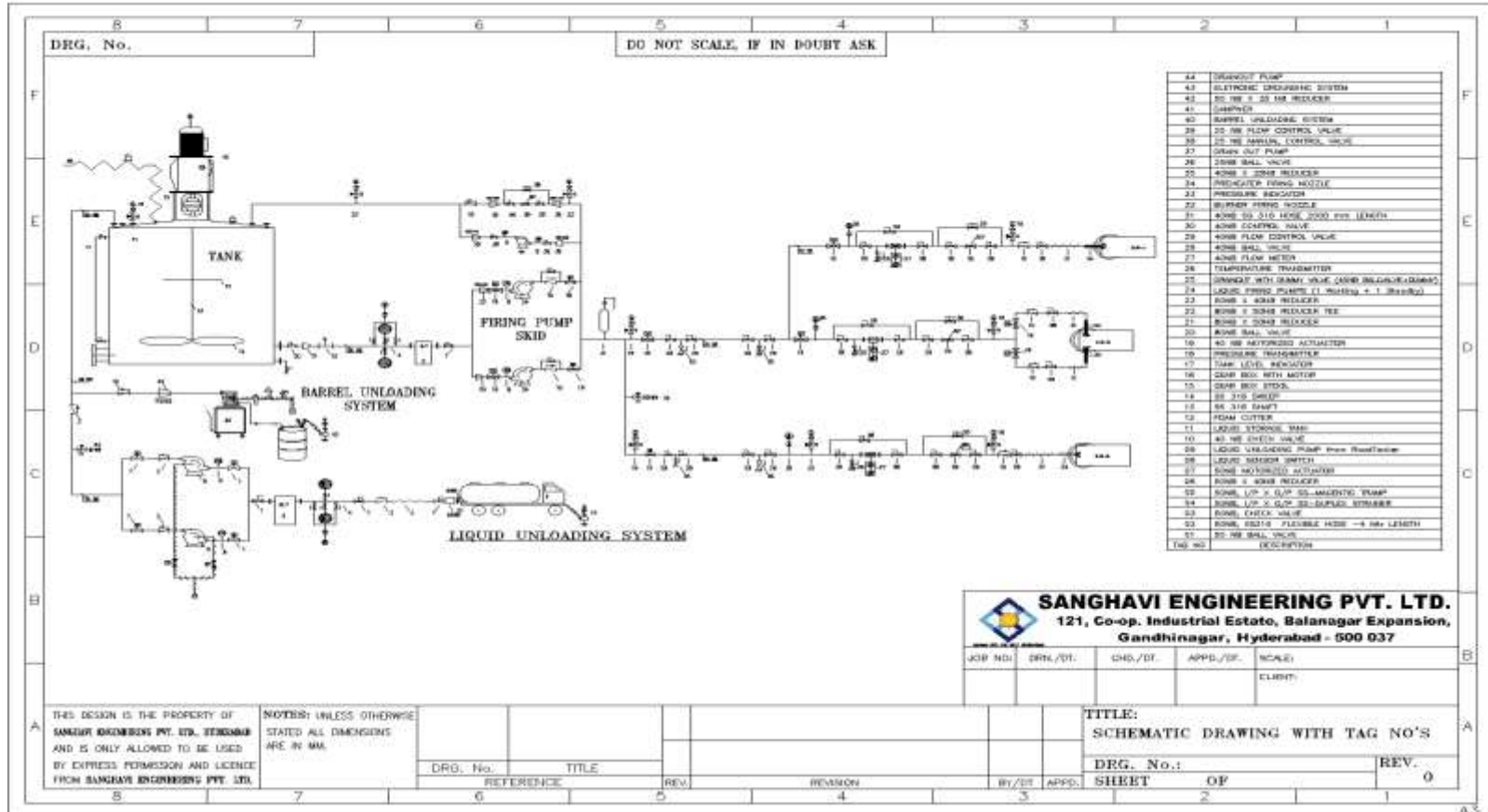
Liquid AFR System Advantages

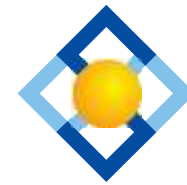
- **Liquid fuels can be atomized with compressed Air with solid particle of size less than 1- 8mm.**
- **Existing firing system can be used with less modifications.**
- **Does not require heavy structural engineering.**
- **Less Power consumption**



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Process Flow

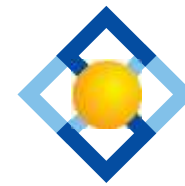




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Liquid AFR Handling System

- Receiving Station
- Storage Station
- Transfer Station
- Firing Station

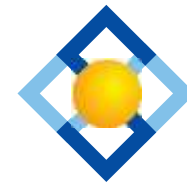


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System Description

Receiving and Storage Station:

- Receiving Liquid solvents are carried to site in Tankers or barrels and are transferred into the properly designed storage tanks.
- Nitrogen blanketing is to be present in the tank to avoid any vapors coming out of the storage tank to atmosphere.
- Liquid solvents are unloaded by using pumps, filtered and are transferred to storage tanks.
- Storage tanks are coated inside with Special lining to avoid corrosion and required safety equipments are provided.
- Agitator is provided in the tank for maintaining the homogeneity of the liquid.
- Grounding system is provided to neutralize the static charges developed during the transfer of liquid

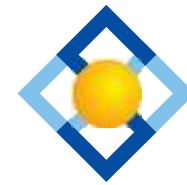


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System Description

Transfer and Firing Station:

- Liquid stored in the tank is filtered and thus transferred for firing.
- Seal-less Pumps are used for the transfer of liquid from the storage tank.
- Lined Pipes, bends and fittings are used for conveying of the liquid.
- Control Valves, Transmitters and Switches are provided for easy monitoring and control of the system.
- Drain out Pump is provided for removing the liquid from the line during emergency.
- Drain out valves are provided in the line



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THANK YOU

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