### **PRE-FEASIBILITY REPORT**

For

## **PROPOSED EXPANSION PROJECT**

## Jyoti Resins & Adhesives Ltd.

Located at Survey No. 873, Village: Santej, Tal: Kalol, Dist.: Gandhinagar, Pin: 382721 State-Gujarat

February 2022

### Pre-Feasibility Report

### Table 1: Executive Summary

No.	Details	Information
1	Name of Unit	Jyoti Resins & Adhesives Ltd.
2	Site Location	Survey No. 873, Village: Santej, Tal: Kalol, Dist.: Gandhinagar, Pin: 382721 State-Gujarat
3	Activity	Manufacturing of Synthetic Resin Adhesive (Poly Vinyl acetate Adhesive)
4	Capacity (EC approved Product Capacity and proposed Capacity of additional Products)	Existing: Synthetic Resin Adhesives (PVAA): 1,500 MT/Month Proposed: Synthetic Resin Adhesives (PVAA): 3,500 MT/Month Total after expansion: Synthetic Resin Adhesives (PVAA): 5,000 MT/Month
5	Water Management	Source: Water Tankers Water requirement for the Existing Product: 9.625 cum/d. Water requirement for the Proposed Product: 30.62 cum/d. The domestic sewage will be disposed of through the Septic tank and soak well. The industrial wastewater generation will be nil and proposing Zero Liquid Discharge Unit.
6	Plot area	7,016 sqm
7	Power Requirement	Existing: 180 KVA from UGVCL Proposed: 120 KVA from UGVCL Total: 300 KVA from UGVCL Existing: DG set of 125 + 62.5 KVA as Emergency power supply Proposed: DG set of 125 KVA Total: 2 nos. x 125 KVA + 1 nos. x 62.5 KVA
8	Man Power	Existing: 95 employees Proposed: 250 employees Total: 345 employees
9	Investment	Existing: 0.80 Cr. Proposed: 2.60 Cr. Total: 3.40 Cr.

### 2. Introduction of the Project / Background Information

### 2.1 Identification of Project and Project Proponent

M/s. Jyoti Resins & Adhesives Ltd. is located at S. No. 873, Opp. Anand Health Care, Ranchhodpura Road, Village: Santej, Taluka: Kalol, District: Gandhinagar, Gujarat, India. The unit has proposed to expand the manufacturing capacity of synthetic resin adhesives (PVAA) from 1,500 MT/M to 5,000 MT/M. The total land area of the plot is 7,016 sq. m.

M/s. Jyoti Resins & Adhesives Ltd. is promoted by Mr. Jagdish Patel, CEO & Managing Director of the company, has wide experience of 25 years in chemical industries, and Mr. Utkarsh Patel, Executive Director of the company, and has experience of 13+ years in the chemical industries. The main product of Jyoti Resins & Adhesives Ltd. is famous for the brand name "EURO 7000". Recently the market demand for the product "EURO 7000" has grown exponentially. Jyoti Resins & Adhesives Ltd. has become the leading manufacturer of high-grade synthetic resin adhesives. It has entered the National market and today manufacturing site has grown to Global Standards. Over the years the company has built an excellent reputation in the domestic market and is very well known for its deliveries, services, and quality products.

### 2.2 Nature of the Project

As per the EIA Notification, 2006 & subsequent amendments, the proposed expansion project comes under category 'A-listed at item 5(f). The project is located outside the notified industrial area. Therefore, the category of the proposed project will come under category 'A'. Unit is having valid EC (Vide No. J-11011/429/2017-IA-II (I) dated 14th July, 2020) and CC&A (AW-42531 dated 10-08-2020 & Valid up to 09-04-2029) for manufacturing 1,500 MT/M of synthetic resin adhesives (PVAA). The unit has proposed for expansion of manufacturing capacity of synthetic resin adhesives (PVAA) from 1,500 MT/M to 5,000 MT/M.

### 2.3 Employment Generation

The existing employment to 95 employees and for expansion employment will be to 250 employees, total employment will be to 345 employees.

### 3. Project Description

**3.1 Type of Project and interlinked and interdependent Project, if any** No

### 3.2 Location:

The unit is located at S. No. 873, Opp. Anand Health Care, Ranchhodpura Road, Santej, Kalol, Gandhinagar, Gujarat. The Google image 1 shows the plant located in surrounding area and Image 2 showing in 10 km radius circle area.

### Image 1: Showing the location of the plant







### **3.3** Details of alternate site and the basis of selecting the proposed site.

At present the units produces 1,500 MT/M of Synthetic Resin Adhesive (PVAA) & 150 MT/M of Adhesive SH (Non-EC product). However, Unit has adequate Land to expand the Production Capacity up to 5,000 MT/Month for Synthetic Resin Adhesive (PVAA).

The site is well connected by metallic roads and close to Sardar Patel ring Road (3 Km), Kalupur Railway Station (Ahmedabad) (17 km) and Airport (15 km). The raw material required for this plant is easily available from and within local markets of Gujarat. Manpower required is easily available and which in turn will generate employment. Moreover this will result in revenue generation and socio-economic up liftment through CSR activities. Hence the project justifies the location site and its need.

### **3.4** Size and magnitude of the Operations.

The product name and capacities are enclosed in below table.

Sr.	Product name	CAS no.	Existing Capacity in MT/month	Proposed Capacity in MT/month	Total Capacity in MT/month	Transportation
1	Synthetic Resin Adhesive (PVAA)	9003-20-7	1,500	3,500	5,000	By Road ways

### Table 2: The Product details with capacities

### 3.5 Process Description

# Manufacturing Process of Synthetic Resin Adhesive or Poly Vinyl acetate Adhesive:

A polymer is a macromolecule composed of repeating structural units connected by covalent bonds. White glue or polyvinyl acetate is a polymer composed of the repeating vinyl acetate structural unit. To produce the polymer (polyvinyl acetate) on aqueous conditions is necessary the reflux of vinyl acetate, potassium per sulfate and a surfactant (soap) at 80 °C for 40 minutes. The water reacts along with the vinyl acetate in order to produce the polyvinyl acetate chain. The potassium per sulfate is a catalyst which helps accelerate the reaction without itself being consumed. Finally, the surfactant is used in order to bring the immiscible water and vinyl acetate together in order to react successfully. Potassium per sulfate it is used as initiator for the polymerization producing radicals, molecules highly reactive.

### **Chemical Reaction:**



# Raw Material Used in Manufacturing Synthetic Resin Adhesive (Poly vinyl Acetate Adhesive):

- PVA (Poly Vinyl Alcohol) → (CH2 CH OH)N
- VAM (Vinyl Acetate Monomer) → CH3 C00CH = CH2

- Water
- SBC (Sodium bi Carbonate) Catalyst
- PPS (Potassium Per Sulphate)
- Formaldehyde (Preservative)
- Octanol
- DBP (Di butyl Phthalate) (Plasticizer)

### Stage 1:

Water is charged in vessel (closed vessel with condenser) and heat is given from the boiler by setting the boiler temp around 100oC. When the temp of vessel is come to 60oC the PVA is added to water, then stirring is started to make PVA solution. At 70oC – 72oC the vinyl acetate monomer is added slowly with presence of catalyst PPS and SBC. This process will take around 5 – 6 hrs for adding the monomer. Boiler heating is required only for two hours.

In above process the reflux of monomer is recovered 100% in to the vessel because of reflux overhead vapour condenser and the closed vessel. So, the whole monomer and water is used as solvent and become the part of mixture. No effluent is generated. There will be no liquid or solid waste from the process. After complete addition mixture is stirred in vessel at least for 1 hour to ensure remaining monomer will react completely. Thus PVA Emulsion is ready.

### Stage 2:

Poly vinyl alcohol solution in water, the plasticizer (DBP), octanol and preservative (Formaldehyde) is added to mixture. The finished good is PVA adhesive or synthetic resin adhesive. This is a homopolymer reaction. The Finished good is packed in. Vessel is washed by water and this water is reused in next batch. So, there will no waste water generation till finished product produced. It's a zero liquid waste process.



### 3.6 Summary of Raw materials

The raw material consumption is given in below table.

Sr.		CAS no. of	Existing	Proposed	Total	Mode of
	Raw material	Raw	Consumption	Consumption	Consumption	Transport
		Materials	(MT/Month)	(MT/Month)	(MT/Month)	
1	VAM (Vinyl					By Road
	Acetate	108-05-4	690	1280	1970	ways
	Monomer)					
2	GH-17 (Poly	0002 80 5	60	52	117	By Road
	Vinyl Alcohol)	9002-89-3	00	52	112	ways
3	Pva-173 (Poly	9002-89-5	60	50	110	By Road
	Vinyl Alcohol)	9002-89-3	00	50	110	ways
4	P.P.S					By Road
	(Potassium	7727-21-1	2	5	7	ways
	per Sulfate)					
5	S.B.C.					By Road
	(Sodium Bi	144-55-8	1.50	3.50	5.00	ways
	Carbonate)					
6	D.B.P. (Di					By Road
	Butyl	84-74-2	20	25	45	ways
	Phthalate)					
7	Octanol	111-87-5	7	8	15	By Road
		111 07 3	,		15	ways
8	Formaldehyde	50-00-0	3	5	8	By Road
		50 00 0				ways
9	DM Water	7732-18-5	7/15	2033	2778	By Road
		1132 10-5	745	2033	2770	ways

### Table 3: The Raw Materials Consumption details

### 3.7 Resource Optimization/ recycling and reuse

There is no any wastewater or solid waste will be generated.

# 3.8 Quantity of wastes to be generated (liquid and solid) and scheme for their Management / disposal

### 3.8.1 Water Estimation

### **Table 4: Water Consumption Details:**

No	Description	Existing Water	Proposed Water	Total Water
		Consumption KL/day	Consumption KL/day	Consumption KL/day
1	Domestic	3.05	11.25	14.30
2	Industrial			
	2.1 Process	Nil	Nil	Nil
	2.2 Boiler	Nil	Nil	Nil
	2.3 Cooling	0.48	9.52	10.00

No	Description	Existing Water	Proposed Water	Total Water
		Consumption KL/day	Consumption KL/day	Consumption KL/day
	2.4 Washing	0.095	0.23	0.32
3	Gardening	6.00	Nil	6.00
	Total	9.625	21.00	30.62

Water Source: Through Tankers. DM quality water is being used in Cooling and Washing area.

**Competing Users** of DM water are Pharma & API companies only.

### Table 5: Waste Water Generation Details:

No	Description	Existing Wastewater generation KL/day	Proposed Wastewater generation KL/day	Total Wastewater generation KL/day
1	Domestic	2.44	9.00	11.44
2	Industrial			
	2.1 Process	Nil	Nil	Nil
	2.2 Boiler	Nil	Nil	Nil
	2.3 Cooling	Nil	Nil	Nil
	2.4 Washing	Nil	Nil	Nil
	2.5 other use	Nil	Nil	Nil
	Total	2.44	9.00	11.44

\* Sewage is being and will be disposed of through Septic tank and soak well.

### 3.8.2 Air Emission Details

### Table 6: Fuel Gas Emission Details

Ν	Air	Stac	Existi	Propo	Total	Fue	Existing	Propose	Total	Air
о.	Emiss	k	ng	sed	Capac		Fuel	d Fuel	Fuel	Polluti
	ion	Heig	Capac	Capac	ity,	typ	Consum	Consum	Consum	on
	Sourc	ht,	ity,	ity,		е	ption	ption	ption	Contr
	е	m					kg/hr	kg/hr	kg/hr	ol
										Syste
										m
1	Ther	16	4	4 Lakh	8	Wo	Wood:	Wood:	Wood:	Multi
	mic	m	Lakh	Kcal/h	Lakh	od	14.60	14.60	29.20	cyclon
	Fluid	for	Kcal/	r	Kcal/		T/Month	T/Month	T/Month	е
	Heate	each	hr		hr					Separ
	r									ator
2	D.G	2 m	62.5	125	312.5	Die	Diesel:	Diesel:	Diesel:	Adequ
	Set	for	KVA	KVA	KVA	sel	37.50	25.00	62.50	ate
	(Stan	62.5	&				L/hr	L/hr	L/hr	Stack
	d By)	KVA	125							Height
		&	KVA							with
		2.5								Cataly
		m								tic
		for								Conve
		each								rter

N o.	Air Emiss ion Sourc e	Stac k Heig ht, m	Existi ng Capac ity,	Propo sed Capac ity,	Total Capac ity,	Fue I typ e	Existing Fuel Consum ption kg/hr	Propose d Fuel Consum ption kg/hr	Total Fuel Consum ption kg/hr	Air Polluti on Contr ol Syste m
		125 KVA								for propo sed 125 KVA DG set

### 3.8.3. Hazardous Waste Details

### Table 7: Hazardous Waste generation & its management Details

No	Waste name	Existing	Proposed	Total	Facility for
	and Category	Quantity/year	Quantity/year	Quantity/year	Disposal
1.	Discarded	160 nos./year	440 nos./year	600 nos./year	To Sell to
	Containers,	(2.40 MT/year)	(6.60 MT/year)	(9.00 MT/year)	authorized
	bags, liners,				Recyclers
	barrels (33.1)				
2	Used spent oil	20 kg/year	100 kg/year	120 kg/year	To Sell to
	(5.1)				authorized
					Recyclers

### Table 8: Others Waste generation & its management Details

No.	Waste name	Existing	Proposed	Total	Facility for
		Quantity/year	Quantity/year	Quantity/year	Storage and
					Disposal
1	Fly Ash	30 kg/day	140.00 kg/day	170.00 kg/day	To sell to Brick
					manufacturer or
					to Cement
					manufacturers for
					coprocessing

### 4. Site Analysis Connectivity

The unit is connected with Sardar Patel Ring road on outer periphery of the City Ahmedabad.

### Table: Details of nearest locations:

No	Particulars	Details
1	Nearest Road	NH – 8C (7 KM., SE)
2	Nearest Railway station	Ahmedabad Railway Station (16 km, SE)
3	Nearest Airport	Ahmedabad Airport (15 km, ESE)

### Land Form, Land use and land ownership

Land Form: Flat Land use: Non-agricultural land Land Ownership: Private land

### Topography

The unit is to be developed on flat terrain. The overall plot area of Engineering unit is 14,252 sqm.

### **Existing Land use pattern**

The land is of industrial use purpose. The area of the project site is 7,016 sqm.

### Existing Infrastructure

Industrial Area (Processing Area) (Plant facilities, R&D and Utility Services)

**Residential Area** (Non-Processing Area) (Green belt, Raw material storage area, Admin and open area).

### **Green Belt**

The unit has already developed a greenbelt area of 2,519 m<sup>2</sup> within plant premises. There are shrubs and trees developed in the greenbelt area. 33 % of the total plot area is earmarked for green cover/lawn development in the existing facility. Suitable plant species of local varieties are planted with adequate spacing and density for their fast growth and survival.

**Social Infrastructure** Depending on the growth of the company the required social infrastructure will be provided.

**Connectivity** (Traffic and Transportation Road/ Rail/Metro/Waterways etc) Road and railways are very close to the working site. There is no proposal to make any new kind of connectivity.

**Drinking water Management** (Source & Supply of water) Water for drinking is source from the tanker water supply.

**Sewerage System** Domestic wastewater is treating into a septic tank followed by a soak pit.

#### Industrial Waste Management

There is no effluent generation from the unit.

### Solid Waste Management

It is proposed that the total wastes will be used for leveling of the worked-out area.

### **Power Requirement & Supply/Source**

Electricity shall be obtained from UGVCL. The total power requirement after the proposed expansion project will be 300 KVA.

### 5. Proposed Infrastructure

No.	Parameters	Details
1	Industrial Area	7,016 sqm.
2	Residential Area	The plot is located within Santej village. The nearest residential area is Rakanpur village distance of about 1.00 km.
3	Connectivity	Nearest Road: NH – 8C (7 KM., SE) Ahmedabad Railway Station, 16 km Ahmedabad Airport, 15 km
4	Green Belt	The green belt of 2,519.56 sqm. (35 % of total plan area)
5	Social Infrastructure	The industrial unit is located within Santej village.
6	Drinking Water Management	Source: Water Tankers
7	Power Management	Source: UGVCL Existing: 180 KVA Proposed: 120 KVA Total Requirement: 300 KVA DG set (for Backup) Existing: 1 No. x 62.5 KVA., 1 nos x 125 KVA, Proposed: 1 nos x 152 KVA
8	Waste Water	The water requirement for industrial purpose will be 10.32 KLD and effluent generation is nil. Water requirement will be for domestic (14.30 KLD) and plantation purpose. (6.00 KLD) Unit is having septic tank and soaks well for domestic water treatment and disposal.
9	Hazardous waste Management	The hazardous waste generated will be disposed off to Authorized recyclers.

### 6. Final Recommendations

M/s. Jyoti Resins & Adhesives Ltd. is located at S. No. 873, Opp. Anand Health Care, Ranchhodpura Road, Village: Santej, Taluka: Kalol, District: Gandhinagar, Gujarat, India. The unit has proposed to expand the manufacturing capacity of synthetic resin adhesives (PVAA) from 1,500 MT/M to 5,000 MT/M. The total land area of the plot is 7,016 sq. m. The project will neither be consuming water for Process and nor generating effluent from the premises. There will not be Process Gas Emission from Existing as well as after proposed expansion in unit. The unit activity will be less pollution potential in nature as its main business is resin manufacturing and having very less negative Environmental impact and significance.