

Preliminary Proposal of 30TPD Bottle Glass Project for

Ref No: JEF-NTK-30TBG-2022-01QT

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1. Premises

JEFFER Engineering and Technology Co., Ltd is a leading engineering contractor in Glass industry in China. JEFFER has been providing Turnkey projects that include engineering, procurement, construction and project management for clients worldwide. Those projects include sodium silicate, tableware, container, glass fiber, float glass, sheet glass, lighting/lamp, crystal, borosilicate glass plants. JEFFER has already designed and constructed over hundreds glass plants in China and abroad.

JEFFER has wide business relations with the USA, Indonesia, Myanmar, Vietnam, Thailand, Jordan, India, Egypt, Ethiopia, Algeria, Uganda, Macedonia, Russia, Uzbekistan, Tajikistan, etc.

This proposal is prepared for a Green Bottle Glass Production Line with capacity of 30t/d according to the requirement of Mr. Elbek, from Nutripick LLC, which is preliminary and will be made modification after further discussion between the client and JEFFER.

2. Main Technical Parameter of Bottle Glass Production Line

2.1. Overview of product

- Product: Vodka bottles (750ml, 500ml, 300ml)
- Kind of glass: Soda-lime glass
- Daily capacity: 50,000 pcs (finished products)
- Color of bottle: Clear
- Glass quality: Chinese standard GB11614-2009

2.2. Furnace

- Type of furnace: End fired regenerative furnace
- Melting capacity: 30 t/d
- Number of doghouse: One set
- Fuel type: Natural gas
- Calorific value: 8,600Kcal/kg (assumed)

2.3. Regenerator

- Type: Vertical single pass regenerator
- Checker type: Chimney block



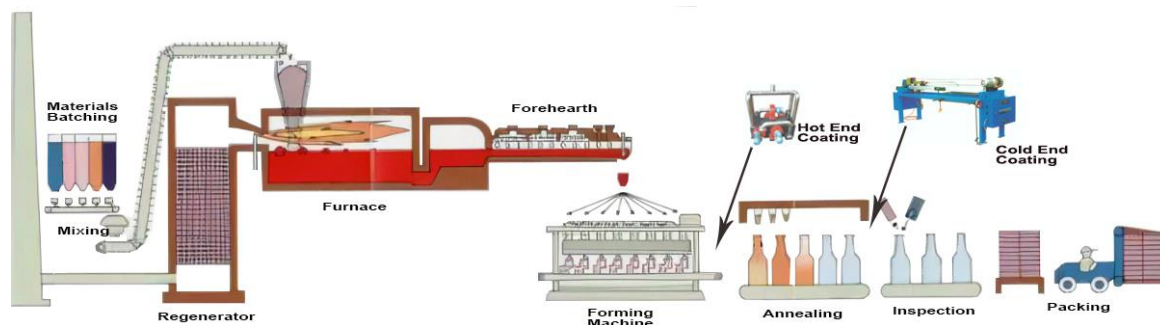
End fired regenerative furnace supplied by JEFFER for your reference

3. Typical Technical Process

The production process of bottle glass production line can be generally described as below:

- 1) Qualified raw materials will be batched in batch plant and conveyor to furnace hopper via belt conveyor.
- 2) The batched material is discharged into the furnace through a full-sealed batch charger, which is located under the furnace hopper.
- 3) The batched material is molten in the furnace under a high temperature of approx. 1520°C, and clearing as a qualified glass liquid.
- 4) The qualified glass liquid goes into the forehearth through the throat and becomes a suitable forming glass liquid.
- 5) According to the required shape, weight, the sheared glass liquid drops into the I.S. machine to form the glass bottles and/or jars accordingly.
- 6) Before entering into the annealing lehr, the hot end coating machine will help the glass bottles and/or jars to improve its strength, which will increase and provide a better adhesion of the products.
- 7) The glass bottles and/or jars transfer into the annealing lehr by conveyor to eliminate the permanent stress and temporary stress.
- 8) The cold end coating machine can improve the scratch resistance of the glass bottles and/or jars, as well as protecting the hot end coating.

- 9) The finished products are packed and transferred to the finished product storage warehouse after inspection.



Typical Technical Process Flow Chart of Glass Bottle Production Line

4. Raw Materials

Table 2: Chemical components of qualified main raw materials requirement

Raw material	Moisture (%)	Chemical Composition	Granularity
Silica sand	<5	SiO ₂ ≥ 97%; Al ₂ O ₃ <0.5%; Fe ₂ O ₃ <0.05%; TiO ₂ <0.005%; Cr ₂ O ₃ <0.001%	>0.7mm, 0% >0.65mm, <5% <0.1mm, <5%
Feldspar	<1	SiO ₂ <70 %; Al ₂ O ₃ >16%;	>0.5mm, 0% <0.1mm , <20%
Dolomite	<1	CaO>30%; MgO>21%; Fe ₂ O ₃ <0.15%	>2.5mm, 0% <0.1mm, <20%
Limestone	<1	CaO>52 %; Fe ₂ O ₃ <0.15%	>2.5mm, 0% <0.1mm, <20%
Soda ash	<1	Na ₂ CO ₃ >99%	

5. Main Technical parameter and equipment description of production line

5.1 Batch Plant

The batch plant is designed for a 30tpd bottle glass factory, which includes four sections, raw materials charging into silos, dosing/weighing, mixing, batched material delivering to furnace hopper.



Weighing system and feeder supplied by JEFFER for your reference

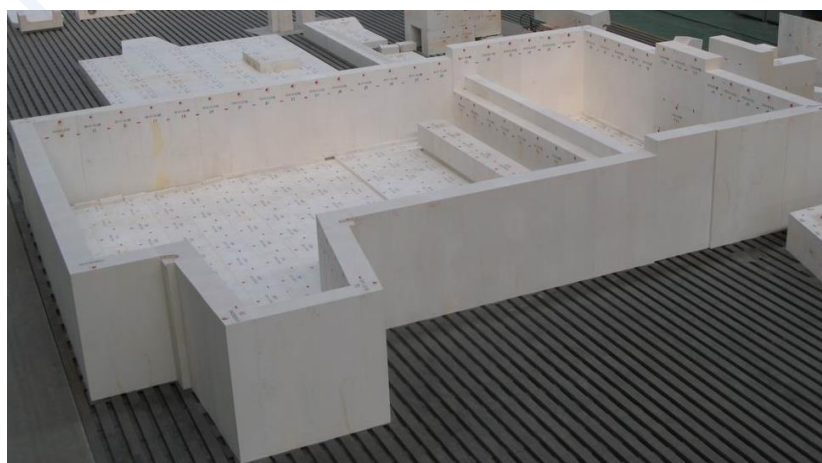
This reliable batch plant has a character of:

- High precision of weighing
- Easy operation
- Easy maintenance
- Automatic recording and data maintenance
- Improving melting quality of glass liquid

5.2 Furnace

The proposed melter is an end fired regenerative furnace designed with appliance of the most advanced technology, which ensure the quality of glass liquid, low energy consumption.

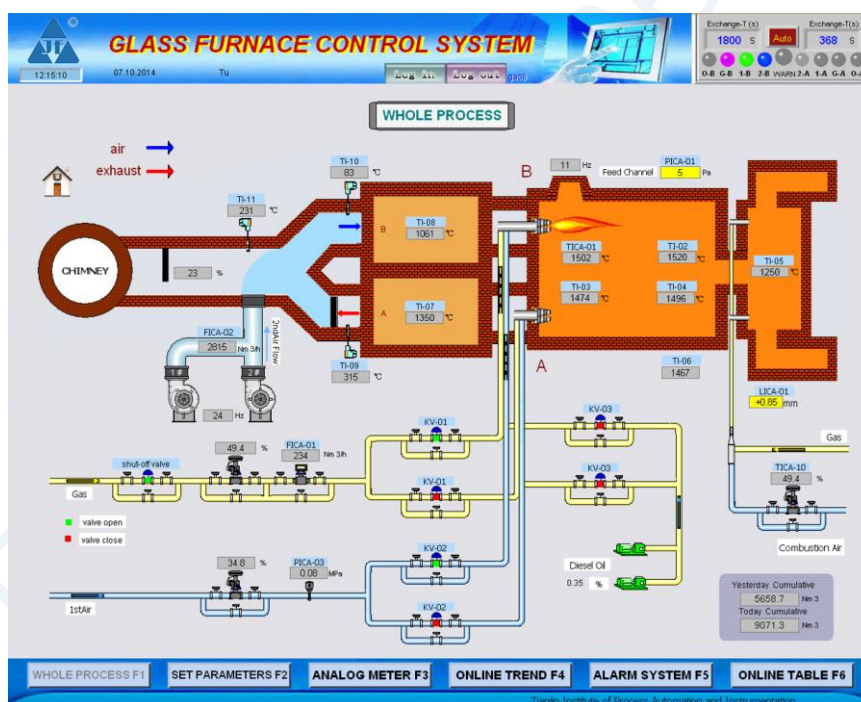
The choice of refractory materials for the various parts of the furnace takes full consideration of the request to obtain a long furnace campaign. For the construction of the furnace, only most appropriate and high quality refractories will be selected.



Melting tank preassembly supplied by JEFFER for your reference

Instrument and Automatic Control System of Furnace

- One complete set of advanced and reliable computer automatic control system (**Siemens PLC, S7-1500, SCADA**) will be applied for this furnace.
- Three operation modes (**Full-automatic, semi-automatic and manual**) will be freely **switchable**, which can avoid any fault of the automatic system.
- Glass level control accuracy is $\pm 0.1\text{mm}$, which is measured by laser and controlled by PLC. Batched material charging system is synchronized with glass level measuring system, its motor equipped one set of inverter and can be automatically adjusted to guarantee smooth production.
- The most vital furnace operating parameters and equipment are connected to a safety and alarm system, which provides visual and audible alarm in case that pre-set maximum and minimum limit values are exceeded. The alarms are announced by clear text entries on the screen of the computer system, a flashing light and siren.



Furnace control system supplied by JEFFER for your reference

5.3 Forehearth

- Quantity: 1 set
- Daily nominal output: ≥ 30 ton per day

- Burner system: Advanced multi gas mixture burners
- Number of section: Three sections, including:
 - No.1# cooling / heating section
 - No.2# cooling / heating section
 - 1 conditioning section
- Temperature control:
 - No. #1 Cooling / heating section: Automatic control
 - No. #2 Cooling / heating section: Automatic control
 - Conditioning section: Automatic control
 - Spout: Manual control
- Temperature measurement:
 - Forehearth entrance: 1 thermocouple Pt-RH-Pt; type S
 - Cooling section No. 1# : 1 thermocouple Pt-RH-Pt; type S
 - Conditioning section No. 2# : **1 tri-point thermocouple Pt-RH-Pt; type S**
(This thermocouple will insert into the glass liquid)
 - Spout: 1 thermocouple Pt-RH-Pt; type S
- Temperature precision: $\pm 1^{\circ}\text{C}$ Controlled by SIEMENS PLC

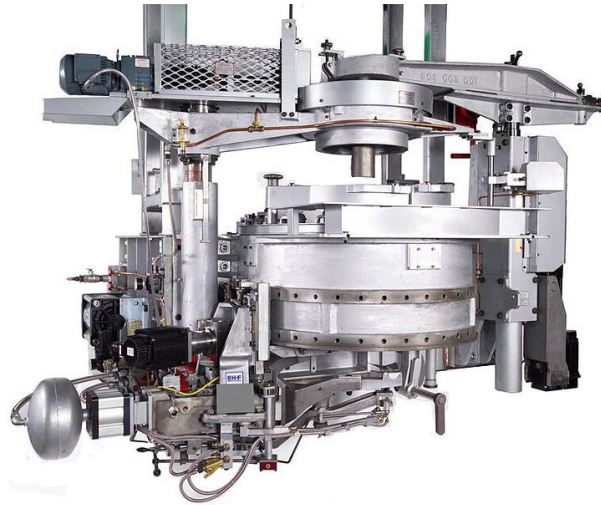


Forehearth and distributor supplied by JEFFER for reference

5.4 Forming Section

5.4.1. Gob feeder

One set of single god servo feeder matched with one set of 4 section single Gob I.S. machine is equipped.



Servo gob feeder supplied by JEFFER for your reference

5.4.2. I.S. machine

One set of 4 section single Gob I.S. machine is equipped for this 25tpd glass bottle production line.



I.S. machine supplied by JEFFER for your reference

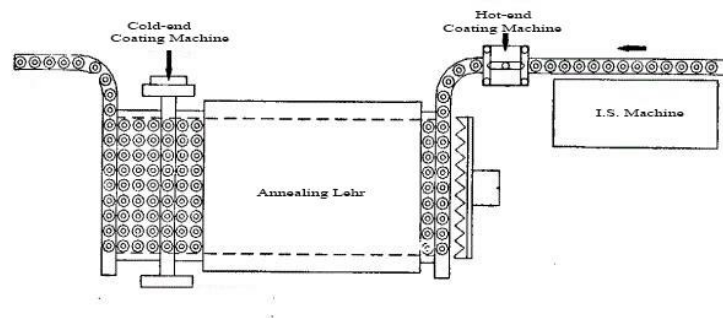
5.4.3. Ware Handling

One set of ware handling equipment will be supplied, which includes:

- Ware transfer
- Cross conveyor
- Stacker

5.4.4. Coating Machine

The coating treatment method is widely used to protect the surface of the bottle, which can prevent the blind crack and scratch on the bottle. Adopting hot-end coating and cold-end coating methods, it can increase the strength and frictional resistance of the bottle and reduce the breakage rate of the finished products.



- **Hot end coating machine**

The hot end coating machine can strengthen the ability of internal pressure intensity, impact resistance and wear resistance of the bottle and/or jars.



Hot-end coating machine supplied by JEFFER for your reference

- **Cold-end spraying equipment**

The cold end coating machine can enhance the scratch resistance of the glass bottles and/or jars, as well as protecting the hot end coating.



Cold-end coating machine supplied by JEFFER for your reference

5.4.5. Annealing lehr

The annealing lehr (the heat treatment section of process) is controlled by the SIEMENS PLC with respect to both heat profiles, in accordance with process know-how and data sheets, as well as the transporting rollers.



Annealing lehr supplied by JEFFER for your reference

5.5 Comprehensive inspection machine

Glass bottle comprehensive inspection machine is specially and widely used for the quality inspection of the bottles and/or jars, eliminated substandard products in order to ensure the quality of the finished products.



[Comprehensive inspection machine supplied by JEFFER for your Reference](#)

6. Scope of supply of the seller

6.1 Design scope

6.1.1 Basic design

- Layout for batch plant
- Layout for furnace and ancillary equipment arrangement.
- Layout for forming equipment and ancillaries.
- Layout of glass furnace workshop -- General arrangement and positioning of all equipment and machines.
- Load calculation and column parameters;
- Basic engineering for all media (fuel, combustion air, cooling air, flue gas, compressed air, etc.) within the furnace area;
- Basic engineering for electric and control unit, panel arrangement, mains structure, equipment specifications, software documentation.

6.1.2 Detail design

- Detail assembly and installation drawing of related mechanical equipment of raw material batching devices;

- Detail assembly and installation drawing of related equipment of furnace;
- Detail assembly and installation drawing of related equipment of forming section.
- Detail engineering/design for the furnace installation.
- Detail list equipment with description and specification.
- Detail list of equipment and tools which will be used for installation and commissioning.

6.1.3 Documentation consisting of design drawing, manual, operation technology, technical specifications. Technical documentation consists of :

- Technical information;
- Instruction of equipment installation and commissioning;
- Operation manual of equipment;
- Maintenance manual of equipment.

6.1.4 All technical documentation will be in English.

6.2 Scope of materials and equipment supply

6.2.1. Equipment of raw material batching

- Intake equipment
- Dosing and weighting equipment
- Mixer and transportation equipment
- Electric equipment and automatic batching control system

6.2.2. Melting section equipment

- Refractory materials of furnace
- Combustion equipment of furnace
- Mechanical equipment of furnace
- Electrical equipment and instruments furnace
- Automatic control system of furnace

6.2.3. Forehearth

- Refractory materials
- Combustion equipment and mechanical equipment
- Instrument and Automatic control system

6.2.4. Forming section

- Gob feeder

- I.S. machine
- Ware transfer
- Cross conveyor
- Stacker
- Vacuum pump with accessories
- Mould cooling fan
- Pressure stabilizing valve
- Electric control instruments

6.2.5. Hot end coating machine

6.2.6. Cold end coating machine

6.2.7. Annealing Lehr

6.2.8. Comprehensive inspection machine

6.2.9. Air compressor and dryer

6.2.10. Automatic packing machinery and ancillaries

6.2.11. Laboratory and maintenance workshop

7. Exclusion

- All buildings and civil works, including the foundation of machinery and equipment and groundwater treatment.
- Steel chimney, silos, hoppers, steel structure of batch plant and furnace, operation platform, stairways and hand rail etc.
- Red bricks and wood for furnace installation.
- Moulds
- Soft water and recycle water treatment equipment, water drainage and sewage treatment facilities of the plant.
- Air duct and pipe, water pipe, electric cable and tray.
- Electric power, water and compressed air connected to joint points of furnace nominated by the Seller.
- Lightings, air-conditioner of workshops and plant.
- Communication and fire-fighting facilities of workshops and plant.
- Lubrication grease and oil needed in test running and commissioning.

- Equipment Installation and commissioning under the supervision of the Seller's experts.
- Items excluded in the Seller's scope.

8. Quotation Price

8.1. Quotation items and price: please refer to following Table 4;

Table 4: Quotation items and price for production line

No	Description	Qty		Price in USD
1	Batch plant, including	1	set	130,000.00
1.1	Intake equipment			
1.2	Dosing and weighting equipment			
1.3	Mixer and transportation equipment			
1.4	Electric equipment and automatic batching control system			
2	Melting Section, including			1,278,500.00
2.1	Refractory materials	1	batch	
2.2	Mechanical equipment	1	set	
2.3	Combustion equipment	1	set	
2.4	Instrument and automatic control system	1	set	
3	Forehearth (30t/d)	1	set	108,500.00
4	Forming section			378,300.00
4.1	Gob feeder	1	set	
4.2	I.S. machine	1	set	
4.3	Ware handling device	1	set	
4.4	Vacuum pump with accessories	1	set	
4.5	Mould cooling fan	1	set	
4.6	Pressure stabilizing valve	2	set	
4.7	Electric control instruments	1	set	
5	Hot end coating machine	1	set	13,000.00
6	Cold end coating machine	1	set	12,000.00
7	Air compressor and dryer			130,000.00
8	Annealing lehr	1	set	99,800.00
9	Comprehensive inspection machine	1	set	91,000.00

No	Description	Qty		Price in USD
10	Automatic packing machinery and ancillaries	1	set	152,000.00
11	Laboratory	1	set	100,000.00
12	Equipment of maintenance workshop	1	set	76,000.00
13	Engineering/Design & Technology Documents			100,000.00
Total price in USD EXW Chinese Factory				2,669,100.00

Remarks:

- Origin of refractory materials: China;
- Mechanical equipment: China;
- Computer system (including DCS system): **SIEMENS**;
- Main Electrical component/parts: **Schneider and IDEC**;
- Main Pneumatic component: **SMC and CKD**;
- The price list of option item are equipped for two production lines.
- Supervision of installation & commissioning, furnace heating up will be quoted after discussion based on the pandemic situation.

9. Terms of Payment

- 9.1 Down Payment: Thirty percent (30%) of the total contract price shall be paid by T/T within ten (10) days after the date of contract signed as down payment.
- 9.2 Letter of Credit: The Buyer shall establish an irrevocable letter of credit through Buyer's reputable Bank for the remaining sum of seventy percent (70%) of the Contract Price in favor of the Seller.
- 9.3 From this Letter of Credit, the proportional payment of the total contract price shall be paid to Seller at sight against the shipping document (B/L, Invoice & Packing List etc.) of the Contract Goods based on the shipment value.
- 9.4 L/C (irrevocable Letter of Credit) should be accepted by the Bank of China.

10. Delivery

10.1. The shipment:

- First shipment: within 130 days after receipt of Full Down Payment.
- Last shipment: within 180 days after receipt of Full Down Payment.

10.2. The equipment shall be shipped by container (oversize goods excluded) through China to the destination appointed by the BUYER.

- 10.3. Within Twenty (20) days before the shipment the SELLER shall send the name, quantity, weight, and volume of the Goods, departure port to the BUYER by fax or E-mail.
- 10.4. Upon the completion of the loading of the goods, the SELLER shall immediately provide the BUYER with notice of shipment by Fax or Email. The notice shall include the Contract number, name of commodity, quantity, net and gross weight, measurements, invoiced value, bills of lading number, sailing date and estimated date of arrival at the port of unloading.

11. Valid of the Quotation

This quotation will be valid within 30 days from the date of this quotation.

12. Warranty

- 12.1 The SELLER shall guarantee that all machinery and equipment are brand-new and conforms to the technical standards regulated in the Contract.
- 12.2 The Warranty on mechanical parts on machinery and accessories (consumables and wear parts are not included) shall cover 12 (twelve) months since the commissioning date or 18 (eighteen) months from the issuing date of the Bill of Lading, which one occurs first.

13. Documents

The following documents shall be prepared by the SELLER and submitted to the paying bank:

- Clean on-board ocean bill of lading.
- Commercial invoice, indicating contract number and shipping mark.
- Certificate of origin.
- Packing list with indication of contents, shipping weight and number of cases.

14. Packing

All the equipment shall be carefully and properly packed, and shall meet the requirements of ocean and inland transportation. The SELLER shall take measures to protect the equipment from the damage of rain water, and moisture in valid time, and ensure the equipment shall be anti-corruption, shockproof and deformation-proof.

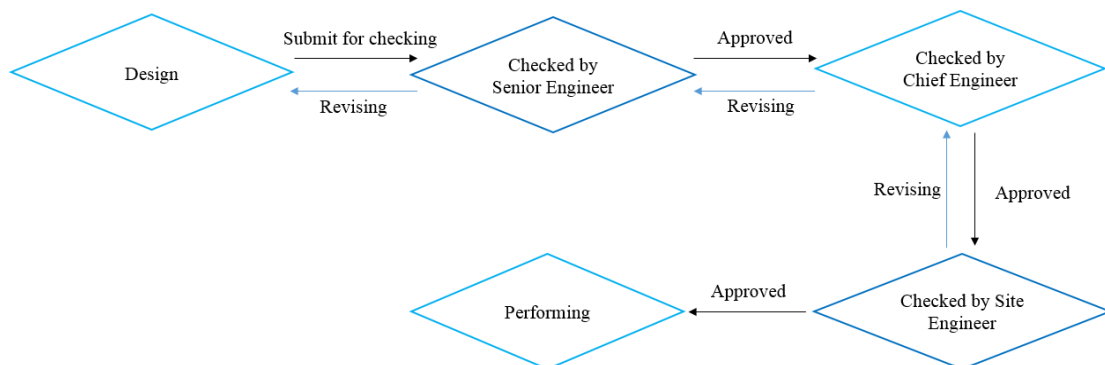
15. Management and Quality Control System

Based on the accumulated practical experience of the projects, a perfect management and quality control system has formed. According to the requirement of clients, JEFFER is trying its best to provide a most optimized and economic design plan to them.

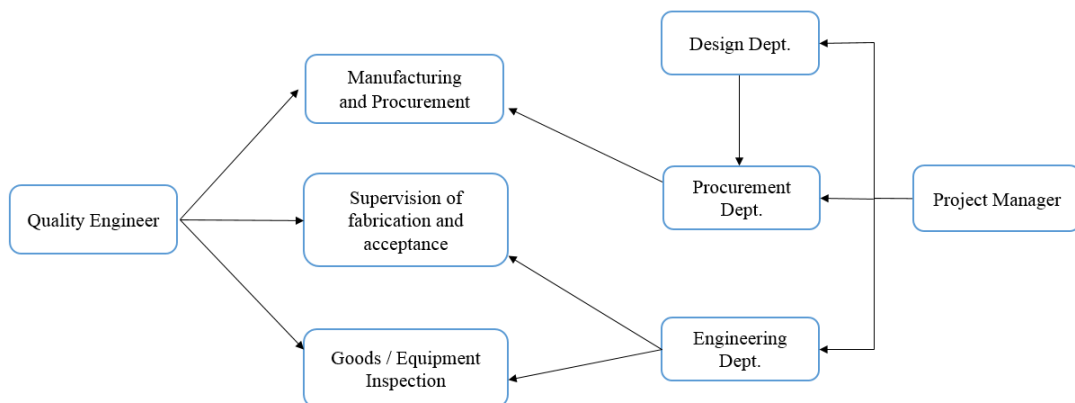
• ISO Certificates



• Quality Control in Design Stage



• Quality Control in Manufacturing Stage



- **Quality Management System**

