

MANUAL OF INSTALLATION, OPERATION AND MAINTENANCE

BOMBAS INK



Pumping Solutions

Mr. Proprietary

Congratulations! You just buy a simple construction equipment, designed and manufactured with the latest technology with excellent performance and provides easy maintenance.

The purpose of this Manual is to inform the user, the details of the equipment and techniques of proper installation, operation and maintenance.

The **IMBIL** recommends that the equipment is installed and care as recommended for good technique and with the instructions contained in this Manual, and is used under the conditions of service for which it was selected (flow, total head, speed, voltage , frequency and temperature).

The **IMBIL** is not liable for defects arising from failure of service requirements and recommends that this manual is used by staff responsible for installation, operation and maintenance.

 Pumping Solutions	
MODEL:	
SERIAL:	
TAG:	
IMPELLER [Ø]:	
SPEED:	
DIRECTION:	
FLOW [Ø]:	
HEAD/ PRESSURE:	
DATE.:	

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For consultation on the equipment or spare parts in order to indicate the code of the piece, model line, the pump and also in the series found in the identification and nameplate engraved in low relief on the suction flange.

NOTE

The IMBIL asks the client who, after receiving The guarantee of your equipment, fill out and send the data to the left IMBIL, facilitating the exchange of information between the CLIENT and IMBIL.Índice

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Application

The INK Chemical Pumps have been developed to meet the needs of chemical and petrochemical industries, the pumping of organic and inorganic products. Can be used in steel mills and sugar, in pulp and paper industry, in food and beverage, manufacturing of rubber and synthetic fibers, the pumping of liquefied gases, the movement of oil and condensate heat. Are especially applied in the pumping of liquids that are extremely aggressive, which must be kept clean, have high temperatures, which have a high specific weight or special requirements that require the sealing of the shaft.

Precautions

Before submitting the pump to a different data contract work with other liquids, with different concentrations and temperatures will be necessary to consult the Imbil. During maintenance, before removing the pump from its premises to make sure the valves and the records on the side of pressure and sucção the pump is closed and Vedema effectively. The pump should be completely drained. The temperature of the carcass must be a maximum of 60 ° C. Make sure that the carcass is not under pressure before releasing the nuts.

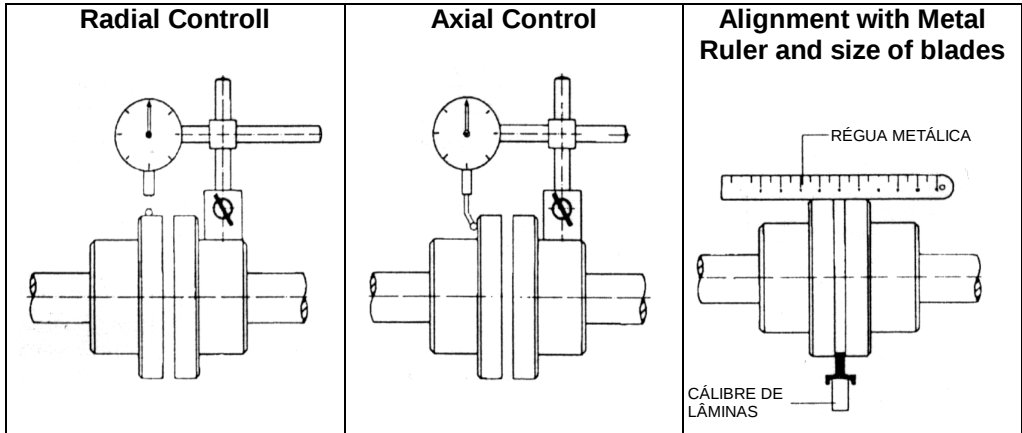
Installation of Pump

Alignment of Base

- The pumps must be installed and aligned by authorized persons. An incorrect installation can cause premature wear as a consequence and inconvenience in the operation. When the pump is supplied with motor, coupling and on the combination and assembly are made carefully in the factory. In the installation must be observed the following:
- The base should be carefully leveled on your block foundation with the aid of a water level.
If necessary, insert shims of metal, especially with the chumbadores.
- The set girante should rotate freely, is to turn the coupling between the motor and pump with your hand.
After leveling the base, it is to fill this with cement mortar.
- Only after the complete curing and drying of the mortar, we can tighten the nuts of chumbadores equally and strongly to subsequent total.
Then must be a new alignment control of the coupling.

Coupling

- Run the alignment with the suction pipes and repression already connected.
- The installation of the coupling must be hot (oil bath or oven at 100 ° C). No knock to make the assembly operation of the coupling.
- With the aid of clock comparator, or failing, metal ruler and size of blades, control the radial and axial misalignment to prevent abnormal vibrations that interfere in the life of the equipment.



- The radial and axial alignment should remain within the tolerance of 0.15 mm, following the clearance between the tips of the motor shaft and the pump as specified by the manufacturer of the coupling.
- To improve safety in operation, must be installed in a Guardian or a Guardian of Coupling Drive (example: Guard-belts), as Law 65 / 4 portaria MTb 3214 (NR 12 item 12.3).

Tubing and connections

- The suction pipes and pressure must not transfer mechanical stresses on the pump, which should not be used as support for the tubes.
The loss of load in the suction pipe should be kept at small values. Therefore should be avoided cuts short, sharp curves, etc..
- You should select the diameter of the tubes to a flow velocity not exceeding 3m/seg.
Provide a record of pressure in the pipe, preferably installed after the flange of the pump pressure, to adequately regulate the volume and pressure pumping.
It is recommended to install a check valve between the pump and the record, when the pressure tubing is too long. In new installations it is recommended to install a screen protector next to the pump suction flange, and this should be an area free from 3 to 4 times the section corresponding to the pump suction pipe. The screen



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should be cleaned regularly and can be removed when you are sure that the pipe is clean.

- Pumps with mechanical seal includes the lines of movement between the seal and pump housing, when this movement is made with the pumped liquid itself.
- When the movement is made by an outside source, the corresponding connection will be made in the installation and for the client.
- In case of sealing of packing separate source, or cooling, the links should also be made by the client. The corresponding connections are located properly identified in the pumps.
- Lines from external sources should be properly cleaned before the connection of the pump.

Instrumentation

- It is recommended the use of manometer manometer and the pressure in pipes and suction, respectively, to better control the operation of the pump. The scales should correspond to approximately 150% of the higher pressure pump. The instruments should be provided with registration.
- When it is chemically aggressive liquids, both instruments and records must be of suitable material.
 - When the liquid has solid particles or suspensions, you must use tabs or instruments of membranes.
- To improve life of the instruments, records assistants must be normally closed, and remain open only when the reading process.

Operation of the Pump

Start the Pump

- Before placing the pump in operation to make sure the correct direction of rotation of the engine, the alignment of the coupling, the connection of pipe pressure, suction and without auxiliary voltage and mechanical cleaning of the sieve of the suction pipe.
- Before starting the engine, it will be necessary to observe the following requirements:
- Check oil level in bearing.
- In cases where cooling is provided, open the registry corresponding power and control the free flow of water, discharge.
- The pressure and suction tubing and the pump should be filled with the liquid being pumped.
- The record of the suction side should be fully open and, on the pressure, closed.
- Check the sealing of the packing, the press-gasket should not be overly tight. In the case of mechanical seal, it must not leak.
- Open the valves of the lines of separate power, the packing or mechanical seals, when they exist.



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- After being checked the points above, take a short departure in engine and control the smooth and gradual deceleration of all.
- Then, to start the engine and open the record of sucking up to achieve the volume and pressure determined. The gauge indicates when the increase in pressure, comprising the water column specified for the pump multiplied by specific weight of the liquid pumped. The pump should not operate long enough to record closes, not to damage the gasket or the mechanical seal.
- Undertake the appropriate regulatory bodies regulating flow or pressure in the lines of movement of the auxiliary packing or mechanical seals, when they exist.

Stop the pump

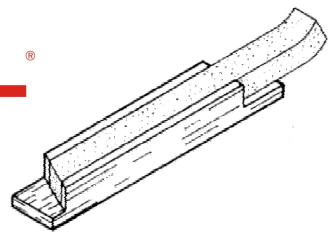
- Close the record of the pressure pipe (when facilities are not starting and stopping automatic).
- Stop the engine and observe the gradual and smooth deceleration of the whole.
- Close the record of the suction pipe (not when it comes to automatic operation).
- Close the valves of the lines feeding the auxiliary sealing or washing the packing or the mechanical seal (provided that there is any contra-indication by the manufacturer of the seal).
- The valve chamber for cooling the feed should be closed only when it has the total cooling of the pump.
- In very cold regions where there is risk of freezing, the pump and a cooling chamber to be completely drained.

Care during Operation

- The pump should always work without vibration and with finesse.
- The level of liquid in suction tank should never be less than the NPSH requirements of the pump, added to the vapor pressure of the liquid pumped, and the loss of load to the flange of the suction pump.
- The engine should not be overloaded.
- The pump can not work on the dry, or for a long time with the record closed.
- It is recommended a control on the oil level and temperature of the bearings work.
- Squeeze The gasket should never be too tight to allow a small drip during the operation, in which bombs were set packing.

Through sealing gasket

- The quality and type of gasket used and care during their assembly factors are crucial for a correct seal.
- The material of the gasket should be appropriate to the liquid pumped. It is recommended the use of gasket pressed in rings, to ensure the accuracy of the seal and finish the set.
- The gasket is usually provided as a continuous strip to be cut into rings with the



ends in the oblique diameter of the proper size Bushing Protection.

- To cut the ring gasket, we use a simple device as shown in figure beside. Having cut the first ring, make sure that your size is correct for the perfect adjustment of the housing gasket.
- The housing of the gasket should go through a thorough cleaning before placing the new rings.
- It is important to check the smoothness of the surface of Bushing Protector, which should always be changed when it presents minimal damage, to ensure the sealing and to prevent a short life for the gasket.
- When you replace the gasket of a pump, the lock ring must be located exactly along the feeder channel of the liquid seal.
- It is important to make the amendments of the rings are not. To do this, move the amendment of the second ring, about 120 degrees on the position of the first ring and so consecutively, until the last ring gasket.
- The gasket should be tight Squeeze originally a light, and only after a longer operation, tight ultimately reaching a drip flashing.

Mechanical seal by seal

- Despite the advantages of a Mechanical Seal on the packing, it is subject to wear, which depends on factors such as lubricating qualities of the liquid pumped and contained impurities. So it is not possible to set up a space of time recommended for maintenance and each case must accumulate experience.
- It is recommended a thorough inspection of the seal after each 4000 hours of operation, repeating this investigation with more or less time, as the wear occurred. Parts with wear limit should be exchanged before causing leaks.
- The sliding parts must be replaced in pairs. At the beginning of the operation and until the surface sliding accommodate if it is normal that small leaks occur.
- Where should a pump packing, mechanical seal to be modified, a number of brands of seal can be installed without special adaptations in the body of the pump. Only Bushing Protection should be changed, and Aperta gasket should be replaced by a superimposed for the seal.

Lubrication

- If the pump is placed in operation after a long stationary period or in storage, you should wash the bearings and support with gasoline or benzol, before the first operation.
- The control oil level and temperature in the bearing is very important during the operation. The temperature may rise to 50 ° C above the ambient temperature must not exceed 80 ° C total. The oil level should be between the marks in the oil-level indicator.
- The first oil change should be made after the first 200 hours of operation. Then, an annual return will suffice.

Table of recommended oils:

Fabricante	Até 3000 rpm	Acima de 3000 rpm
CASTROL	HYSPIN - 68	HYSPIN - 46
ATLANTIC	EUREKA - 68	EUREKA - 46
ESSO	ÓLEO PARA TURBINA - 68	ÓLEO PARA TURBINA - 46
MOBIL OIL	DTE - 26	DTE - 24
IPIRANGA	IPTUR AW - 68	IPTUR AW - 46
PETROBRÁS	MARBRAX TR - 68	MARBRAX TR - 46
SHELL	TELLUS - 68	TELLUS - 46
TEXACO	REGAL R & O - 68	REGAL R & O - 46

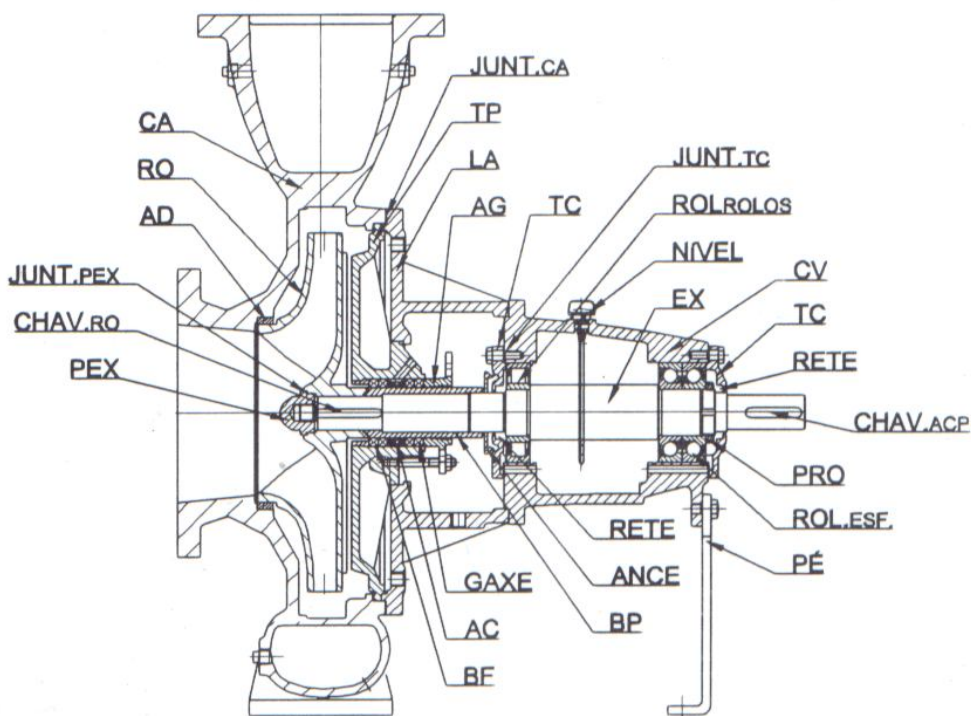
Problems during the operation and the probable causes

- If you decrease the volume of pumping, the causes could be:
- Reduction of engine speed.
- Elevation of the counter-pressure system:
An adaptation may be done by raising the speed of the engine, or replacement of the rotor of the pump, with a diameter greater
- The pump works on a cavitation:
The suction pressure is insufficient.
This can be motivated by huge losses in the suction pipe (eg a clogged sieve) or if the back pressure of the system decrease. In this case, the pump pumps a larger volume than expected, to which the suction pressure is not enough.
Cleaning in a sieve, respectively, an increase of pressure in the system, for the record suction bottleneck, eliminate these problems.
- Wear pronounced in the sealing rings:
Worn parts should be changed and the main parties recovered.
- Entry of air through the packing, operations with negative suction or vacuum tank:
Provide liquid seal on the lock ring of packing.
When you see leaks in mechanical seals, the reasons may be the following:
- If not noted in the heating or superimposed on the body of the box to seal the defect may be located in the secondary ring seals on the rotating shaft or the ring fixed in the overlapped. These fences should be replaced.
- If you notice a warming box or superimposed on the seal, the sides of the contact ring and the rotary ring fixed are defective and should be replaced. It is important that these parts are always exchanged in pairs. The Exchange must be observed that the wear has been due to suspensions and particles in the liquid or by clogging of the recirculation line, which provides the cooling.



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List of Parts



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Código	Qtde.	DESCRIÇÃO
AC	01	LOCK RING
ANCE	01	RING CENTRIFUGE
AG	01	PRESS GASKET
BF	01	BUCHER OF FUND
BP	01	BUCHER PROTECTORS
CA	01	CARCASS
CV	01	CAVALETO
CHAV.ACP	01	PIN OF THE COUPLING
CHAVE.RO	01	BRACE OF IMPELLER
EX	01	AXIS
GAXE	04	GASKET
JUNT.CA	01	JUNTA OF CARCASS
JUNT.PEX	01	NUT TO THE AXIS
JUNT.TC	02	JUNTA OF TAMPA'S CVALETO
LA	01	LANTERN
PÉ	01	FOOT SUPPORT
PEX	01	NUT SHAFT
PRO	01	THE ROLLER NUT
RETE	02	RETAINER
ROLESF	01	BALL BEARING
ROL.ROLO	01	ROLLER BEARING
RO	01	IMPELLER
TP	01	PRESSURE CAP
TC	02	COVER OF CAVELETE
NIVEL	01	OIL LEVEL DIPSTICK

Pump Maintenance

- You will not need to remove the body of the pump suction pipe and pressure.
- The components of the pump should be treated with the utmost care in the removals and remontagens.
- Trancas beats and should be avoided.
- Any piece stuck on the axis, may be easily removed after heating.

Disassembly of Pump

1. Remove the coupling spacer piece and, when it exists.
2. Drain the pump housing through the hole at the bottom of it.
3. Disconnect the auxiliary pipelines for liquid sealing of cooling or washing.
4. Remove the nuts fixing the flash in the carcass.
5. Remove the foot of the Bridge Support.
6. Remove the flash along with Bridge and rotor assembly.



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7. Drain the oil Bridge.
8. Desrosquear Nut of the Rotor, remove the rotor and the bracket draw.
9. Dismantle the sealing of the axis:
 A-When the pump is equipped with gasket, remove the tight gasket, the gasket and the ring of Rings padlock.
 B-When the pump is equipped with Mechanical Seal, follow the instructions of the manufacturer of the seal.
10. Remove the cover of Pressure
11. Loosen the nuts fixing the flash in Bridge, and withdraw it.
12. Remove the Bushing and Ring Protection Centrifuge Axis.
13. Remove half of the coupling which is at the axis, if it has not already been done.
14. Loosen and remove the two caps of the Bridge.
15. Carefully remove the axle with the bearings.
16. If the bearings have to be exchanged should be cooked with chickpeas or lamp welding (making sure that the axis remains cold).

Note:

- The fittings should be inspected and replaced when necessary.
- Bearings, Shaft, Bridge and the components of the packing should be cleaned with benzine or benzol.

Reassembly of the pump

- The reassembly should be done in reverse order, with all care, in the possession of the pump shown in cutting, in order to ensure a smooth and reassembly a smooth operation.
- The following items should be especially noted:
- The placement of new bearings, it is important that they are recommended by the project. When you make a substitution, the new bearings should be heated in oil bath, up to approximately 80 ° C and placed on the axis previously clean, sliding them up the bumps of back.
- Caring for the fences the covers of Bridge are not damaged, when enter the joint axis / Roller in Bridge.
- In Mechanical seal pumps that have, it is important to ensure that the fixed ring of the seal is not damaged in the assembly.
- In pumps with gasket, the Bucha Protector must be free of scratches, grooves and remnants of the previous gasket.
- Introducing the braces and the seals of the rotor, make sure the surfaces to be sealed are cleaned.
- Provide firm grip on the Rotor

Recommended Spare Parts

The IMBIL recommends the quantity of spare parts according to the number of pumps as follows:



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Denominação	Quantidade de Bombas					
	2	3	4	6	8	10
	Quantidade de sobressalentes					
CARCASS	-	-	-	-	1	2
COVER OF CAVELETE	-	-	-	-	1	2
FOOT SUPPORT	-	-	-	-	1	2
AXIS	1	1	2	2	2	2
THE ROLLER NUT	1	1	2	2	2	2
IMPELLER	1	1	2	2	3	4
Set of Bearings	1	1	2	3	3	4
Cavalete	-	-	-	-	1	2
Covers the Bridge	-	-	-	-	1	2
LANTERN	-	-	-	-	1	2
PRESS GASKET	-	-	-	-	1	2
LOCK RING	1	1	2	2	2	2
Ring gasket	8	8	10	12	16	20
Wear ring	1	2	2	2	3	3
RING CENTRIFUGE	-	-	-	-	1	2
BUCHER PROTECTORS	1	2	2	3	3	4



ORIGINAL

WARRANTY CERTIFICATE

WARRANTY TERM

The present “**Warranty Term**” has as objective to guarantee to the user all equipment shipments and/or the materials produced by the manufacturer, under the following conditions:

This term is valid for 12 (twelve) months from the effective start-up date of the equipment or 18 (eighteen) months from the invoicing date to the original user, whichever happens first.

The equipments and materials are covered by this warranty in regards to the repair or substitution of parts by IMBIL factory or by the authorized IMBIL technical assistance service against materials or fabrication defects, as long as there is evidence of these defects and against invoice presentation, with the following restrictions:

- All the material / equipment made by IMBIL or substituted part removed against warranty will become property of the manufacturer.
- Any repair, modification or exchanges against warranty will not prorogate the original equipment or substituted part warranty term.
- The manufacturer cannot be held responsible for losses caused by the equipment stop (Loss or Damage to Property).

The warranty does not cover:

- Transportation of the defective materials from the facility where they are installed to the manufacturer plant / technical assistance service and the later return to the original costumer facilities.
- Travel and hotel expenses from the manufacturer technician, which will be charged according to the current pricing at the time of the repair service, when this it is performed at the installation site.

This warranty loses effect if the problem happens due to the following cases:

- Operational conditions that differ from the indicated by the manufacturer.
- Normal wear caused by the use or by erosion, abrasion or corrosion.
- Incorrect use, lack of knowledge from the operator, improper use, inadequate transportation, movement or stocking, assembly or operation other than the recommended by the technical manual provided by the manufacturer.

The equipments, due to constant improvements, are subject to changes without previous notice. The warranty is effective only if this slip is sent to the manufacturer.

COSTUMER WARRANTY CONTROL

Name: _____ Serial No. _____ Invoice _____ Date ____/____/____
Address: _____
ZIP Code: _____ City: _____ State: _____ Country: _____



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Reseller – Stamp and Signature

TOLL FREE NUMBER – COSTUMER SERVICE CENTER (BRAZIL): 0800 14 8500

MANUFACTURER WARRANTY CONTROL

Serial No. _____ Invoice _____ Date ____/____/____

Name: _____

Address: _____

Zip code _____ City _____ State: _____ Country: _____



Owner Signature

Reseller – Stamp and Signature

Please fill out this form, detach it and send it to the manufacturer.

CUSTOMER SATISFACTION SURVEY

Dear Customer,

The biggest concern of IMBIL Group is to offer the best Customer Service, Product, Associated Services and Technical Support. For us, it is very important to know your opinion about the IMBIL's Quality. In knowing so IMBIL Group will be able to continually improve its quality. You can contribute by filling out this Customer Satisfaction Survey.

IMBIL GROUP thanks for your help.

Customer: _____	
Address: _____	
City: _____	State: _____ Zip Code: _____
Contact: _____	Date: ____/____/____
Department: _____	Function: _____
Phone: (____) _____ - _____	E-mail: _____

Region: ☐ North ☐ Northeast ☐ South ☐ Southeast ☐ West Central ☐ Africa ☐ Central America ☐ North America ☐ South America ☐ Asia ☐ Europe ☐ Oceania	Application: ☐ Sugar and Ethanol Industry ☐ Distilleries ☐ Mining / Steel Industry ☐ Sanitation ☐ Pulp and Paper ☐ Irrigation ☐ Valve ☐ Air Conditioning ☐ Chemical / Petrochemical / Naval ☐ Food Industry / Textile ☐ Steam Generation / Cogeneration ☐ Fire Fighting ☐ Other _____
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Product purchased: (Please indicate product's description and/ or serial numt) _____
Acquisition of product: ☐ IMBIL ☐ Authorized Distributor ☐ Representative _____

1. CUSTOMER SERVICES QUALITY	Completly Satisfied	Very Satisfied	Satisfied	Dissatisfied	Completely Dissatisfied
* Facility for contact, agility and efficiency in providing the information requested.					
2. COMMERCIAL CONDITIONS	Completly Satisfied	Very Satisfied	Satisfied	Dissatisfied	Completely Dissatisfied
* Meeting your expectations related to commercial conditions.					
3. DELIVERY TIME	Completly Satisfied	Very Satisfied	Satisfied	Dissatisfied	Completely Dissatisfied
* Meeting your expectations related to delivery time.					
4. TECHNICAL INFORMATION	Completly Satisfied	Very Satisfied	Satisfied	Dissatisfied	Completely Dissatisfied
* Meeting your expectations related to technical data provided with the product.					
5. DELIVERY QUALITY	Completly Satisfied	Very Satisfied	Satisfied	Dissatisfied	Completely Dissatisfied
* Meeting your expectations related to product shipping conditions (packaging, visual aspects).					
6. OPERATION QUALITY	Completly Satisfied	Very Satisfied	Satisfied	Dissatisfied	Completely Dissatisfied
* Meeting your expectations related to product and operation conditions promised.					
7. POST SALES	Completly Satisfied	Very Satisfied	Satisfied	Dissatisfied	Completely Dissatisfied
* Efficiency on services performed					

Would you have any suggestion on how to increase customer satisfaction on IMBIL's Products / Service?

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