

USING  
THE TRIZ-METHODS  
IN REAL PRACTICE

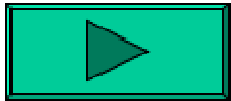
# Comments

You know, the final goal of the Theory of Inventive Problem Solving is an obtaining of the breakthroughing solutions. Unfortunately, these solutions sometimes are very difficult to use in real manufacturing.

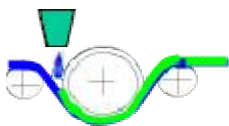
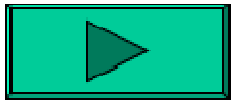
But if you understand the TRIZ methods deeply, you can find very simple solution of yours problem. I would like present you the results of my job in different consulting projects. These examples of solution easy for understanding and applications.

**Of course, these projects do not have any connections with my work for Samsung SDI.**

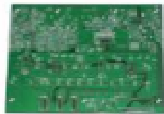
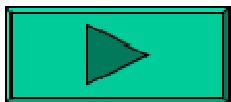
# Examples of Problem



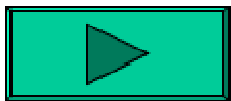
1. INCREASING OF QUALITY THE  
MAGNETS



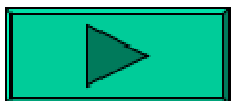
2. THE IMPROVEMENT OF QUALITY OF  
THE POLYMERIC LENSES



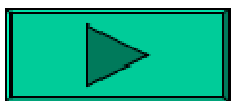
3. DECREASING THE POLLUTION  
OF PCB



4. DECREASING OF ABRASIVE WEAR OF  
THE DIAMOND WHEELS



5. INCREASING THE LIFE-TIME OF THE  
ELECTRIC MOTOR



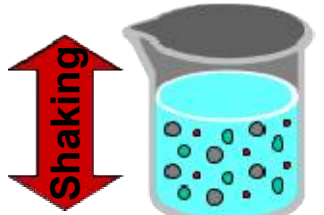
6. ELIMINATE THE CAUSES OF DEFECTS  
IN STEEL SHAFT

# 1. INCREASING OF QUALITY THE MAGNETS

The using of the magnets are very important. But the manufacturing of magnets is not easy problem.

# 1.1.1 Process Description

1. INCREASING  
OF QUALITY  
THE MAGNETS



All component of compositions are mixing very precisely. Usually, the components are mixing in the vessel with alcohol solution. During the shaking the distribution of components in the vessel is good.

+150 °C



The solution is evaporated in the vacuum furnace after mixing.

+800 °C



The dried mixture is sintered in the special matrix



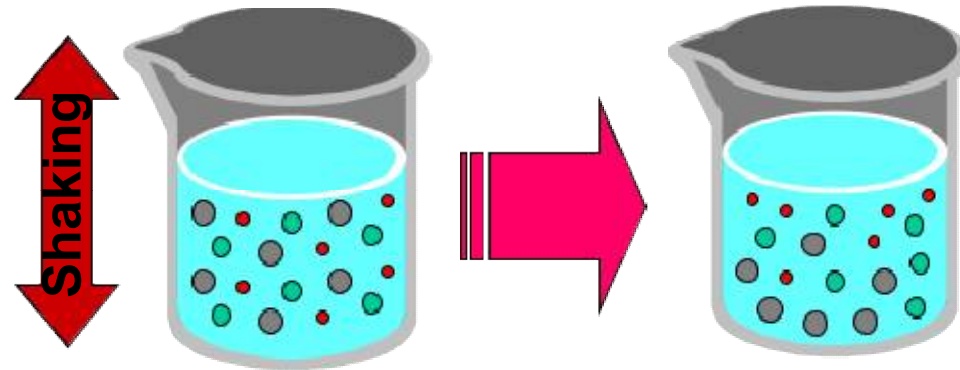
and produce a magnet.

# 1.1.2 Definition of Problem

1. INCREASING  
OF QUALITY  
THE MAGNETS

The components of magnet have a different dimensions and specific gravity. The components distribution is an uniform, during the shaking.

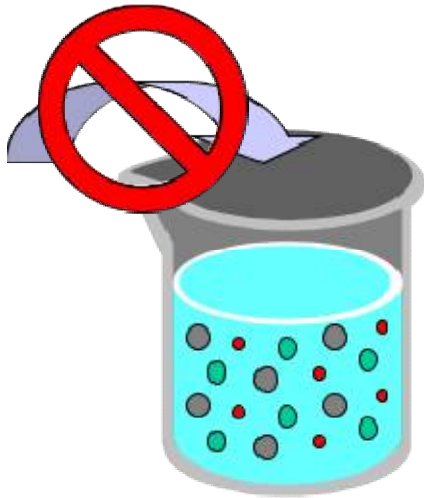
But if you stop the shaking, then the more heavy particles will sedimented from solution more quickly. The distribution of the particles will changed and the quality of magnet will deteriorated.



## How to prevent the changing of distribution of the components?

# 1.1.3 Requirements and Limitations

1. INCREASING  
OF QUALITY  
THE MAGNETS



- The inserting of any additional substances is prohibited.



- The reducing of quantity of solvent will deteriorate of the particles distribution and prohibited also.

# 1.2.1 Problem Analysis

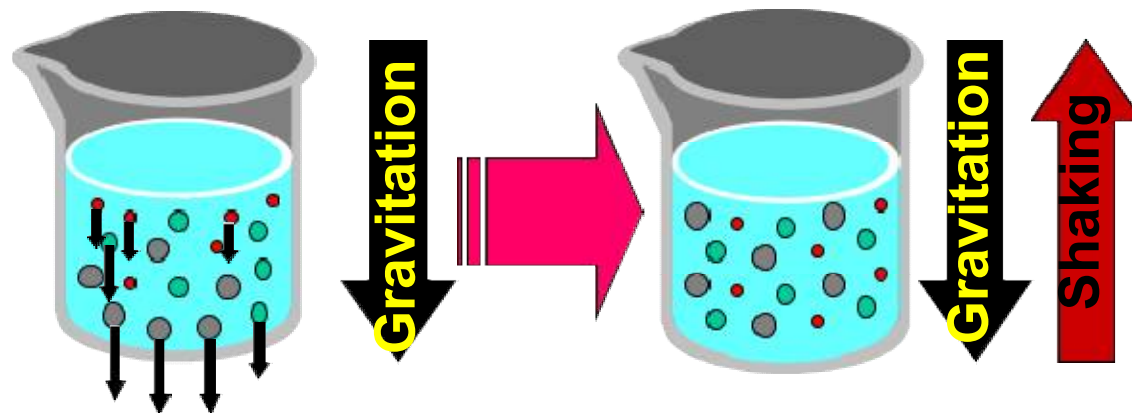
1. INCREASING  
OF QUALITY  
THE MAGNETS

**Why components are sedimented unevenly?**

The components have a different specific gravity. The heavy components will be gravitate to the bottom by influence of gravitation of Earth. Shaking prevented the process of sedimentation.

**Why we have to use the shaking?**

The support of the particles by solvent is ineffective and we have to prevent the sedimentation by using the Mechanical Force.



**But after stop of shaking you have to solve this problem by other methods.**




# 1.2.2 Model of problem

1. INCREASING  
OF QUALITY  
THE MAGNETS


The gravitation is the law of nature and we can not find any contradiction here.

**Hence, in our case we can use the Substance-Field Analysis.**

 **Substance-Field Analysis (SFA)** is method, which let present any Problem Situation as an abstract Model. This Substance-Field (Su-Field) model includes two Substances and Field, which guarantee the interaction between Substances. Su-Field model represents short model of Technological Process.

**The Substance-1 is a Processing's Object and the Substance-2 is a Tool;**

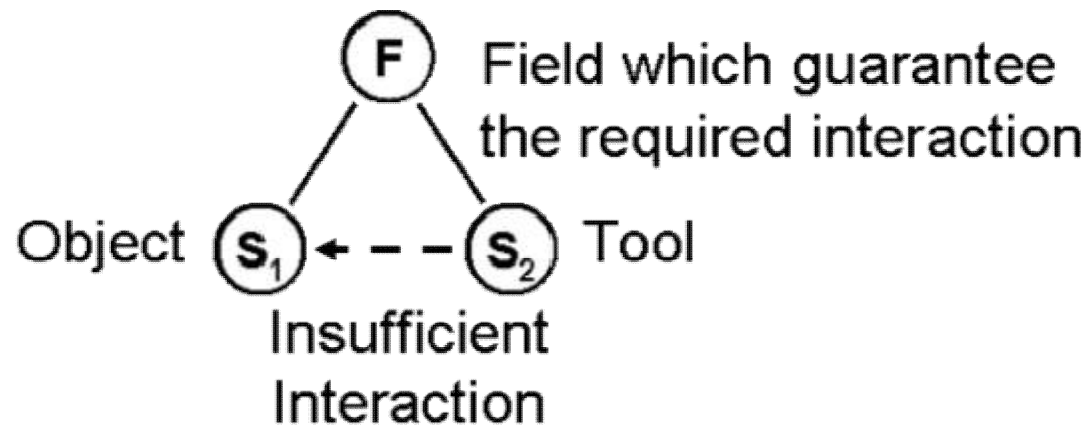
 Substances are components in the Engineering System having rest mass, for example, the wheels, the seats, and the battery of a car;

 A Field is similar to energy in a broad sense. Some examples of fields are mechanical, electrical, magnetic, gravitational, chemical, biological, and thermal fields.

# 1.2.3 Su-Field Model

1. INCREASING  
OF QUALITY  
THE MAGNETS

In our case Su-Field Model (SFM) include magnet's Particles (Substance-1), Solvent Substance-2) and they Physical-Chemical interaction (Chemical Field). This interaction is not sufficient and the Gravity can separated our particles and the molecules of solvent. We can draw the Su-Field model of this process as:




**We have to use the system of Standards for the solution of this problem.**

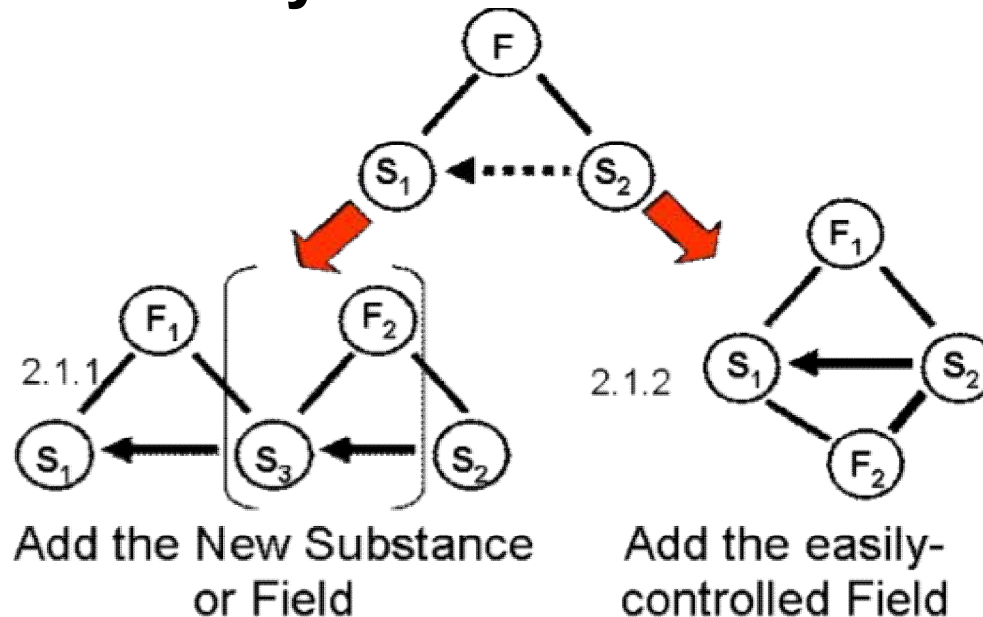
# 1.2.4 Standards using

1. INCREASING  
OF QUALITY  
THE MAGNETS

Consider how it can be done

 **Standard of Inventive Solutions:** A set of typical solutions for the technical problems which presented as a Su-Field Models. The system from the 76 Standards is used now.

If the necessary to enhance a Su-Field Model you can:



# 1.2.5 Using of Fields

1. INCREASING  
OF QUALITY  
THE MAGNETS

We can not insert the any additional substance, but we can use the modification of some available substances or insert the new field.

## Which kinds of fields we can use? The order of fields:

**Mechanical field:** moving, increase or reduce of pressure, inertia, gravitation, centrifugal force, vibration, impact, hydrostatic, aerodynamic and hydrodynamic effects.

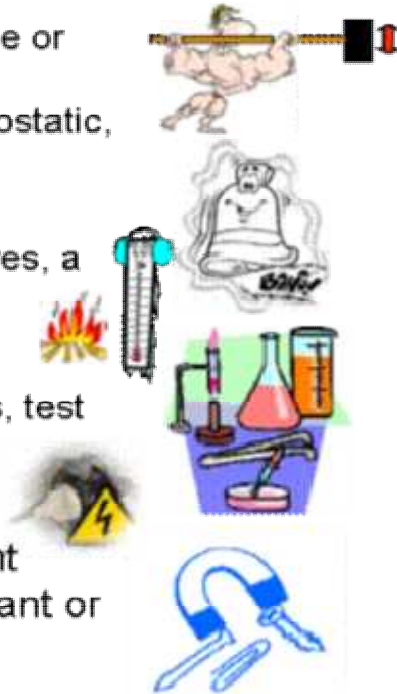
**Acoustic field:** fluctuations sound, ultrasound, an infrasound, standing waves, a resonance.

**Thermal field:** heating or cooling.

**Chemical field:** chemical reactions, test and smelt.

**Electric field**

**Magnetic field:** a field of constant magnets; a field created by a constant or an alternating current.



For example, you can use the gravitation Field and make the mixture in zero gravity. Is it possible? - Yes, but very expensive!

The influence of Ultra Sound increased the sedimentation process.

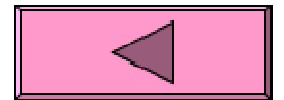
The Thermal Field may be applied.

The using of any additives is prohibited. Electrical and magnetic forces may be applied in principle (Electro-osmosis), but these property of components are very various.



# Do you have any ideas, how to applied the thermal Field to our problem?

*Prompt: the solvent can support the particles better, if the viscosity of solvent increase.*





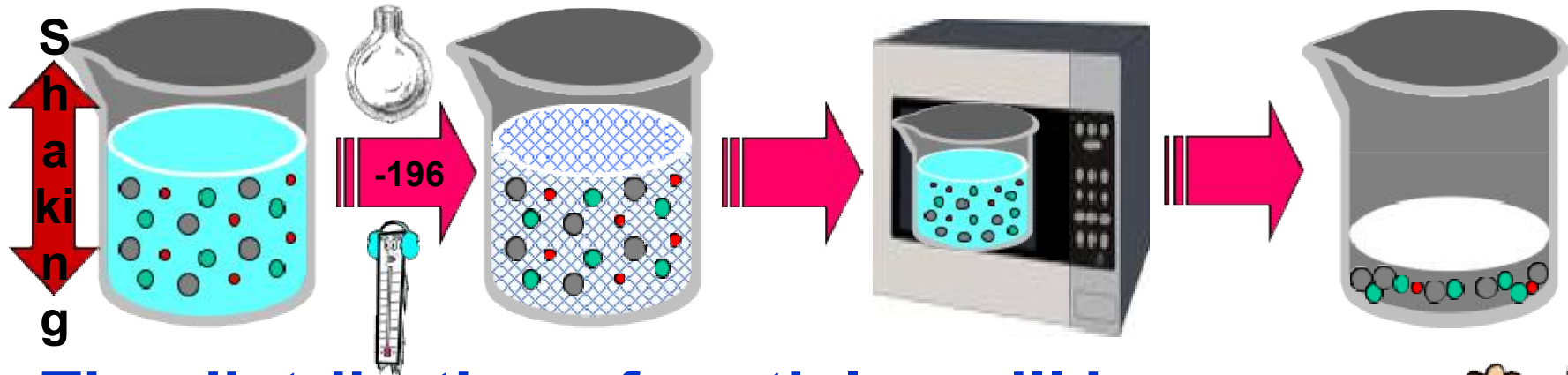
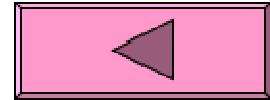
# 1.4 Proposal

1. INCREASING OF QUALITY THE MAGNETS

Shaking prevented the process of sedimentation.

After shaking, you cool the mixture by liquid nitrogen.

The solvent are evaporated from freezed mixture the in the cooling chamber with vacuum.



**The distribution of particles will be very good. The new magnet was formed on next day and the magnetic field of this magnet was increased on 15%.**

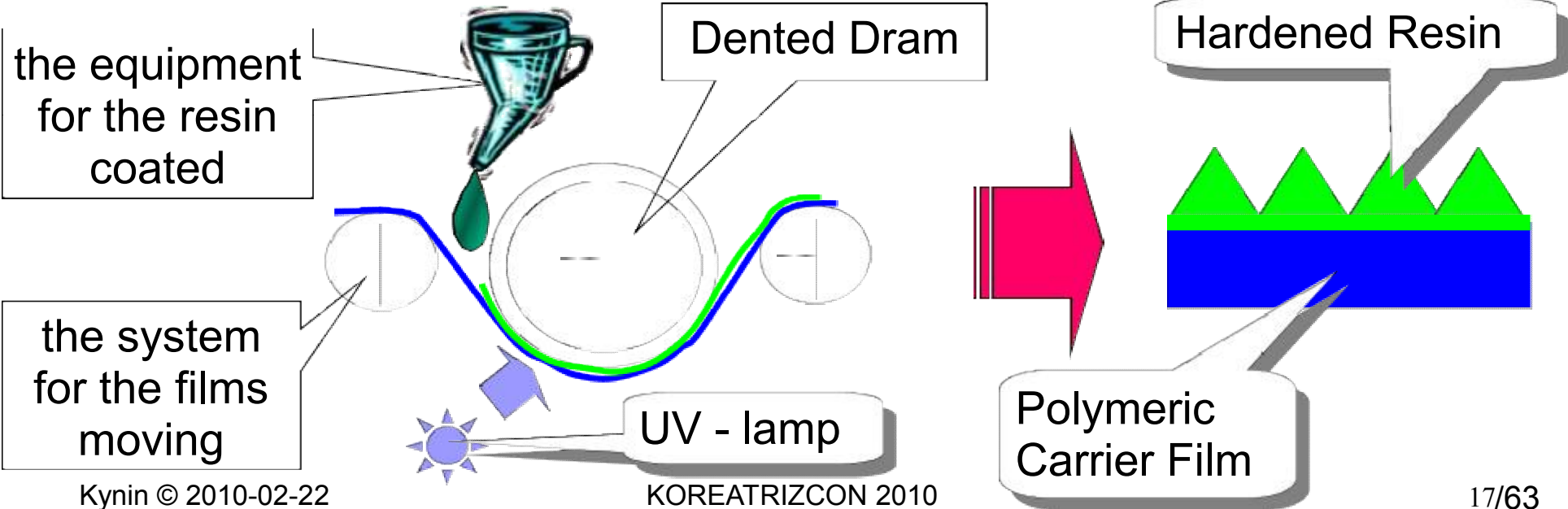


# **2. THE IMPROVEMENT OF QUALITY OF THE POLYMERIC LENSES**



# 2.1 Process Description

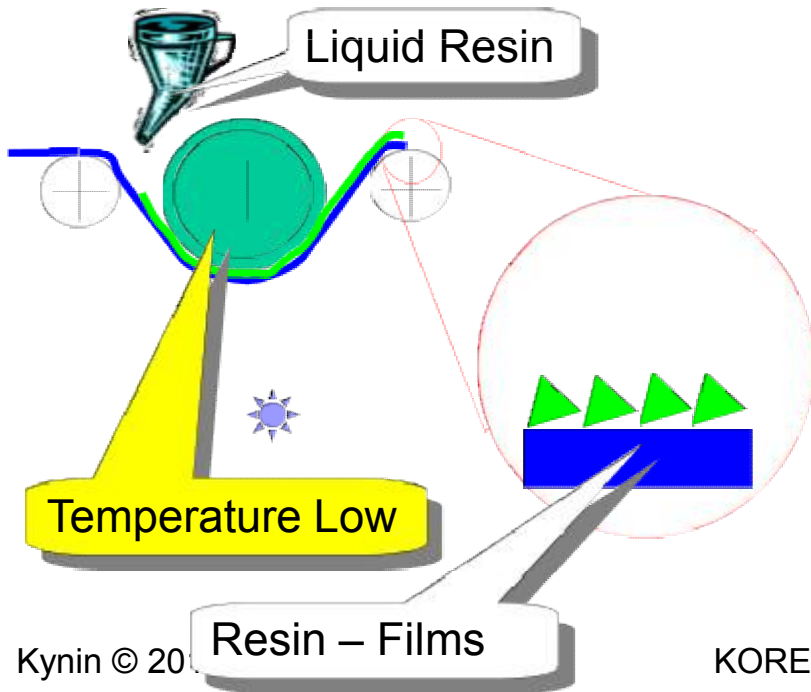
The polymeric lenses are using in a various areas of industry. One of the manufacturing method is the coating of the polymeric film by the special resin, forming of profile of lenses and hardening of resin by the UV treatment. The real process includes:



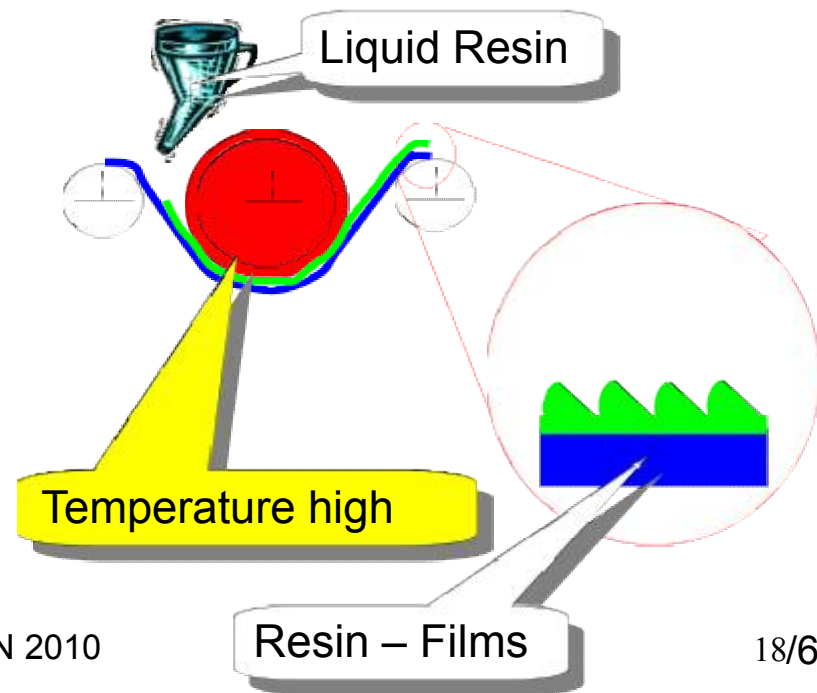
# 2.1.1 Definition of Problem

Unfortunately, this process had a serious problems

If you is heated the dram, then the adhesion between polymeric film and the resin coating is good, but the shape of lenses is bad.




If you do not be heated the dram, then the shape of lenses is good, but the adhesion between polymeric film and coated resin is bad.

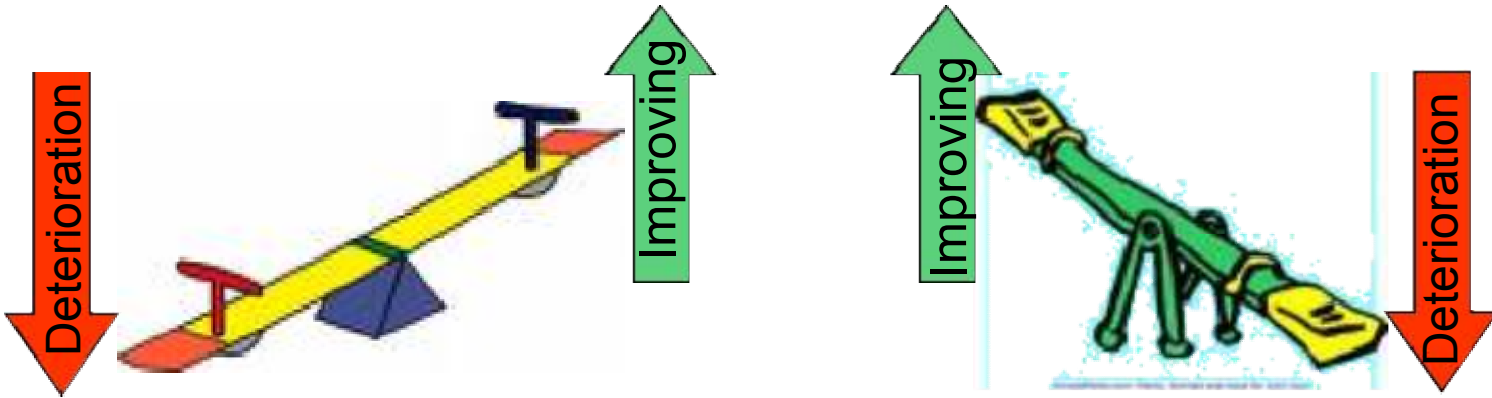


# 2.2.1 Problem Analysis

The alike situation named in TRIZ the  
“Technical Contradiction”.

 TECHNICAL CONTRADICTIONS (TC) – this is situation, that if we improved one part (or one parameter) technical system, then another part (or another parameter) of this system will be deteriorate obligatory.

This situation may be presented in picture form.

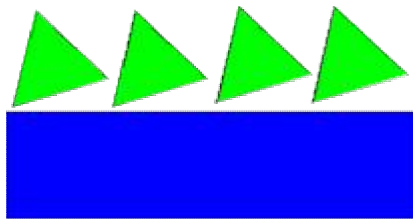


# 2.2.2 Formulation of TC parts

2. THE IMPROVEMENT OF QUALITY OF THE POLYMERIC LENSES

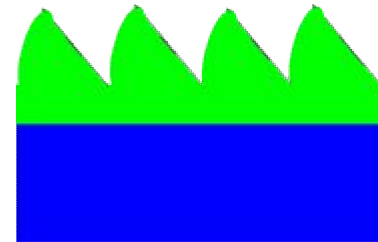
## Contradiction #1:

IF the temperature of drum is low,  
THEN the profile of resin is good,  
BUT the resin detached from carrier film and quality is bad.



## Contradiction #2:

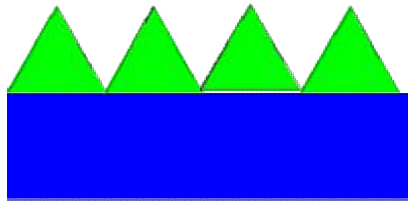
IF the temperature of drum is high,  
THEN the resin do not detach from carrier film,  
BUT the profile of resin is not good.



## 2.2.3 Formulation of TC

2. THE  
IMPROVEMENT  
OF QUALITY  
OF THE  
POLYMERIC  
LENSES

We have to sharpen the Contradiction:  
the resin do not detach from carrier film **AND**  
the profile of resin is good.



# 2.2.4 Choice the Engineering Parameters

2. THE IMPROVEMENT OF QUALITY OF THE POLYMERIC LENSES

We have to choose the Engineering Parameters. If first parameter is improving, then second parameter is deteriorating necessarily. The list includes 39 Engineering Parameters.

No	Characteristics of Engineering Systems	No	Characteristics of Engineering Systems
1	Weight of a mobile object.	21	Power
2	Weight of a stationary object.	22	Loss of energy.
3	Length of a mobile object	23	Loss of substance.
4	Length	24	Loss of information.
5	Area of a mobile object	25	Loss of time.
6	Area of a stationary object.	26	Amount of substance.
7	Volume of a mobile object	27	Reliability.
8	Volume of a stationary object.	28	Accuracy of measurement.
9	Speed.	29	Accuracy of manufacturing.
10	Force.	30	Harmful factors acting on an object from outside.
11	Tension /Pressure.	31	Harmful factors developed by an object.
12	Shape.	32	Manufacturability.
13	Stability of composition.	33	Convenience of use.
14	Strength.	34	Repairability.
15	Time of action of a mobile object	35	Adaptability
16	Time of action of a stationary object.	36	Complexity of a device.
17	Temperature	37	Complexity of control.
18	Brightness.	38	Level of automation.
19	Energy spent by a mobile object	39	Capacity/Productivity.
20	Energy spent by a stationary object.		

We have to improved the parameters "Accuracy of manufacturing the reliability of the system" OR Shape, BUT in such a case you deteriorate the parameter Strength.

# 2.2.5 Choice of the PRINCIPLES

2. THE IMPROVEMENT OF QUALITY OF THE POLYMERIC LENSES

We have to improved the parameters "Accuracy of manufacturing the reliability of the system" (Row #29) OR Shape (Row #12), BUT in such a case you deteriorate the parameter Strength (Column #14).

Column 14: deteriorate the Strength

Row 12: Shape

Row 29: Reliability of system

**Principles: 3, 27, 30, 14, 10, 40.**

# 2.2.6 Principles using

We have to use the Alshuller's Matrix.

This Matrix defined the dependence between the Engineering Parameters. The recommend Principles are placing on the intersection of the Rows and Columns

Was offered 40 basic methods (principles) for the solving of the Technical Contradictions (TC).





# 2.3 Generation of Idea: PRINCIPLES

2. THE  
IMPROVEMENT  
OF QUALITY  
OF THE  
POLYMERIC  
LENSES

## 3. LOCAL QUALITY:

- a. Transition from a homogeneous structure of an object (or outside environment action) to a heterogeneous structured.
- b. Have various parts carry out different functions.
- c. Place each part of the object under conditions most favorable for its operation

## 10. PRIOR ACTION

- a. Carry out all or part of the required action in advance
- b. Arrange objects so they can go into action in a timely matter and from a convenient position

## 14. SPHEROIDALITY

- a. Replace linear/ flat/ parallel/ cubical shapes piped parts with curved / spherical ones
- b. Use rollers, balls spirals
- c. Replace a linear motion with rotation; utilize a centrifugal force

## 27. DISPOSE (Inexpensive, Short-Lived Object For Expensive, Durable One)

- a. Replace an expensive object by a collection of inexpensive ones, back out some properties (e.g. longevity)

## 30. FLEXIBLE MEMBRANES OR THIN FILM

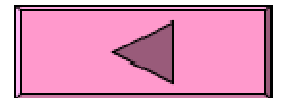
- a. Replace traditional constructions with those made from flexible membranes or thin film
- b. Isolate an object from its environment using flexible membranes or thin film

## 40. COMPOSITE MATERIALS

- a. Replace a homogeneous material with a composite one

# Do you have any ideas, how to applied these principles to our problem?

*Prompt: How the resin can save a good shape and has a good adhesion?*

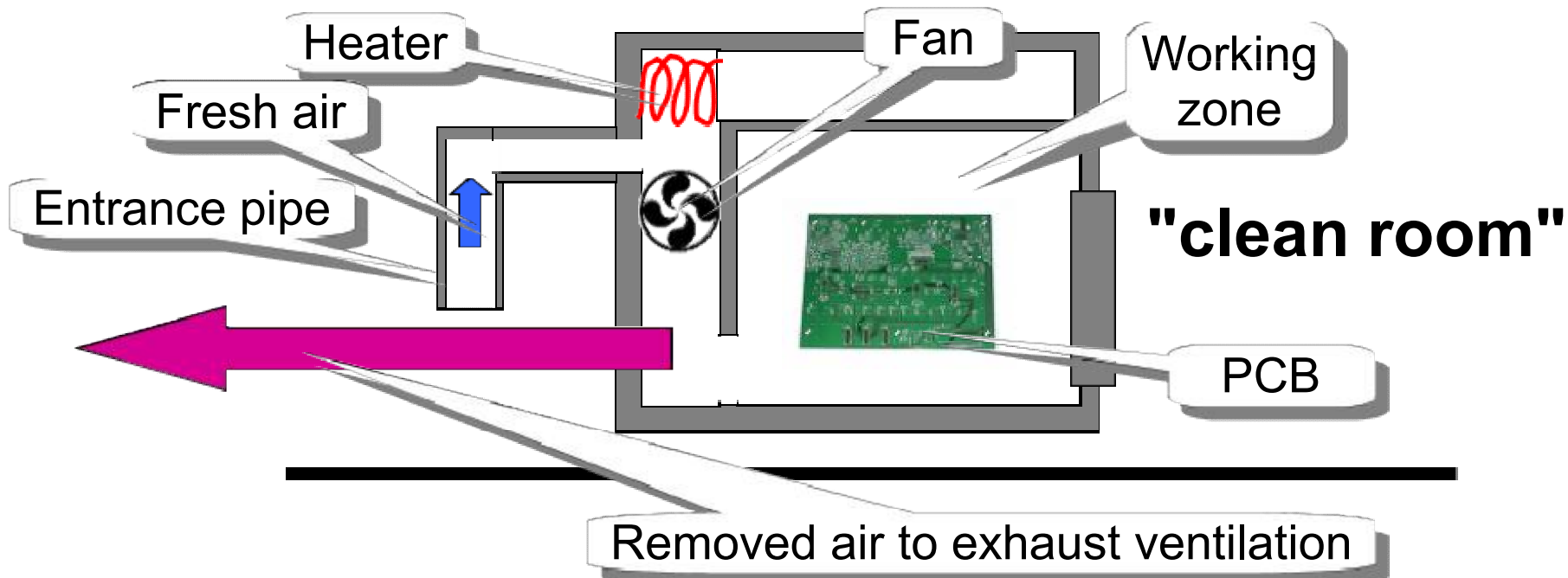




# **3. DECREASING THE POLLUTION OF PCB**

# 3.1.1 Process Description

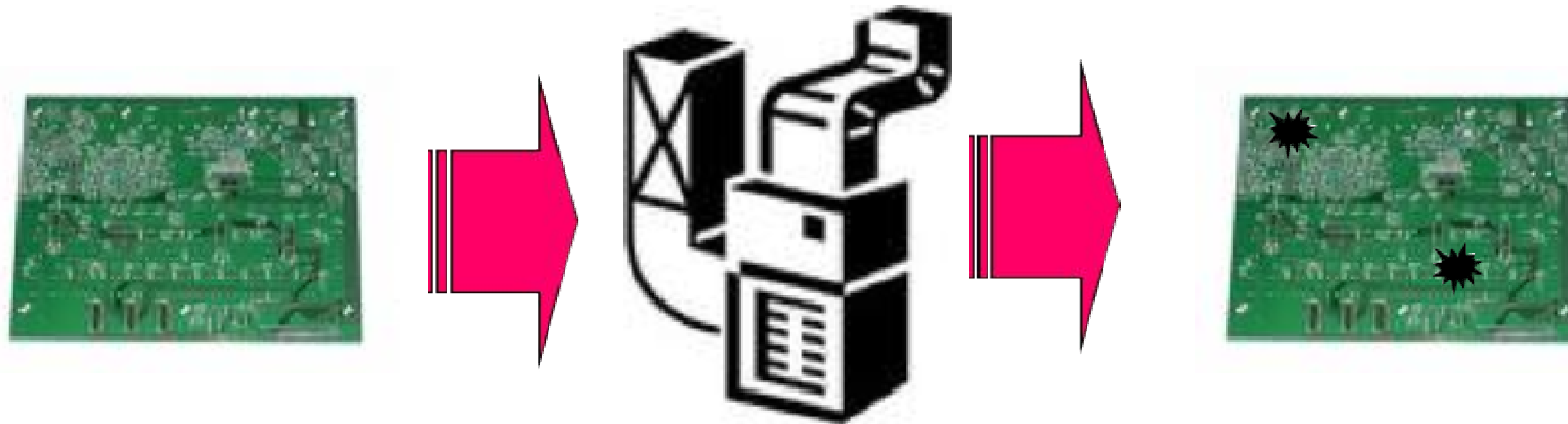
The Printed Circuit Boards (PCB ) was dried after the deposition of protective covering in the furnace. The furnace consists of the working zone, heater, fan and system of fresh air access. Part of used air removed to exhaust ventilation.



# 3.1.2 Problem Description

3. DECREASING  
THE POLLUTION  
OF PCB

The operation was realized in the "clean room". Sometimes the dust particles settle to surface and spoil the PCB. Customer would like decrease the quantity of PCB with defects.



**How to decrease the quantity of PCB with defects?**

# 3.2 Problem Analysis

3. DECREASING  
OSCILLATION  
OF CD-DISC

In this case we can use the method named “Anticipatory Failure Determination” (AFD).

The main idea of AFD method is very simple. For example, you observed some undesirable effect. On next step you think how to created and enhanced this undesirable effect. This method help us to overcome the Mental Inertia.

Reformulation of our problem to “Harmful proposal”:

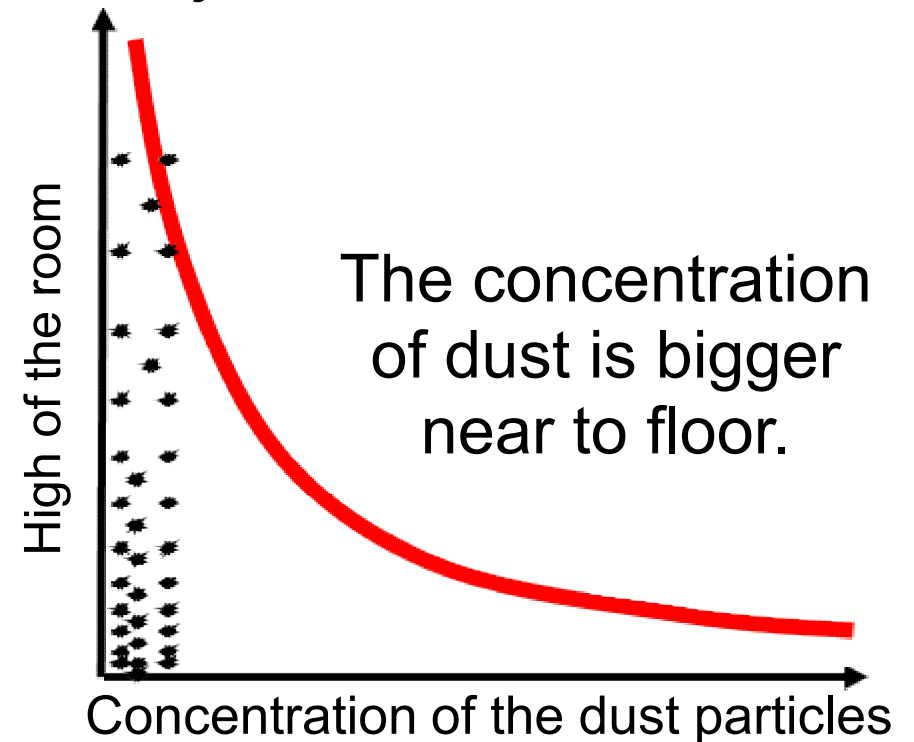
**How to input the particles of dust to the furnace?**



# 3.3.1 Analysis of Environment

3. DECREASING  
OSCILLATION  
OF CD-DISC

The air in the "clean room" contained very small quantity of dust particles. We can not increase this quantity. But, how to increased the quantity of dust and injure the PCB? We know, all particles in the gaseous and liquid phases sensed the influence of gravitation. During the process the particles move to direction of floor. This effect named "Sedimentation" (See Ex. 1). Hence, the concentration of the dust particles in the room will depends on from high of the room (See the Fig.).

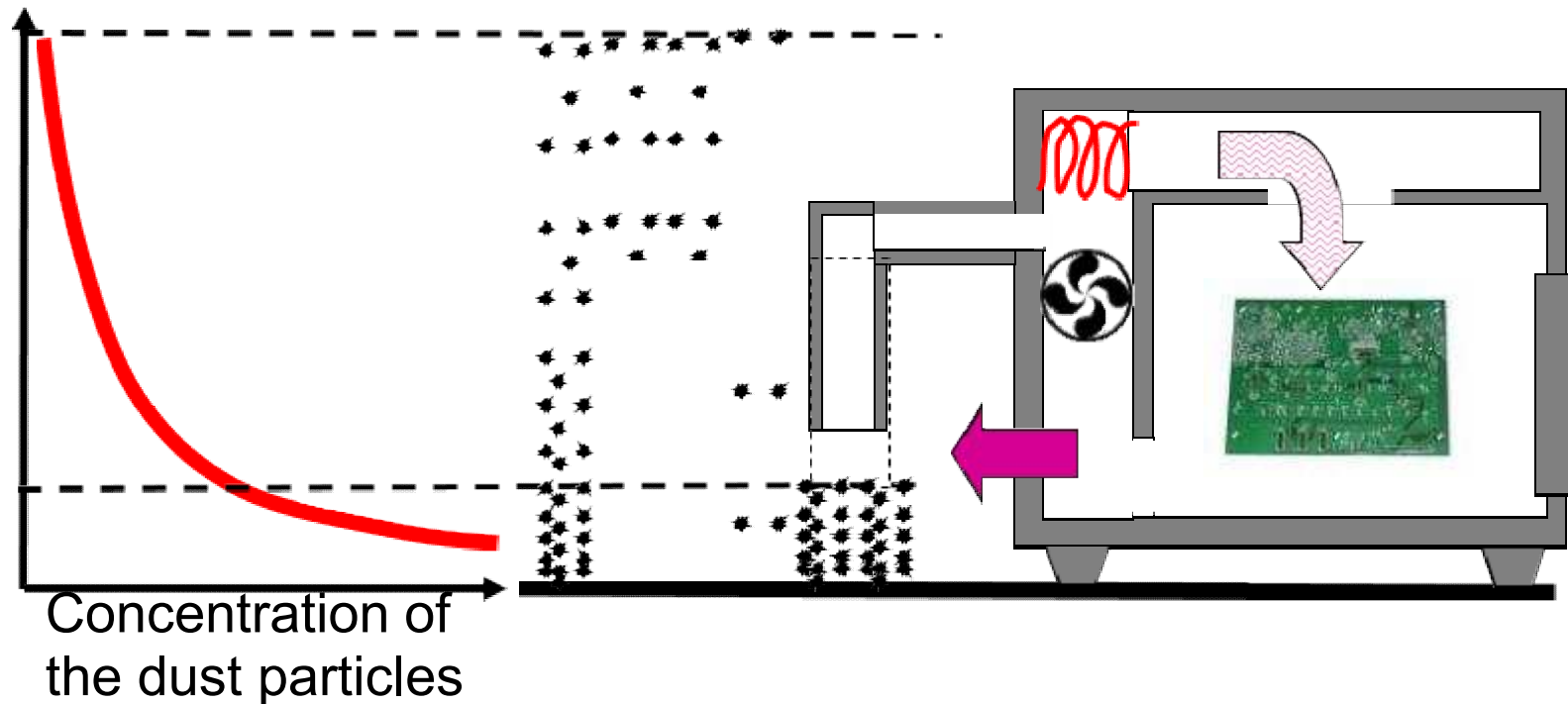




# 3.3.2 How to spoil PCB?

3. DECREASING THE POLLUTION OF PCB

We can increase the pollution of PCB if we place the entrance pipe near to floor. The concentration of dust in this place is biggest.

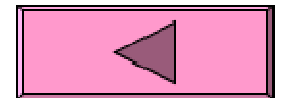


We can see our "Harmful proposal" in our design...

**Do you have any ideas,  
how to applied result of  
“Anticipatory  
Failure  
Determination”  
to our problem?**



*Prompt: How to increase the concentration of the dust  
in the entrance pipe?*





# **4. DECREASING OF ABRASIVE WEAR OF THE DIAMOND WHEELS**

# 4.1 Problem Description

The diamond wheels are using for cutting of various materials. These tools is not cheap. Unfortunately, these tools have the abrasive wear and must be changed. Besides, the abrasive wear is a uneven. The one side of the diamond wheels has a more wear, than the second side. The engineers changed the direction of rotation, but did not have any success.

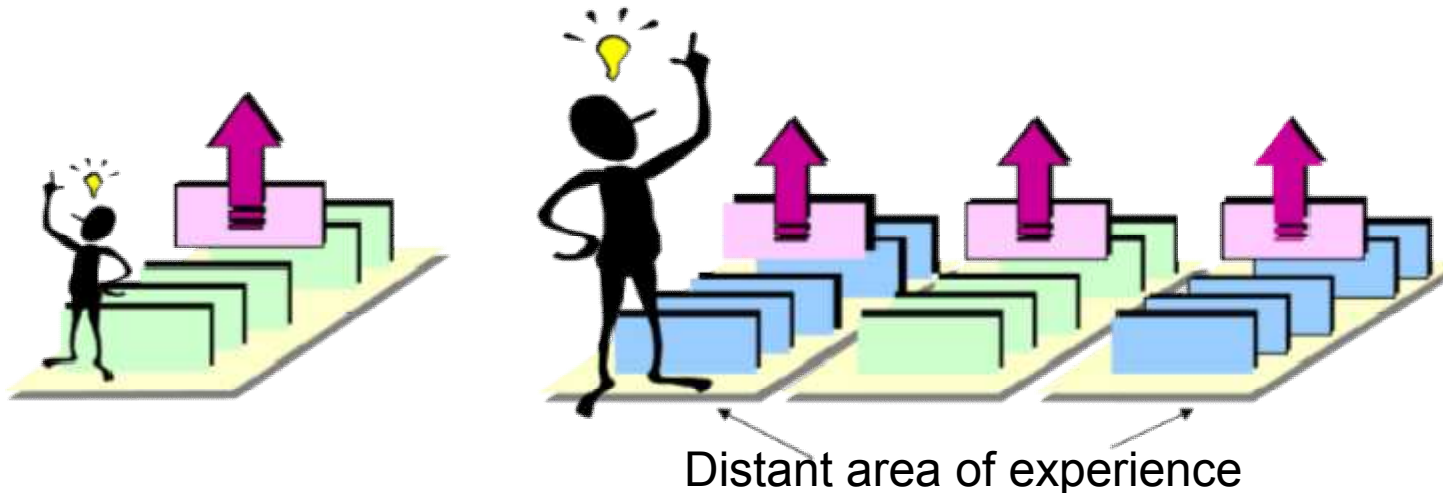


**How to increase the working time of the diamond wheels?**

## 4.2 Problem Analysis

We have to understand the cause of this effect. Why the diamond wheels have the wear with one side only? Why the wear don't depends on from the direction of wheels rotation? We can use the Functional Oriented Search (FOS) for the search of cause.

- *Function-Oriented Search (FOS) is a problem solving tool based upon identifying existing technologies worldwide, using function criteria.*



# Comments to 4.2

4. DECREASING  
OF ABRASIVE  
WEAR OF THE  
DIAMOND  
WHEELS

## What's this FOS?

This is a method of the information search, which based on the search of the analogy (identity) function of improving Engineering System.

**But, what is the difference between traditional methods and FOS?**

Usually, you are can find the information about narrow areas, corresponded to yours experience. For example, if you are mechanical engineer, you will to view the mechanical methods, only. But many interesting solutions may be placed in other scientific areas.

FOS can help you find the analogy solution in the distant areas.

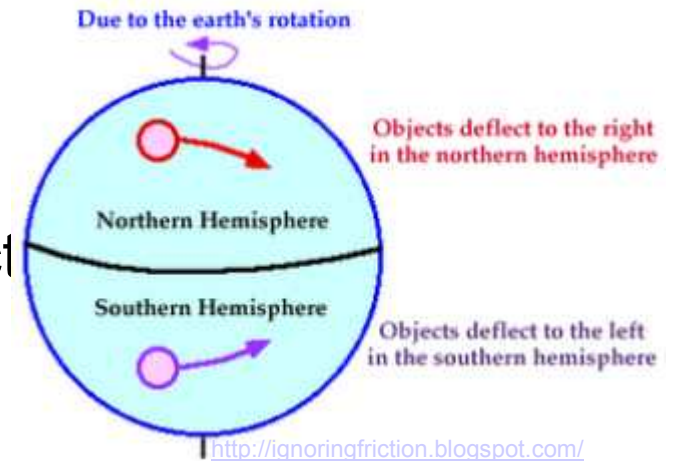
# 4.3 Search result

4. DECREASING OF ABRASIVE WEAR OF THE DIAMOND WHEELS

Search was accomplished by key phrase: "uneven abrasive wear". The result of search was "uneven abrasive wear of rails in consequence of the Coriolis force influence".

*Coriolis force acting perpendicular to the direction of motion and to the axis of rotation; on Earth the Coriolis effect deflects moving bodies to the right in the Northern Hemisphere and to the left in the Southern Hemisphere\**

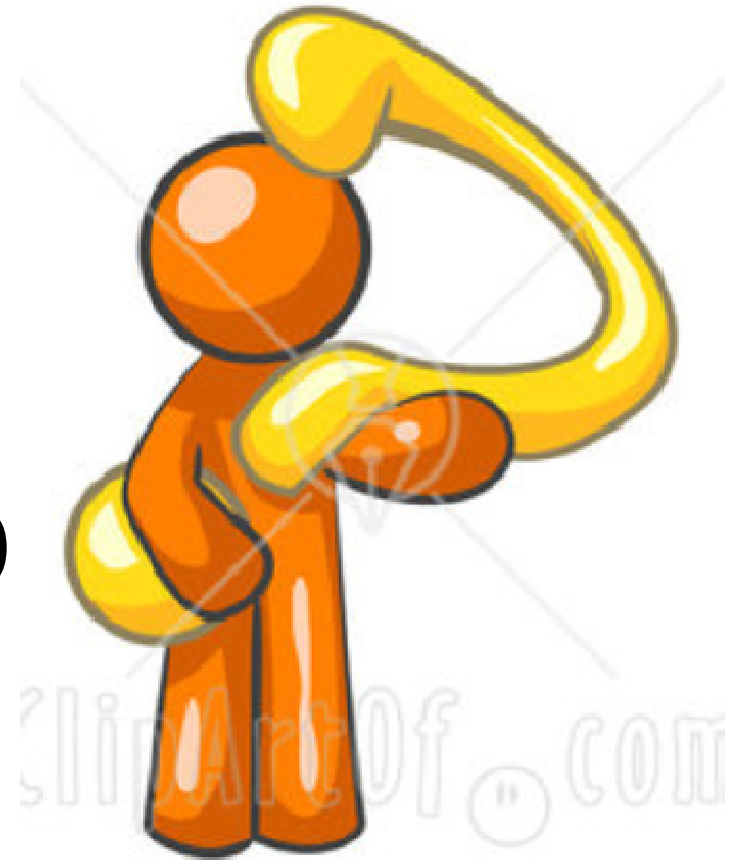
Although the Coriolis force is relatively small and does not have an observable influence on small systems such as the whirlpool of a draining bathtub, toilet or sink the Coriolis effect can have a visible effect over large amounts of time and has been observed to cause uneven wear on railroad tracks and cause rivers to dig their beds deeper on one side\*\*.



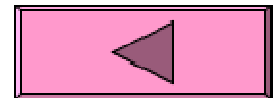
\*<http://www.websters-online-dictionary.org/CO/CORIOLIS+EFFECT.html> \*\*[http://www.upto11.net/generic\\_wiki.php?q=coriolis\\_effect](http://www.upto11.net/generic_wiki.php?q=coriolis_effect)



# Do you have any ideas, how to applied Coriolis effect to our prob



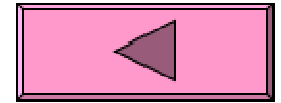
*Prompt: How can use the abrasive wheels with uneven wear?*



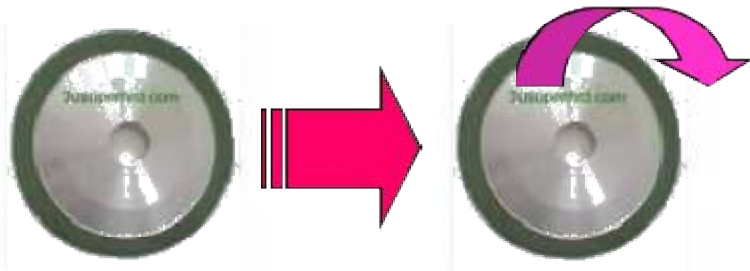
# 4.4 Proposal

4. DECREASING  
OF ABRASIVE  
WEAR OF THE  
DIAMOND  
WHEELS

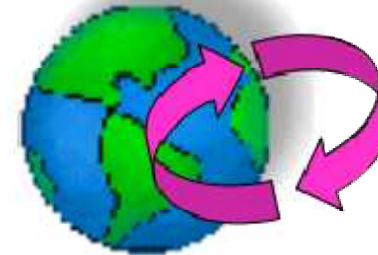
Two variants of this problem solving was proposed:



1. We can remove the diamond wheel, reverse the wheel and fix to again.



2. We can remove the diamond wheel and exchanged with manufacture from South Hemisphere.



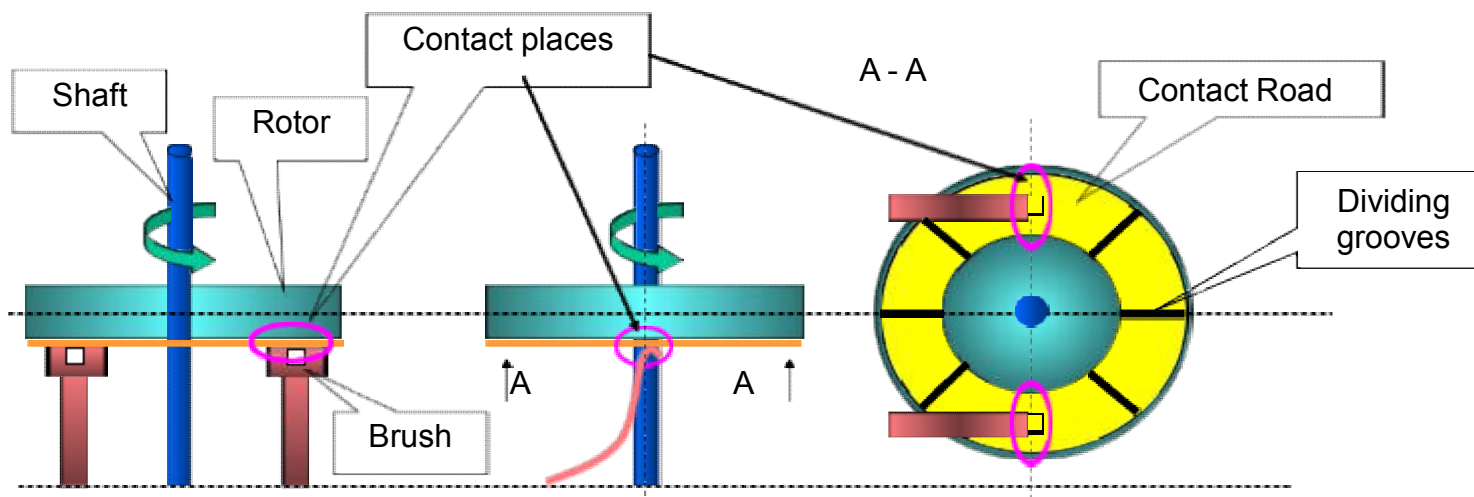
**Advantages:** not any changes.

**Disadvantages:** additional operation.

# **5. INCREASING THE LIFE-TIME OF THE ELECTRIC MOTOR**

# 5.1.1 System Description

Two electrical brushes are placed on the stator of the motor. The brushes have a shape, looks like a fork and are made from copper alloy. The copper contacts road on rotor. These contacts is separated to segments. Brushes pressed to the rotor and copper contacts road are weared contact road during the work.



## 5.1.2 Problem Description

But the life time of the electro-motors is insufficient. The wear of the electrical contacts are often cause of electro-motor breaking down.



**How to increase the life time of electromotor and reduce the contact's wear?**

# 5.1.3 Requirements and Limitations

**What changes of the object are not acceptable?**

**It is impossible to change:**

- Common design of the product.
- Main principle of object action.

Is it possible to impart additional functions to an object?

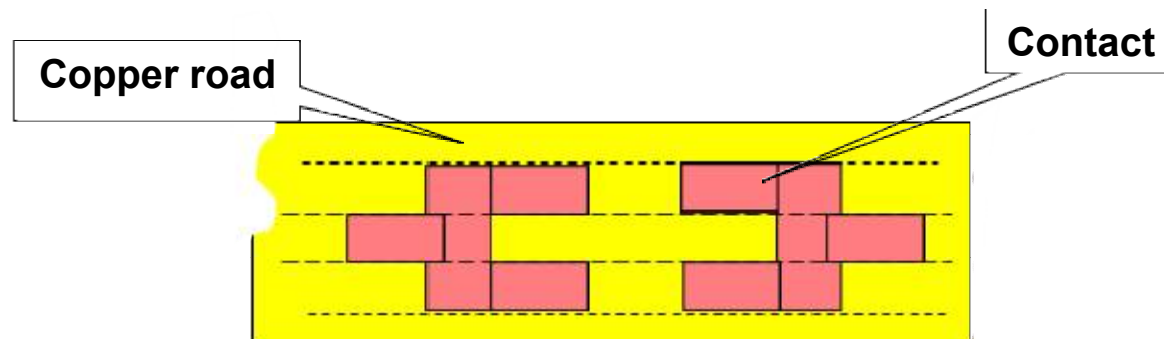
**– No**

Is it possible to increase the cost of an object if significant improvement in the indicators of object efficiency (effectiveness) and object quality

**- No**

# 5.2.1 Problem Analysis

Will examine the system more deeply. We can imagine our system how the linear road. The simple model of system this is a road from copper and two brushes. The brushes placed symmetrically on the copper's road now. First brushes wearied the copper. Second brushes wearied the same place of copper. In this case the surface of copper received the harmful action twice

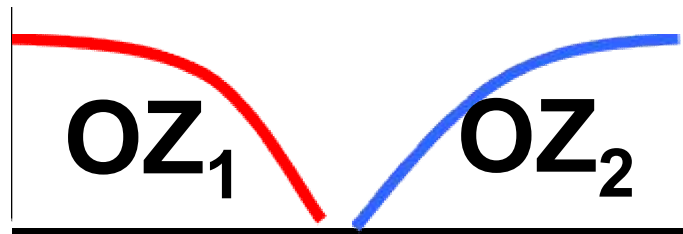


# 5.2.2 Problem Analysis

5. INCREASING  
THE LIFE-TIME  
OF THE  
ELECTRIC MOTOR

We can formulate Physical Contradiction: the contact's surface between brush and copper road **MUST BE BIG** for good transmission of electrical current and **MUST BE SMALL** for saving the copper road from wear.

We have to define the Operative Zone and Operational Time. The Operational Time is same, but the Operative Zone of contacts is different (See Fig.).





# 5.2.1 Separation Principles

5. INCREASING  
THE LIFE-TIME  
OF THE  
ELECTRIC MOTOR

## 1.1. Separation of opposite requirements in space:

- 1.1.1. **SEGMENTATION** (PRINCIPLE#1: a. Divide an object into independent parts; b. Make an object sectional; c. To take this part to working place; d. Increase the degree of an object's segmentation (to molecules and atoms)).
- 1.1.2. **EXTRACTION** (PRINCIPLE#2: a. Extract (remove or separate) a "disturbing" part or property from an object; b. Extract only the necessary part or property).
- 1.1.3. **LOCAL QUALITY** (PRINCIPLE#3: a. Transition from a homogeneous structure of an object (or outside environment action) to a heterogeneous structure; b. Have various parts carry out different functions; c. Place each part of the object under conditions most favorable for its operation).
- 1.1.4. **ASYMMETRY** (PRINCIPLE#4: a. Replace a symmetrical form with an asymmetrical form; b. If an object is already asymmetrical, increase the degree of asymmetry ).
- 1.1.5. **NESTING** (PRINCIPLE#7: a. Contain the object inside another which, in turn, is placed inside a third object; b. Pass an object through a cavity of another object ).
- 1.1.6. **TRANSITION TO A NEW DIMENSION** (PRINCIPLE#7: a. Transition one-dimensional movement, or placement, of objects into two-dimensional; two-dimensional to three-dimensional etc; b. Use a multi-layered assembly of objects instead of a single layer; c. Incline the object or turn it on its side; d. Utilize the opposite side of a given surface; e. Project optical lines onto neighboring areas; f. Project optical lines onto the reverse side, of an object.).
- 1.1.7. **MEDIATOR** (PRINCIPLE#24: a. Use an intermediary object to transfer or carry out an action; b. Temporarily connect an object to another one that is easy to remove ).
- 1.1.8. **COPYING** (PRINCIPLE#26: a. Use a simple and inexpensive copy instead of an object, which is complex, expensive, fragile or inconvenient to operate; b. Replace an object by its optical copy or image. A scale can be used to reduce or enlarge the image; c. If visible optical copies are used, replace them with infrared or ultraviolet copies).
- 1.1.9. **FLEXIBLE MEMBRANES OR THIN FILM** (PRINCIPLE#30: a. Replace traditional constructions with those made from flexible membranes or thin film; b. Isolate an object from its environment using flexible membranes or thin film).
- 1.10. **APPLICATION OF POROUS MATERIALS** (PRINCIPLE#31: a. Make an object porous or add porous elements (inserts, covers, etc.); b. If an object is already porous, fill the pores in advance with some substance ).

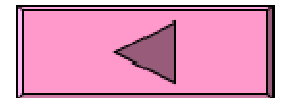
## 5.3 Generation of Idea:

We can create the image of future proposal, if we use these Principles. For example: We can Separated some *Local Quality* from our system. We can make our system *Asymmetrical* and *Transit to New Dimension*.

# Do you have any ideas, how to applied these principles to our pr ?



*Prompt: That we can do asymmetrical?*



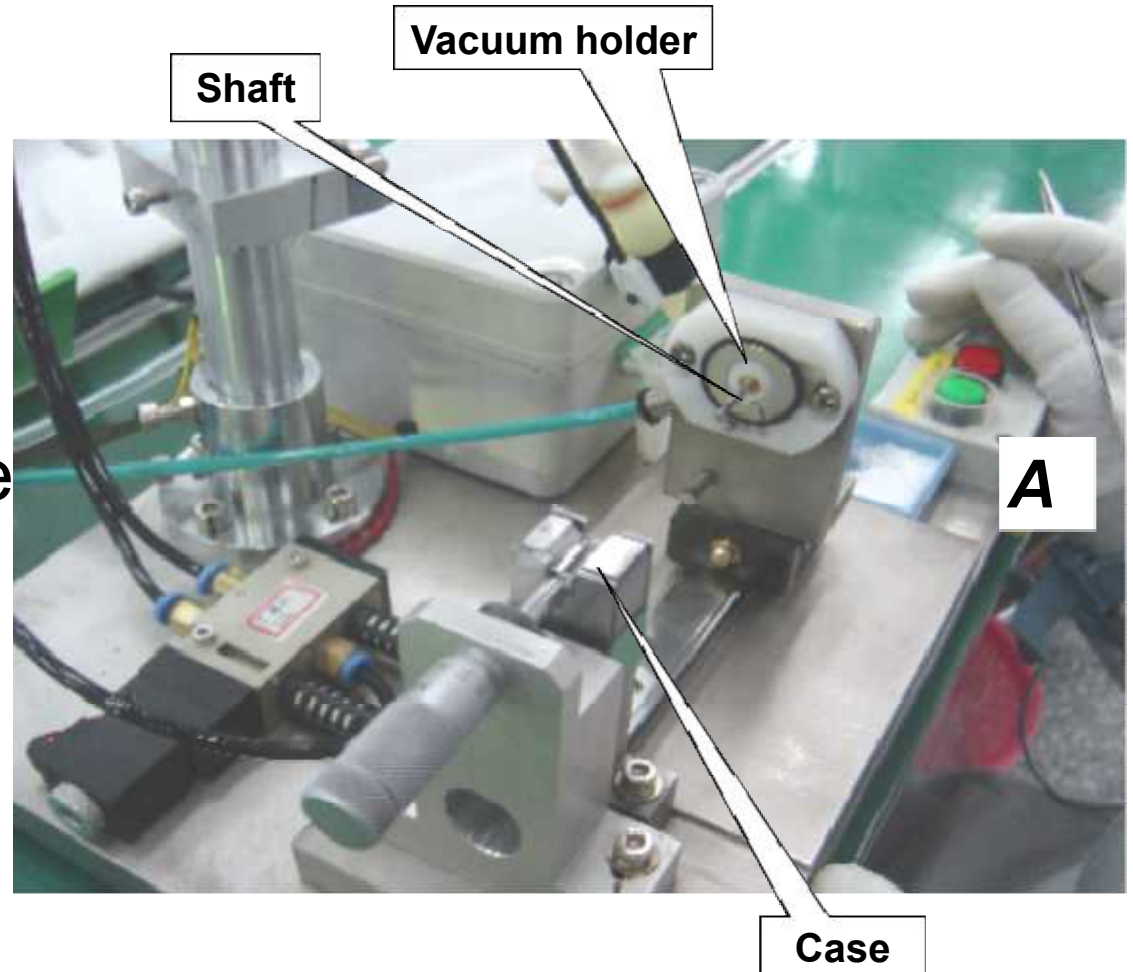


# **6. ELIMINATE THE CAUSES OF DEFECTS IN STEEL SHAFTS**

# 6.1.1 System Description

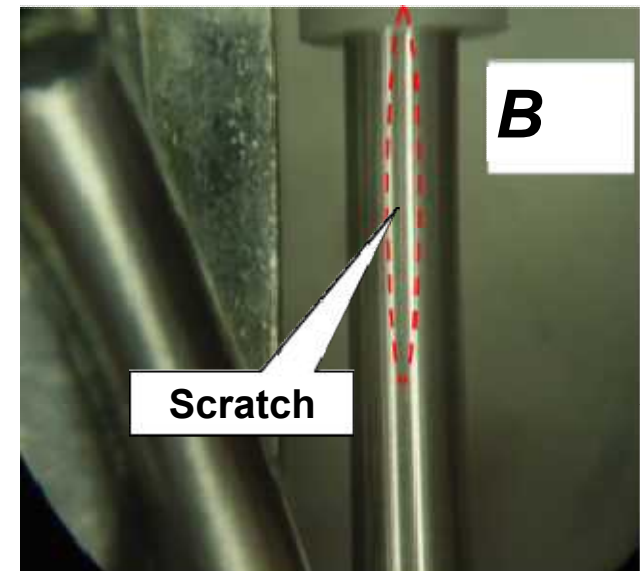
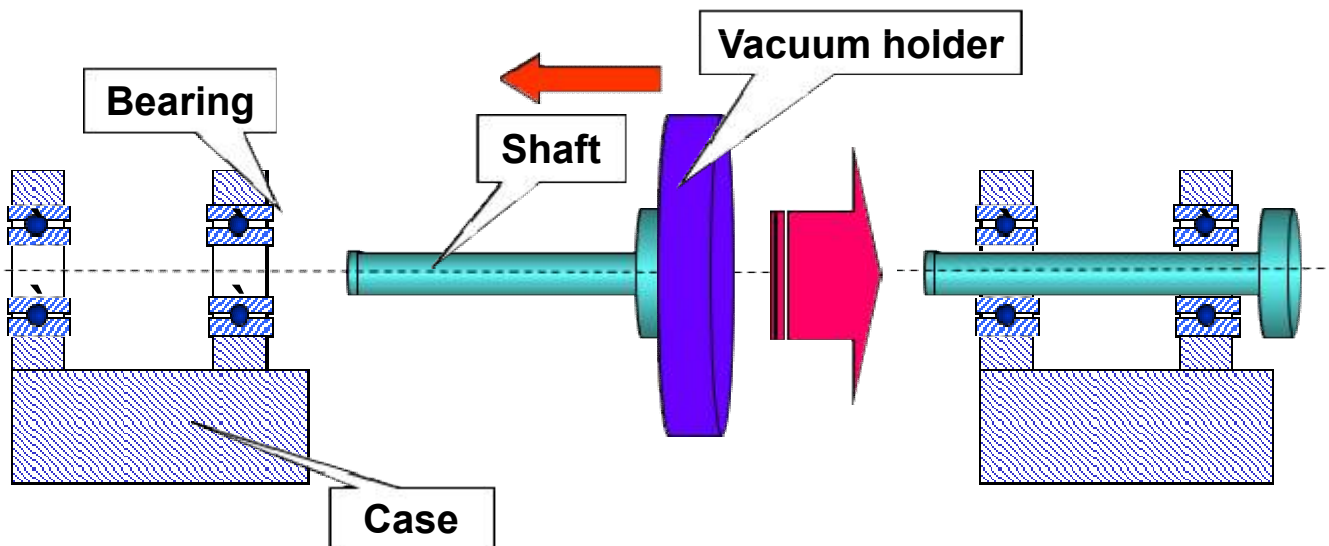
6. ENHANCEMENT  
THE QUALITY  
OF STEEL  
SHAFTS

For the manufacturing some kinds of electronic equipments are using the precise electro-motors. These motors includes the shafts from steel. The quality of polishing of these shafts have to very high. We have to insert shaft to the body by use the presented equipment (See Fig. **A**).



# 6.1.2 Problem Description

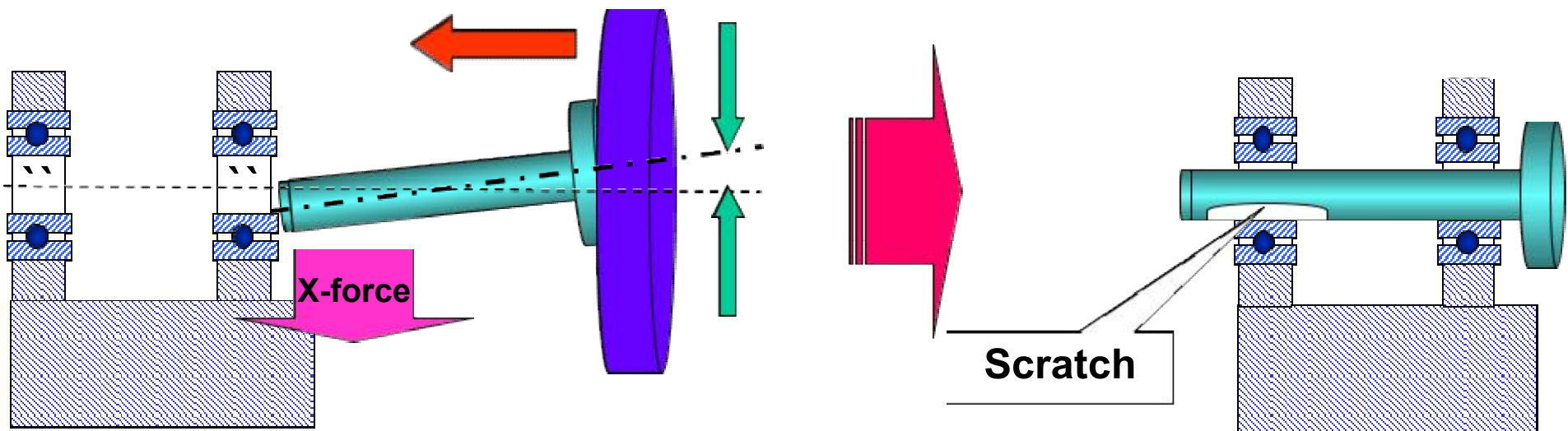
The body include the case and two bearing. The shaft was kept by the vacuum holder and was inserted to the case. Unfortunately, sometimes the shafts had a scratch (See *Fig.B*).



**How to prevented the defects of shafts?**

## 6.2 Problem Analysis

The Root-Cause Analysis showed the possible cause of defects. If we insert shaft to the bearing with small different of direction then the shaft end can hit to edge of bearing and make the scratch.

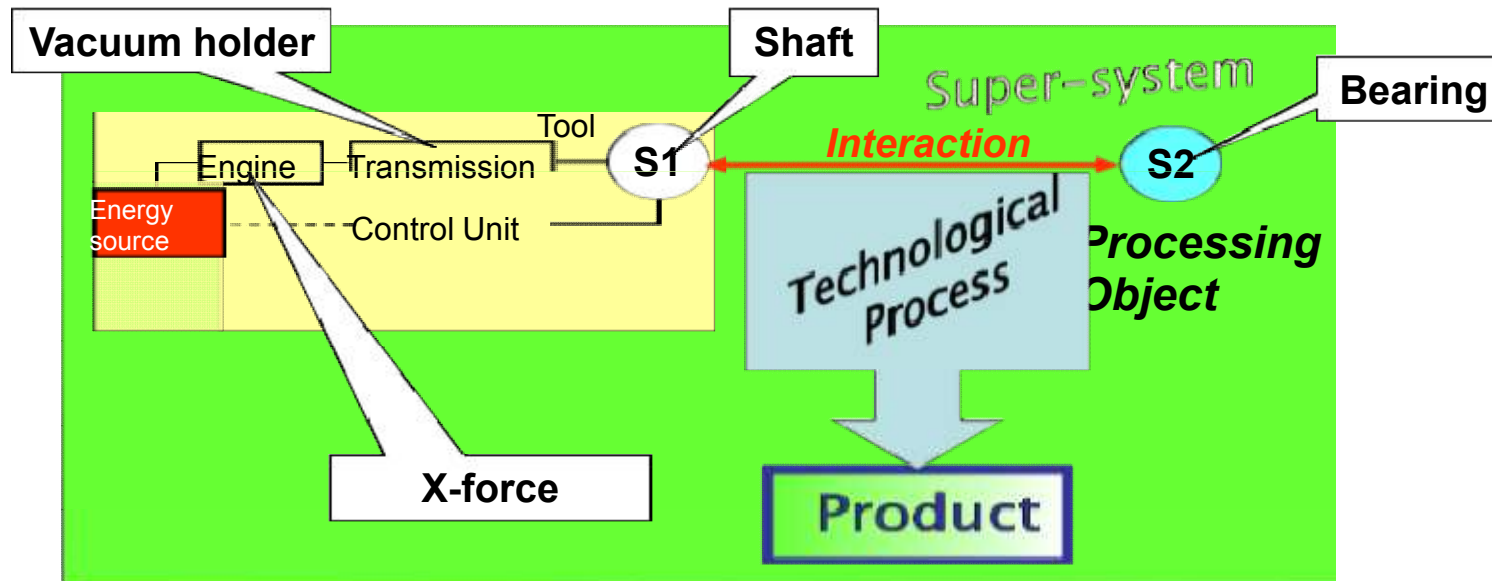




# 6.3.1 Using of model “Harmful Machine”

6. ENHANCEMENT  
THE QUALITY  
OF STEEL  
SHAFTS

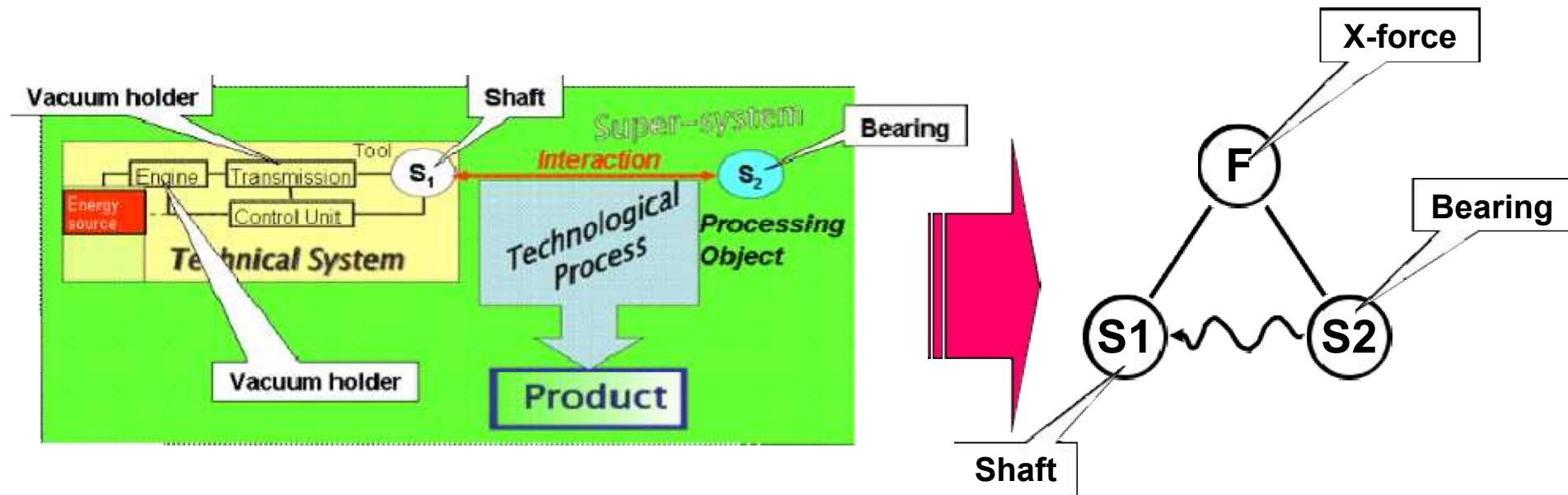
We can use the model "Harmful System" for solving the problem.



# 6.3.2 Generation of Idea

Thus, we are inserting the shaft to the case, but some force is deflecting the direction of moving. Consequently the shaft got a defect. **But what kind of this power?**

Imagine our problem as a system:



# 6.3.3 Search of Field

We can define this force (X-force), if we observe all possible fields.

The order of fields:

**Mechanical field:** moving, increase or reduce of pressure, inertia, gravitation, centrifugal force, vibration, impact, hydrostatic, aerodynamic and hydrodynamic effects.

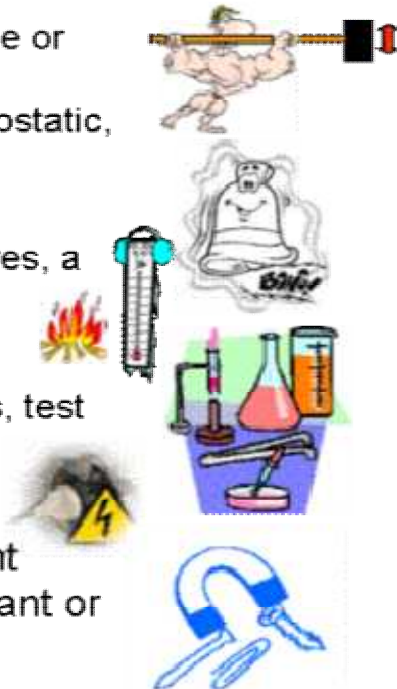
**Acoustic field:** fluctuations sound, ultrasound, an infrasound, standing waves, a resonance.

**Thermal field:** heating or cooling.

**Chemical field:** chemical reactions, test and smelt.

**Electric field**

**Magnetic field:** a field of constant magnets; a field created by a constant or an alternating current.



The gravity influenced to shaft. This is possible cause of problem.

Acoustic field is absent.

Thermal field is absent.

Chemical field is absent.

Electric field is absent.

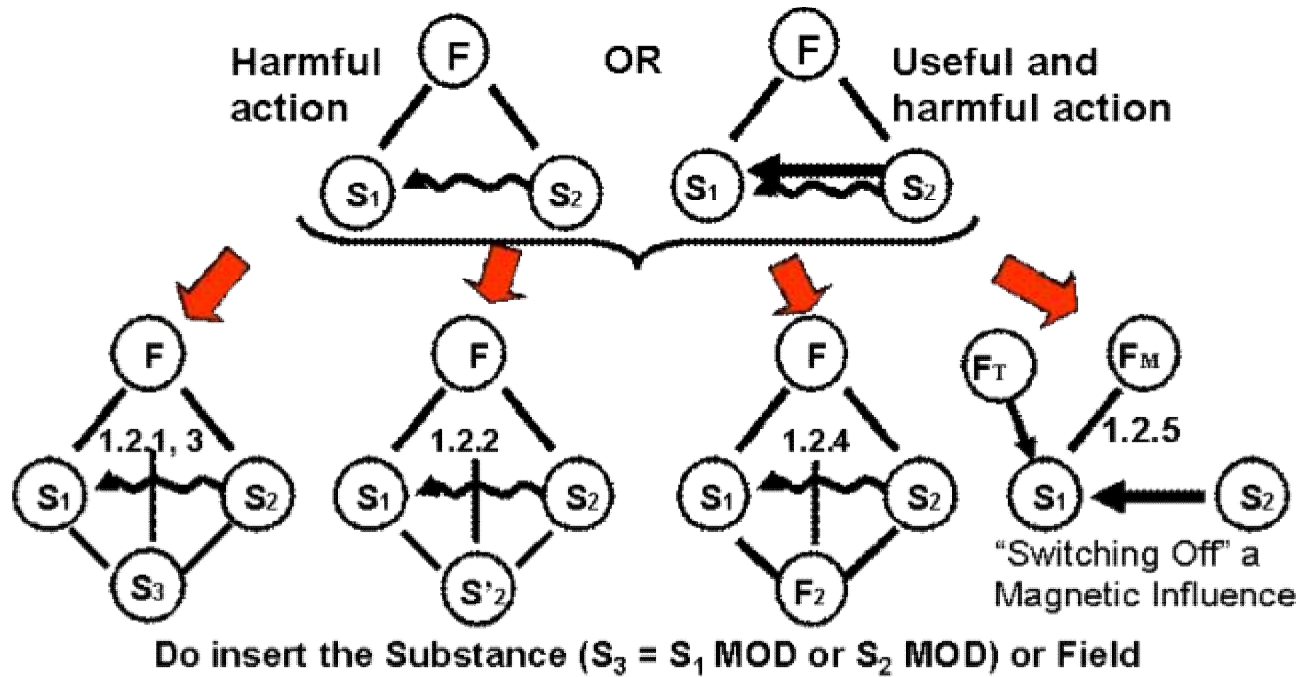
Magnetic field can have some influence.

# 6.3.4 Su-Field Model: 1.2

## Destroying Su-Field Models

6. ENHANCEMENT  
THE QUALITY  
OF STEEL  
SHAFTS

We can insert additional substance, or field, for destroying the harmful interaction. The using of a field is more preferable.



# 6.3.5 Using of Fields

We can insert additional field, for compensation of gravitation force.

The order of fields:

**Mechanical field:** moving, increase or reduce of pressure, inertia, gravitation, centrifugal force, vibration, impact, hydrostatic, aerodynamic and hydrodynamic effects.

**Acoustic field:** fluctuations sound, ultrasound, an infrasound, standing waves, a resonance.

**Thermal field:** heating or cooling.

**Chemical field:** chemical reactions, test and smelt.

**Electric field**

**Magnetic field:** a field of constant magnets; a field created by a constant or an alternating current.



The mechanical force may be applied.

Acoustic - do not have ideas.

Thermal field - do not have ideas.

Chemical field - do not have ideas.

Electric field - do not have ideas.

Magnetic field can be used also.

# Do you have any ideas, how to applied these Fields to our problem?



*Prompt: how to eliminate the harmful influence of gravitation?*

