

# TAKFA at a glance

TAKFA CO, founded by young graduates of top universities of IRAN, has been active in supplying equipment for mining industries, steel factories, direct reduction plants and their associated units.

Focused on meeting the industry demands of auxiliary units, TAKFA is a reliable provider of state-of-the-art technology from renowned manufacturers in 3 main fields:

Fume treatment technologies and dedusting, representative of Fivemasa, Spain Static Var Compensators (SVC), representative of RXPE, China Pneumatic Transport System (PTS), representative of Aerocom, Germany

Aside from the above, TAKFA co has been proudly supplying many factories with spare parts and equipment.



### The Art Auxiliaries

- Our mission is to be responsive to the needs of our clients, sensitive to the needs of our employees and to achieve profitable growth as an experienced leader in supplying quality products, services and technologies to Iron and Steel production facilities.
- Our vision is to be the most customer focused, value driven company bringing world class products and services to the door step of our clients.

**TAKFA CEO** 







TAKFA has successfully created partnerships with renowned and reputed manufacturers and suppliers from around the world assuring our customers of our capability to supply them with high quality equipment at competitive prices backed with required metallurgical and technical support.

































At the same time, we are committed to our suppliers in providing them with consistent market support. With the help of our highly developed infrastructure, TAKFA is now able to supply various equipment and spare parts for the steel industry. Electrical items, instrumentation and mechanical equipment are a few of the items that have been supplied for our clients.

## SVC STATIC VAR COMPENSATOR STATCOM

LIAONING RONGXIN XINGYE POWER TECHNOLOGY (RXPE) IS A LEADING INTERNATIONAL DEVELOPER AND PROVIDER OF HIGH VOLTAGE POWER **ELECTRONIC SOLUTIONS. SUCCESSFUL COMPLETION OF OVER 1800 PROJECTS ALL** OVER THE WORLD HAS MADE RXPE THE LARGEST MANUFACTURER OF SVC UNITS.

Equipped with a fully integrated manufacturing facility, RXPE designs and manufactures SVC and STATCOM systems at its plant in Anshan. Using a modern testing facility, all different sub systems are carefully put under simulated working condition to ensure highest standards are achieved.

Through its bold market presence in Iran and other countries, RXPE is able to quickly dispatch technicians to client sites and provide on-site consultation and maintenance services.



A Static VAR Compensator (SVC) is an electrical device for providing fast-acting reactive power compensation on high-voltage electricity transmission networks to control dynamic voltage swings under various system conditions and thereby improve the power system transmission and distribution performance. SVCs are part of the Flexible AC transmission system device family, regulating voltage and stabilizing the system.

Electrical loads both generate and absorb reactive power. Since the transmitted load varies considerably from one hour to another, the reactive power balance in a grid varies as well. The result can be unacceptable voltage amplitude variations, a voltage depression, or even a voltage collapse.

One of the main Application of SVC is in the steel making industries where the EAF and LF are working. Due to the reactive and active impulse caused by the operation of EAF, the system voltage is fluctuating and flicking. The harmonic current caused by EAF makes the voltage distortion. The 3-phase unbalanced load of EAF causes negative sequence component and reduces the power factor etc.

#### Major SVC Advantages in Steel Making Plants

SVC in Steel Making industries can,

- Increase power factor, which decrease losses of electric network and cost of production and increases productivity.
- Reduce the reactive impulse to the network which avoids the pressure drop, voltage fluctuation and flicker of network, even reduce malfunction or shutdown of the driving and protection device.
- Reduce high Order Harmonics Current which decreases network voltage distortion.
- Reduce Three-phase unbalance of network and negative sequence current, which avoid the oscillation of electric engine rotor.

#### **RXPE** REFERENCE LIST IN IRAN:

CLIENT	PROJECT SCOPE			
Mobarakeh Steel Company	A complete SVC system 180Mvar / 33 KV			
Mobarakeh Steel Company	1/3 phase Thyristor Valve 180 Mvar / 33 KV			
Mobarakeh Steel Company	SVC System Spare Parts - PCB			
Khorasan Steel Company	Replacing the control system of existing Alstom SVC with RXPE System Control 180Mvar / 33KV			
Khorasan Steel Company	SVC System Spare Parts - PCB			
Foolad Sanat Bonab Company	A complete SVC system 75 Mvar			
Foolad Sanat Bonab Company	SVC System Spare Parts - PCB / Thyristor / Capacitors			
Sefid Dasht Steel Complex	A complete SVC system 180Mvar / 33 KV			
Khazar Steel Company	A complete SVC system 135Mvar / 33 KV			
Khazar Steel Company	SVC System Spare Parts - PCB			
Yazd Rolling Mill	A complete SVC system 80Mvar / 11 KV			
Yazd Rolling Mill	A complete SVC system 90Mvar / 21 KV			
Yazd Rolling Mill	SVC System Spare Parts - PCB / Thyristor / Capacitors			
Yazd Rolling Mill	SVC Auxilliary Equipments - CB / DS / ES / Protection Relays			
Kerman Steel Company	A complete SVC system 55Mvar / 33 KV			
Kerman Steel Company	SVC System Spare Parts - PCB / Thyristor / Capacitors			
Mianeh Steel Complex	A complete SVC system 190Mvar / 33 KV			
Arfa Iron & Steel Co.	A complete SVC system 160Mvar / 33 KV			
Pasargad Steel complex	A complete SVC system 190Mvar / 33 KV			
Ghaenat Steel Co.	A complete STATCOM system 205Mvar / 33 KV			
Kaveh Steel Aria Co.	A complete STATCOM system			
B-MISCo (Bafgh Steel Co.)	A complete SVC system			
Ghadir Neyriz Steel Co.	A complete SVC system 190Mvar / 33 KV			
Mohsen Steel Complex.	A complete SVC system 90Mvar			

#### **CASE HISTORIES**

#### **Mobarake Steel Complex**

Saba Steel Plant has two 180MVar/33KV SVC Systems. The first supplied by RXPE in 2013 is working without any failure. Due to good history, TAKFA-RXPE was awarded the contract to revamp and fit new parts to guarantee performance at peak levels.



During this project, a thyristor valve and several control system boards were successfully designed, manufactured and installed in existing 180 MVar SVC unit. Following successful cooperation the client convinced to define a new project for the existed damaged ANSALDO SVC unit to be replaced with new designed RXPE brand. It is now one of our main ongoing projects have in TAKFA.

#### **Ghaenat Steel Making Company**

As one of the recent steel projects in Iran, the Ghaenat Steel making plant will be equipped with the latest technology by hiring latest technologies & capable vendors. After accomplishment several successful projects in Iran, the TAKFA-RXPE partnership was selected to dedicate the STATCOM system to this plant. With a capacity of 205MVar statcom, the system is designed to compensate reactive power and flicker of 140MT EAF & LF.



#### **Khorasan Steel Complex**

Employing RXPE's technology and knowhow of SVC systems, TAKFA replaced and upgraded the outdated control system of the ALSTOM SVC (1999) unit of Khorasan Steel Complex. A challenging task was performed successfully and the upgraded SVC system has been running smoothly and delivering a steady power factor of 0.99 ever since.



#### **Bonab Steel Industry Complex**

The Main system was purchased from RXPE and was installed by a Turkish contractor in 2011. While the Turkish contractor refused to do his responsibility, TAKFA supplied all the requested spare parts for the client. In additition, in order to increase the service and maintenance knowledge of the client personnel, TAKFA - RXPE held the training courses by RXPE experts and technicians at client factory.



#### **Mashiz Bardsir Steel Company**

A diagnostic procedure was run on the SVC unit of Mashiz Bardsir Steel Co. Dated components were quickly replaced with newer versions and a comprehensive training course was organized to enhance the knowledge of the plant's technicians. The whole process of diagnosis, supplying spares, installation and commissioning was performed in 3 weeks



#### **Yazd Rolling Mill**

Aftfter the successful operatition and swiftft aftfter sales services of their first installed RXPE SVC unit (80Mvar/11KV) in 2011, the client awarded the contract for their second SVC plant to RXPE (90Mvar/21KV). A complete SVC plant with all the necessary spare parts were designed and manufactured by RXPE and is under installatition while TAKFA – RXPE is supervising the operatitions.





### FUME TREATMENT PLANT

FIVEMASA, SINCE 1980, IN SPAIN IS MANUFACTURING CUSTOMIZED SOLUTIONS FOR CONTROLLING ENVIRONMENTAL POLLUTION IN ANY TYPE OF INDUSTRY. WITH OVER 300 PROJECTS IN OVER 30 COUNTRIES, FIVEMASA HAS A TEAM OF EXPERIENCED DESIGNERS AND BENEFITS FROM SEVERAL WELL-EQUIPPED WORKSHOPS TO DELIVER STATE OF THE ART POLLUTION CONTROL SOLUTIONS FOR ANY INDUSTRY.

The equipment is manufactured with high quality western Europe workmanship and outlet emission guarantees are fully in line with the latest EU legislations. The range of products are as follows:

High Temperature Ceramic Filters
Wet Scrubbers
Bag Filters
De-sulfurization plants
Selective Catalytic Reduction (SCR)
Selective Non-Catalytic Reduction (SNCR)
Volatile Organic Compounds (VOC) Removal

Vacuum Cleaning Systems Dry and Semi-dry Gas Absorption Regenerative Thermal Oxidation (RTO)

#### AIR POLLUTION CONTROL SYSTEMS

#### **BAG FILTERS**

Part of the dust which arrives with the gas is separated in the entrance of the filter. The rest of the dust is taken on the surface of the bag, where an indispensable dust precoating is created to obtain high standards of separation. The filter bags are cleaned by periodic pulses of compressed air, which goes to the jet pipes through the opening of the membrane valves. Each row of bags is blown creating a strong pressure increase in the interior of the bags. As a result, the dust settled on the outside of the bags falls.

The membrane valves are electronically controlled allowing the adjustment of pulse time and cycle to the conditions of the desired operations. The electronic controller can be operated manually or automatically commanded by the pressure loss. The automatic controller Maintains constant the pressure loss of the filter.

The FIVEPULSE filters can be made of vertical bags or horizontal bags. These last ones are used when there is height limitation for the extraction of bags. In the vertical filters, the gas entrance can take place by the hopper or by a side of the filter casing. In the horizontal filters however, it takes place by the top part.

We also have round filters, specially for those applications when people must work under high pressure values: 5000 to 8000 mm.w.g. of vacuum pressure.

There are four series of FIVEPULSE filters:

- SQUARE SERIES
- RECTANGULAR SERIES
- DOUBLE SERIES
- INDEPENDENT CHAMBERS SERIES

#### COMPACT FILTER

The compact filters designed by FIVEMASA are cleaned by periodic pulses of compressed air and they are designed to work continuously and minimize residual emissions. Because compact filter provides maximum filter area in a minimum space, the volume of the filter housing can be reduced considerably and so the occupied area. The air charged with dust enters to the filter top or laterally, the filters allows to pass the clean air to the front side of the filter. The dust falls down into the hopper after the cleaning through periodic pulses of compressed air and discharge via a rotary valve or screw conveyor plus rotary valve.

The air with dust enter to the head of the filter housing and clean air goes out through the frontal side of the filter, soothe down flow facilities the dust to fall down into the hopper.

#### **ELECTROSTATIC PRECIPITATORS**

As contaminated air enters the electrostatic precipitators it must pass by speak electrodes. The AC voltage creates a high intensity field wherein the particulate matter in the air becomes electrically charged. The charged particles then pass into a collector plate section which attract and collect. Liquid contaminants coalesce into droplets and run-off the collector plates in a self cleaning action.

#### **SCR (SELECTIVE CATALYTIC REDUCTION)**

The primary difference between SNCR and SCR is that SCR employs a metal-based catalyst with activated sites to increase the rate of the reduction reaction. A nitrogen based reducing agent (reagent), such as ammonia or urea, is injected into the filter system or downstream the filter system. The reagent reacts selectively with the flue gas NOx within a specific temperature range and in the presence of the catalyst and oxygen. For the majority of commercial catalysts (metal oxides), the optimum temperatures for the SCR process range from 250 °C to 427 °C.

#### **SNCR (SELECTIVE NONCATALYTIC REDUCTION)**

SNCR is based on the chemical reduction of the Nox molecule into molecular nitrogen (N2) and water vapor (H2O). A nitrogen based reducing agent(reagent), such as ammonia or urea, is injected into the post combustion flue gas. The SNCR process occurs within the combustion unit which acts as the reaction chamber. Reagent is injected into the flue gas through nozzles mounted on the Wall of the combustion unit. The injection nozzles are generally located in the post-combustion area, the upper area of the furnace and convective passes. The injection causes mixing of the reagent and the flue gas. The heat of the boiler provides.

#### Wet Process SCRUBBERS TYPE VENTURI

The venturi filters are designed with wet entrances for high temperature gases, or dry for saturated or cold gases. They can have a fixed section for a constant air flow and adjustable for a variable air flow. They can be built in reinforced polyester with fiber glass, stainless, normal, covered by rubber in the inside. They are used to capture very small particles and its filtration efficiency is comparable to those of electro statistic precipitators and filter bags. However, the installation cost is lower.

#### MEDIUM ENERGY SCRUBBER FIVESPRAY AND DYNAMIC

The filtration efficiency of this two equipment is similar, but lower than the venturi filters. The pressure loss is between 125 and 200 mm.w.g.

FIVESPRAY can be built with and extracting drag incorporated, meanwhile the second one can't. Its utilization depends on the application and the requirements of the clients.

#### **DROPLET SEPARATORS**

By means of bended profiles, we get the elimination of droplets on vanes by inertial forces. The eliminated liquid film is drain aged to the lower part of the unit, getting out from the assembly device. Depending on the nature of the gas we can supply single stage or multi-stage droplet separators with or without flushing systems.

#### **AIR POLLUTION CONTROL SYSTEMS**

Design and manufacture of below projects, in any type of industry.

- Industrial cleaning plants
- Centrifugal and axial fan silencers
- Antinoise cabins

- Micronizing and drying plant
- Climatization and ventilation
- Milling and classifying

#### **TIPYCAL APLICATIONS:**

- Behind gas scrubbers
- Spray towers

- Air conditioning
- Air and gas cooler

#### FIVEMASA REFERENCE LIST IN IRAN:

#### Saba Steel Persian Gulf

5 stand-alone wet scrubber dedusting plants were designed and supplied for Saba Steel Persian Gulf with a total airflow of 324,000 m3/h. Heavily polluted areas with an inlet dust of up to 70 g/m3 were analyzed and after careful design and high-quality manufacturing of dedusting equipment, an outlet emission of 10 g/m3 was achieved which is well below the limits set by the department of environment.

The whole project was concluded in under 6 months which exhibits tremendous flexibility from Fivemasa in adapting to the client's needs. All electrical components and instruments were supplied from world-renowned European brands such as Siemens.



#### **Golgohar Mining and Industrial**

The Iranian mining giant had decided to revamp their existing facilities in their palletizing plant and one of the equipment that needed upgrading was the wet-scrubber for the bentonite + iron ore concentrate mixer. After a rigorous and diligent technical evaluation by the client, which included visiting previous projects in Iran and manufacturing facilities of Fivemasa in Spain, TAKFA-Fivemasa was selected as the supplier of the wet-scrubber dedusting system. During the course of the project, some technical features were modified in the site location but Fivemasa quickly accommodated the changes and delivered the final equipment according to the latest client requirements.







### PNEUMATIC TRANSPORT SYSTEM

AEROCOM, A WORLD-RENOWNED PNEUMATIC TUBE SYSTEMS MANUFACTURER, IS REPRESENTED IN 80 COUNTRIES AROUND THE GLOBE.

Made in Germany, Aerocom is a world leader in manufaturing modern pneumatic tube systems and internal logistics. We have the experience and expertise to custom design solutions for virtually any application in pneumatic materials logistics. We can provide special technical solutions to meet individual customer specifications.

Items weighing anywhere from 1 gram to 28 kilograms, up to 30 cm in diameter and up to 50 cm in length can be transported in a pneumatic tube system. In this category you can find a whole lot of things: hot steel samples, spare parts, documents, X-ray films, coins, bank notes, oil, etc.

Aerocom systems can transport virtually anything: liquid, toxic, valuable, hot or cold, 0.1 g or 28 kg, provided that it is no more than 30 cm in diameter. This includes a whole range of items: blood or tissue samples, medicines, documents, instruments, Xrays, laboratory specimens, oil, spare parts, hot steel samples, etc.

A pneumatic tube system consists of several main components:

A blower to create the pressure and suction required for transportation, containers, known as carriers, that fit closely in the tubes to convey the articles, and stations where destination is selected and the filled containers are inserted.

Powerful controllers are used to regulate these transportation logistic. These stations receive incoming carriers and gently deposit them out of the system. Diverters are used with tube system to direct the carriers to their selected destination or else to communicate with various zones.

All kinds of material can be simply, rapidly and economically dispatched in this way using air as driving force.

#### **AEROCOM REFERENCE LIST IN IRAN: (TURN-KYE PROJECTS)**

#### **Khorasan Steel Company**

It was an industrial project in one of the major steel plants in Iran. In this project was used a 4-1 diverter and a blower capable of creating both negative and positive pressure. Total tubing length was +300 meters and the longest distance from the laboratory was 155 meters (60 meters was vertical).



#### **Arvand Jahan Ara Steel Co**

Equipped with EAF, LF, CCM and VD, Jahan Ara Steel was set to produce high quality steel and to help them achieve that in an efficient manner, 500 meters of stainless tubing was used to transport the samples between 5 send/receive stations. The complete project was launched in mid of 2022.



#### Iran Alloy Steel Co

As an upgrading project named "yazd 1" IASCO took action to equip new steel melting plant with PTS system through one zone consisting of 4 station from Lab to CCM, LF & EAF furnaces by application of 700 m stainless steel tubing.



#### Other projects

CLIENTS	PROJECT SCOPE		
Farhikhtegan Hospital	2 zone 24 station		
Qaem Hospital	1 zone 12 station		
Shomal-e-Amol Hospital	2 zone 26 station		
Takht-e-Jamshid Hospital	2 zone 24 station		
Amiralmomenin Hospital	2 zone 20 station		
Milad Hospital	2 zone 24 station		
Noor Hospital	1 zone 12 station		
Heshmatye Hospital	2 zone 19 station		
Omid Hospital	2 zone 19 station		
Emam Hossein Hospital	2 zone 26 station		
Women Hospital	3 zone 28 station		
Aftab Hospital	2 zone 15 station		

CLIENTS	PROJECT SCOPE		
Sina Hospital	2 zone 11 station		
INII	4 zone 36 station		
Mam Infertility Treatment Clinic	1 zone 16 station		
East Hospital	2 zone 16 station		
Milad Hospital	2 zone 34 station		
Pars Hospital	2 zone 20 station		
Emam Reza Hospital	3 zone 52 station		
Shariati-2 Hospital	6 zone 68 station		
Mahdi Clinic Hospital	7 zone 61 station		
National Cancer Center Hospital	2 zone 28 station		
Al-Badoor Hospital (Bagdad-Iraq)	1 zone 12 station		
Basrah Hospital (Iraq)	2 zone 22 station		





## AUXILIARY

equipment

THE LADLE AND ELECTRIC ARC FURNACES ARE CONVENTIONAL EQUIPMENT OF STEEL MAKING PROCESS. TAKFA IS EXPERTISED IN PROVIDING THE REQUIRED AUXILIARY EQUIPMENT OF FURNACES AS ANOTHER "ART OF AUXILIARY".

#### TECHNOLOGY HIGHLIGHTS & EQUIPMENTS WHICH WE SUPPLY

- Emergency Stirring Lance
- Wire Injection (Two or Four Strand feeding Machine)
- Automatic / Manual Samplers
- Lime and Carbon Injection System

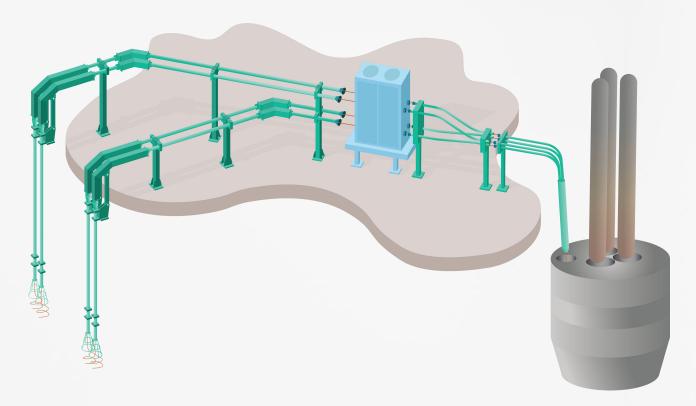
Full compliance with safety standards and environmental requirements.

#### **WIRE INJECTION (FEEDING MACHINE)**

The basic wire feeder consisting two pairs of straight flat-notched rolls through which the wire is pinched and propelled. In order to add the alloying element into the ladle furnace, the wire injection system plays a key role. Depending on the additive element, the design and features of injected wires are critical. By TAKFA state-of-art solutions, the steel-making plants are very close to reach the most efficient production schedule. There are different types of wire injection systems as two, four or six strand wire feeding package. The wire feeding machine can be provided with a complete guiding system bringing the wire up to the liquid steel, and the design of the guiding system is tailor-made according to the space available and the Customer request.

The consuming material of wire is also selective as below:

- CaSi Cored Wire
- Calcium Cored Wire
- Aluminum Wire



#### **EMERGENCY STIRRING LANCE (ESL)**

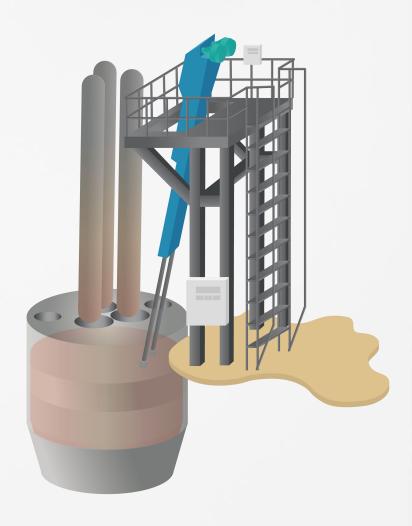
In metallurgical processing, the effective and reliable stirring of the melt is one of the prerequisites for higher productivity. The ESL is to blow the inert gas (argon) through a refractory lance into the melted steel bath, in order to provide the homogeneity melt and avoids production line stoppage and financial loss.

#### **AUTOMATIC / MANUAL SAMPLERS**

The sampling system also called measuring lance manipulator (MLM) used to grab and measure the sample or steel chemical analysis without having to power off the ladle furnace and monitor its features (temperature, oxygen and carbon content, and so on) from the internal molten material of the ladle furnaces. The automatic sampler applies specifically to LF, VD, or VOD, whereas the manual sampler applies also to EAF.

In the automatic sampler, the lances carrying device holds one or two independent carriages, moved by a gear motor with chain drive; the position of the lances is automatically monitored. An automatic slag-breaking lance can be also provided to break the slag on the top of the liquid steel and give access inside the ladle.

TAKFA proudly can be your supplier of control module (PLCs), sensors, and consuming material of MLM accordingly.



#### **LIME & CARBON INJECTION SYSTEM**

The lime and carbon system injects powders into the Electric Arc Furnace (EAF) by means of a pneumatic transport system. With a capacity up to 60 Kg/min, the system is designed to provide the feed for the KT-Lance which in turn would inject the additives into the molten metal. The driving force for injection comes from the pressurized air/nitrogen. Bagfilter dedusting units have also been considered in the design to collect the dust caused by filling the tanks.

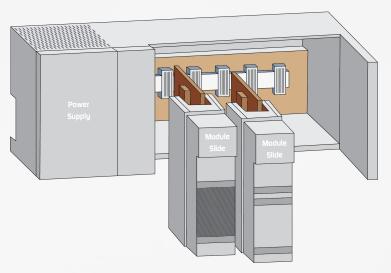
As a turn-key project, described package for Ghaenat steel making plant project is handed over by TAKFA.



#### **AUTOMATION**

PLC is a very common and vital equipment in modern industries which has a key role in automation field. The TAKFA's automation specialists present the best specific solutions for any application in Steel industries. The well experienced experts in TAKFA are so eager to access, design, select, supply, and finally to set-up the various types of PLC systems.

It is when the team members are presenting after sale services unconditionally as per conventional standards to the clients as well.



#### **SUPPLY CHAIN**

Beside our core activities, we oblige ourselves to equip the clients with all main mechanical, electrical, instrumental equipment & parts as well as bulk items as raw material in steel making plants.

That's why we have planted all fundamental principles in the company for customized procurement of piping & fittings, MV & HV electrical motors, switchgears & panels, gearboxes & drive units, different type of pumps, instruments, and etc., from Far East & Western European countries.

Moreover, for those equipment & packages who have manufacturing works by nature, then Takfa will also be able to manage foreign engineering / procurement & local manufacturing at the same time by using existed potentials.

Takfa complies with your demands!

