

Theoretical Foundations of the Technological Structure of a Large Solar Furnace

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Abstract:

This in the article big voluminous the sun ovens and the sun ovens limited data removed.

Keywords: The sun ovens, paraboloid mirror, thermal-physical, spectral-optical, heliostat area, sun radiation.

Introduction: Present time technique development high and very high temperatures get requires tools. High very high temperatures get for used concentrator the sun devices the sun ovens that is called High temperatures harvest doer devices as the sun ovens try when seen , their row cases another kind of to devices than in practice to apply more suitable arrival was determined . Man ancient of times since the sun from energy use for striving came For example , great thinker Archimedes spherical look in the mirror focus distance mirror curvature of the radius by half equality proved and such mirrors using the sun energy to collect aspired Medium Asia scientists are also average of the century in the beginning of the lens the sun its rays collect ability ownership those who identified Abu Rayhan Beruni and his a contemporary of Abu Ali ibn Sina lens and of mirrors focusing property right those who understand Ibn Sina in his work " Donishnoma " . the sun of the rays heat effect and of the lens optical property about the following wrote : « Magnifying glass using to burn therefore for harvest will be , then everyone on the side the light collector there is a point . This point is strong light up and heats up.”

Current at the time high temperature the sun ovens one how much countries (Algeria, Japan , France , USA, GFR and others have) Paraboloid mirror very big to size have to be need has been

cases the heliostat common mechanism with managed not so much big didn't happen one how many mirrors from the collection consists of by doing is taken . France in the south Pyrenees of the mountain range eastern in the part in Odeo built capacity was 1000 kW the sun stove , present at the time in the world the most big the sun is an oven . This is the sun in the oven of the heliostat himself above as we said , a lot numerous mirrors from the system consists of Various showed that different the sun in ovens conducted experiences that's it the sun oven in focus is located heat of the absorber temperature 30000 K, some in ovens and to 37000 K is enough We in Table 6.1 edge in hand built some the sun in ovens harvest done temperatures showing let's go

Abroad built the sun in ovens harvest done temperature

Oven is located state	Returner diameter	Harvest operating temperature (K)
France (Mont-Louis)	10.7 m	3720
France (Odeo)	It is 40 m high and 54 m wide	3889
Tashkent	2 m	3000
Moscow	1.5 m	3000
Tbilisi	0.9 m	3000
New York	1.5 m	3500

For example , the main one in Mont-Louis (France) . the sun in the oven one 60 kg per day near soluble materials (zirconium oxide , calcium zirconate , chromium , dolomite , aluminum oxide) is dissolved . Another one example let's bring in Odeo (France) . the most big the sun the oven is 12 mm thick plate in 4 min 40 sec half meter in length melting goes Smaller the sun in ovens , for example , Tashkent in the city built in a GU-2 oven (2 m in diameter) . equal to paraboloid mirror) steel , aluminum and their alloys melting and to welding about experiences held Yerevan in the city built 2 m in diameter projector type the sun in the furnace (of the heliostat size 2.5x3 m 2) quartz and blast furnace , marten and electricity arc in ovens used to the heat resistant materials melted of these substances melting temperature 2000-26000 C. This temperature the sun in the oven harvest to do can The usual melting in ovens , for example , electric in ovens much high the temperature harvest to do can But the sun ovens to them than one how much to the advantages has : the sun in ovens of heat to the object point to the character have , focal from the center of the spot a little get away with of the object temperature fast decreases . That's a lot big important have Because this without melting (or under investigation) material other substances with unnecessary reactions does not enter That's why for the sun furnaces very clean materials in preparation is using

It's difficult soluble oxide of materials new ones synthesis make, their exploitation features improve in order to light heat treatment giving, thermal-physical, spectral-optical characteristics to determine , pure materials get , new technique parts to the light stability learning such as issues high temperature conditions done is increased . In this laser and artificial heat sources has been ovens with one in line the sun energy concentrators are also wide is used. Above shown issues in solving, different spectral content strong light currents necessary when their use one by one right road is considered In these cases the most valid big sized The sun energy concentrators is to apply. UzR FA " Physics Sun " of IICHB capacity was 1000 kW big The sun Pechi (KQP) is like that is the source. materials It's difficult strong soluble assembled the sun rays under the influence of synthesis to do and study 1978 UzR FA Physics and Technology



institute (FTI). and this in the field of 1993 FTI and KQP one how many laboratories based on organize done

Material expert like Tashkent province Parkent district big the sun oven of the institute main scientific direction turned. KQP is automatic management to the system have has been heliostats area and focus zone (technological minor) a high density constant light flow harvest done complicated optics mechanical from the complex consists of Oven Tashkent 45 km away from the city of Parkent Tian Shan mountain in the district in the skirts located



in

Place geographical lat 41° 20', sea from the level height 1050 m. Heliostat area slope on the mountainside chess cells such as of the 62 heliostats

located consists of Their task day during mirror concentrator surface the sun rays with continuously light up is standing. All heliostats one different size and to the construction have The dimensions were 7.5x6.5 m of the heliostat returning flat surface with 195 mirrors element size is 0.5x0.5 m, thickness is 6 mm of facets consists of Facet returning layer back from the side aluminum powder in a vacuum spray, brand EMAK-5164 paint with to protect through harvest done Facet common The number is 12090, return of the area surface is 3022.5 m² ha equal to

Rotating slotted prison different in the form of light pulses 1 second and from him more than continuity with to get possibility gives Impulses automatic note to do system photometric gauge using received of impulses characteristic to measure up to 1 m has been to samples light flow , mechanical effect to give can of the CCP separately elements adjustment according to executable control-adjustment works , focal stain energetic and spectral characteristics change for focal stain analyzer radiometer energy density note reach automatic system , television measure system and technical to see systems is used . " Sun " object in the area The sun of radiation to change observation according to take went a lot yearly studies year during Sunny days the number is 250-270 days to be showed. Device of the elements average repetition the coefficient is 0.7 equal, time pass with in the air dust because of this amount up to 0.5 fall can, therefore for always prophylactic things done by increasing stand up necessary Returner of elements accuracy, mirror the surface taking into account the error in total, 35 angles minute in the interval shaking stands of the system such state 700 W/cm². The sun radiation 3-30 W/cm² step when falling with E=3-780 W/cm² energy illumination harvest to do provides. Of the oven common power is around 0.7 MW, focal stain maximum diameter and - 1.2 m, focus in the plane light flow of density spectral distribution, the temperature was 6000 K absolute black to the body is similar. But, the concentrator and of heliostats in its facets aluminum back from the side sprayed due to 0.7-11 μm of the spectrum in the field depths there is Current at the time KQP Create and in use acquired experience based on of heliotechnics the following directions according to complex scientific studies take is going

Summary: I am this the article in my writing in Uzbekistan big the sun ovens and whole in the world the sun ovens about data I collected and them common power about data I collected Most gratifying Tashkent region in Uzbekistan Parkent district big the sun oven electricity station that there is our fight can I am this in the article in my conclusion that's it my input can

- big The sun of devices optical elements designing;
- high temperature The sun energetic devices design, assembly, adjustment to do and to work to drop organize to do
- Mirror collection of systems (KYS). calculation to do methods work output;

- KYS returner surface control and straightening making, concentration area measure new methods Create; - heliostat chase system for new automatic programmable methods Create;
- various different mirror returning of elements characteristics to measure standardization;
- " Sun " complex in the base created unique test stand parameters improvement Materials science institute scientists by The sun in the oven high temperature oxides harvest to do about row studies is being executed. In the institute small, from heat expansion coefficient extreme in the fields to the heat Endurance such as unique exploitation and physical and chemical to the characteristics have There are more than 160 oxides synthesis will be done . This studies based on the following is taken:
- a lot functional ceramics (top temperature heaters, thermocouples, re converters, gas burners);
- constructive ceramics (plate, tube , chip and others);
- to the fire resistant ceramics (ceramic of engines elements, reinforcement shutters);
- Electronics, chemistry and another fields for optical, super permeable and another kind of ceramic materials .

Current at the time, many yearly from exploitation then, of KQP main optical-energetic characteristics project parameters suitable will come and this device unique research equipment as science and of technique fundamental and practical issues in solving important place holds

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