

Production of Composite Materials from Mycelium: Potential and Applications in Türkiye

Süleyman Bayramoğlu

Here is our 55-year JOURNEY



PEXpipe

BIO
TR
Biomimicry

BIO
IKUM
Kalmıyorsa hayat vardır



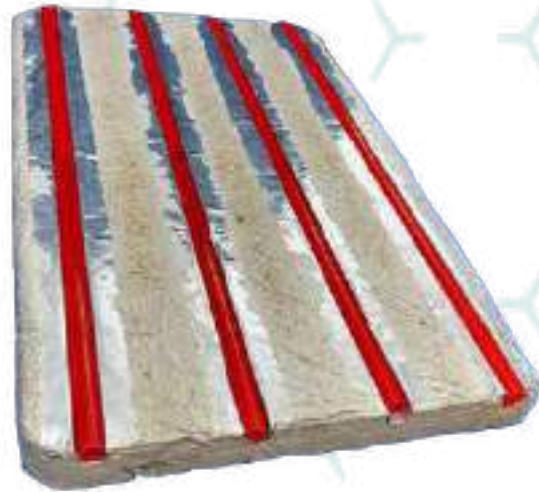
Q&E
SLAB

BioPEX
created by bioklim

BIO
WRAP
created by bioklim

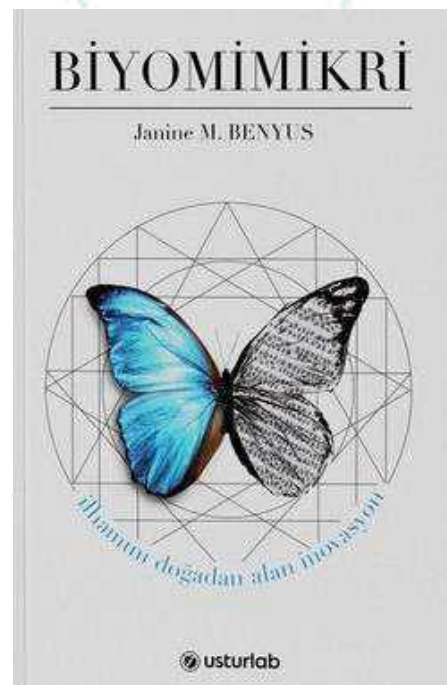
PEXpipe
pexapipe offers

COOL CEIL and **GREEN NATURE**



PEX^a pipe

Süleyman Bayramoğlu

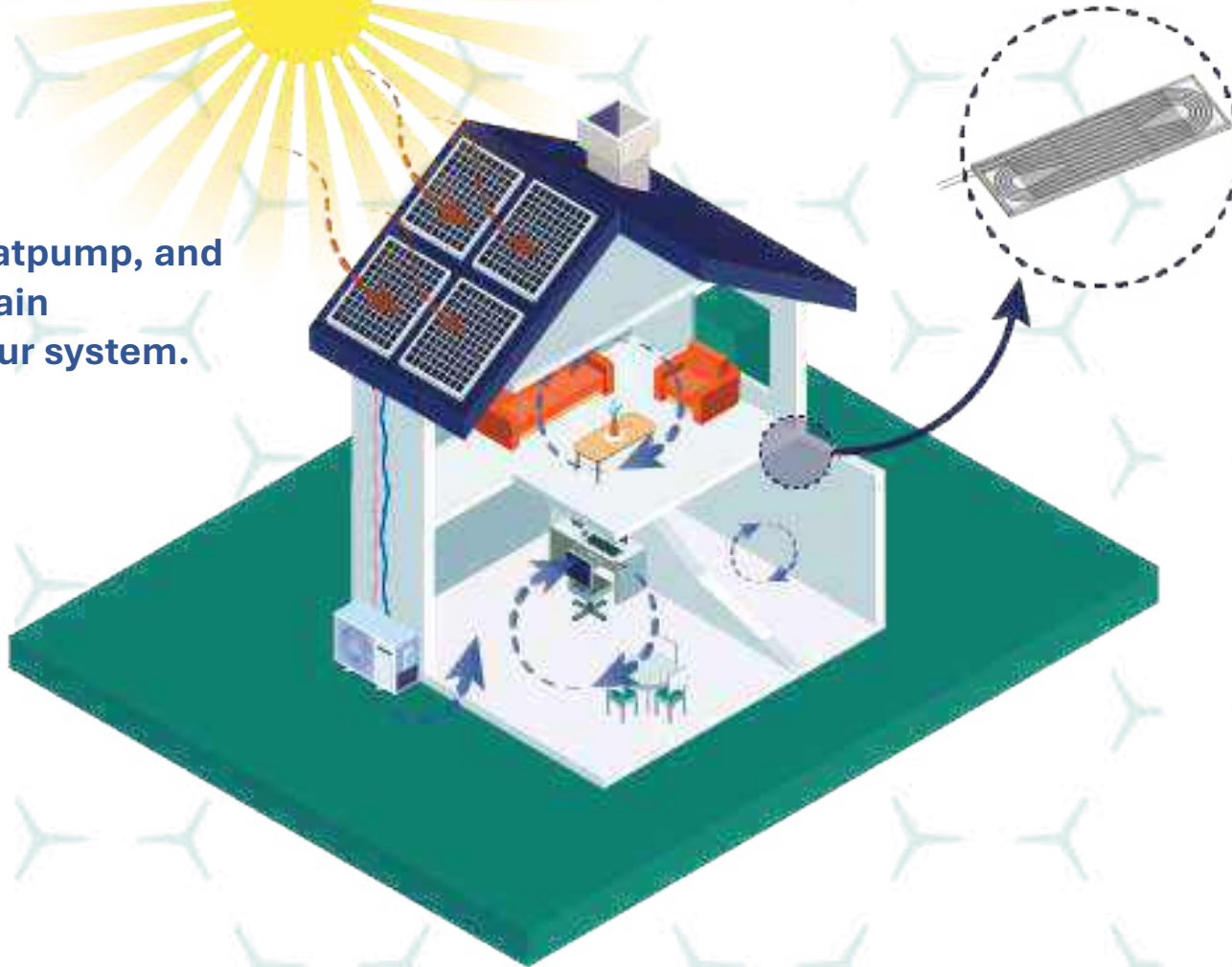


PEX pipe
Süleyman Bayramoğlu



The exciton coming from the sun transforms into Bioiklim with BIOPEX.

Solar panels, Heatpump, and Biopex are the main components of our system.

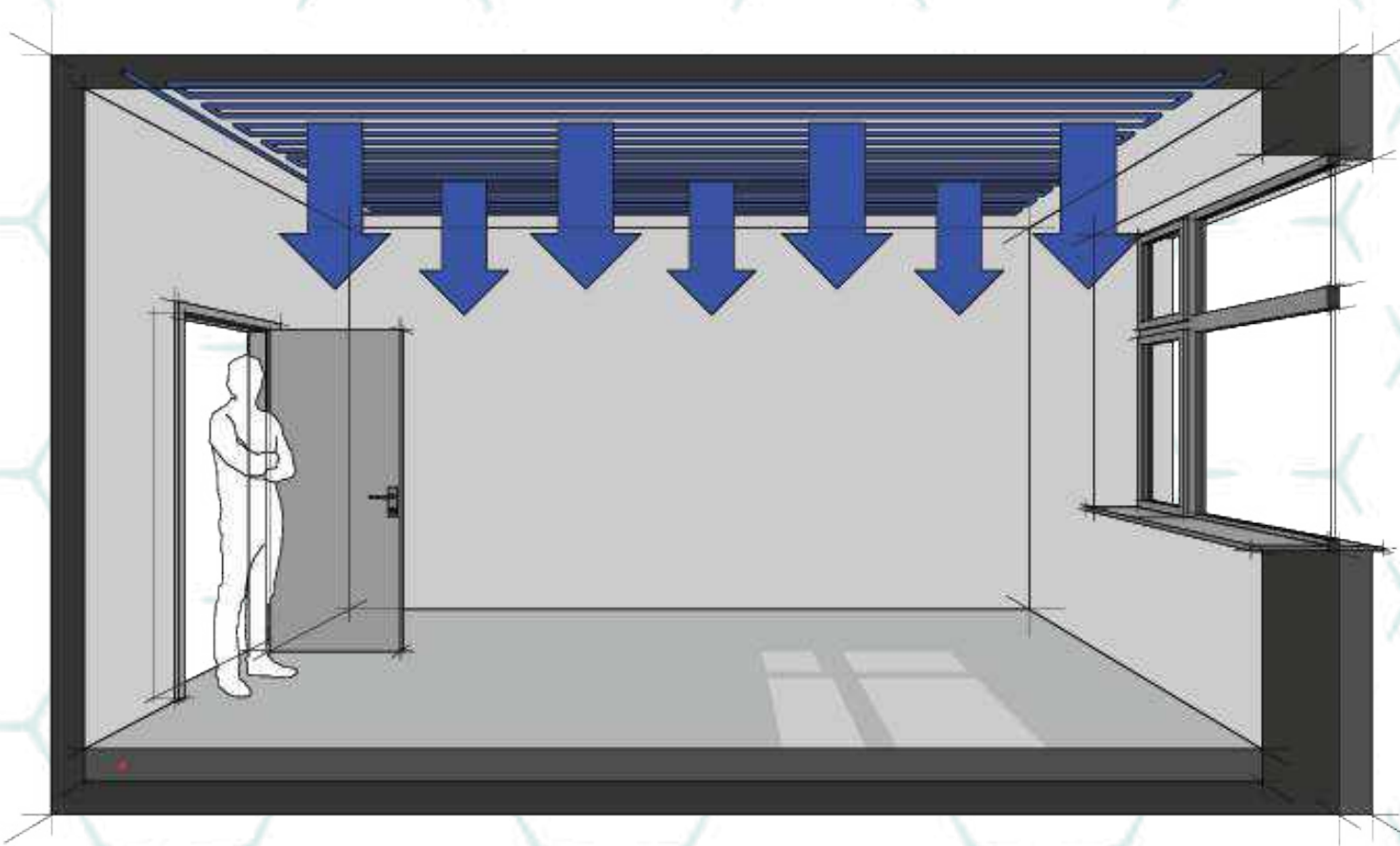


Introducing **Bioclimate**, which produces sustainable solutions by drawing inspiration from nature through biomimicry; here it is with the philosophy of

"If the Climate is Suitable, There is Life."

PEX^apipe

Süleyman Bayramoğlu



CoolCeil is a ceiling cooling system.

With this system, you can experience summer in the most comfortable and cool way.

CoolCeil is important in the future.

Bioclimate provides us with sustainable comfort.

PEX[®] pipe

Süleyman Bayramoğlu

BEFORE 40 YEARS, WE KNEW THIS



PEX pipe



... AND NOW



PEX pipe

Süleyman Bayramoğlu

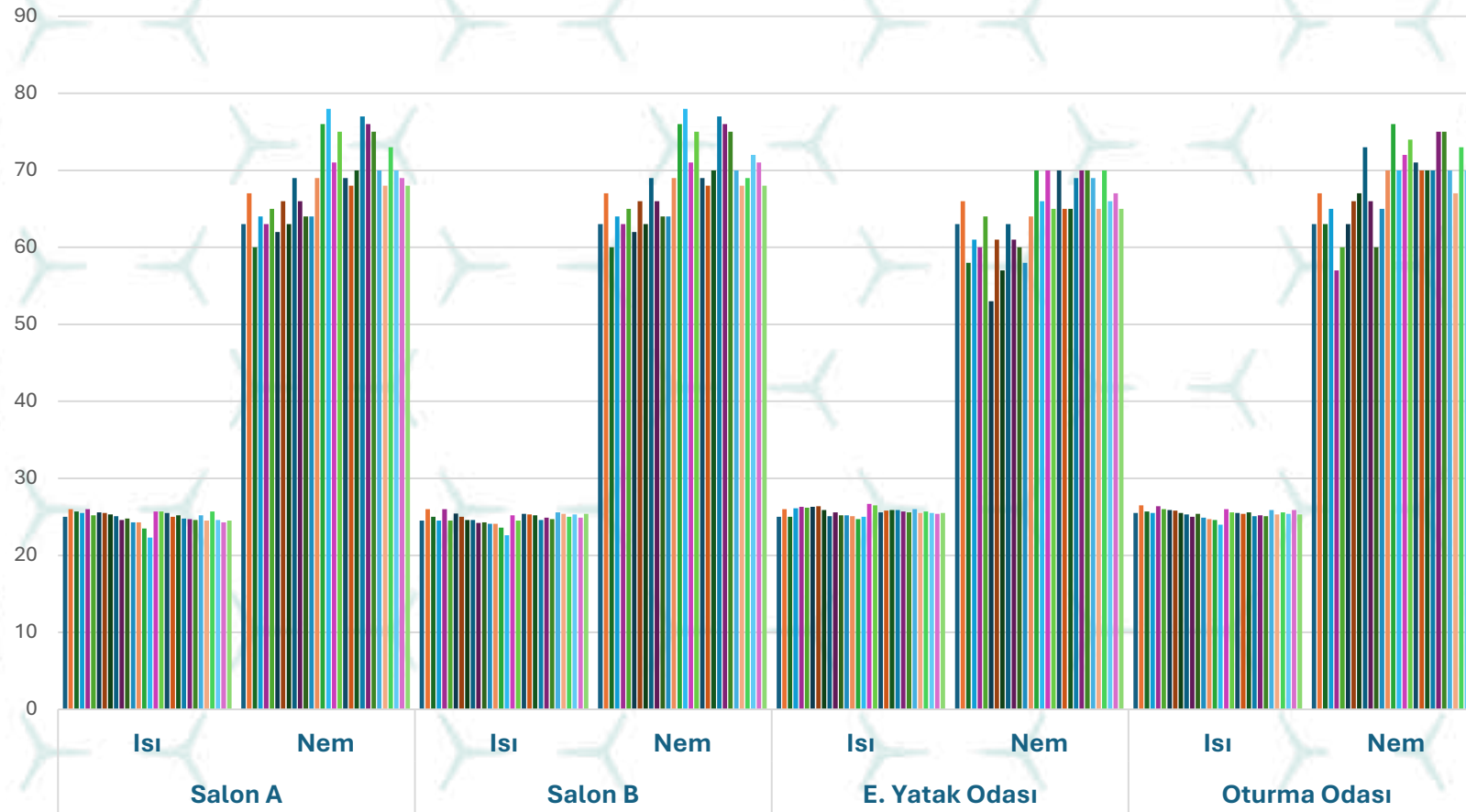


SB House,2024

PEX pipe

Süleyman Bayramoğlu

SB HOUSE COOL CEILING MEASUREMENTS



NOTE:

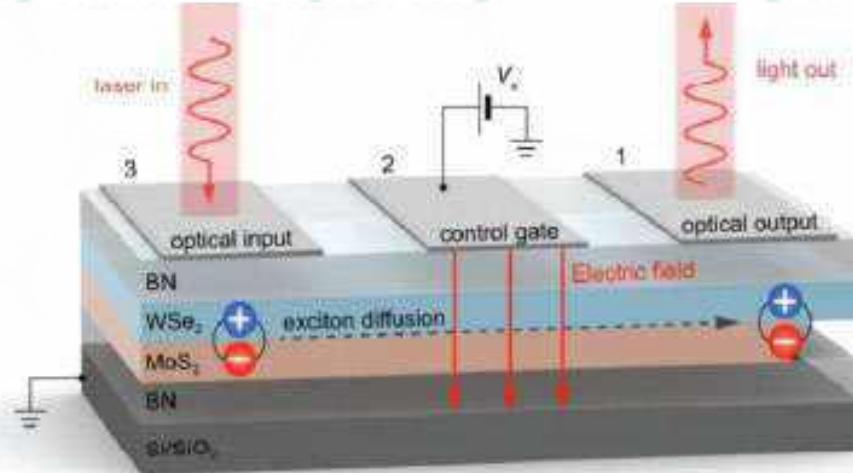
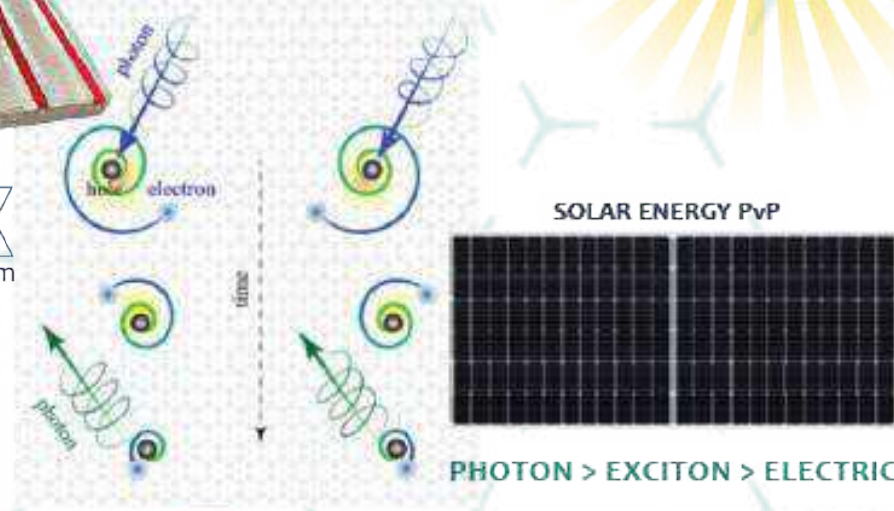
Measurements lasting 30 days resulted in a meeting room coolness of 24-25 C.

HP 20 C. The outside air was between 30-35 C.



BIOPEX PANEL (BP) = %100 BIOLOGIC (HEMP+ MYCELIMUM)

BIOIKLIM = PVP + AWHP + BP + PEXa



After extensive research, R&D efforts, and successful testing, **Biopex Composite Panel** has reached a producible state. Regarding thermal conductivity, **Biopex** is comparable to **Styrofoam**, but it excels in **fireproof** compared to Styrofoam.

Biopex demonstrates unique performance in heating and cooling systems on all surfaces, especially on the **ceiling**. This not only increases energy efficiency but also optimises building insulation. It minimises environmental impacts and reduces long-term energy costs.

PEX^a pipe

Süleyman Bayramoğlu



After long experiments, when we learned that **hemp** is the **most efficient** of the products used in composite materials, we decided to focus on this issue. In this context, you see the **hemp field** we cultivate in **Sinop and Samsun**

PEX[®] pipe

Süleyman Bayramoğlu





TÜRKİYE 2. KENEVİR SEKTÖR BULUŞTAYI

BULUŞTAY



27 HAZİRAN 2024
PERŞEMBE - 14.00

OMU Omtel
Sahil Tesisleri



When I took the hemp wood in my hand, I was amazed to see its **physical structure** and decided that the large space formed in it could be beneficial in **building insulation**.

PEX[®] pipe

Süleyman Bayramoğlu

Sinop Hemp Field



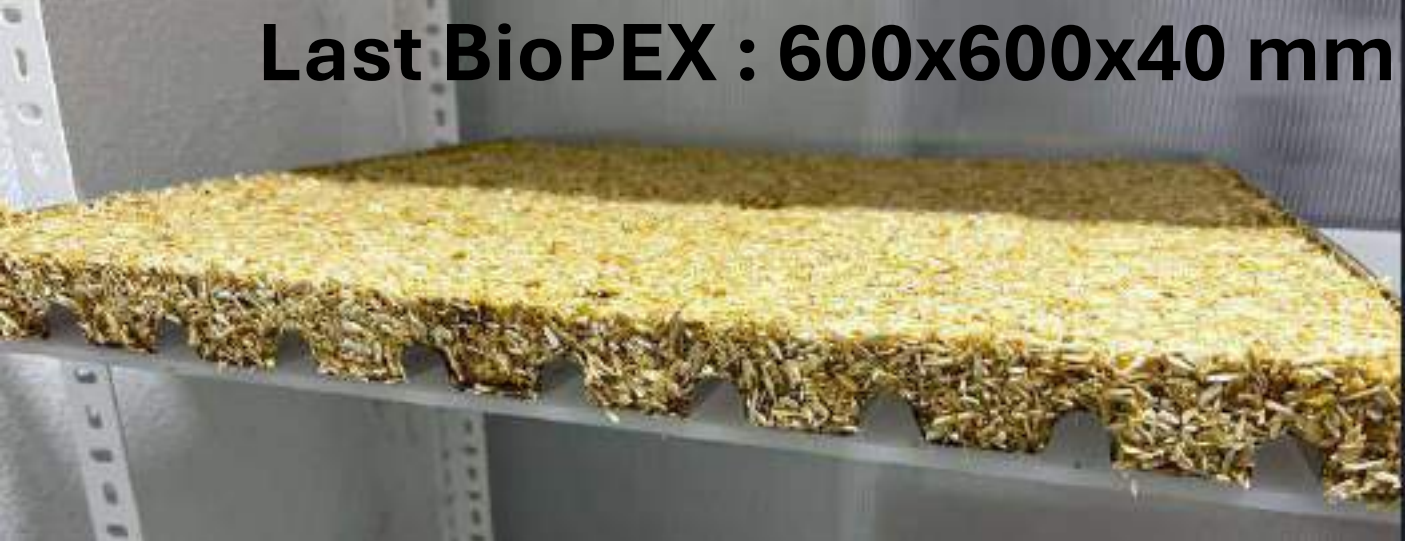
In the early years, I used the **traditional hemp fiber peeling method**. After a few years of **unsuccessful** attempts, I decided that the fiber should be sorted in accordance with the value of the wood.

PEX^a pipe

Süleyman Bayramoğlu



Last BioPEX : 600x600x40 mm



By trial and error, I obtained efficient **hemp crumbs** prepared in the desired size in a natural yellow color that does not contain **any bacteria**. Since then, we have been able to produce very successful composites. I would like to express my gratitude to **ASTAB Makine** (Izmir) for providing us with this opportunity.

PEX^a pipe

Süleyman Bayramoğlu



Although I made an R&D agreement with Aydın University, after entering it, I was surprised to discover that universities are not science centres at all. For this reason, I set up a 100 m2 laboratory under my house. My biggest advisor in this study, whose name I must mention with gratitude, was **Ms. Semra EROL**.



PEX^apipe

Süleyman Bayramoğlu



After much trial and error, I learned that the best type of binding fungus is the **Ganoderma group**. For the past 4 years, I have been using the mycelia of this mushroom.

Since I don't like to keep secrets like other producers and start-ups.

I have made it **my mission** to open all my inventions and methods (patents) to young people between **the ages of 15-35**.

PEX pipe

Süleyman Bayramoğlu



An example of our successful **living tissue** duplication processes.

PEX^a pipe

Süleyman Bayramoğlu



I realized the most miraculous result of my work in the field of construction for more than half a century when I discovered the **fireproof** of **Biopexs**.



PEX^a pipe

Süleyman Bayramoğlu



We are grateful and thankful to **Ganoderma Lucidum** for providing these beautiful links.



PEX^a pipe

Süleyman Bayramoğlu



Experiments with different
sizes of hemp at various
times

PEX^apipe

Süleyman Bayramoğlu



Grow It
Yourself® Kit
\$34.99



Into the
Woods Kit - In
partnership
with Melany
Kahn
\$45.99



Apart from us, we also made a trial on the containers of many organizations such as trinkets, packaging, etc. On the side, the front and back of the egg carrier are shown.

Ecoviative, one of the pioneers of this industry, also sells packaged products at a **price of \$ 30-50 / kg.** Fueling the profit drive in the world.

PEX pipe

Süleyman Bayramoğlu



We have come a long way in our work with **Molecular Biologist Zehra AĞIRTIŞ**, with whom we have been working for the last two years in our second-generation laboratory.

Thank you for your support and efforts in **micellar production, composite material production and R&D studies.**

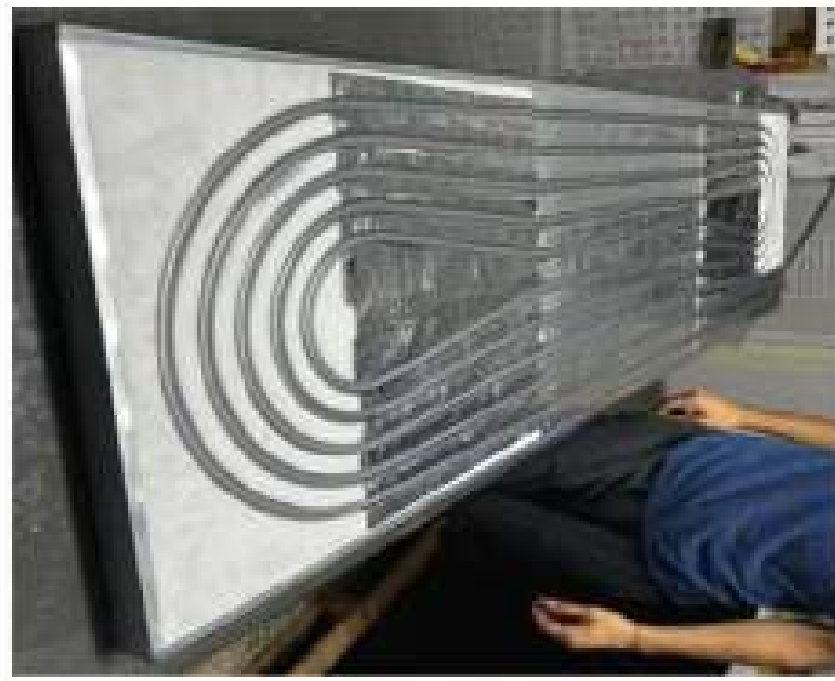


PEX[®] pipe

Süleyman Bayramoğlu



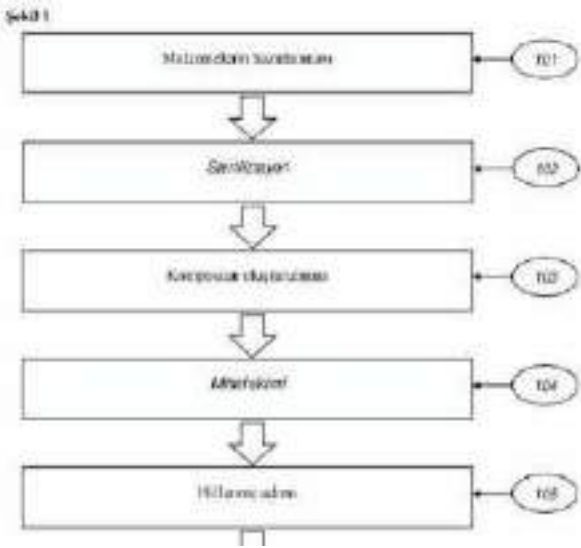
After 10 years of work for **Biopex**, we have achieved successful products. We started the **Field Tests** by doing a mixed application in my own home. I hope that the integration processes into the structure will be completed in a short time.



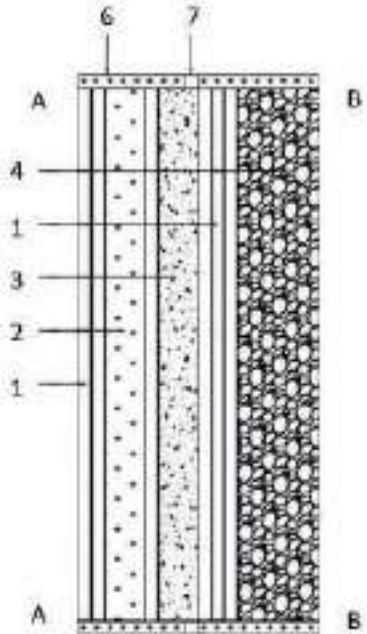
PEX^a pipe

Süleyman Bayramoğlu

There have been **two patent** applications across Turkey. It was taken by Bolu Technical High School teacher **Mehmet Celtek** and **Tepe Group**.



67557/7	BİLİM SANAT MERKEZİ	TABAKLAR MAH. ANADOLU SK. 7 /TÜRKİYE
Buluş Sahipleri		
Kısay No	İsim	
6923353	MEHMET ÇELTEK	
Buluş Bilgileri		
Buluş Başlığı	MANTAR ESASLI ISI YALITIMLI YANICINA DAYANIKLI KOMPOZİT MALZEME	



ŞEKİL 1

Buluş Bilgileri

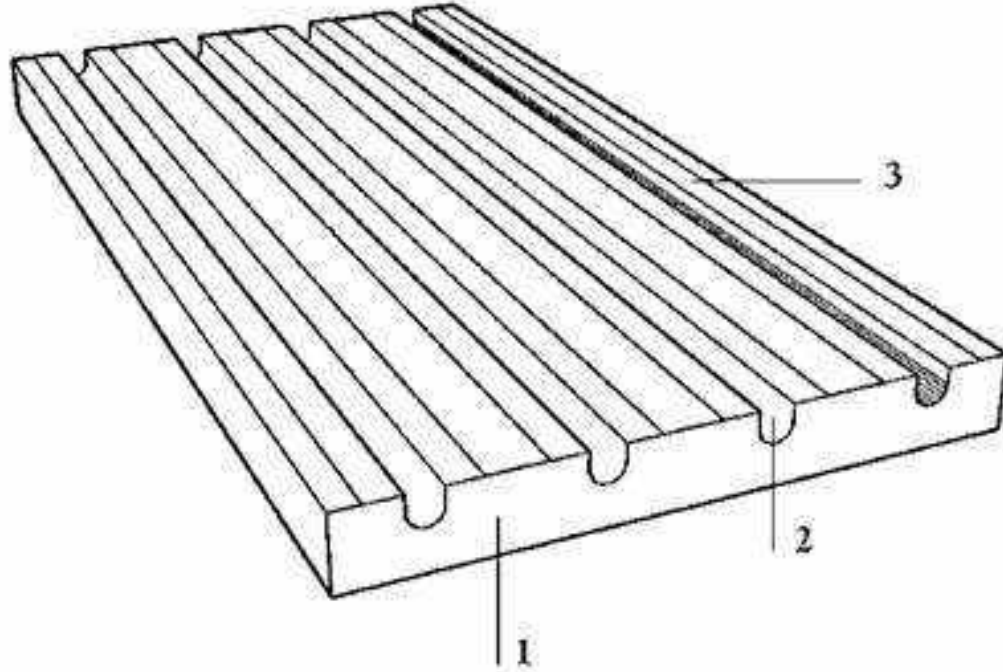
Buluş Başlığı: MANTAR ESASLI ISI YALITIMLI YANICINA DAYANIKLI KOMPOZİT MALZEME

Buluş Özeti:

ÖZET: MANTAR ESASLI ISI YALITIMLI YANICINA DAYANIKLI KOMPOZİT MALZEME buluşu; çok katlı, arpa çamuru, çam çamuru ve çavdar çamuru malzemelerinin içiyle mantar hiflerinin (mikelyum) sacına (101) ile oluşan ısı yalıtımlı ve yangına dayanıklı kompozit malzeme ile ilgilidir. Kompozit malzeme; mantar misellerinin gelişmesi için uygun malzemelerin hazırlanması (101), tüm bileşenlerin steni edilmesi (102), malzeme ve bileşenlerden kompozitün oluşturulması (103), misel ekleminin (104) yapılması, uygun sıcaklıkta misel gelişimi başlatılmasına (hiflenme) (105) kadar beklenmesi, kompozitün alınarak kalıplara yerleştirilmesi (106), tekrar gelişim ortamına alınması ve misel sayısının (107) gerçekleştirileceği kadar beklenmesi, sarım sarımında finrtlama işlemiyle (108) misel gelişiminin durdurulması süreçleri ile elde edilmiştir.

Patent Sahibi : TEPE GRUBU

The subject of the Biopex patent dated 29/09/2023

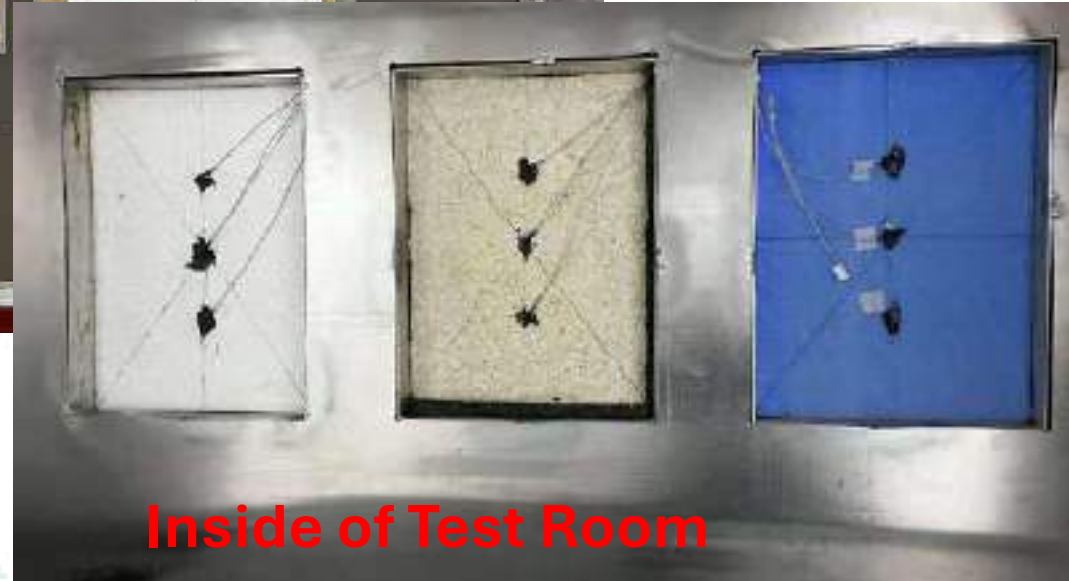


Interest: Your application dated 29/09/2023, numbered **2023/012228** and reference **30322.02**.

Your patent application attached to your registered request has been received by our Institution and dated **29/09/2023** and
It was registered in the Registry with the number 2023/012228.



Thermal insulation values measuring device, which we prepared the first tests of our product with our own means. Samples were measured with a total of **18 sensors + 2** sensors inside and outside the device.



Inside of Test Room

PEX pipe

Süleyman Bayramoğlu

22/MART/2023 TEST RESULT TABLE



BioPEX comparative measurement report with two products in use, EPS and XPS.

Heat Conduction Coefficients λ

- * EPS 0,039
- * XPS 0,036
- * Biopex 0,032

Tablo 1: Öncüki tabanlık ve buluşta kullanılan ürünlerin ısı iletim katsayıları ve yoğunluk karşılaştırması

Materyal	Isı İletim Katsayısı (W/mK)	Yoğunluk (kg/m³)
Taşyünü	0,043	320-1000
Bakalınsız Cam Yünü	0,045	130
Strofor	0,036	20
Alüminyum	203	2.700
Krom	111	7.200
Gez Beton (C20/C30)	0,11	350
Kenevir	0,040-0,050	20-68
Regolit	0,030	1540
Mantar miselyumu	0,05****-0,07*****	380*****
Nişasta	0,030	1500

PANEL NAME		XPS BLUE						BIOPEX						EPS WITE					
INSIDE/OUTSIDE		OUTSIDE			INSIDE			INSIDE			OUTSIDE			OUTSIDE			INSIDE		
SENSORY NO		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	8,00	18,00	18,60	18,00	55,00	56,00	56,00	41,70	47,00	45,00	18,00	18,30	18,50	19,00	20,00	20,00	57,00	59,00	59,00
	İÇÖRT-DİŞÖRT-FARK	40,00	14,00	26,00	18,20	55,67	37,47				44,57	18,27	26,30				19,67	58,33	38,67
2	9,00	17,60	17,60	17,60	35,00	35,10	35,00	34,00	34,60	34,00	17,10	17,10	17,30	17,30	17,30	17,30	33,00	32,00	31,00
	İÇÖRT-DİŞÖRT-FARK	34,00	14,00	20,00	17,60	35,03	17,43												
3	10,00	18,20	18,00	18,10	34,30	33,90	33,00	31,20	31,20										
	İÇÖRT-DİŞÖRT-FARK	39,40	15,00	23,60	18,10	33,73	15,63												
4	11,00	17,80	17,60	17,50	29,60	29,50	29,70	29,10	29,10										
	İÇÖRT-DİŞÖRT-FARK	39,30	15,30	24,00	17,63	29,60	11,97												
5	12,00	17,80	17,70	17,80	29,80	29,80	28,80	29,60	29,50										
	İÇÖRT-DİŞÖRT-FARK	34,70	15,50	19,20	17,77	29,47	11,70												
6	13,00	18,10	18,00	18,00	30,20	30,10	30,00	30,10	30,00										
	İÇÖRT-DİŞÖRT-FARK	34,40	15,30	19,10	18,03	30,10	12,07												
7	14,00	18,10	18,00	17,80	31,10	31,00	30,00	31,40	31,30										
	İÇÖRT-DİŞÖRT-FARK	34,70	15,50	19,20	17,97	30,70	12,73												
8	15,00	17,50	17,30	17,30	28,20	28,30	29,10	30,00	32,60										
	İÇÖRT-DİŞÖRT-FARK	35,10	15,80	19,30	17,37	28,53	11,17												
9	16,00	18,30	18,10	17,90	30,20	30,00	30,00	29,60	29,70	29,60	18,30	18,20	18,20	16,90	16,90	17,40	34,40	37,00	36,70
	İÇÖRT-DİŞÖRT-FARK	35,00	15,50	19,50	18,10	30,07	11,97				29,63	18,23	11,40				17,07	36,03	18,97
10	17,00	18,20	18,00	18,00	35,00	34,80	35,00	33,40	33,30	33,00	18,20	18,10	18,20	17,30	17,40	17,60	31,80	31,80	30,50
	İÇÖRT-DİŞÖRT-FARK	33,20	15,40	17,80	18,07	34,93	16,87				33,23	18,17	15,07				17,43	31,37	13,93
				20,77			15,90						14,55						17,41

Tablo 1. Öncelikli teknik ve buluşta kullanılan ürünlerin ısı iletim katsayıları ve yoğunluk karşılaştırması

Malzeme	Isı İletim Katsayısı (W/mK)	Yoğunluk (kg/m³)
Taşyünü	0,043	33** - 100***
Bakalırsız Cam Yünü	0,045	130
Strofor	0,036	20
Alüminyum	203	2.700
Krom	111	7.260
Gez Beton (C2/C30)	0,11	350
Kenevir	0,040-0,050	20-68
Regolit	-----	1540
Manter miselyumu	0,05**** - 0,07*****	390*****
Niçasta	-----	1500

PEX pipe

Süleyman Bayramoğlu

BEFORE 40 YEARS, WE KNEW THIS



FINALLY:

As someone who has fit about 10 patents into my 55 years of business life, the most difficult birth took place in **July 2024, which lasted 14 years.**

We were finally able to test ceiling cooling, **which was based on years of theoretical work.**



PEX pipe



... AND NOW

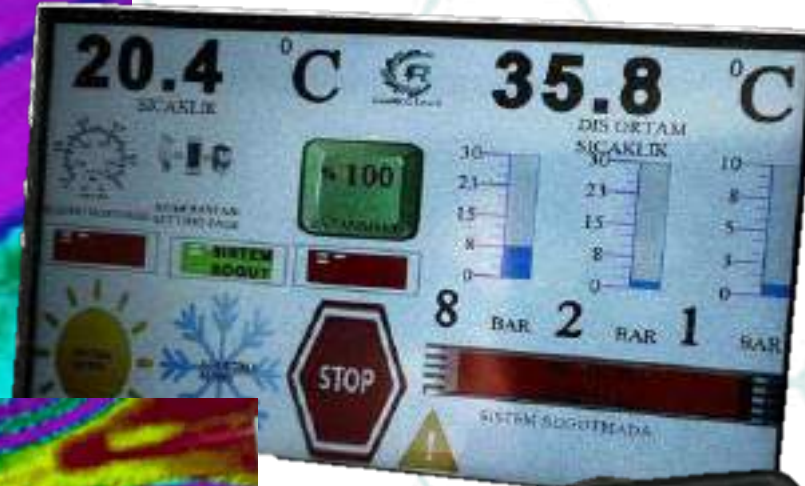
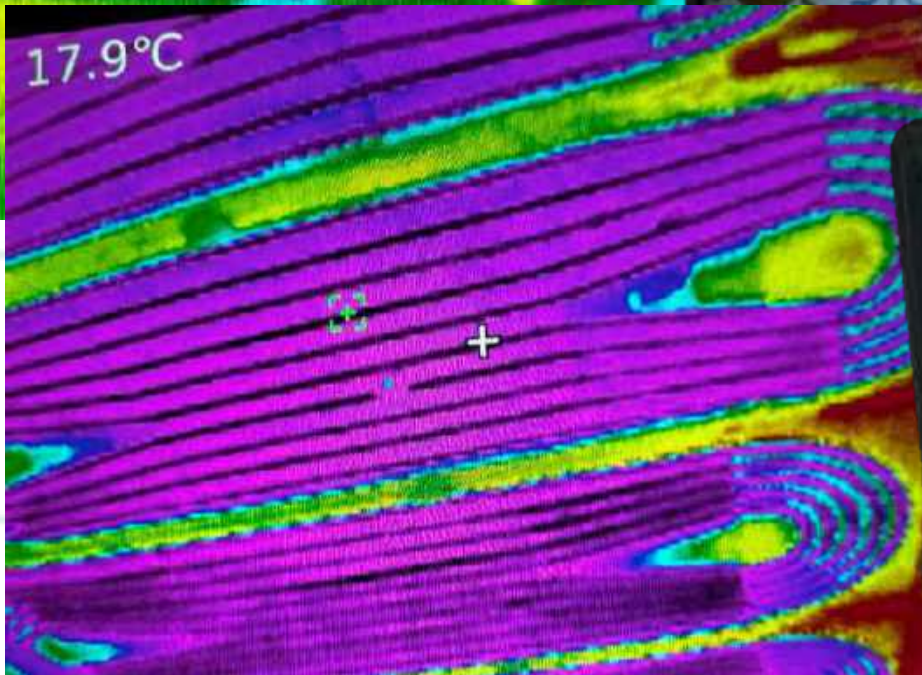
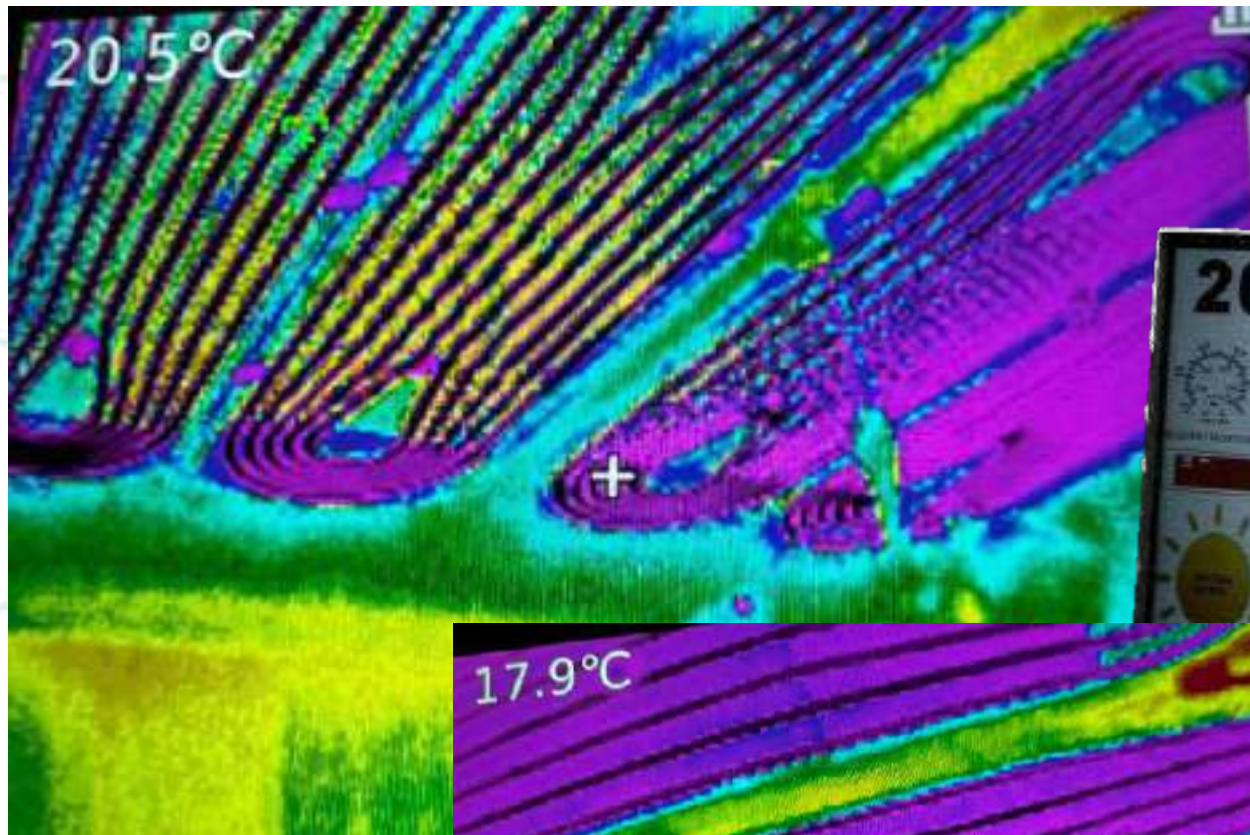


PEX pipe

Süleyman Bayramoğlu



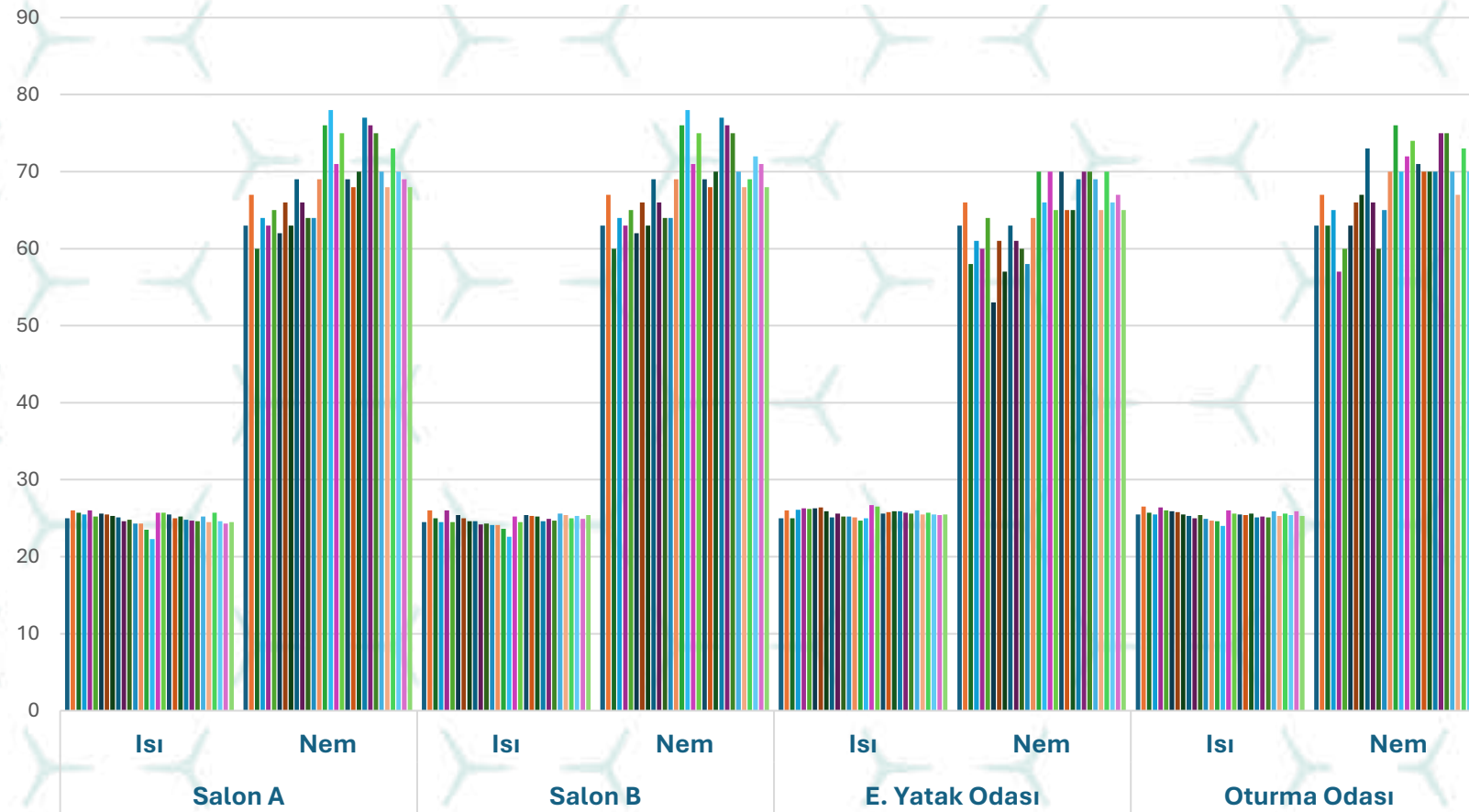
As you can see here, various measurements have been made. You see a few that I consider important. With the **infrared camera**, you see the performance of the **Data Heatpump** and the **digital heat-humidity meter** in the room.



PEX pipe

Süleyman Bayramoğlu

What is the problem here?



NOTE:

Measurements lasting 30 days resulted in a meeting room coolness of 24-25 C.

HP 20 C. The outside air was between 30-35 C.



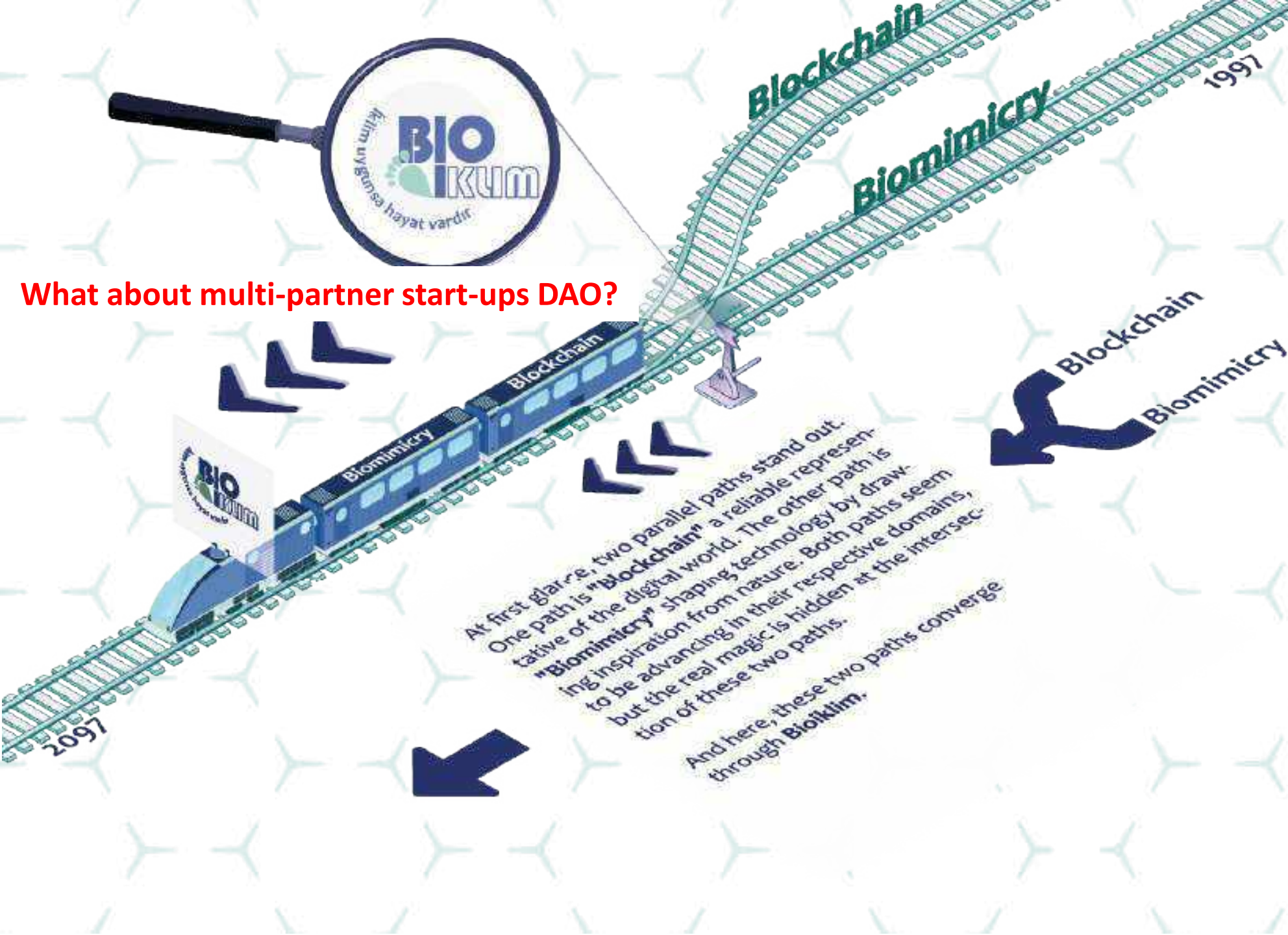
Suleyman BAYRAMOGLU acquired **Future Literacy** skills in 1961 and rapidly designed the advancing future train. He produced **room thermostats** and **automatic control systems** as required by his heating works. Thus, in 1996, he incorporated the concept of **IoT (a pioneer in Blockchain)**.

In 1997, the **Biomimicry** approach was initiated by **Janine Benyus** into the tracks of the designed train, progressing towards the future.

He has allowed us to set a solid goal **for the next 100 years** and create a forward-looking vision.

PEX^a pipe

Süleyman Bayramoğlu



At first glance, two parallel paths stand out. One path is "Blockchain" a reliable representative of the digital world. The other path is "Biomimicry" shaping technology by drawing inspiration from nature. Both paths seem to be advancing in their respective domains, but the real magic is hidden at the intersection of these two paths. And here, these two paths converge through **Bioiklim**.

What about multi-partner start-ups DAO?



THANKS

To contact us and get information about our products:

www.pexa.com.tr

To follow our articles in the field of Biomimicry:

www.biotr.org



PEX^a pipe

Süleyman Bayramoğlu

+905326110392