



AZIPOD

ELECTRIC SERVO PROPELLER

BUSINESS PLAN & ESCAPE LOST PLAN

12'000'000EURO TO 20'000'000 EURO

RBTC@S MAKINA İMALAT SAN. ve TİC LTD. ŞTİ.

Tic Sic No: 169091-5 Mersis No: 0734165493600001

Pendik V.D. 734 165 4936

Best Regards / с уважением

Aydın AYDEMİR

Kurucu / Co-Founder / Соучредитель

Makina Mühendisi / Mechanical Engineer

Call: 0090 555 553 0720

e-Mail: eng.aydinaydemir@gmail.com

aydin@rbtcs.com.tr

Adress: TEKNOPARK İSTANBUL C BLOK Sanayi Mah.
No:1/9A 34906 Kurtköy PENDİK İSTANBUL (SAW Sabiha
Gokcen Airport Counter)

RBTC^{CS} AZİPOD INVESTMENT PLAN

Dear KATAPULT VENTURE CAPITAL BOARD OF DIRECTORS.

I attached RBTC^{CS} AZİPOD INVESTMENT PLAN.pdf

Please invite us, teams, zoom meeting talking about this plan.

We designed Turkey first CPP (Controlled Pitch Propelled) in Milper Propellers at 2010. Project invested in SSB (Turkish Government).

We developed Pitch Calculation Software tool.

Our engineering heritage comes from Ord. Prof. Dr. Ata NUTKU.

Azipod my project partner and my teacher Prof. Dr. Alican TAKINACI. Istanbul Technical University have got test validation and verification Pool LABOROTY. Dr. Takinacı is Co-Founder of ITU Test Pool.

<https://angmdl.itu.edu.tr/>

Our designed **VALIDATED MORE THAN %96** between real life scale model. Before we are simulated NUMECA FINE MARINE.

Dr. Takinacı; Azipod Project and company shareholder partnership 20%

Aydın AYDEMİR Azipod Project and company shareholder partnership 20%

VentureCapital Investor Found Azipod Project and company shareholder partnership %60

Saygılarımla... / Best Regards... / Mit freundlichen Grüßen... / с уважением...

Aydın AYDEMİR

Makina Yüksek Muhendisi / Mechanical MSc. Engineer

Co-Founder of RBTC^{CS}

Whasapp: 0090 555 553 0720

e-Mail: aydin@rbtcs.com.tr

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[https://www.facebook.com/eng.aydinaydemir?locale=tr TR](https://www.facebook.com/eng.aydinaydemir?locale=tr_TR)

Adress:TEKNOPARK İSTANBUL C BLOK Sanayi Mah. No:1/9A 34906

Kurtköy PENDİK İSTANBUL

(SAW Sabiha Gokcen Airport Counter)

Tax Code: Pendik VD. 734 165 4936

IBAN: TR42 0001 0007 8495 4522 5050 01

Ziraat BANK Hesap No: 784 - 9545 2250

Swift Code: TCZBTR2A

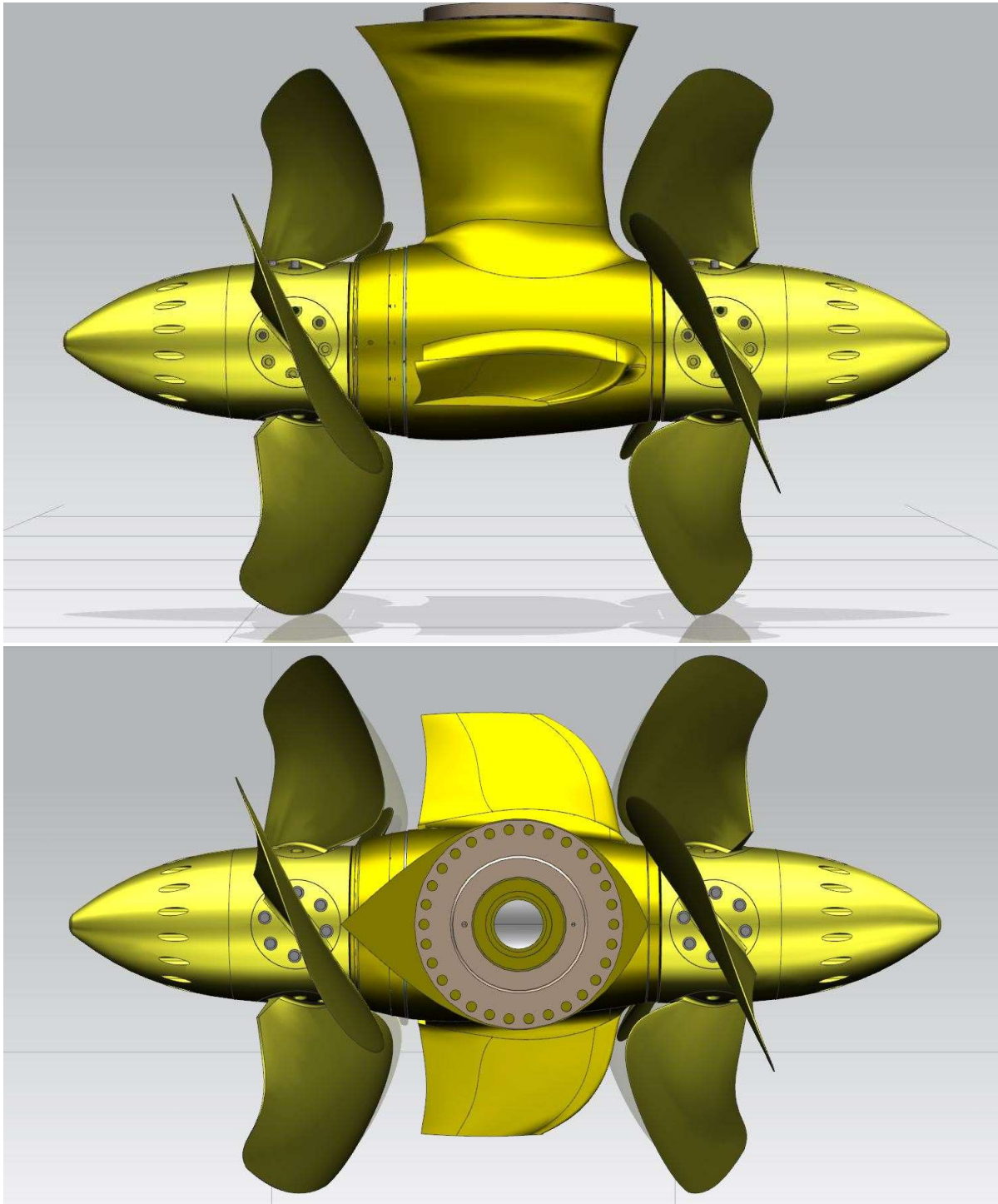
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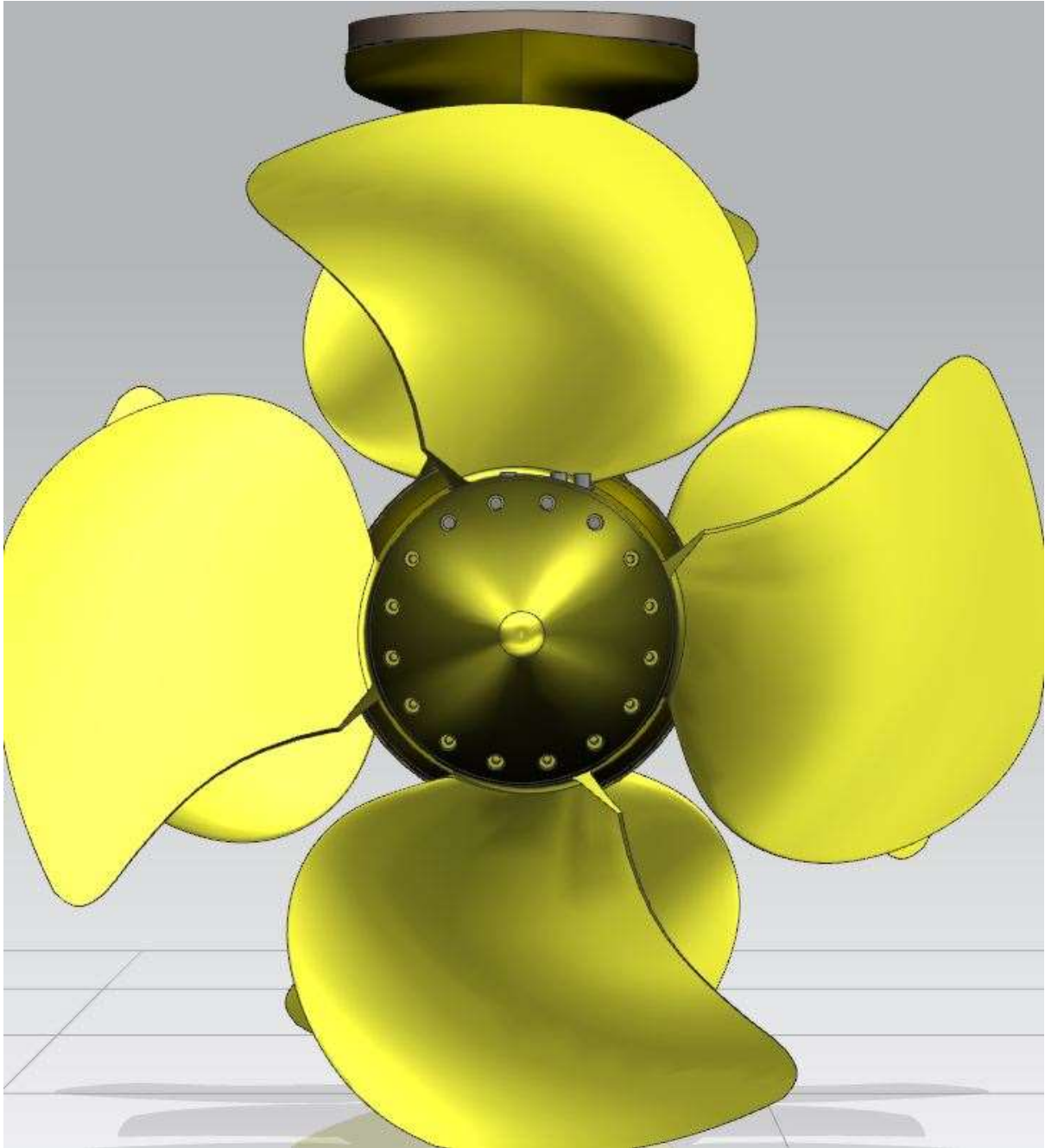
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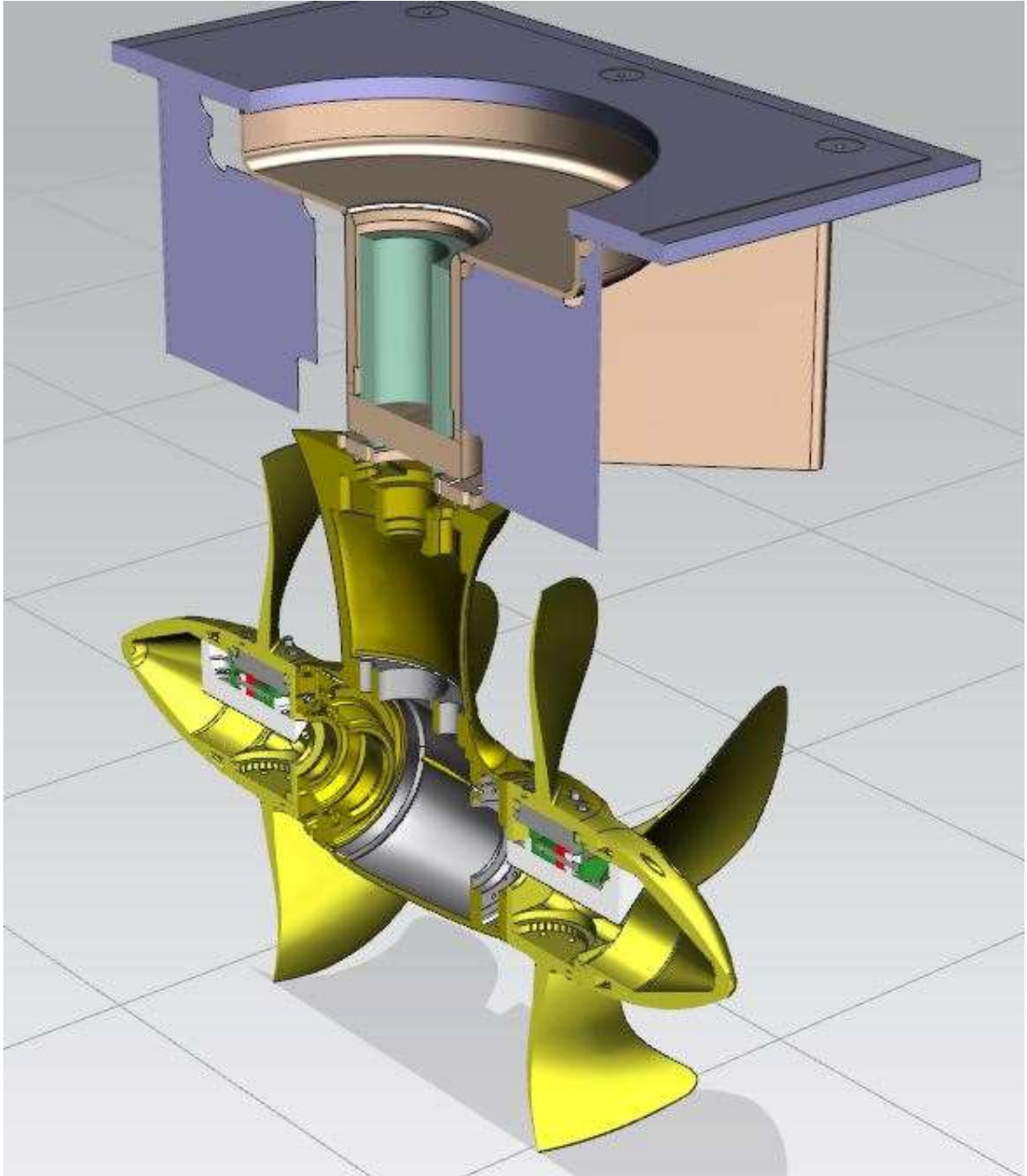
https://www.youtube.com/watch?v=WKNPz_nL254&t=13s

<https://www.youtube.com/@aydinaydemir327>

<https://rbtcs.com.tr/medina-umbrella>







TÜRKİYE'NİN İNOVASYON MERKEZİ

300

AR-GE FİRMASI

5000

AR-GE ÇALIŞANI

1500

AR-GE PROJESİ



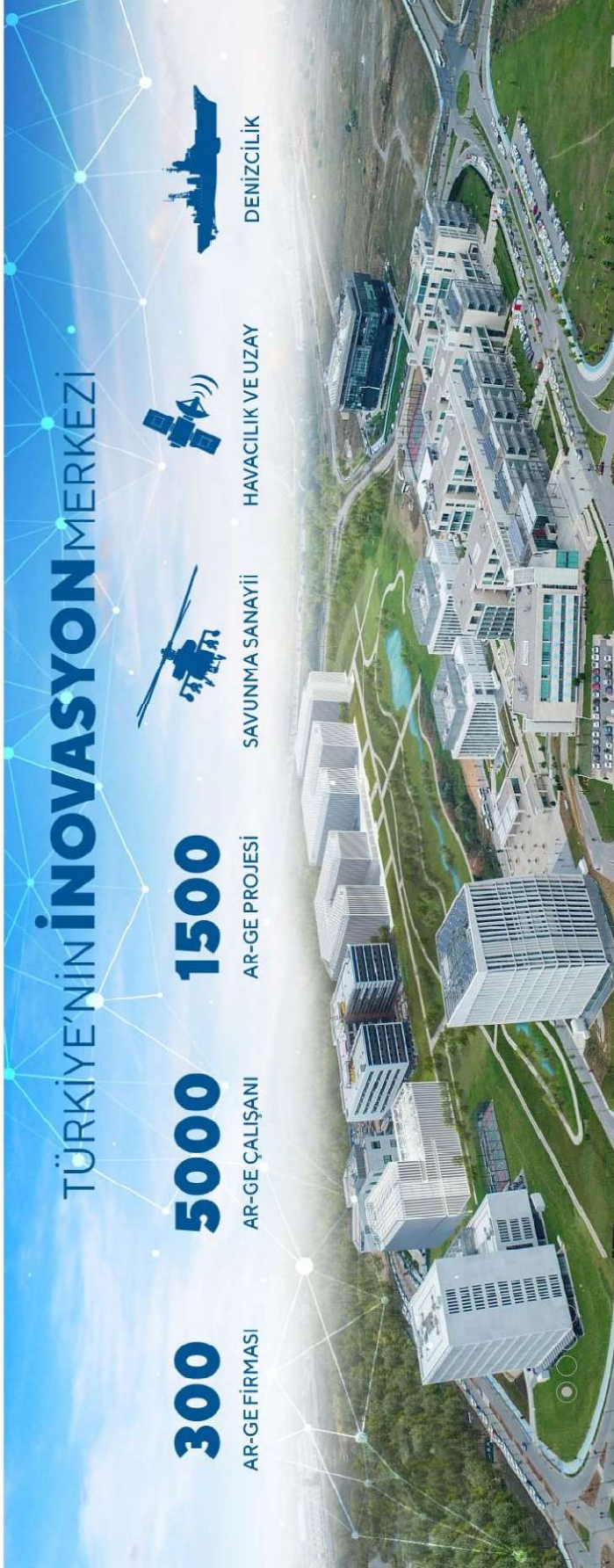
SAVUNMA SANAYİİ



HAVACILIK VE UZAY



DENİZCİLİK



EXPERIENCE

Our company RBTCS; is founded by Milper PROPELLER SAN. R & D Engineers.

Facebook Company Link:

https://www.facebook.com/milperpropeller/?_tn_=%2Cd%2CP-R&eid=ARBnc8gBE4ed5rWXlq5SqCODHjq3EP43Mi9OIx049DUUM1-GZndKEcjm9NNEoOfpod13w401GQFse2UD

Our team / Our colleagues

Prof Dr. Aican TAKINACI ; takinaci@gmail.com; takinaci@itu.edu.tr; 0090 536 368 03 54

Mak. Mh. Aydın AYDEMİR ; eng.aydinaydemir@gmail.com; aydin@rbtcs.eu; 0090 555 553 0720

**Dr. Takinacı; Azipod Project and company shareholder partnership
20%**

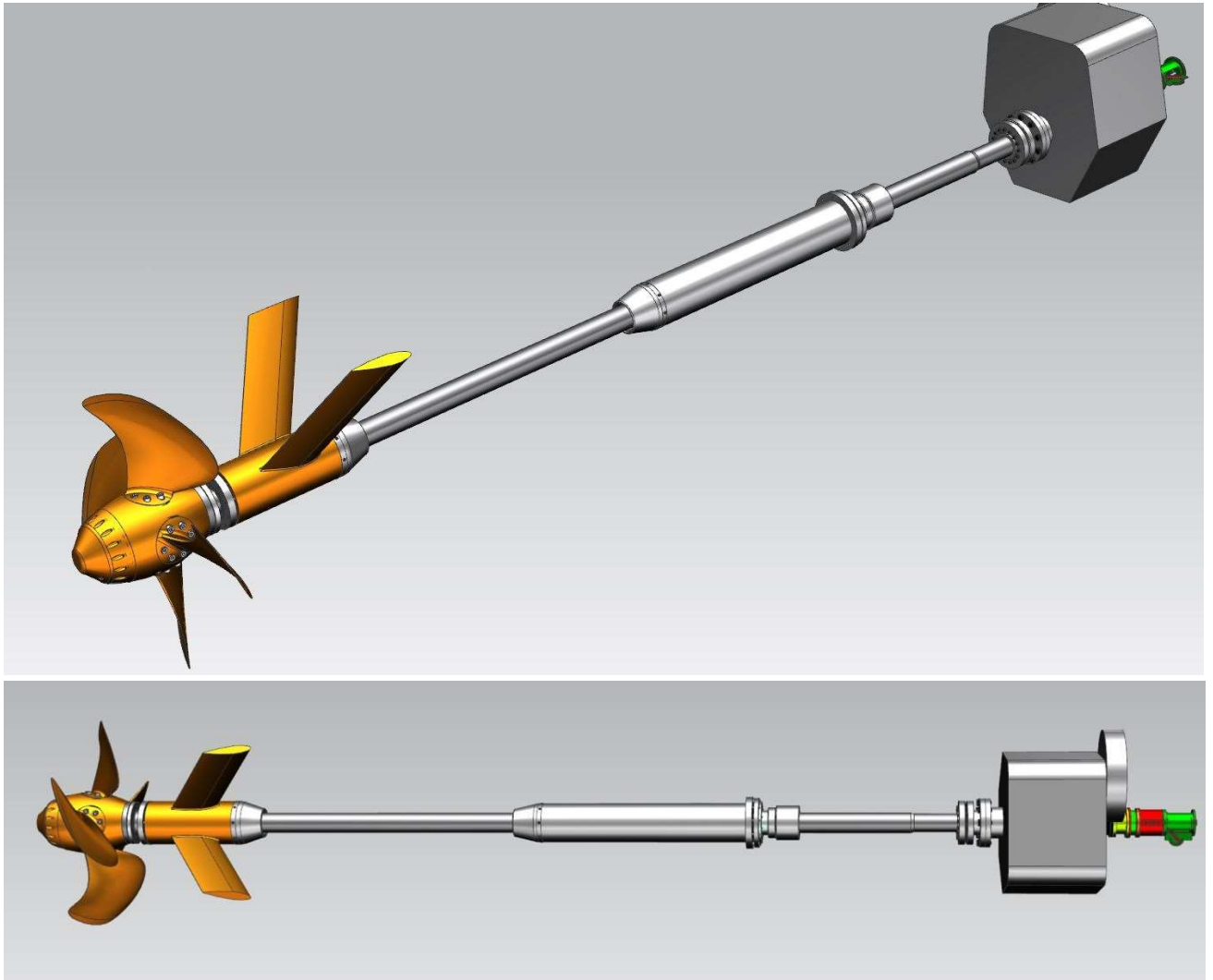
**Aydın AYDEMİR Azipod Project and company shareholder
partnership 20%**

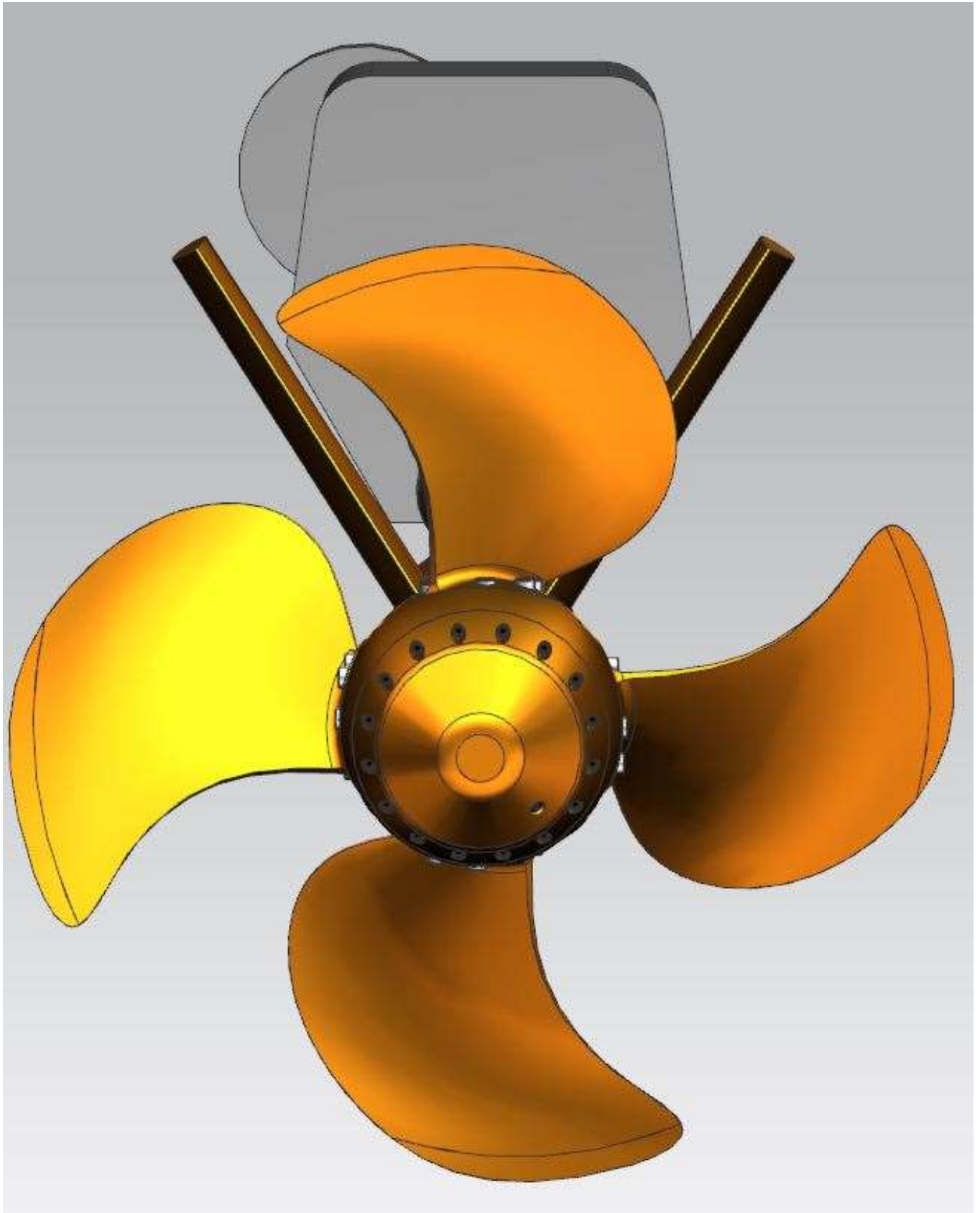
**VentureCapital Investor Found Azipod Project and company
shareholder partnership %60**

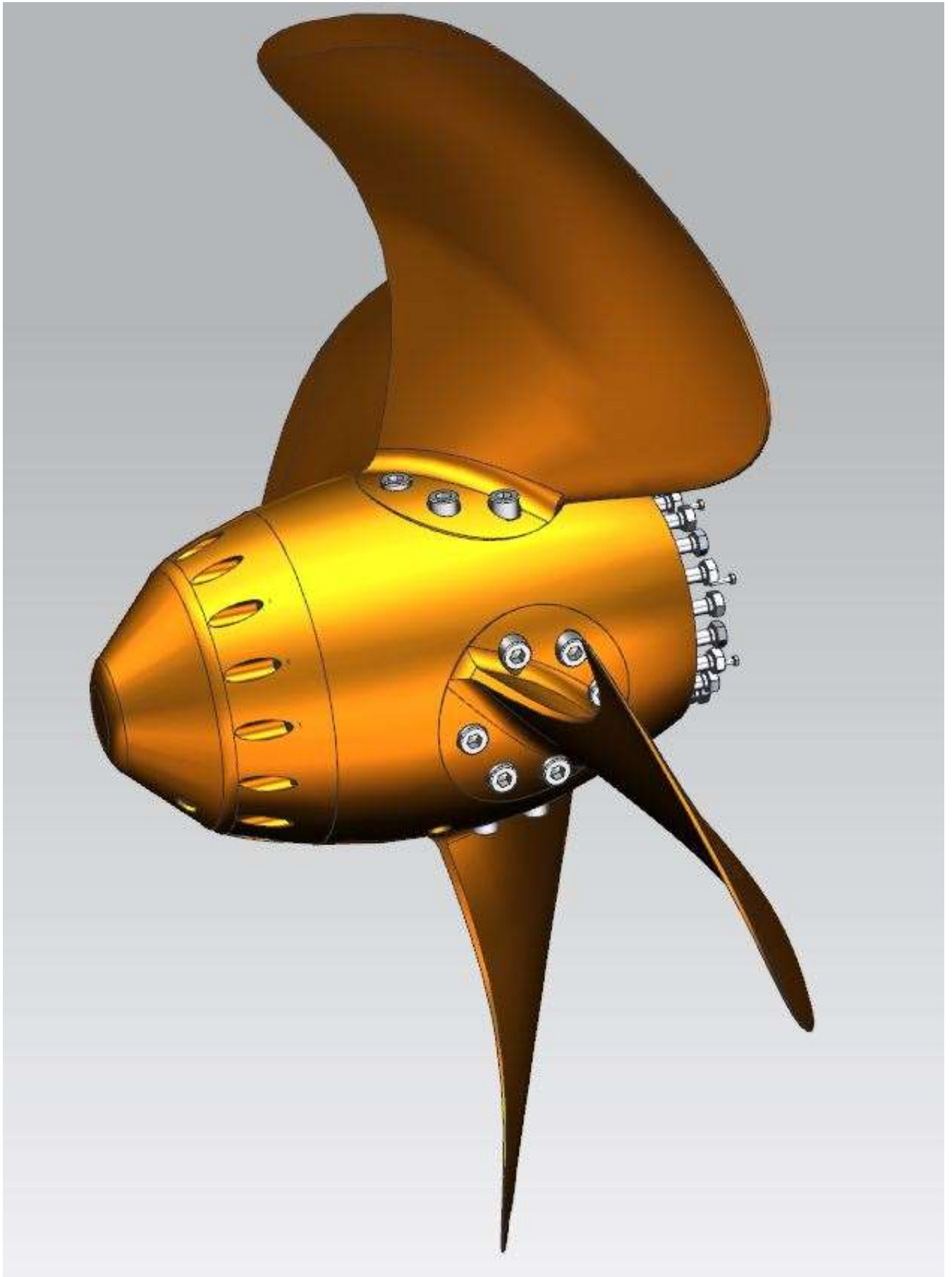
We have developed Turkey's first Steering Pitch Propeller system in 2014 - 2016. The Undersecretariat of Defense Industry provided 1'340'000 EUR of support and grant for the CPP project. The project was completed with the main contractor of the SNR shipyard, owned by Ertan ŞENER, within the body of SNR Holding. Only 3 countries in the world; (Germany, Switzerland and Turkey) propeller blade geometric pitch design algorithm has been developed first time in Turkey by us. The name of this algorithm is Pitch design, patented worldwide. All studies were verified with ANSYS fluent and CFX, ANSYS Structural analysis and Structural Fluid data transfer software. It was fabricated and validated by testing with torque sensors. CPP Project was approved and certified by Turk Lloyd. The first CPP propeller and

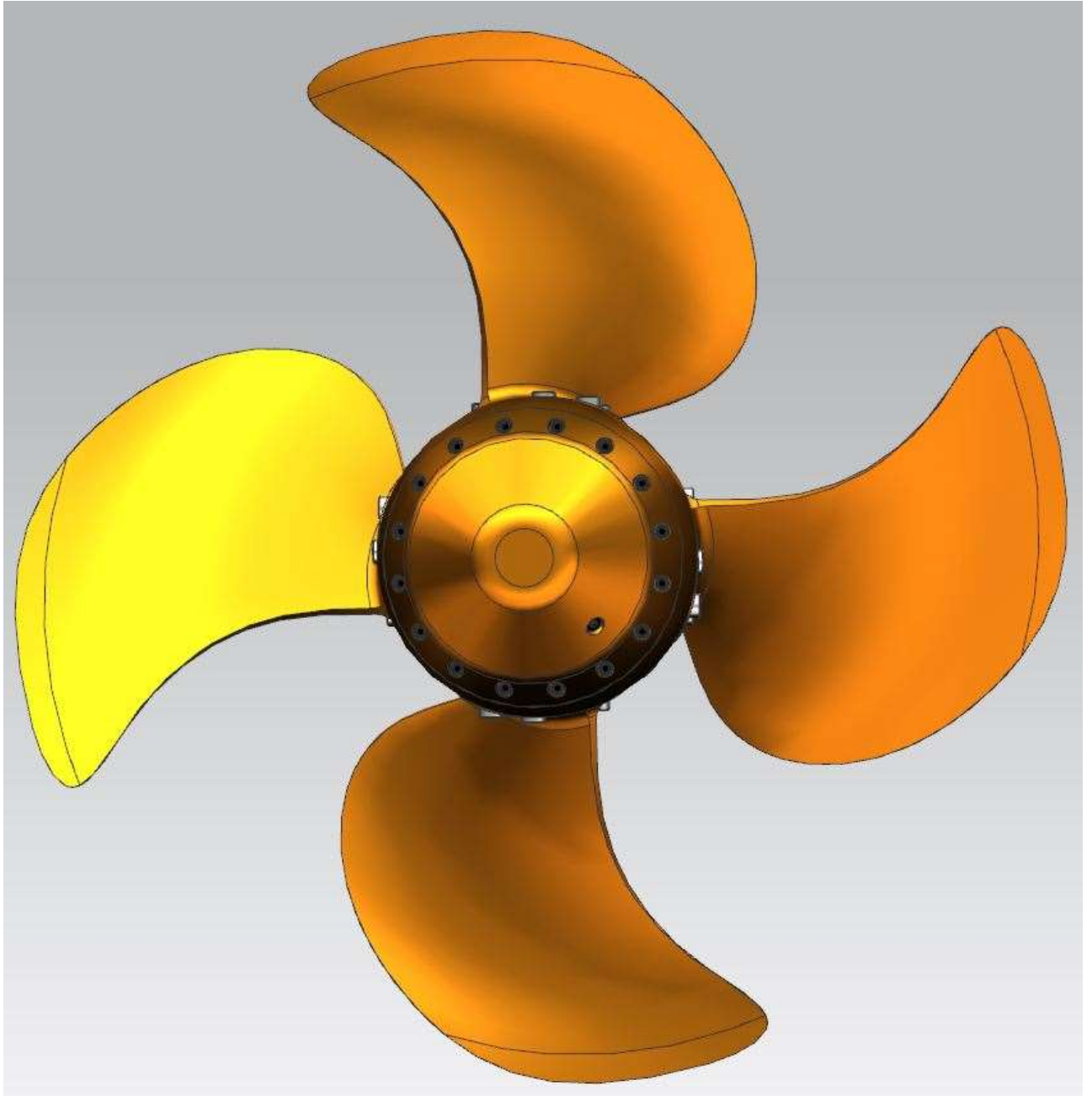
blades were made of CU4 material chrome manganese copper alloy. In the 2nd phase of the project, a lighter, same geometric shape propeller blade was designed and manufactured by using carbon fiber fabric cutting, hand laying and molding techniques. Working in salty sea water with a density of 1024gr/m³, this technology is engineering know-how ready to be used in aircraft engines and fan blades in natural gas turbines, low pressure and high pressure compressors.

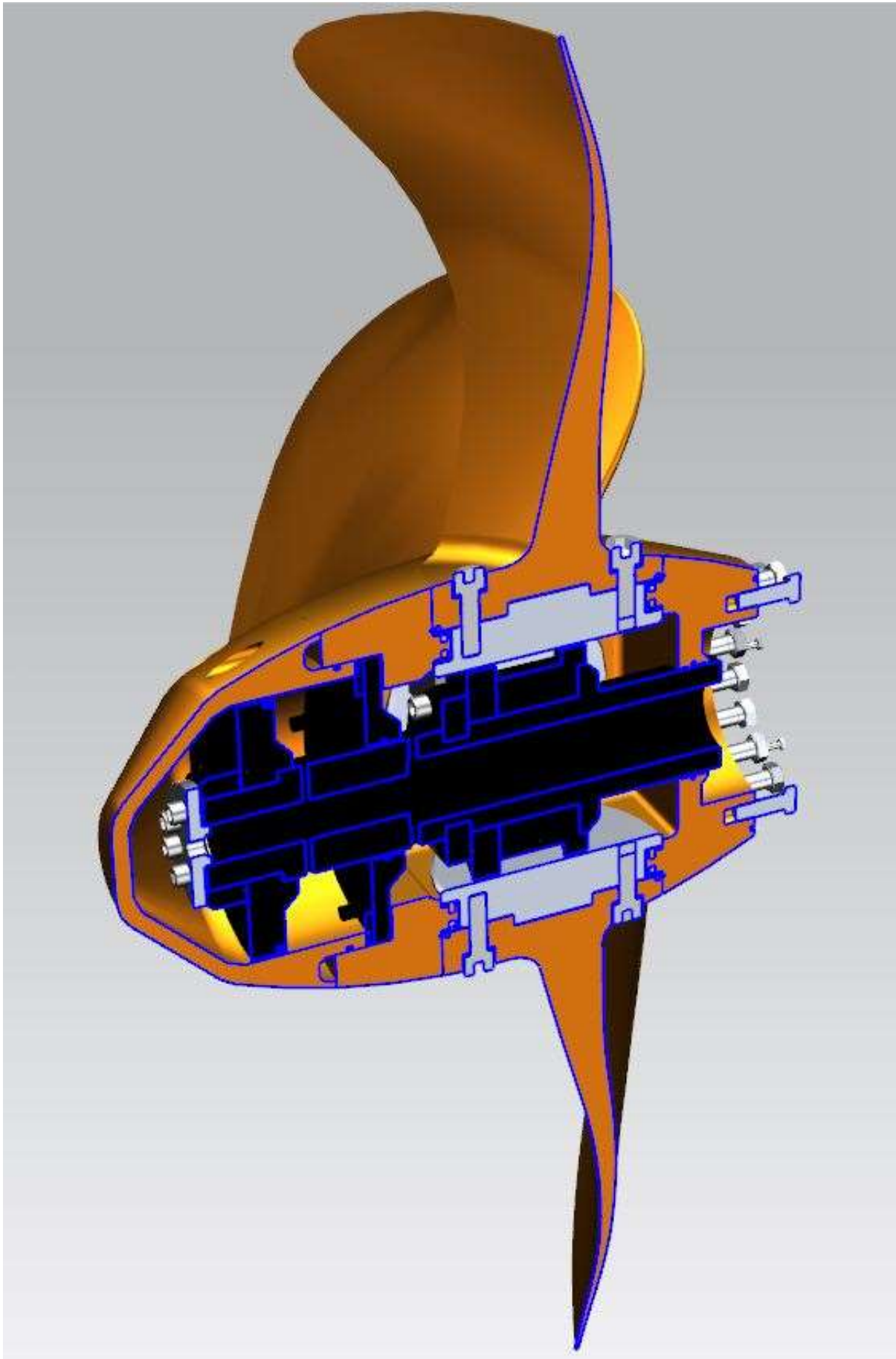
Milper Propeller Technologies Inc., could not achieve commercial sales success and did not issue Invoice due to political reasons. Therefore, its fixed expenses were not met and the employment contract of all of the company's employees was terminated and it became a dormant company that did not carry out commercial activities.







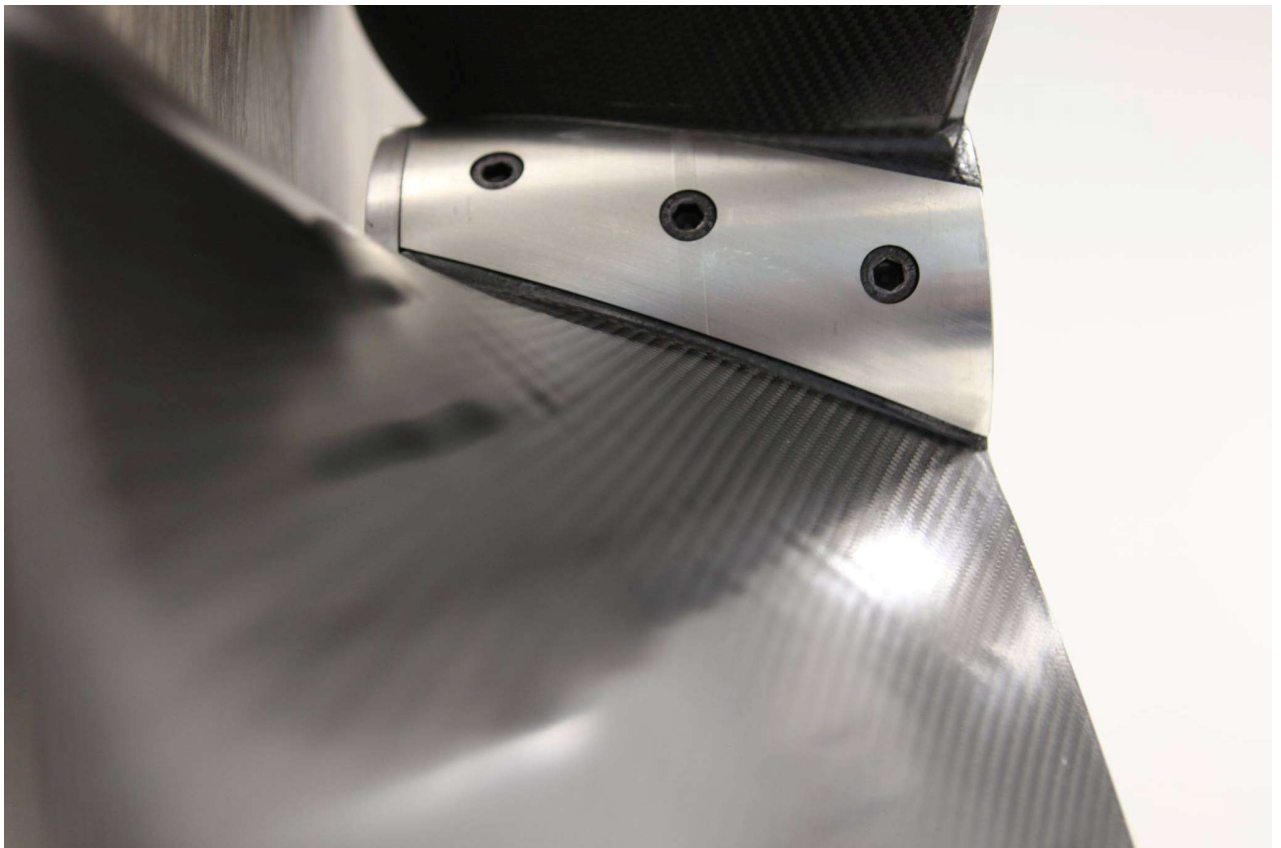












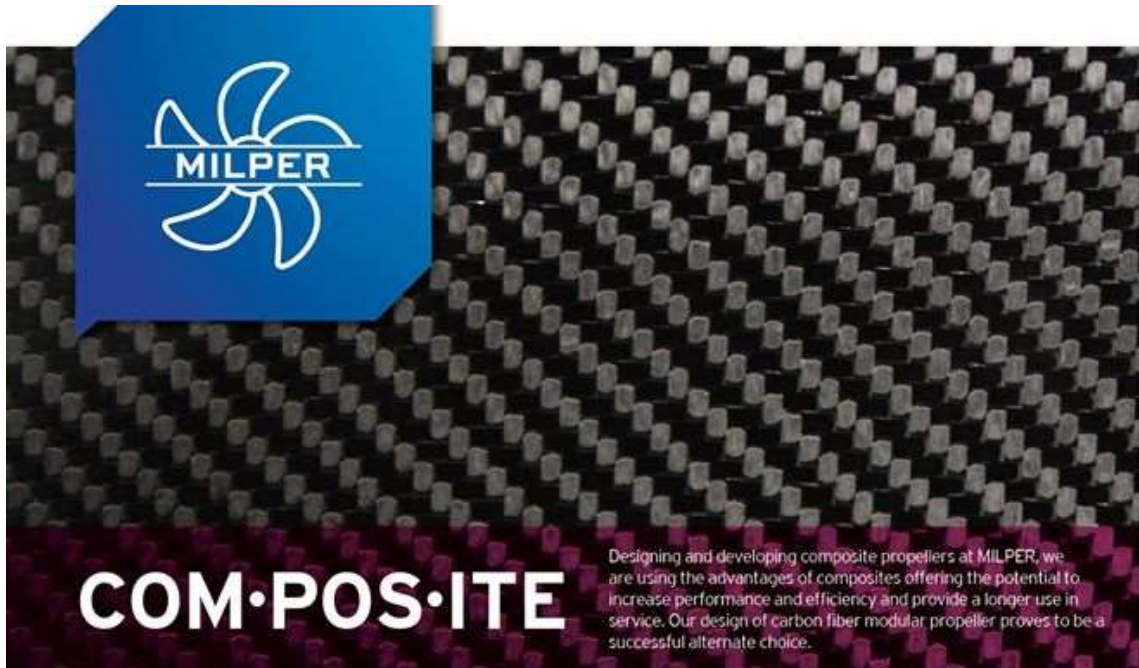


Elle yatırma tekniđi ile carbonfiber kumaşının kalıp içerisinde pişirilmesi sonucu üretilen pervane kanadı. Cap 1400mm Aynı tork ve itme deđerlerini test sonucunda mühendislik hesapları doğrulanmıştır.

Propeller blade produced by firing carbon fiber fabric in the mold with the hand tilting technique. Cap 1400mm Engineering calculations were validated as a result of testing the same torque and thrust values.

Yapılan çalışma akademik makale olarak bilimsel dergilerde 2016 yayınlandı. Türkiye Avrupa ve Orta Dođu'da ilk ve tek Carbonfiber Gemi pervanesi imalatı çalışmasıdır.

The study was published in the scientific journals as an academic article in 2016. It is the first and only Carbonfiber Ship propeller manufacturing study in Turkey, Europe and the Middle East.



Designing and developing composite propellers at MILPER, we are using the advantages of composites offering the potential to increase performance and efficiency and provide a longer use in service. Our design of carbon fiber modular propeller proves to be a successful alternate choice.

DEVELOPING PRODUCTS OF FUTURE!

We have proven that having less vibration and cavitation noise characteristics, the use of composite blades in military applications would be the right choice. Commercial vessels can also benefit from being equipped with composite propeller blades due to increased fuel efficiency and higher comfort due to noise reduction.

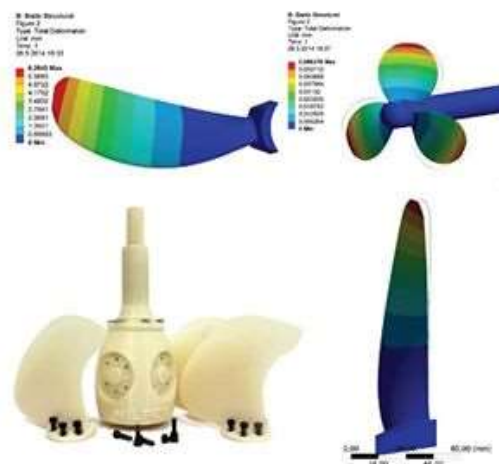
CHALLENGING ENGINEERING STUDIES AT MILPER

MILPER performs Fluid-Structure Interaction (FSI) study for efficiently designing composite propeller blades. MILPER uses iterative product development approach for product development:

Initial Design > Analysis > Detail Design > Analysis > Final Prototype Design.

ADVANTAGES

- Lightweight
- High Efficiency
- Lower Vibration Characteristics
- Lower Cavitation Noise Characteristics
- Replaceable Blades Design allowing ease of installation and removal
- Smaller Geometry
- Lightweight
- Material Strength / High Fatigue Strength Properties



www.milper.com.tr

Teknopark Istanbul - Sabiha Gökçen Havalimanı Yolu, No: 2822-23 / 34912 - Pendik - Istanbul / Turkey

TEKNOLOJİ**Sena Nomak***

MILPER geliştirdiği su türbini sistemini tanıttı



MILPER, geliştirdiği Su Türbini sistemini Amsterdam'da gerçekleştirilen Electric&Hybrid Marin World Expo'da tanıttı. Bu sistemle yelkenli teknelerde çok düşük direnç ile 3 kw'a kadar elektrik üretimi mümkün...

Küresel bir etkinlik olan Electric&Hybrid Marine World Expo 2015 dünyanın dört bir yanından katılımcılara ev sahipliği yaptı. Etkinlik kapsamında, gerçekleştirilen konferansta 80 bildiri ile en yeni trendler sektörün değerlendirilmesine sunuldu. Yaklaşık 150 firmanın denizcilik sektörü için en yeni elektrik ve hibrit uygulama, fikir, konsept ve çözümlerini sergiledikleri 3 gün süren Electric&Hybrid MarinWorld Expo'da MILPER de ürün ve çalışmalarını sergiledi. MILPER, geliştirmekte olduğu klasik pervane sistemlerinin yanı sıra, kompozit pervane, su jeti ve elektrik üretimi için kullanılan su türbini gibi ürünlerini tanıttığı fuarda, dünya devi sektör oyuncularını ile birlikte yer alarak Türkiye'yi temsil etti.

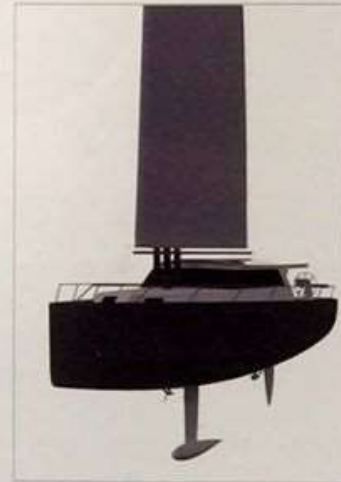
Fuar süresince düzenlenen ve uzman hakem heyeti tarafından seçilen bildirilerin sunulduğu konferans kapsamında denizcilik sektörü paydaşları bir araya gelerek yeni nesil gemi sevk sistemleri için geliştirilen teknolojiler ile ilgili bilgi birikimlerini birbirlerine aktarma ve paylaşma imkânı da buldular. Etkinlik kapsamında gerçekleştirilen bu konferansta MILPER Genel Müdürü Sena Nomak, bir Avrupa Birliği projesi olarak yürütmekte oldukları "Sıfır Emisyonlu Yenilenebilir Enerji Üreten Hibrit Biokompozit Yelkenli Yat Konseptinin Geliştirilmesi" konulu sunumunda proje kapsamında geliştirilmekte olan su türbini tasarımının da sektörel lansmanını gerçekleştirdi. Sektörde bu amaçla geliştirilen ilk ürün olma özelliğini

taşıyan "Su Türbini" ile yelkenli teknelerde çok düşük direnç ile 3 kw kadar elektrik üretimi mümkün kılınması oldukça ilgi çekti.

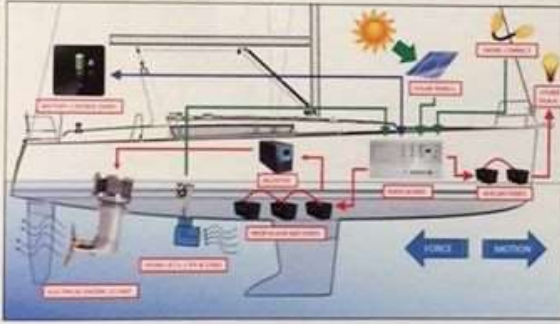
sistemi bir elektrik motorundan güç alıyor. Tekne üzerinde bu motor sistemini beslemek üzere yüksek kapasiteli batarya sistemi farklı yenilenebilir enerji kaynaklarından güç alıyor.



Avrupa Birliği 7. Çerçeve Programı kapsamında yer alan ERA-NET Transport çağrısından destek alan 2 platform projesinden birisi olan ve yürütücülüğünü MILPER'in gerçekleştirdiği "Sıfır Emisyonlu Yenilenebilir Enerji Üreten Hibrit Biokompozit Yelkenli Yat Konseptinin Geliştirilmesi" projesinde tasarımı ve tüm analizleri tamamlanan teknede her hangi bir fosil yakıt bulunmuyor. Sıfır emisyonun hedeflendiği proje kapsamında kanat profilli yelkenle seyir yapan teknenin manevra sırasında ya da rüzgâr olmadığında kullanacağı pervane

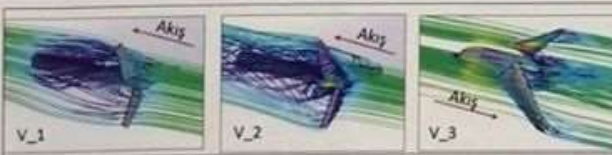
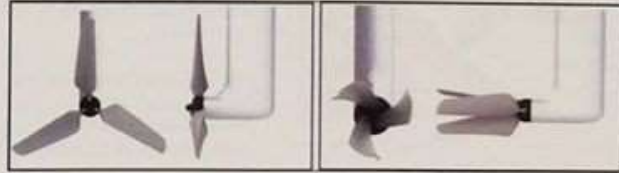


1. Rüzgâr: Yelken ile ana tahrik gücü olarak kullanılan rüzgâr, aynı zamanda rüzgâr türbini ile elektrik üretimi amacıyla da kullanılıyor.
2. Güneş: Geniş yüzey alanı elde edilmesi amacıyla deck-saloon olarak tasarlanan teknede yaklaşık 10 metrekare güneş paneli alanı bulunuyor.
3. Su akışı: Yelken ile seyir halinde iken tekne altına entegre edilmiş türbinler vasıtasıyla elektrik elde edilirken, demirli halden de yüksek akıntı hızlarında elektrik elde edilmesi mümkün hale geliyor.



Özellikle su altındaki akışın elektriğe çevrilmesi amacıyla kullanılan türbin çok yenilikçi uygulamalar barındırıyor. Tasarım ve tüm analizleri MILPER bünyesinde gerçekleştirilen ürünün prototip üretimi halen devam etmekte, önümüzdeki aylarda testlerinin gerçekleştirilmesi hedefleniyor. 1 kW, 2 kW ve 3 kW olmak üzere 3 farklı güçte tasarlanan ürünler, tekneye entegre olarak sadece bu amaçla üretilen piyasada ilk ürün olacak. Tahrik ve jenerasyon amaçlı olarak çift maksatlı kullanılan ürünlerin aksine MILPER tarafından geliştirilen bu türbinler yalnızca elektrik üretimi için optimize edildiklerinden hem düşük hızlarda elektrik üretim imkanı sağlayacaklar, hem de seyir halinde gerektiğinde kapatılarak düşük direnç yaratmaları sağlanabilecek.

Elektrik motoru ile sevk sırasında ya da jenerasyon istenmeyen yelken seyirinde direncin azaltılması maksadıyla sistem manuel olarak 180o döndürüldüğünde kanatlar otomatik olarak kapanmakta ve yaratılan direnç düşmektedir. Her 3 durumdaki direnç analizleri ve değerler aşağıda görülmektedir.



Türbin	Hareket	Kanat	Direnç
V_1	Dönüş var	Açık	758 [N]
V_2	Sabit	Açık	281 [N]
V_3	Sabit	Kapalı & Ters	42 [N]

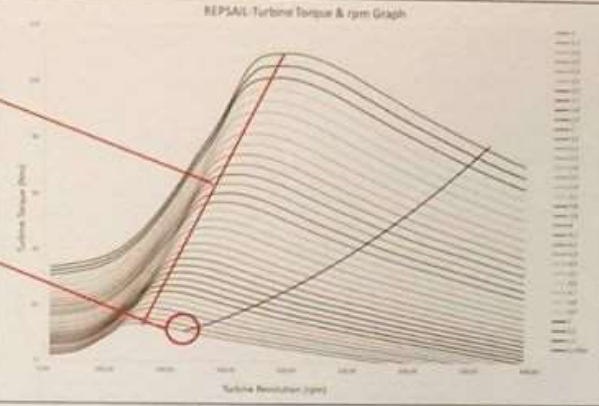
Piyasadaki çok maksatlı ürünlerin aksine yalnızca jenerasyon amaçlı olarak kullanılmak üzere tasarlandığı için, hem kanatların özel tasarımıyla hem de düşük torklarda devreye giren sabit mıknatıslı jeneratör sayesinde çok düşük hızlardan başlayarak elektrik üretimi mümkün olabilmektedir.

TEKNOLOJİ

Özel kanat tasarımı sayesinde maksimum tork eğrisi tüm akış hızları için ötelenmektedir.

Sonuç:

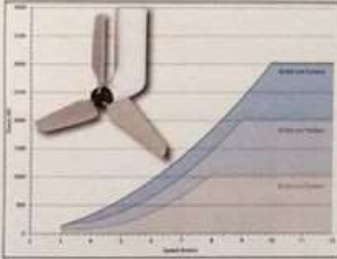
2 m/s akış hızında (yaklaşık 3,8 knot tekne hızı) her bir türbin için yaklaşık 200 W enerji üretimi



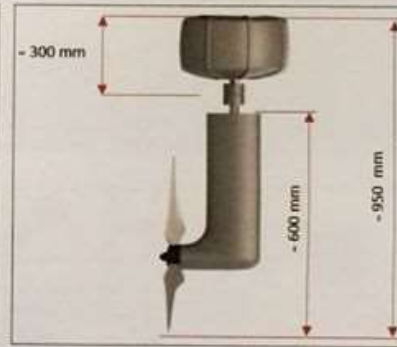
Farklı enerji jenerasyon ihtiyaçları ve farklı tekne boyutları için 3 farklı model üzerinde çalışmalar sürdürülmektedir.

- Ø 400 mm pervane çapı (1 kW)
- Ø 500 mm pervane çapı (2 kW)
- Ø 600 mm pervane çapı (3 kW)

Ø 500 mm pervane çapına sahip ürün için yukarıda genel boyutlar verilmiştir. Bu ürünün alternatör dâhil toplam ağırlığının 30kg'ın altında olması hedeflenmektedir. Aynı şekilde tekne içerisindeki yerleşimi kolaylaştırmak üzere gerekli toplam hacmin 30 cm x 30 cm x 30 cm içinde kalması amaçlanmaktadır.



2011 yılında deniz araçları için pervane ve şaft sistemlerini tasarlamak ve üretmek amacı ile kurulan Milper Pervane Teknolojileri A.Ş., 24 kişinin istihdam edildiği, Teknopark İstanbul'da 200 metrekarelik ofis alanına ve Tuzla'da 1000 metrekarelik bir atölyeye sahip bir mühendislik ofisidir. Tüm tasarım ve üretim altyapısının yanı sıra kendi yazılımlarını geliştirmekte olan Milper, aynı zamanda CFD, FEM gibi yöntemleri içeren ileri mühendislik analizi alet



yapısını bünyesinde bulundurmaktadır. Firma sahip olduğu tüm bu imkânları kullanarak yürüttüğü projeleri ile elde ettiği başarı ve kazanımlarla birçok TÜBİTAK ve Avrupa Birliği projesini yürüterek sektöre yüksek katma değer sağlayan bir firma olma özelliğini taşımaktadır.

MILPER Milli Pervane projesi kapsamında Türkiye'de ilk defa yönlendirilebilir kanatlı pervane ve şaft sisteminin (CPP; Controllable Pitch Propeller) klas onaylı tasarımını bitirmiş, Türk Loydu gözetiminde üretimine devam etmektedir. Önümüzdeki dönemde Türk gemi inşa sektörünün yüksek verimli pervane tedarikçisi olarak, bu konudaki dışa bağımlılığı ortadan kaldırmayı hedeflemektedir. Dünya çapında geliştirilen yeni teknoloji ve ürünlerin takip edilmesi, bu teknoloji ve ürünleri geliştiren firma ve kişiler ile iletişimin sağlanması ve bilgi paylaşımının gerçekleştirilmesinin

son derece önemli olduğuna inanan MILPER, bu bağlamda ulusal ve uluslararası konferans, fuar, seminer gibi etkinliklere katılmaya özen göstermektedir. MILPER, bu tip etkinliklerde edindiği bilgi ve tecrübelerini ülke ekonomisine katkı sağlayacak ürünler geliştirebilmek için kullanmaya devam edecektir.

**Sena Nomak, 1998 yılında İzmir Bornova Anadolu Lisesi, 2002 yılında ise İstanbul Teknik Üniversitesi Gemi Makineleri İşletme Mühendisliği bölümünden mezun oldu. 2006 yılında aynı üniversiteden Deniz Ulaştırma Mühendisliği dalında Yüksek Lisans derecesi aldı. Halen aynı programdaki Doktora çalışmasını tez aşamasında sürdürmektedir. Halen Milper Pervane Teknolojileri A.Ş.'de Genel Müdür, YKSN Denizcilik Enerji Savunma San. ve Tic. Ltd. Şti.'de ise yönetici ortak olarak görev yapmakta; sektörde yer alan çok farklı ölçeklerdeki kuruluşlara iş rehberliği, mentorluk ve süreç danışmanlığı ile katkı sağlamaktadır.*





Bakanlar kurulunun ziyareti / **Visit of the Council of Ministers**



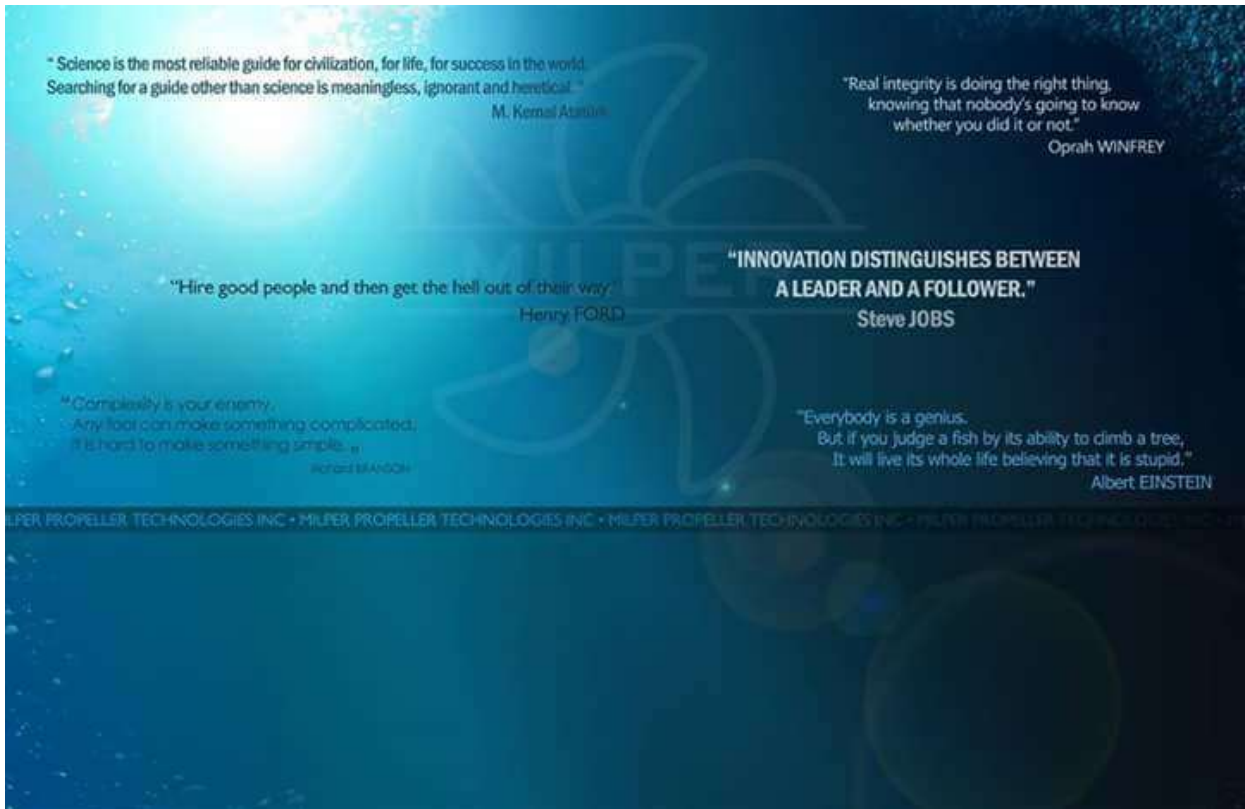
İlk iş günü fotoğrafı. Aramıza hoş geldiniz. / **First working day photo. Welcome aboard.**



Tüm kurucu Ar&Ge Mühendisleri ilk gün kuruluş anısına çekilen aile fotoğrafı.
A family photo of all founding R&D Engineers, taken on the first day in memory of the establishment.



Family photo taken after closing meeting with all R&D engineers, Technical assembly field team, Management Team, Defense Industry Secretaries.



OUR COMPETITORS

ABB AZIPOD, SWITZERLAND

<https://new.abb.com/news/detail/24879/abb-azipodr-electric-propulsion-can-save-17-million-in-fuel-costs-annually-study-shows>



**SIEMENS SCHOTTEL AZIPOD, ALMANYA&AVUSTURYA /
GERMANY&AUSTRIA**

SYSTEM SOLUTIONS - PROPULSION AND MANOEUVRING

<https://www.schottel.de/marine-propulsion/scd-combi-drive/>



OUR TARGET GOAL

A couple; 2 pieces of 10 MegaWatt 4500mm in diameter with Right and Left pitch; The price of the AZIPOD propeller is 2X16=32 Million EURO. Delivery Time is between 2 years - 4 years. Since it is a strategic product, it is sold as a result of commercial and political agreements between countries. During political crises; Spare parts supply and maintenance agreements can be canceled unilaterally by the manufacturer. AZIPOD propellers were purchased from ABB Switzerland for the TCG Anadolu Multi-Purpose Amphibious Assault Ship (Aircraft) built in Istanbul, Turkey at the Tuzla SEDEF shipyard. In TCG Rumeli, which will be built as a twin of the same ship, we can manufacture the AZIPOD ship propeller, for which we, as RBTCS, have our own design idea and industry rights, by doing R&D studies, with domestic and national resources. But; for this, it is necessary to purchase the Technical Specifications by making a donation to the Foundations of the families of the Turkish Armed Forces Martyrs.

Azipod Propeller Technology is the only engineering solution that provides constant stability in X, Y, Z coordinate plane even in strong currents in stormy weather conditions.

With Azipod propellers positioned at certain intervals on the pipelines that will transport oil to mainland Turkey in case the Hydrocarbon deposits sought in the Eastern Mediterranean and Black Sea Basin are extracted; in stormy weather conditions, even in strong currents, it is ensured to stay stable in the X, Y, Z coordinate plane. In this way, environmental disasters are prevented. Uninterrupted oil flow is provided.

Azipod Propellers in Commercial Container Ships of 20.000 or more, Oil and Chemical Tankers provide maneuvering assistance without the aid of a trailer. It has less fuel consumption compared to conventional Fixed pitch propellers.

Since it is not possible to test a 10 MegaWatt Azipod Propeller in real life, it is necessary to produce a 100-fold smaller model of the 100KiloWatt Azipod Propeller, to measure engineering values with a Dynanometer in the ITU Ata Nutku Test Pool, and to carry out Strength-Life tests by providing water-brake resistance. Outcomes ITALIAN Lloyd RINA; Turk Lloyd, British Lloyd Broveritas, German Lloyd DNW, etc. must be approved and certified by one of the independent accreditation bodies. Thanks to this certificate, the ship can continue its commercial activities in international waters. Dynanometer and water-brake investment should be made for this process. We plan to complete these designs and tests within one year.

In the first year investment, ANSYS Fluent & CFX Structural and Numeca FineMarine investments, 4*256 core DELL Server investments, 10-person engineering team and office expenses, launch and marketing activities must be paid. The costs of visiting at least two of the shipyards every week among the 68 shipyards in Turkey, Mediterranean, Black Sea and Middle East Regions; and making the presentation of the project should also be covered.

In the second year, we plan to manufacture and install a 10 Megawatt right and left pitch Azipod propeller. We plan to get the approval of the ship's speed requirements by conducting cruise trials on the ship.

In the second year, we are planning to manufacture Carbonfiber blades by weaving Carbonfiber yarns on styrofoam in first-degree

clean room conditions with the investment of Industrial 24 axis Robot application. We will be able to test the differences between the Carbonfiber Wing and the CU4 material steel alloy wing on board. For this project, we have to do more than 4 billion lines of robotic coding. In the offline robot coding project, we obtained the sales and technical support rights of Stuttgart CENIT Fast Suite software in Russia, Turkey and the Middle East.

Since the carbon fiber wing is lighter at the same strength values, it reaches a high torque value in a shorter time. This is a great advantage.

It is necessary to invest in a factory with a closed area of 50,000 square meters and a roof height of 24 meters under the crane hook. There should be a distance of 24m X 24m between the columns. Completion of 8,000 square meters in the first year of construction of this building is sufficient for manufacturing 100 KW models. For other parts, investment in foundry, 13 Axis KESSER CNC horizontal machining bench, 8.000 square meter first-degree cleanroom and 24 axes Industrial Carbonfiber yarn surface laying Robot cell investment. Investments in Punch, Mold, Servomotor Rotor & Stator, cabling Bearing and Reducer manufacturing, servodrive manufacturing should be completed. In Teknopark Istanbul's Kocaeli Dilovası Machinery Specialization Industrial Zone, grants are given for 49 years of land allocation R&D projects. The construction of the building should be done by the investor.

Our Partners

ELECTRIC MOTOR MANUFACTURER ALTERNATIVES

EMF MOTOR; Yüksek Torq kalkış motoru kurucuları; <https://www.emfmotor.com/>

Scaled model test propeller; **100KW; 100RPM; No need gearbox;**
Patent pending all around the world. No used copper, made by silisium plate.

Our partner; **EMF MOTOR** High Torque take-off motor founders;

Hasan Basri KAYAKIRAN ; hasanbasri.kayakiran@emfmotor.com; 0090 532 231 68 23

Evren KAYAKIRAN ; evren.kayakiran@emfmotor.com; ekayakiran@hotmail.com;
0090 532 701 94 80

☰ **EMF Motor®** 🔍



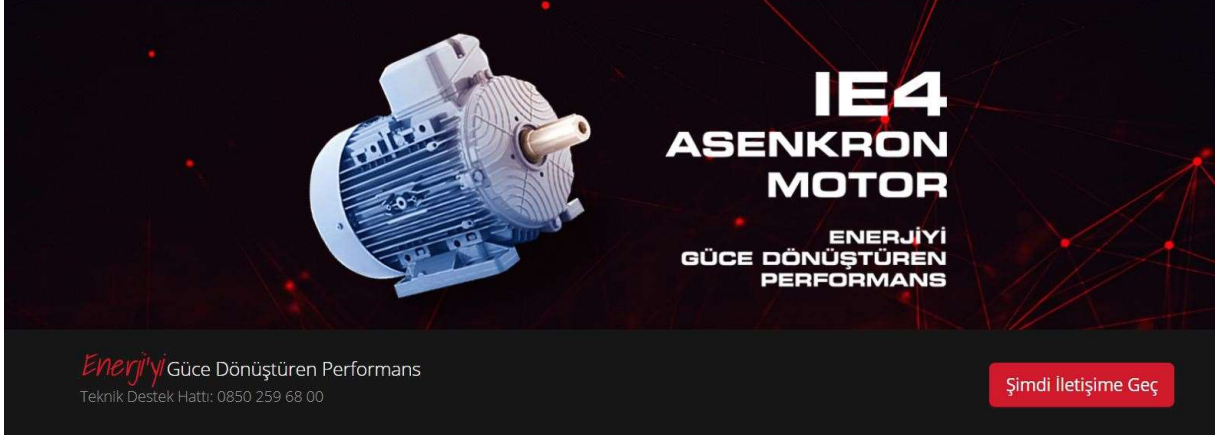
The screenshot displays the EMF Motor website with a navigation menu on the left and a search icon on the right. The main content area features six images, each with a caption below it, illustrating the use of SQM Torque Motors in various industrial and commercial settings:

- Plastik için SQM Tork Motoru**: Image of a large industrial gear mechanism.
- Değirmen için SQM Tork Motoru**: Image of a traditional windmill.
- Soğutma Kulesi için SQM Tork Motoru**: Image of a large industrial cooling tower.
- HVLS için SQM Tork Motoru**: Image of a large industrial fan or propeller.
- Cam & Seramik için SQM Tork Motoru**: Image of stacks of orange and grey ceramic or glass plates.
- Asansör için SQM Tork Motoru**: Image of a modern skyscraper.

AE MOTOR; Orta devir; Torq motorları; <http://www.aemot.com.tr/>

Scaled model test propeller; **100KW; 1000RPM; must be use planet gearbox; conventional asynchronous motor.**

AeMOTOR Sami Akdoğan; sami.akdogan@aemotor.com.tr; 0090 532 155 52 90



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PERFORMANS

Enerji Güce Dönüştüren Performans
Teknik Destek Hattı: 0850 259 68 00

Şimdi İletişime Geç

3 MegaWatt asenkron motor üretilip Kayseri Büyükşehir Belediyesi demiryolu sistemi kullanılmıştır.

3 MegaWatt asynchronous motors were produced and used at the railway system of Kayseri Metropolitan Municipality.



ELK MOTOR; Yüksek devir; Torq motorları; <http://www.elkmotor.com.tr/>

ELKMMOTOR A. Raif Altunsu; raif@mesdokum.co.tr; 0090 532 745 33 29

Scaled model test propeller; **100KW; 1800RPM; must be use planet gearbox; conventional asynchronous motor.**



ANASAYFA

HAKKIMIZDA

DÖKÜMANTASYON

ÜRÜNLER

TEKNİK AÇIKLAMALAR

İRTİBAT



5 MegaWatt asenkron motor üretilip BURSA Büyükşehir Belediyesi demiryolu sistemi kullanılmıştır. DURMA TRANWAY in resmi elektrik motoru tedarikçisidir. <http://www.durmaray.com/lang/en>

5 MegaWatt asynchronous motors were produced and used at the railways sytem of BURSA Metropolitan Municipality. DURMA TRANWAY is the official supplier of electric motors.



Investment

13 AXIS CNC SIMULTANEOUS HORIZONTAL PROCESSING MACHINE INVESTMENT-KEMA MAKINA-BURSA

<http://kema.com.tr//stok-tezgahlar>

Harun KESER ; harun.keser@kema.com.tr; 0090 532 241 54 81

Erol BAHTİYAR; erol.bahtiyar@kema.com.tr; 0090 533 435 89 68

MADE IN KEMA BRAND; NEW 2024 MANUFACTURING COST İS NEARLY 4'500'000 EURO. (+-%10).

MADE IN KEMA BRAND; SECOND HAND 30'000-80'000 HOURS WORKED COST IS 1'800'000 EURO (+-%10).

MADE IN SPAIN SORALUCE BRAND; NEW 2024 MANUFACTURING COST İS NEARLY 8'200'000 EURO. (+-%20).

MADE IN SPAIN SORALUCE BRAND; SECOND HAND 30'000-80'000 HOURS WORKED COST IS 5'400'000 EURO (+-%20).

KEMA is an copy & same Bench of Soraluçe.

Between 1996-2006, the company which carried out the field installation and service works of the Spanish SORALUCE brand; later on, produced 18 gigantic CNC machines working in Turkey with its own brand. Its benches have been working non-stop for more than 14 years in the industry.

<https://www.soraluce.com/en/products>

<https://www.kema.com.tr//urunler/9-20-22/Danobat+Grup/Soraluce+CNC+Freze/TA+Modeli>

1 TEMEL ÖZELLİKLER

1.1 GENEL ÖZELLİKLER

- Boyuna Hareket (X)..... 12.000mm.
- Enine Hareket (Y)..... 3.000mm.
- Dikine Hareket (Z) 2.000mm.
- Ram'a açısı ±10°.
- Sabit tabla ebadı (2 adet) 4.000mm x 3.000mm.
- Sabit tabla yükleme kapasitesi 10.000kg/m².
- Döner tabla ebadı 3.000mm x 3.000mm.
- Döner tabla hareketi (W) 3.000mm.
- Döner tabla yükleme kapasitesi 60.000kg.

1.2 KONTROL ÜNİTESİ

- SIEMENS 840Dsl
 - 13 Adet servo motor (13 Adet eksen motoru + iş mili motoru)
 - El Çarkı

1.4 EKİPMAN İÇERİKLERİ

- Çalışma bölgesi aydınlatma lambası
- X ve Y eksenlerinde kızak ve vidalı milleri koruyucu teleskobik muhafaza
- Koruma panelleri
- Ortogonal kafa
- D'andrea
- 90° açılı kafa
- Fix boring kafa
- Otomatik kafa değiştirme ünitesi (5 istasyonlu)
- Takım içinden su verme (20 bar)
- ZF Şanzıman
- Lineer cetvel
- Paletli tip talaş konveyörü
- Lazer takım ölçümü
- Parça ölçüm probu

1.4 KURULUM

- Kurulum fiyata dâhildir. Kurulum esnasında kullanılacak vinç hizmeti müşteri tarafından karşılanacaktır.

1.5 NAKLİYE

- Nakliye fiyata dahildir.

2 TEKNİK ÖZELLİKLER

2.1 HAREKET ÖLÇÜLERİ

- Boyuna Hareket (X) 12.000mm.
- Enine Hareket (Y) 3.000mm.
- Dikine Hareket (Z) 2.000mm.
- Ram'a açısı $\pm 10^\circ$.
- Döner tabla hareketi (W) 3.000mm.

2.2 LİNEER EKSEN HAREKETLERİ

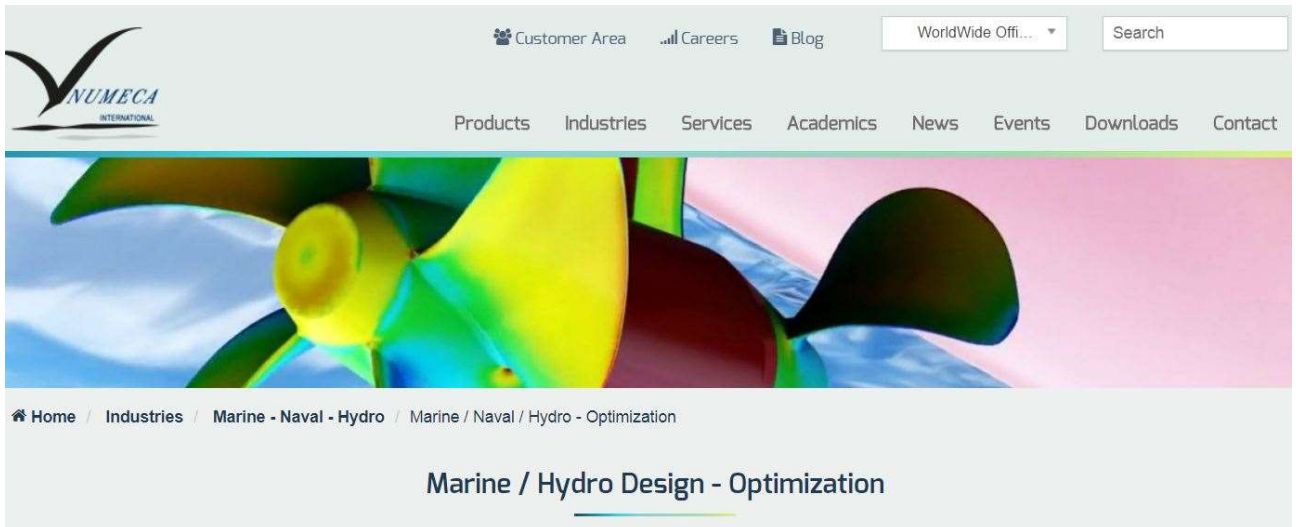
- İlerleme adımları ISO R-229'a göre Adımsız Ayarlanabilir
- Boşta Hareket Hızı (X-Y-Z eksenleri) 20.000 mm/min.
- Kesme Hareket Hızı (X-Y-Z eksenleri) 10.000 mm/min.
- Eksen sürme kuvveti (X-Y-Z eksenleri) 20.000 N.

Additional investments can be selected for options such as magnetic table investment, wi-fi Industry 4.0 communication in 13 axis CNC machining center investment.

INVESTMENT OF NUMECA FINE MARINE

Pars Makina; Prof. Dr. Sinan AKMANDOR 00903123851944;
sinan.akmandor@parsmakina.com;

The Mathematical Model Network (MESH) Aspect Ratio value of 1.0 is the only engineering software that solves the geometric form by modeling it. By dividing the real wing Geometry into 1 million parts; each piece; the ratio of the longest side to the shortest side is called the Aspect Ratio. Upon this acceptance; the fundamental Principle of Finite Element Theory is formulated. This software, whose codes were written by the Netherlands-based R&D company, provides solutions with a higher than 98% approach to the Pool test test results. Turkey distributor Pars Makina Prof. Sales and technical service are provided by Sinan AKMANDOR. In the first year; $22'372.80+67'130.20=89'503,00$ EURO investment is required.





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E-mail : info@parsmakina.com

COMMERCIAL PROPOSAL

Date: 27/03/2019

From: PARS MAKINA LTD.
Contact: Dr. İbrahim Sinan Akmandor
+90 532 2063708
sinan.akmandor@parsmakina.com

CUSTOMER : Mr. Aydın Aydemir
RBTCS
Teknopark Istanbul C Blok Sanayi Mah.
No:1/9A 34906 Kurtköy Pendik İstanbul
Turkey
Tel: 0090 555 553 0720

1) Quotation

Description	Quantity	Cur ency	Unit Price	Total Price
(FM-SPA-AL) FINET TM /Marine START Package Commercial package including: - Pre-processing tool: HEXPRESS TM - Unstructured CFD Solver, 8 cores included - Post-processing tool: CF View TM - C-wizard - Rhino plugin One simultaneous access to pre/post-processing and CFD solver.	1	EUR	18.960,00-	18.960,00-
Sub Total				18.960,00-
Taxes (18% KDV)				3.412,80-
GRAND TOTAL				22.372,80-

2) Payment, Terms & Conditions

Our payment terms are 30 days end of month.

Our Bank Info.	Pars Makina San. ve Tic. Ltd. Şti. EUR Account: İş Bankası Ahi Evran Caddesi Şubesi IBAN: TR89 0006 4000 0024 1570 0143 56
-----------------------	---

3) Information on the license

Please fill in the following information with FULL NAME and EMAIL:

- Person Responsible for Purchase:

.....

- Person Responsible for Installation and IT:

.....

- Person Responsible for Technical Support (Prim ary User):

.....



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Faks : +90 312 385 1942
E-mail : info@parsmakina.com

4) Additional information

Invoice address:
Delivery address: Turkey
VAT number:
Po number from the purchase company:
License should be delivered on (dd/mm/yyyy):

FOR ACCEPTANCE

- NAME:

.....

- TITLE:

.....

- SIGNATURE:

.....

TERMS AND CONDITIONS

Acronyms & Definitions

- **AL - Annual License:** Lease of the licensed products during one calendar year, includes maintenance services. The Annual License fee is subject to modifications on an annual basis.
- **PL - Perpetual License:** Purchase of the licensed products, includes maintenance services during the first calendar year. Perpetual License keys are delivered on an annual basis. Before the license file arrives to expiration, if the maintenance is resumed with a new annual maintenance contract, the license file will be extended for one additional year and its encryption upgraded to give access to the latest releases of the products, if not the license file will be extended "as is", namely without upgrade, for one additional year. This process is repeated annually.
- **AMC - Annual Maintenance Contract:** Continuation of maintenance services for perpetual licenses during one calendar year.
- **Licensed Program(s):** The current version of the software products listed in the quotation, including related - documentation.
- **Maintenance:** Maintenance services include software upgrades and support. Hotline, email and web-based services for software installation and troubleshooting are included and available to the current and previous major release. Customer area access included for documentation and software download.
- **Advanced support:** Provides access to extended engineering, training, hardware and software resources from skilled NUMECA Application Engineers.
- **Consultancy services:** Provides access to services from highly qualified personnel of NUMECA. Such services are linked to a dedicated Work Order.
- **Training services:** Classroom and dedicated on-site training services can be provided by NUMECA for the licensed programs. Course materials are considered as confidential information and can be retained by trainees with the same rights as for the licensed programs.

Annual Maintenance Contract

Maintenance coverage must be continuous for all licensed software units. In the event that Maintenance lapses, upon the eventual reinstatement of Maintenance, a reinstatement fee will be assessed. The applicable rates can be found below:

- **3 m lapse:** The original maintenance fee is applicable. Maintenance starts from the original renewal date for at least 1 full year.
- **3m < 3 y lapse:** The backwards maintenance fees for lapses greater than three months are calculated based on net license fees multiplied by the applicable regional maintenance rate. In addition to back maintenance, a 25% surcharge applies to reinstatement.
- **3 y lapse:** The maintenance contract cannot be renewed for lapses greater than three years; a new license needs to be purchased.

NUMECA reserves the right to change its Reinstatement Fee Policy at any time, with or without notice.

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Usage of the Licensed Programs

- License is granted subject to the license agreement acknowledged during the installation and payment of all applicable fees outlined in the commercial proposal. Bridge licenses starts with the receipt of the purchase order, unless otherwise agreed, and is extended upon payment completion.
- Floating licenses are provided for a usage limited to a specified site (premises of the customer within 25kms radius). Sublicensing, distribution or transfer of the licenses to third party is not allowed without the prior written consent from NUMECA.
- License server changes are limited to 3 times per year free of charge for active licenses and require signing NUMECA's License Server Change form.

Pricing & Payments

- Pricing is fixed during the specified validity of the commercial offer. All licensed programs are subject to annual indexation and/or price adjustment.
- Payment terms are specified according to the commercial offer. Overdue payments shall be increased automatically and without prior notice with a monthly rate of 1%.

Confidentiality

Content and conditions of this offer are confidential and cannot be disclosed without prior, explicit and written authorization from NUMECA.

License Agreement

The license agreement terms and conditions are included in the software installation package. When installing NUMECA software, the user will have to read and accept the license agreement terms and conditions. These terms and conditions are the most recent ones and supersede all other terms and conditions.

SPECIAL ACADEMIC TERMS AND CONDITIONS

This Terms applies to the Academic Licensed Programs listed and identified in the quotation (quoted line item) with the word "ACADEMIC". These special terms and conditions apply to all Academic Institutions, Universities, Schools or Research Centers and everyone affiliated with these academic institutions.

Licensee agrees that the following Special Academic Terms and Conditions will apply to the Licensed Programs:

- The Licensed Programs may be used for educational purposes only or associated with a laboratory to supplement educational tasks.
- The Licensed Programs may be used for non-funded research projects.
- The Licensed Programs shall not be used for funded research projects or any consulting activities.
- The Licensed Programs shall not be used in a service bureau or network type operation, which is directly or indirectly competitive with services available for commercial service organizations.
- ANY USE OF THE LICENSED PROGRAM, NOT EXPLICITLY AUTHORISED HERE ABOVE, SUCH AS, BUT NOT EXCLUSIVELY, INDUSTRIAL RESEARCH AND DEVELOPMENT TASKS, FUNDED RESEARCH PROJECTS, CONSULTING ACTIVITIES, SERVICE BUREAU OR COMMERCIAL NETWORK TYPE OPERATIONS, WILL BE SUBJECT TO PRIOR AGREEMENT OF NUMECA. IF THIS AGREEMENT IS GRANTED, A ROYALTY FEE OF FIFTEEN (15) PERCENT OF THE FULL COMMERCIAL PRICE IS REQUIRED FOR EACH PROJECT IN WHICH THE LICENSED PROGRAMS ARE USED.
- Licensee shall designate a primary user, such user being the main contact between NUMECA and Licensee related to the use of such Licensed Programs with the Academic Institution, according to this license agreement.
- The Licensed Programs shall not be sublicensed, loaned or made available for use by any other Department of the Academic Institution of which Licensee is a part, unless the Department complies with the conditions defined above.

ANNEX: PROGRAM DESCRIPTION

FINE/Turbo: FINE/Turbo is a Flow Integrated Environment for rotating and turbo-machinery. The software embeds in a easy-to-use and application-driven GUI, open to full python based scripts, NUMECA's full automatic grid generation (AutoGrid), the fastest CFD suite for rotating machinery (incompressible and compressible fluids, subsonic to hypersonic flow regimes) with CPU Booster and the powerful Flow Visualization Software CFView. All types of multi-stage axial, radial or mixed-flow configurations are supported: compressors, turbines, pumps, fans, propellers or contra-rotating propellers. From meshing to outputs, the FINE/Turbo is the most intuitive, fast and automatic simulation tool on the market.

FINE/Open with OpenLabs: FINE/Open with OpenLabs is a powerful CFD Flow Integrated Environment dedicated to complex internal and external multiphysics flows. FINE/Open with OpenLabs solves any flow, from incompressible to low and high speed flows, including combustion, multiphase, cavitation, radiation, chemistry & hellip;. It combines full automatic unstructured hexahedral grids with

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an ultra-fast CPU-Booster based preconditioned compressible solver with fast agglomerated multigrid acceleration and adaptation techniques. FINE/Open with OpenLabs allows users to freely develop and exchange physical models in CFD, with a new revolutionary open approach to open CFD. Complex programming tasks are avoided through the usage of an easy meta-language.

FINE/Acoustics: FINE/Acoustics is a fully CFD Integrated environment dedicated to Aero-Vibro-Acoustic simulations. It provides the capabilities to solve a wide range of aero-acoustic and fully coupled vibro-acoustic problems, from simple pre-design calculations to detailed large scale analyses of complex systems. FINE/Acoustics is a fully integrated system including meshing, CFD, noise detection and propagation.

FINE/Marine: FINE/Marine is an integrated CFD software environment for the simulation of mono-fluid and multi-fluid flows around any kind of ships, boats or yachts including various types appendages, as well as offshore structures, digues... The powerful and customized graphical user interface drives the user into the whole simulation process and integrates marine-dedicated features. It embeds fully automatic grid generation, ultra fast and accurate solver and efficient post-processing.

AutoMesh: The first comprehensive grid generation toolset covering all range of applications, with a suite of dedicated tools for high-quality grids. AutoMesh includes the following meshing tools:

- AutoGrid5: Full Automatic Hex Multi-block Structured Meshing of Multi-stage Turbomachinery
- HEXPRES S: Unstructured Full-Hexahedral Meshing
- HEXPRES S/Hybrid: Full Automatic Parallel Unstructured Hex Dominant Meshing for complex and/or unclean geometries
- IGG: Interactive Geometry Modeler and Multi-Block Structured Grid Generator

CFView: CFView is a polyvalent parallelized scientific visualization software system. It offers a large type of qualitative and quantitative outputs for 2D/3D scalar and vector fields. Steady/unsteady results on structured and/or unstructured grids can be handled easily with CFView allowing a straightforward analysis of complex physical systems.

FINE/Design3D: FINE/Design3D is a highly customized Integrated Environment for the design and optimization of blades and channels of rotating machinery. This tool allows designers to explore the concept of computer-based innovative design. FINE/Design3D is integrated in a user-friendly interface with full parametric blade modeler (AutoBlade), advanced neural network, and efficient optimization algorithms. Its all-in-one structure allows a direct integration into the design cycle.

AutoDesign: AutoDesign is the entry point of the 1D-to-3D design and optimization multiphysics and multidisciplinary software environment for turbomachinery, developed by NUMECA. AutoDesign is a powerful tool dedicated to fast preliminary design and optimization of multistage machines from initial design objectives. Integrated with AutoGrid5, FINE/Turbo and FINE/Design3D, it offers an integrated chain from a 1D preliminary to 3D detailed multidisciplinary optimization system dedicated to turbomachinery applications.

FINE/FSI-Offshell: FINE/FSI-Offshell is a fully integrated solution for strongly coupled fluid-structure interaction simulations. It is developed by NUMECA International and Open Engineering, combining the latest technology in Multidisciplinary, Multiphysics & Computational Fluid Dynamics and FEM.

OpenLabs Membership for Academics: The OpenLabs Membership for Academics allows users to create their own CFD research code within a professional, quality-assured environment while accessing unlimited CPUs and solvers. The NUMECA's membership program for academic research and education includes:

- Annual membership
- FINE/Open with OpenLabs: as many licenses on as many cores as needed for your department
- Documentation and tutorials included
- Access to online discussion forum
- Labs exchange

CPU-Booster: CPU-Booster reduces the computation time by up to one order of magnitude with an optimum efficiency on large mesh size. CPU-Booster is available with FINE/Turbo and FINE/Open with OpenLabs and can be applied to various turbomachinery and external flow configurations.

Modal and Flutter Analysis: The Modal and Flutter Analysis tool is an efficient method for fluid structure interaction prediction, available with FINE/Turbo and FINE/Open with OpenLabs. Only one single integrated code is used: the modal equations of the structure part are solved within the fluid flow solver. No additional interpolation is required between fluid and structure data during the FSI computation, therefore reducing the computation time and increasing the accuracy.

Nonlinear Harmonic (NLH) Method: The Nonlinear Harmonic method can be used on both single and multi-stage turbomachinery configurations and allows a significant speed-up for unsteady analysis leading to a CPU gain of 2 to 3 orders of magnitude compared to full-unsteady simulations. This unique technique computes the unsteady flow field by means of the Fourier decomposition of the periodic fluctuations based on a pre-selected number of harmonics, typically associated with the blade passing frequencies of the turbomachinery configuration and their multiples. It also provides the full unsteady flow field predictions for the selected harmonics. Furthermore, because of the transposition to the frequency domain, only one blade channel is required.

Uncertainty Quantification: With NUMECA's automated Uncertainty Quantification module, designers now have the capability to easily quantify the effect of operating and geometrical uncertainties on CFD results.

TABGEN/thermo: Available in FINE/Turbo and FINE/Open with OpenLabs, the NUMECA's TABGEN/thermo module is a powerful thermodynamic table generation tool, allowing users to generate tables for fluids and for mixtures.

TABGEN/Chemistry: TABGEN/Chemistry is a powerful combustion table generation tool, which is available in FINE/Open with OpenLabs. TABGEN/Chemistry provides combustion tables for arbitrarily complex reaction schemes. With this tool thermochemical and transport data are generated for the flamelet, equilibrium, hybrid BML/flamelet and FGM combustion models available within the FINE/Open with OpenLabs package.

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E-mail : info@parsmakina.com

COMMERCIAL PROPOSAL

Date: 27/03/2019

From: PARS MAKINA LTD.

Contact: Dr. İbrahim Sinan Akmandor
+90 532 2063708
sinan.akmandor@parsmakina.com

CUSTOMER : Mr. Aydın Aydemir
RBTCS
Teknopark Istanbul C Blok Sanayi Mah.
No:1/9A 34906 Kurtköy Pendik İstanbul
Turkey
Tel: 0090 555 553 0720

1) Quotation

Description	Quantity	Cur ency	Unit Price	Total Price
(FM-SPA-PL) FINE™ Marine START Package Commercial package including: - Pre-processing tool: HEXPRESS™ - Unstructured CFD Solver, 8 cores included - Post-processing tool: CF View™ - C-wizard - Rhino plugin One simultaneous access to prepost-processing and CFD solver.	1	EUR	56.890,00-	56.890,00-
Sub Total				56.890,00-
Taxes (18% KDV)				10.240,20-
GRAND TOTAL				67.130,20-

2) Payment, Terms & Conditions

Our payment terms are 30 days end of month.

Our Bank Info.	Pars Makina San. ve Tic. Ltd. Şti. EUR Account: İş Bankası Ahi Evran Caddesi Şubesi IBAN: TR89 0006 4000 0024 1570 0143 56
-----------------------	---

3) Information on the license

Please fill in the following information with FULL NAME and EMAIL:

- Person Responsible for Purchase:

.....

- Person Responsible for Installation and IT:

.....

- Person Responsible for Technical Support (Prim ary User):

.....



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Tel : +90 312 385 1944/203
Faks : +90 312 385 1942
E-mail : info@parsmakina.com

4) Additional information

Invoice address:
Delivery address: Turkey
VAT number:
Po number from the purchase company:
License should be delivered on (dd/mm/yyyy):

FOR ACCEPTANCE

- NAME:

.....

- TITLE:

.....

- SIGNATURE:

.....

TERMS AND CONDITIONS

Acronyms & Definitions

- **AL - Annual License:** Lease of the licensed products during one calendar year, includes maintenance services. The Annual License fee is subject to modifications on an annual basis.
- **PL - Perpetual License:** Purchase of the licensed products, includes maintenance services during the first calendar year. Perpetual License keys are delivered on an annual basis. Before the license file arrives to expiration, if the maintenance is resumed with a new annual maintenance contract, the license file will be extended for one additional year and its encryption upgraded to give access to the latest releases of the products if not the license file will be extended "as is", namely without upgrade, for one additional year. This process is repeated annually.
- **AMC - Annual Maintenance Contract:** Continuation of maintenance services for perpetual licenses during one calendar year.
- **Licensed Program(s):** The current version of the software products listed in the quotation, including related - documentation.
- **Maintenance:** Maintenance services include software upgrades and support. Hotline, email and web-based services for software installation and troubleshooting are included and available to the current and previous major release. Customer area access included for documentation and software download.
- **Advanced support:** Provides access to extended engineering, training, hardware and software resources from skilled NUMECA Application Engineers.
- **Consultancy services:** Provides access to services from highly qualified personnel of NUMECA. Such services are linked to a dedicated Work Order.
- **Training services:** Classroom and dedicated on-site training services can be provided by NUMECA for the licensed programs. Course materials are considered as confidential information and can be retained by trainees with the same rights as for the licensed programs.

Annual Maintenance Contract

Maintenance coverage must be continuous for all licensed software units. In the event that Maintenance lapses, upon the eventual reinstatement of Maintenance, a reinstatement fee will be assessed. The applicable rates can be found below:

- **3 m lapse:** The original maintenance fee is applicable. Maintenance starts from the original renewal date for at least 1 full year.
- **3m < 3 y lapse:** The backwards maintenance fees for lapses greater than three months are calculated based on net license fees multiplied by the applicable regional maintenance rate. In addition to back maintenance, a 25% surcharge applies to reinstatement.
- **3 y lapse:** The maintenance contract cannot be renewed for lapses greater than three years; a new license needs to be purchased.

NUMECA reserves the right to change its Reinstatement Fee Policy at any time, with or without notice.

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OSB Mah. Turan Çiğdem Cad.
No:30 06374 Ostim/ANKARA
Tel : +90 312 385 1944/203
Faks : +90 312 385 1942
E-mail : info@parsmakina.com

Usage of the Licensed Programs

- License is granted subject to the license agreement acknowledged during the installation and payment of all applicable fees outlined in the commercial proposal. Bridge license starts with the receipt of the purchase order, unless otherwise agreed, and is extended upon payment completion.
- Floating licenses are provided for a usage limited to a specified site (premises of the customer within 25kms radius). Sublicensing, distribution or transfer of the licenses to third party is not allowed without the prior written consent from NUMECA.
- License server changes are limited to 3 times per year free of charge for active licenses and require signing NUMECA's License Server Change form.

Pricing & Payments

- Pricing is fixed during the specified validity of the commercial offer. All licensed programs are subject to annual indexation and/or price adjustment.
- Payment terms are specified according to the commercial offer. Overdue payments shall be increased automatically and without prior notice with a monthly rate of 1%.

Confidentiality

Content and conditions of this offer are confidential and cannot be disclosed without prior, explicit and written authorization from NUMECA.

License Agreement

The license agreement terms and conditions are included in the software installation package. When installing NUMECA software, the user will have to read and accept the license agreement terms and conditions. These terms and conditions are the most recent ones and supersede all other terms and conditions.

SPECIAL ACADEMIC TERMS AND CONDITIONS

This Terms applies to the Academic Licensed Programs listed and identified in the quotation (quoted line item) with the word "ACADEMIC". These special terms and conditions apply to all Academic Institutions, Universities, Schools or Research Centers and everyone affiliated with these academic institutions.

Licensee agrees that the following Special Academic Terms and Conditions will apply to the Licensed Programs:

- The Licensed Programs may be used for educational purposes only or associated with a laboratory to supplement educational tasks.
- The Licensed Programs may be used for non-funded research projects.
- The Licensed Programs shall not be used for funded research projects or any consulting activities.
- The Licensed Programs shall not be used in a service bureau or network type operation, which is directly or indirectly competitive with services available for commercial service organizations.
- ANY USE OF THE LICENSED PROGRAM, NOT EXPLICITLY AUTHORISED HERE ABOVE, SUCH AS, BUT NOT EXCLUSIVELY, INDUSTRIAL RESEARCH AND DEVELOPMENT TASKS, FUNDED RESEARCH PROJECTS, CONSULTING ACTIVITIES, SERVICE BUREAU OR COMMERCIAL NETWORK TYPE OPERATIONS, WILL BE SUBJECT TO PRIOR AGREEMENT OF NUMECA. IF THIS AGREEMENT IS GRANTED, A ROYALTY FEE OF FIFTEEN (15) PERCENT OF THE FULL COMMERCIAL PRICE IS REQUIRED FOR EACH PROJECT IN WHICH THE LICENSED PROGRAMS ARE USED.
- Licensee shall designate a primary user, such user being the main contact between NUMECA and Licensee related to the use of such Licensed Programs with the Academic Institution, according to this license agreement.
- The Licensed Programs shall not be sublicensed, loaned or made available for use by any other Department of the Academic Institution of which Licensee is a part, unless the Department complies with the conditions defined above.

ANNEX: PROGRAM DESCRIPTION

FINE/Turbo: FINE/Turbo is a Flow Integrated Environment for rotating and turbo-machinery. The software embeds in a easy-to-use and application-driven GUI, open to full python based scripts, NUMECA's full automatic grid generation (AutoGrid), the fastest CFD suite for rotating machinery (incompressible and compressible fluids, subsonic to hypersonic flow regimes) with CPUBooster and the powerful Flow Visualization Software CFView. All types of multi-stage axial, radial or mixed-flow configurations are supported: compressors, turbines, pumps, fans, propellers or contra-rotating propellers. From meshing to outputs, the FINE/Turbo is the most intuitive, fast and automatic simulation tool on the market.

FINE/Open with OpenLabs: FINE/Open with OpenLabs is a powerful CFD Flow Integrated Environment dedicated to complex internal and external multiphysics flows. FINE/Open with OpenLabs solves any flow, from incompressible to low and high speed flows, including combustion, multiphase, cavitation, radiation, chemistry & hellip;. It combines full automatic unstructured hexahedral grids with

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an ultra-fast CPU-Booster based preconditioned compressible solver with fast agglomerated multigrid acceleration and adaptation techniques. FINE/Open with OpenLabs allows users to freely develop and exchange physical models in CFD, with a new revolutionary open approach to open CFD. Complex programming tasks are avoided through the usage of an easy meta-language.

FINE/Acoustics: FINE/Acoustics is a fully CFD Integrated environment dedicated to Aero-Vibro-Acoustic simulations. It provides the capabilities to solve a wide range of aero-acoustic and fully coupled vibro-acoustic problems, from simple pre-design calculations to detailed large scale analyses of complex systems. FINE/Acoustics is a fully integrated system including meshing, CFD, noise detection and propagation.

FINE/Marine: FINE/Marine is an integrated CFD software environment for the simulation of mono-fluid and multi-fluid flows around any kind of ships, boats or yachts including various types appendages, as well as offshore structures, digues... The powerful and customized graphical user interface drives the user into the whole simulation process and integrates marine-dedicated features. It embeds fully automatic grid generation, ultra fast and accurate solver and efficient post-processing.

AutoMesh: The first comprehensive grid generation toolset covering all range of applications, with a suite of dedicated tools for high-quality grids. AutoMesh includes the following meshing tools:

- AutoGrid5: Full Automatic Hex Multi-block Structured Meshing of Multi-stage Turbomachinery
- HEXPRES S: Unstructured Full-Hexahedral Meshing
- HEXPRES S/Hybrid: Full Automatic Parallel Unstructured Hex Dominant Meshing for complex and/or unclean geometries
- IGG: Interactive Geometry Modeler and Multi-Block Structured Grid Generator

CFView: CFView is a polyvalent parallelized scientific visualization software system. It offers a large type of qualitative and quantitative outputs for 2D/3D scalar and vector fields. Steady/unsteady results on structured and/or unstructured grids can be handled easily with CFView allowing a straightforward analysis of complex physical systems.

FINE/Design3D: FINE/Design3D is a highly customized Integrated Environment for the design and optimization of blades and channels of rotating machinery. This tool allows designers to explore the concept of computer-based innovative design. FINE/Design3D is integrated in a user-friendly interface with full parametric blade modeler (AutoBlade), advanced neural network, and efficient optimization algorithms. Its all-in-one structure allows a direct integration into the design cycle.

AutoDesign: AutoDesign is the entry point of the 1D-to-3D design and optimization multiphysics and multidisciplinary software environment for turbomachinery, developed by NUMECA. AutoDesign is a powerful tool dedicated to fast preliminary design and optimization of multistage machines from initial design objectives. Integrated with AutoGrid5, FINE/Turbo and FINE/Design3D, it offers an integrated chain from a 1D preliminary to 3D detailed multidisciplinary optimization system dedicated to turbomachinery applications.

FINE/FSI-Ofelia: FINE/FSI-Ofelia is a fully integrated solution for strongly coupled fluid-structure interaction simulations. It is developed by NUMECA International and Open Engineering, combining the latest technology in Multidisciplinary, Multiphysics & Computational Fluid Dynamics and FEM.

OpenLabs Membership for Academics: The OpenLabs Membership for Academics allows users to create their own CFD research code within a professional, quality-assured environment while accessing unlimited CPUs and solvers. The NUMECA's membership program for academic research and education includes:

- Annual membership
- FINE/Open with OpenLabs: as many licenses on as many cores as needed for your department
- Documentation and tutorials included
- Access to online discussion forum
- Labs exchange

CPU-Booster: CPU-Booster reduces the computation time by up to one order of magnitude with an optimum efficiency on large mesh size. CPU-Booster is available with FINE/Turbo and FINE/Open with OpenLabs and can be applied to various turbomachinery and external flow configurations.

Modal and Flutter Analysis: The Modal and Flutter Analysis tool is an efficient method for fluid-structure interaction prediction, available with FINE/Turbo and FINE/Open with OpenLabs. Only one single integrated code is used: the modal equations of the structure part are solved within the fluid flow solver. No additional interpolation is required between fluid and structure data during the FSI computation, therefore reducing the computation time and increasing the accuracy.

Nonlinear Harmonic (NLH) Method: The Nonlinear Harmonic method can be used on both single and multi-stage turbomachinery configurations and allows a significant speed-up for unsteady analysis leading to a CPU gain of 2 to 3 orders of magnitude compared to full-unsteady simulations. This unique technique computes the unsteady flow field by means of the Fourier decomposition of the periodic fluctuations based on a pre-selected number of harmonics, typically associated with the blade passing frequencies of the turbomachinery configuration and their multiples. It also provides the full unsteady flow field predictions for the selected harmonics. Furthermore, because of the transposition to the frequency domain, only one blade channel is required.

Uncertainty Quantification: With NUMECA's automated Uncertainty Quantification module, designers now have the capability to easily quantify the effect of operating and geometrical uncertainties on CFD results.

TABGEN/thermo: Available in FINE/Turbo and FINE/Open with OpenLabs, the NUMECA's TABGEN/thermo module is a powerful thermodynamic table generation tool, allowing users to generate tables for fluids and for mixtures.

TABGEN/Chemistry: TABGEN/Chemistry is a powerful combustion table generation tool, which is available in FINE/Open with OpenLabs. TABGEN/Chemistry provides combustion tables for arbitrarily complex reaction schemes. With this tool thermochemical and transport data are generated for the flamelet, equilibrium, hybrid BML/flamelet and FGM combustion models available within the FINE/Open with OpenLabs package.

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INVESTMENT OF SIEMENS NX CAD;

CAD computer aided Design Software;

Boğaziçi Yazılım; Özgür ŞENEL, Nilgün Bökeer 0090 216 575 6650;

0090 507 485 0322 sinan.akmandor@parsmakina.com;

Boğaziçi Yazılım A.Ş. is the sole distributor of Siemens Digital Industries Software in Turkey. Boğaziçi Yazılım, which has over 25 years of experience in the industry, has managed to provide engineering services for Siemens Digital Industries Software products to more than 3,500 customers and 10,000+ end users during this quarter-century. Our success is supported by our experienced sales and consultancy staff in Istanbul and Ankara offices, as well as a dealer network spread throughout Turkey.

Boğaziçi Yazılım, with the power gained with Siemens Digital Industries Software solutions, of which it is the Turkey Distributor, has provided thousands of companies with the experience gained in many sectors such as Automotive, Transportation, Aviation and Defense Industry, White Goods, Machinery Manufacturing, Health and Medical Devices, Maritime, Molding and products starting from conceptual design. offers end-to-end innovative solutions from development, manufacturing and after-sales support.

As Boğaziçi Yazılım, our aim is to always be the first solution provider that comes to our customers' minds regarding the issues we serve, and to successfully meet the demands of our customers who trust us with the "Strategic Business Partner" approach.

Our goal in all the work we do; to find solutions to the current needs of our customers, to find solutions to the growing and changing future needs of our customers within their growing structures, to create long-term plans that will enable our customers to develop together with the developing technology.

As we leave behind a successful history of more than 25 years in the sector, we thank our valued customers for their trust in us.



A total of 8'600.00 EUROx10= 86'000.00 EURO investment is required for 10 users.

INVESTMENT of OPENMIND HYPERMILL CAM CAM computer aided Manufacturing Software

OPEN-MIND; Murat ODABAS; Emre ŞİNEL; 0090 216 575 6650;

0049 815 3933 500 info@hypermill-turkiye.com;

<https://www.openmind-tech.com/tr.html>

Propeller / finned discs can safely be programmed to CAM and can be effectively milled, and the impellers and finned discs can be programmed using this application without requiring additional information. The integrated automatic functions in the multi-blade package minimize the number of parameters that must be entered. Proven crash control guarantees a very high level of process reliability. The use of rugged tools allows machining with high feed parameters and feed rates.

For a total of 2 users, an investment of 41'370.00 EUROx2=82'740.00 EURO is required.



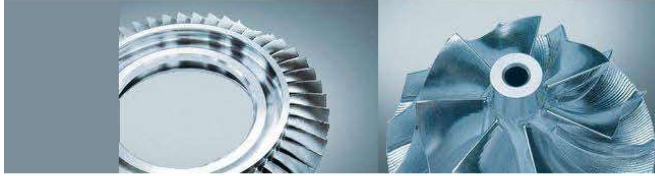
For a total of 4 users, an investment of 30'600.00 EURO x4 = 122'400.00 EURO is required.



**Milling of impellers
and blisks made easy**

IMPELLER / BLISK





The *hyperMILL*[®] multiblade kit – as simple as a standard application

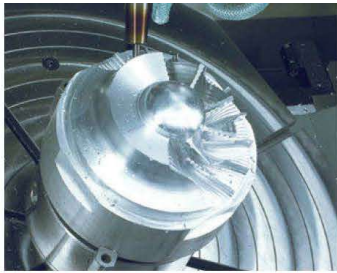
With the multiblade kit, the machining of impellers and blisks has never been simpler. Integrated automated functions reduce the number of parameters needing to be entered to a minimum. The straightforward, graphics-based user interface is easy to learn. Moreover, dependable collision checking and collision avoidance guarantee the highest possible process safety at each stage of machining.



Complete: With this kit, all strategies required for machining multi-bladed parts are easily defined. In addition to general applications such as roughing, hub finishing and blade finishing, the machining strategies also include more specialised applications.

Straightforward: Automated functions keep the number of parameters that need to be defined to a minimum. The graphics-based user interface illustrates the functions of the parameters very clearly. This means that programming is no longer the exclusive domain of experienced specialists.

Multi-faceted: There are no CAD data restrictions. CAD integration in a full-scale CAM product means that general machining strategies can be also be applied



without the need of any second CAM product. Furthermore, multiblade cycles permit the use of conical tools, barrel, bullnose etc.

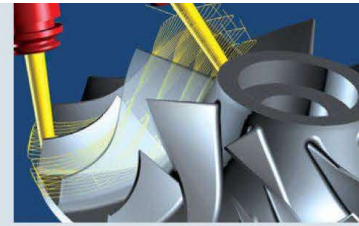
Fast: The advantages of *hyperMILL*® feature technology apply throughout when machining multi-bladed parts. Complete machining sequences that have already been run successfully for similar jobs with the same material can be imported via drag-and-drop. Subsequent changes in design or programming of similar



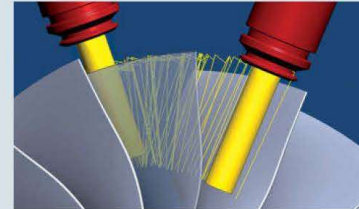
versions require only a few clicks of the mouse.

Process-safety: The use of robust tools allows machining with high infeed parameters and feedrates. Proven *hyperMILL*® collision checking guarantees a high level of process safety. The operator has a choice between two strategies: Collision avoidance around the Z-axis or perpendicular to the camberline, a curve between two blades. The optimum tool orientation provides room for utilizing thicker tools.

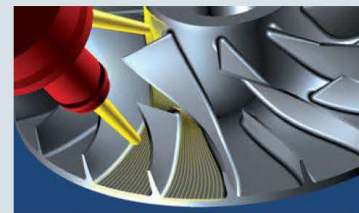
Multiblade roughing: In the roughing strategy, the blades are machined in a continual process starting from pre-machined stock or a semi-finished part. No time-consuming simulation of the removal of material is required.



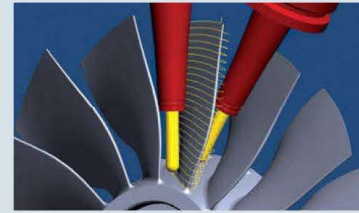
Multiblade plunge roughing: If long, slender tools that use low cutting feedrates are required to fit in the available pocket, plunge roughing may be a suitable alternative. This always allows the most rigid tool to be employed to finish the surface partially in accordance with the geometry. This allows very efficient machining.



Multiblade hub finishing: The tool path profile can specify the hub's aerodynamic behaviour and visual result to suit individual customer requirements. This machining strategy can also be used for rest material machining close to the blade



Multiblade point milling: The strategy „Point Milling“ is an HSC strategy which enables superb milling of all curved blades. The blades are machined in a continual spiralling movement with point contact from the tool.



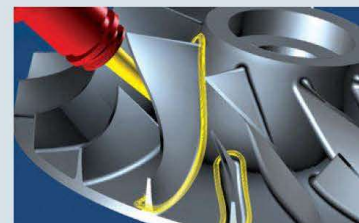
Multiblade flank milling: Where the blade surfaces allow for precise swarf cut machining, the strategy „Flank Milling“ can be used. This reduces machining time, as *hyperMILL*® will automatically calculate the optimal tool orientation.



Multiblade edge milling: This machining strategy is used whenever leading and trailing edges cannot be generated together with the blade surfaces.



Multiblade fillet milling: Fillet milling is the ideal strategy when the radii between the hub and the blade surfaces vary. This strategy also facilitates rest material machining – the basic requirement for choosing a suitable blade and hub machining tool.





HyperMILL Fiyat Teklifi

FİRMA ADI	RBTC S MAKİNA İMALAT	TEKİF NO	2019-Rev.1
TEL/FAX	0555 553 07 20	TEKLİF TARİHİ	08.11.2019
YETKİLİ KİŞİ	AYDIN AYDEMİR	SATIŞ YETKİLİSİ	Emre Şinel
E-MAIL	Eng.aydinaydemir@gmail.com	TEKLİF KONUSU	Fiyat Teklifi

Sayın Aydın Bey;

Görüşmemize istinaden tarafımızdan istemiş olduğunuz *HyperMILL* 5 Eksen cam sistemlerine ait fiyat teklifimizi aşağıda bilgilerinize sunuyoruz. Teklifimizi olumlu bulacağınızı ümit eder, çalışmalarınızda başarılar dileriz.

Ürün Adı	Lisans Adeti	Fiyat
<i>hyperCAD-S GE</i>	1 Adet	1.200 €
<i>hyperMILL Expert</i>	1 Adet	8.100 €
<i>hyperMILL 7M-5X Eksen Modülü</i>	1 Adet	10.950 €
<i>5 Eksen index&simultane freze postprocessor</i>	2 Adet	7.200 €
<i>4 Eksen indexing freze postprocessor</i>	1 Adet	1.700 €
<i>4 Eksen index&simultane freze postprocessor</i>	1 Adet	2.650 €
<i>Makine Model Simülasyon</i>	4 Adet	4.800 €
<i>Bakım Anlaşması ve Versiyon Güncelleme</i>	1 Yıllık	4.770 €
<i>Eğitim</i>	3+3 Gün	Ücretsiz
Genel Toplam		41.370 €+KDV

Açıklamalar

- Döviz kuru; ödeme günündeki TCMB satış döviz kuru esas alınacaktır.
- Yukarıda beyan edilen fiyatlara KDV dahil değildir.
- Sürüm güncellemeleri; yeni sürümleri, sürüm yükseltmelerini otomatik yükleyebilirsiniz.
- İş saatleri içerisinde ücretsiz teknik destek; telefon ile teknik destek alabilir, uzaktan masaüstü bağlantısıyla sorunlarınızı anında giderebilirsiniz.
- Firmada yapılması durumunda Eğitimcinin Yol ve Konaklama giderleri alıcı firma tarafından karşılanacaktır.
- Firma bakım anlaşması süresi içinde, her ay düzenlenen Open MIND eğitim sınıfındaki Eğitimler ücretsizdir.
- Makine simülasyonu hazırlanması konusunda; makine katı modeli firma tarafında tedarik edilerek tarafımıza paylaşılacaktır.



OPEN MIND TURKEY YAZILIM A.Ş.
Çeçen sok. Akasya Plaza A Blok K:26 D:150 34660
Acıbadem / Üsküdar / İstanbul / TÜRKİYE

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Taiwan	OPEN MIND Technologies Taiwan Inc. Rm. F, 4F., No.1, Yuandong Rd., Banqiao Dist. New Taipei City 22063 • Taiwan Phone: +886 2 2957-6898 E-mail: Info.Taiwan@openmind-tech.com

OPEN MIND Technologies AG is represented worldwide with own subsidiaries and through competent partners and is a member of the Mensch und Maschine technology group, www.mum.de



We push machining to the limit

www.openmind-tech.com

Computer, Workstation and Server Investment

Electronic goods investment is 30% more expensive in Turkey compared to European Union countries due to taxes. If it can be developed in Turkey with its own purchases, it can be possible to invest in this part with a lower cost.

Investment of DELL M7740 Mobile Work Station 10 Pieces; 10X4'213.00 EURO= 42'130.00 EURO

Required to use SIEMENS NX CAD



Investment of DELL T7920 Mobile Work Station 6 Adet; 6'527.00 EURO= 39'165.00 EURO

NUMECA FINE MAIRNE is required to use OPENMIND HYPERMILL; 2 are simultaneous remote desktop computers for data storage. It will be stored in 2 different offices as requested by the investor.



Investment of ; 1TB Solid State Msata2 External Disk :
24 pieces; 62X213.00 EURO=13'206EURO.

It is necessary for backing up all the work done. It will be used to send all engineering knowledge to the investor.

Employee Expenses COST and Fixed Costs

4 pieces, Founder 1 month salary 2'680 EURO; $4 \times 2'000.00 = 10'720.00$ EURO;

10 pieces, R&D Engineer 1 month salary 1'340 AVRO; $10 \times 1'340.00 = 13'400.00$ AVRO;

Total 1 Year Cost; 289'440.00 EURO;

Technopark Istanbul M2 rental cost is 68 EUR per month; 120m² Office Annual cost; 97'920 EUR. As a result of some agreements with the Republic of Turkey, the rental cost can be donated.

Vehicle Expenses; 2 pick-up trucks and 4 units; C-segment Sedan Vehicle purchase; 120'000 EUR Leasing contract is made for at least 3 years. And the rental price is more expensive than the purchase price of the vehicle. Vehicles can be purchased second hand. It will be used for more than 100 customer visits in the first year.

Flight ticket costs are not foreseen for international flights. Can be requested from customer.

Investment of ITU ATA NUTKU TEST POOL;

In order to measure the engineering data of a 100kw compact test propeller; A dynamometer must be purchased from CUSSONS TECHNOLOGY LTD. The price of the dynamometer is 356'000 Pounds approximately 412'000 EURO.

If Dynamometere is donated to Istanbul Technical University, the Tests will be made free of charge and there will be no need to go to the 3rd country for the Test.

Certification of propeller test data is a sine qua non for insurance of merchant ships. Insurance companies and banks require Accreditation, Certification and Testing in order to sign a contract with the ship owner.

CUSSONS TECHNOLOGY LTD.

SALFORD - MANCHESTER - ENGLAND
Tel: +44 161 833 0036 E-mail: sales@cussons.co.uk

BUDGETARY QUOTATION

End-User: ITU - Istanbul Teknik Universitesi
Rektörlüğü
106M481 Nolu TUBITAK Projesi
Maslak-Istanbul
Turkey
Contact: Dr Emin Korkut

Client: ITU - Istanbul Teknik Universitesi Rektörlüğü
106M481 Nolu TUBITAK Projesi
Maslak-Istanbul
Turkey

Date: 04-Jan-16
Validity: N/A
Destination: TURKEY
Your ref: NEW TOWING TANK
Currency: GBP (English Pounds)

Our reference: Q13531
Page: 7 of 11

Item Code:	Catalogue Number:	Qty:	Description:	Unit Price:	Total:
H105 Type Open Water / Self Propulsion Podded Propeller Dynamometers					
5.1	H105-10	2	Cussons H105-10 Self Propulsion Podded Dynamometer - Self Propulsion Podded Dynamometer for use with the R350M Multi-Component Balance and Drive Motor / Control System - This is designed for use in self propulsion tests or open water podded propeller tests in towing tanks this includes: - H105 Podded Propeller Dynamometer rated at 10Nm Torque and 200N Thrust max speed 2000rpm & Dummy Propeller Dynamometer - Qty 1 Strain-gauged Instrumented Torque and Thrust measuring sensor / element with telemetry system; - Qty 1 Torque, thrust and Speed display racks together with interconnecting wiring; - Qty 1 Dummy Sensor for use in place of measuring sensor if non measurement is required. - Qty 1 Self-Propulsion Gearbox suitable designed with 30mm vertical support to assembly through the model hull - Maximum Torque of 20Nm. Gear Ratio 2:1 (Suitable for use with both the H105-01 (20Nm) & H105-10 (10Nm); - Storage Case <i>Not Including Podded Dynamometer Static Calibration Device see Item 5.5</i>	£70,795	£141,590
5.2	R350M-41	2	Cussons R350M 3 component balance - 3 component version of the R350 balance for use with the H105 Podded Dynameters for Self Propulsion and Open Water Tests in the Towing Tank. This includes storage case for the 3 component balance with all three loadcells, coupling rods. Fx (Unit Thrust) Max - 200N Fy (Side Force Fy1 + Fy2) Max - 200N (please note to achieve the 20Nm Mz with the geometry currently available this would require 2 additional 100N Fy load-cell hence the combine Fy would be 200N.) Mz (Yaw Moment) Max - 20Nm	£51,683	£103,365
5.3	H105 Drive System	2	H105 Podded Dynamometer Drive System - - Qty 1 Drive Motor Max Speed 4000RPM @ 5.4Nm Motor weight is 7kg - (this give the 2000rpm Propeller speed at 10Nm required) (1 for Each Pod) - Qty 1 Drive System control system, Power Supply, Control Rack and includes digital feedback card for encoder - Qty 1 Hollow Shaft Encoder (1 for Each Pod) - Power and signal cables	£22,259	£44,518
5.4	H105 Model Mounting Frame	1 Set	Model Self Propulsion Mounting Frames - Aluminium Extrusion Model Mounting System this is supplied as single screw mounting as well as a twin screw arrangement. - 2 off Single Screw Pod Mounting Frame for use in self propulsion tests in ship models. - 1 off Twin Screw Pod Mounting Frame for use in self propulsion tests in ship models.	£12,873	£12,873
5.5	H105 / R350M Calibration Frame	1	H105 / R350M Storage / Calibration Frame Static - - Storage Stand for the H105/R350 Self Propulsion Model Frame or Open Water Frame - (dependant on final scope of supply) - H105-05 Podded Dynamometer Static Calibration with weight hangers for static calibration of the thrust and torque transducer. <i>Please note this doesn't include standard weights.</i> - R350M Single component Balance Static Calibration device includes levers and weight hangers for static calibration of the Multi Component Balance Loadcell. <i>Please note this doesn't include standard weights.</i>	£17,704	£17,704
5.6	Optional H105 Open Water Mounting Frame	1	Open Water Podded Dynamometer Mounting Frame. - Qty 1 Mounting Frame for use in Open Water Pod test from towing carriage with height adjustment (Only one supplied) <i>Please note this will be based on the same frame as the H29-01 Towing Carriage open water frame - These do not include a pitch adjustment system for the open water mounting frame this can be quoted separately.</i>	£21,364	£21,364

Total Price all items:	£341,416
Packing:	£3,794
FOB UK Port Charges:	£3,048
Insurance:	£3,414
Carriage:	£4,268
Total Budgetary Price:	£355,939

DESPATCH: For Supply of All Equipment Quoted above is currently 24 weeks from contract to dispatch (not including the installation)
SHIPPING / TRANSPORT: To be confirmed
WARRANTY: 12 months from Acceptance of good or 18 months from the receipt of goods what ever is sooner
INSTALLATION: Not Included unless otherwise stated
PAYMENT TERMS: This is to be discussed at contract however stage payments would be agreed at mile stones such as contract, design review, shipment, installation etc.
Please Note: This price does not include training, installation or commissioning at the customers facility as it will be dependant on the final scope of supply but assume 3 days for each item at 880 gbp per man day including expenses except flights.

Signed:



Shaun Ross
K&R Marine Hydrodynamics Division Manager
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Marine Hydrodynamics Division
Cussons Technology Ltd.



CUSSONS
TECHNOLOGY

Investment of Test Propeller

For the Rotor and Stator part of the 100 KiloWatt test propeller to be purchased from EMF, a manufacturing cost of 48'000 EUR per propeller must be paid.

By making 2 test propellers; The second one can be attached to a sailing boat owned by the investor. However, for the manufacture of a circular Stator with a radius of 600 mm and a Circular Rotor with a diameter of 320 mm, an investment of 125'000 EURO for molds, punches and presses is required. This investment will be made only once. It will be the equity capital of our company for all our electric motor manufacturing up to 600 mm radius.

The remaining cost of CU4 Chrome manganese bronze casting of 100 KW azipod, CNC machining and bearing and assembly manufacturing costs 162'000 EUR.

Bearings components can be manufactured in Manisa Tibet Makina.

<http://www.tibetmakina.com.tr/>

Sealings components can be manufactured in Kastas.

<https://www.kastas.com.tr/>

All the component to be used is produced in Turkey. However, they are all non-standard special design products.

More than 28 patent protection can be obtained on the preliminary prototype Azipod design. However, obtaining patent protection in military practice may not be required since it is a state secret.

Investment of Building

Türkiye'de 24m vinç kanca altı yüksekliği olan bir binanın yatırım maliyeti m2 si 460 AVRO – 540 AVRO arasındadır. Bu maliyetin içerisinde harfiyat, temel atma beton, Çelik konstrüksüyon çatı, tavan vinçleri, sandvich panel izolasyon, yangın söndürme tesisatı, trafo, elektrik tesisatı aydınlatma, ofis ve idari binaları içermektedir. Binanın müteahhitlik mühendislik hizmetini kendimiz yapacağımızdan dolayı maliyetimiz yurtdışı maliyetlerine göre daha ucuz olacaktır.

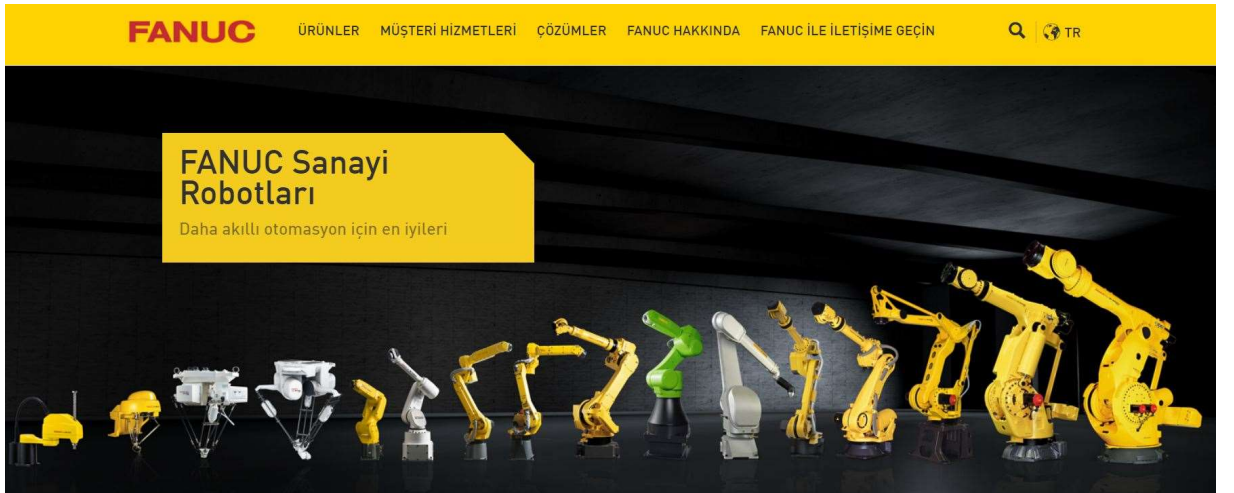
Kesser 13 Eksen CNC Tezgahın montajı fabrika içerisinde yapılacaktır. Ve taşınması mümkün değildir. İlk bir yıl içerisinde 8'000 m2 bina inşaa edilmesi gerekmektedir. Arazi Teknopark İstanbul'un Dilovası'ndaki arazisi 49 yıllığına hibe olarak kiralanabilir. Ancak 49 yıl sonunda mülk sahibi Teknopark İstanbul olacaktır. 8'000m2 bina maliyeti 8'000X760=6'080'000 AVRO yu geçmemektedir.

Kesser 13 Axis CNC Machine will be assembled in the factory. And it cannot be moved. In the first year, an 8'000 m2 building must be constructed. The land of Technopark Istanbul in Dilovası can be rented for 49 years as a grant. However, at the end of 49 years, the owner will be Teknopark Istanbul. The cost of 8'000m2 building does not exceed $8'000 \times 760 = 6'080'000$ EURO.

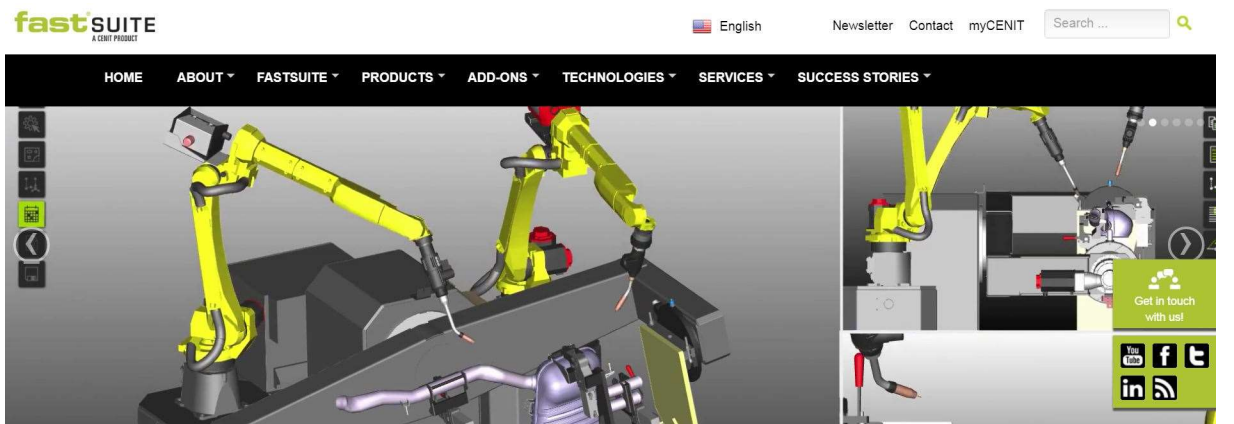
Investment of Carbonfiber Robot

Carbon fiber knitting process can be done with Fanuc Industrial Robot applications external Servo axes and offline ROBOGUIDE software; however, with the CENIT FAST SUITE software, which has not yet started commercial sales, robot programming can be done by spending less engineering hours.

<https://www.fanuc.eu/pl/en/robots>



https://www.fastsuite.com/en_EN.html



Fanuc R2000iC210F COST: 41'000.00 AVRO AVRO
Fanuc M900IB280L-30P-A-PN/0 COST 52'000.00 AVRO
Fanuc M900IB360-30P-A-PN/2 COST 82'000.00 AVRO
One of pieces External Axis and Naptesco Sikloid Gearbox is 12'000.00 AVRO
RoboGuide Software is 18'000 AVRO. Robot Hand tool is; 46'000.00 AVRO
All of FANUC robotic investment is completed 311'000.00 AVRO.

Clean Room M2 investment cost is 680 EUR. 20m X 30m = 600m2 clean room
investment is 48'000.00 EUR.

Other Investment; carbon fiber vacuum furnace... etc. may be realized or outsourced
to 3rd party company.

Carbon Fiber manufacturing investment can be left to the 2nd year investment plan.

WORST CASE SENARIO

In the worst case, even if a military ship is not fitted with a propeller due to political reasons, propellers and equipment are produced to be mounted on commercial ships or used in the manufacture of sailing racing boats. If there is a worse scenario than this, wind turbines in clean energy applications, Francis turbines in hydroelectric dams, R&D and manufacturing can be done. Molds can be manufactured for the automotive and white goods industry.

In advanced high-tech applications, the manufacture of many equipment used in nuclear power plants can be done on the 13 Axis Kesser Horizontal machining simultaneous CNC machine.

When the investor wants to get his money back after a year, the company's shares can be purchased by the shipyards in Turkey, the Mediterranean and the Middle East, with the success stories of the test propeller published in academic journals.

As founding partners, we bring engineering expertise and management expertise to bear on the company's management process. We are ready to work 24/7 to ensure rapid progress within planned investment costs. We agree that if the investor purchases 60% of the company's shares, the other two founding members will share the remaining shares equally.

Even if the investor does not pay all the money at once, he can take over the company shares by paying a certain amount of money and giving a letter of guarantee for the remainder.

We wish our company partnership to last a lifetime and be passed on to our grandchildren...