

1 DETAILED INFORMATION ON THE MOBI-MAT HELIPAD IN A2X

a) Raw material characteristics

RANGE OF PRODUCT	MOBI-MAT® ®
MOBI-MAT® ® TYPE	A2X
WEIGHT*	1.65 kg/m ²
COMPOSITION	100 % Polyester
Recyclability of weaving	100 %

MECHANICAL PROPERTIES	Test Method: Lab-TME 2T (adapted from NF G 071-119 or NEQ ISO 5081)
Tensile strength (warp direction) / 4.20 m	46 metric tons minimum
Tensile strength (warp direction)	13.8 t/m minimum
Elongation at break (%)	21%
Compression	12 Mpa (N/mm ²)

CHEMICAL PROPERTIES	
Moisture regain 20°C – 65% HR	0.4%
Acid resistance	Good
Alkali resistance	Good
Solvent resistance	Good
POL (Petroleum Oils Lubricants) Hydrocarbons resistance : Kerosene type F34, F35, Military oil type F54, domestic oil type XF10	Good
Aviation synthetic fluid resistance (Ex. : Skydrol – HyJet IV A plus (Exxon))	Excellent at ambient temperature (no physical deterioration after 16 days of wetting, 100% mechanical characteristics)
UV resistance	Very good (12 years under middle east sun without deterioration)
Micro-organisms resistance	Excellent

THERMAL PROPERTIES	
Useable temperature	-40°C / + 80°C
Softening temperature	220°C
Melting temperature	260°C
Degradation temperature	300°C

Combustion behavior	Laid on the ground, the mat stops burning as soon as the flame is taken away
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b) Mechanical properties Compressive strength:

The compressive strength of the material is 12 Mpa N/mm²

In accordance with our ISO certifications, all elements entering in the Helipad™ A2X kit are tested



For instance, picture showing an eyelet destructive test on A2X

c) Maximum take-off weight

As stated in §e, the material has a unique resistance against force originated by the landing of a helicopter. The mats are also capable of carrying the full weight of the helicopter on take-off without puncture.

The Mobi-Mat® A2X Helipad™ has the resistance for a take-off weight over 23 000 kg. It is made to support all type of helicopters.



Mobi-Mat® Helipad™ in use with a CH-47 (Chinook) (take-off weight 22,680 kg)

d) Average surface friction

The surface of the A2X provides a non slippery surface, based on the experience acquired in Helipad™ in polyester. The contact area is not flat. The method of crossing polyester threads gives the Helipad™ a rough surface.

The Mobi-Mat® Helipad™s have got an integral, nonskid surface that is suitable for safe VTOL operations of rotary wing aircraft, as well as safe vehicular and personnel trafficking;

**e) Slopes on the Mobi-Mat® A2X Helipad™**

There is no accumulation of water (of liquids) on the Mobi-Mat® A2X surface as it is completely permeable and porous. Our material has got large permeable properties, so that stagnant fuel, grease, ice, melting snow or excessive surface water cannot spool on the mat, this is physically impossible. A non-permeable material cannot be used for Helipad™ construction as it creates puddles, a permeable material is mandatory.

f) Chemical properties

All liquid features, such as lubricants, hydraulics fluids, petroleum products, while drain through the Mobi-Mat® A2X surface. As the Mobi-Mat® A2X is made of polyester (PET) which is chemically an inert material there is no possible chemical reaction with any aviation lubricant.

In addition, polyester is fire retardant. Laid on the ground, the mat stops burning as soon as the flame is taken away.



The Mobi-Mat® A2X Helipad™ is self-extinguishing.

g) Thermal properties

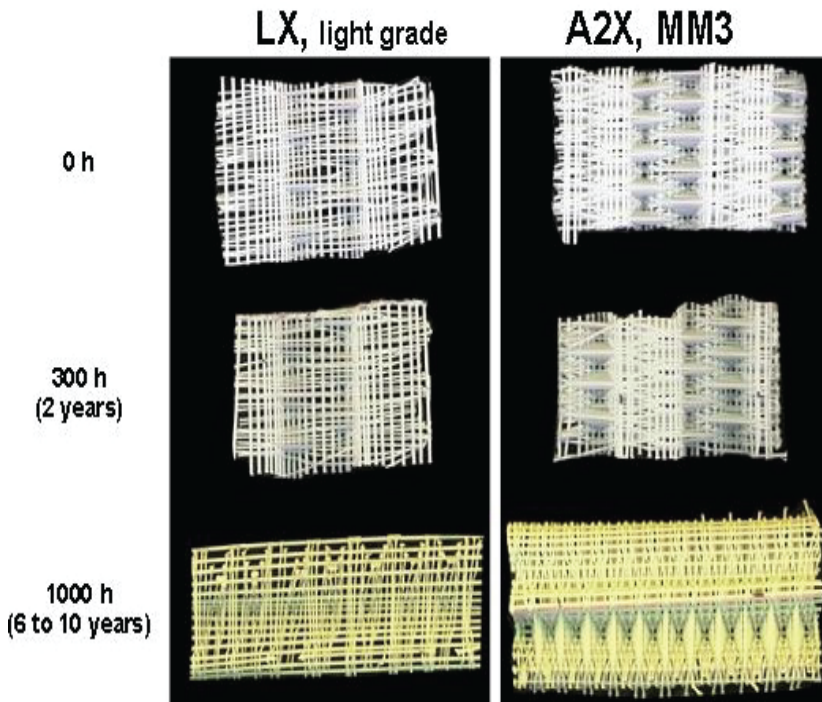
Temperature of use:

The standard usable temperature for Polyester is -40°F (-40°C) / 176°F (+ 80°C). It softens at 428°F (220°C) and melts at 500°F (260°C). It is suitable for external operations at +60°C.

h) UV resistance:

Material oxidation (yellowing) generates a negligible mechanical degradation. Mobi-Mat® keeps all its mechanical characteristics after an intense and prolonged exposure to UV (mini 12 years).

As the material is a woven fabric, there is technically no risk of flaking even if exposed to intensive sunlight during many years.



Accelerated exposition tests on Mobi-Mat® (LX light grade and A2X and MM3), realized in a SEPAP 12.21 (CNRS UMR 6505) enclosure under the following conditions: temperature 60°C (140 F), high irradiance 100 W/m² (9.3 W/sqft).

i) Rapidly installed and easily assembled manually with minimal tools

There are no specific tools or mechanical equipment required for the Mobi-Mat® A2X kit installation and removing.



There is no specific ground preparation required.

A 21m x 20m Mobi-Mat® A2X landing surface is installed within less than two hours by a 4 man crew, which means less than 8 man hours to install the 21m x20m landing mat.

j) Lightweight and easy handled

Due to its lightweight (1,65kg/m² - 71kg per roll) Mobi-Mat® Helicopter matting are easy to handle manually. There is no mechanical handling equipment necessary to install the helicopter landing surface with its accessories. inside a MI-8 helicopter.

A complete A2X HELIPAD™ kit including the anchoring system is easily transported inside or under an MI-8. (5,34m long x 2,29m wide x 1,80m high).

There is no specific equipment necessary to install the helicopter landing surface with its accessories inside a MI-8 helicopter.

Each Mobi-Mat® Helipad™ segment can be handled with a minimum manpower & training



k) Reusable and easily cleaned using water

Each component of our Mobi-Mat® A2X Helipad™ is reusable and can be cleaned using water only. For the cleaning of the mats, we recommend using high pressure water.

l) Durable to sustain 5000 helicopter sorties

We do supply our helicopter landing surfaces since the Mobi-Mat® was invented in 1994.

Please find enclosed some references of past deliveries to some clients. All these Mobi-Mat® helicopter landing surfaces are still in use today.

Our Mobi-Mat® Helipad™ are very robust, reusable and durable. They sustain 5000 helicopter sorties without any problem.

As an example, 24 kits delivered to the French Army in 2009, after having been initially purchased and deployed for the Afghanistan operations, are actually deployed in Mali as you can see on the aerial views bellow. This is the proof of durability of Mobi-Mat® Helipad™

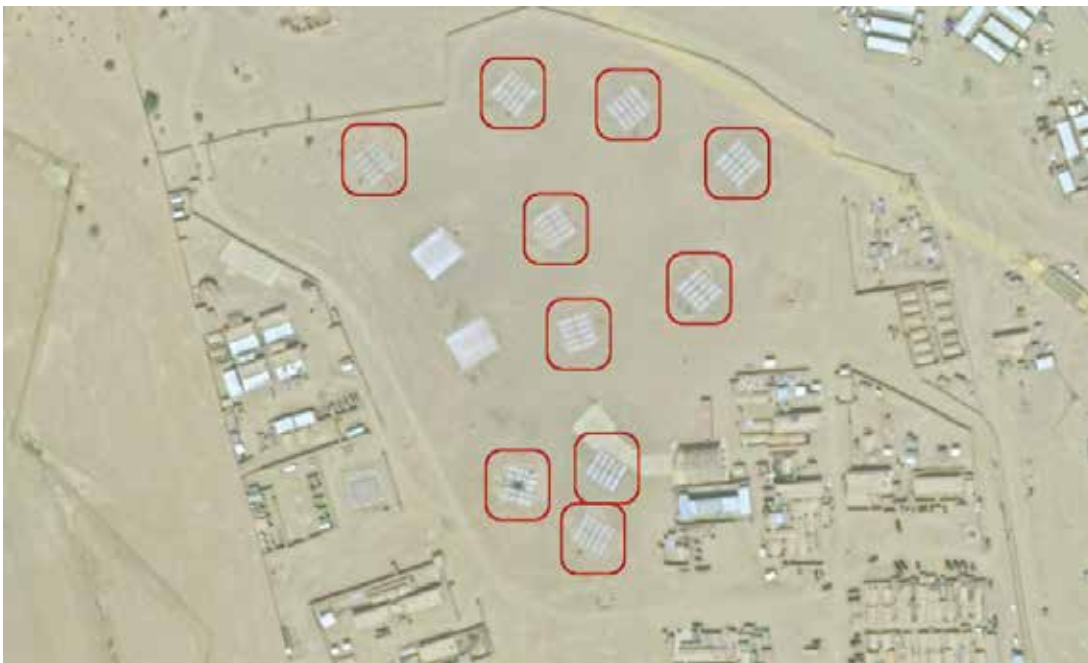
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HELIPAD A2X



Kidal - Mali

<https://www.google.fr/maps/place/Kidal,+Mali/@18.4197279,1.4114505,440m/data=!3m1!1e3!4m5!3m4!1s0x11e46d21bbf978c1:0xda4459a07757a47f!8m2!3d18.4520713!4d1.4096535>



Tessalit - Mali

<https://www.google.fr/maps/place/Tessalit,+Mali/@20.2578804,0.9807825,434m/data=!3m1!1e3!4m5!3m4!1s0x11fc8be2e4d2495b:0x4c763d0e3398b10b!8m2!3d20.2573532!4d0.9910298>

m) Resist dynamic/static loads and provide ground effect

The material has a unique resistance against force originated by the landing of a helicopter. The mats are also capable of carrying the full weight of the helicopter on take-off without puncture.

Our mats have been used with all kinds of engines, including the heaviest ones



Mobi-Mat® Helipad™ in use with a MI 17 (take-off weight 13,000 kg)

The Helipad™ is able to be used as loading area by accepting mechanical handling equipment and trucks across it. This is very important for helicopter refueling operations as the refueling vehicles can drive on the matting systems. The Mobi-Mat® Helipad™ is adaptable to natural ground conditions



HELIPAD A2X



Mobi-Mat® Helipad™ in use with a Super Puma (take-off weight 11,200 kg)



Mobi-Mat® Helipad™ in use with a EC 725 Caracal (take-off weight 11,200 kg)



Mobi-Mat® Helipad™ in use with a CH-47 (Chinook) (take-off weight 22,680 kg)

n) Reduce free object damage (FOD)

The Mobi-Mat® Helipad™s can be used at shore or on sandy area, as it avoids FOD and brownout. The pictures bellow are showing the difference when the matting system is used during operation in sandy area.



Tiger Helicopter

o) Skid resistant for helicopters, vehicles and persons. Avoid pooling of water.

Made from a roll of high-density polyester mesh with a patented non-skid surface, Mobi-Mat® A2X Helipad™ ensures excellent grip even in extreme conditions such as surfaces covered with sand, dust, mud and snow.

Due to its unique tri-dimensional weaving process, the Mobi-Mat® A2X Helipad™ provides safe landings to helicopters, helicopter crews and ground support squadrons.

Our textile fabric is completely porous, permeable to water and to all liquids, including oils and fuels. There is no need to slope it to avoid spooling of water.

There is no accumulation of water (or any liquids) on the Mobi-Mat® A2X surface as it is completely permeable and porous. Our material has got large permeable properties, so that stagnant fuel, grease, ice, melting snow or excessive surface water cannot spool on the mat, this is physically impossible. A non-permeable material cannot be used for Helipad™ construction as it creates puddles, a permeable material is mandatory.

p) Suppress dust and be visible from the air

The pictures bellow are showing the difference while the Tiger helicopter is landing with our without a Mobi-Mat® Helipad™. When the engine is landing on the Mobi-Mat® Helipad™, there is no dust cloud on the helicopter landing area.



Tiger Helicopter

q) Vision with night goggles

The Mobi-Mat® A2X Helipad™ has a white colour, with large integrated black stripes. This makes the Mobi-Mat® landing surface highly visible from the air during the approach manoeuvres of the aircraft.

The large markings of the Mobi-Mat® A2X Helipad™ makes the product particularly visible when using night vision goggles as stated by the picture bellow.

**r) Not sun reflective**

The Mobi-Mat® Helipad™ are not sun reflective



2 Decommissioning and Disposal

Project :	
Producer	ETS A. DESCHAMPS ET FILS - France
Saler	
Responsible POC :	

Concerned Product	Helicopter Landing Mat in A2X
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a) Environmental Targets (objectives):

Product:	Made of recyclable components
Fabric process :	Non polluting fabric process
Suppliers :	Cooperation with environment orientated suppliers

Environmental Targets (reached) :

Product :	100% of the product is recyclable
Fabric process :	Non polluting (manual assembly & mechanical weaving process)
Raw material	Cooperation with environment orientated suppliers

Constitution of the matting :

Design :	Polyester (PET) filament
Material :	PET monofilament
Recycled product	Yes
recyclable	Yes
% part of the single mat	95%
Remarks :	Recyclable product. Has to be brought to a recycling facility in order to be melted and reused.

Design	Eyelets
Material :	Stainless steel
Recycled product	No
recyclable	Yes
% part of the single mat	5 %
Remarks :	Recyclable product. Has got to be cut out of the mat with scissors and brought to a recycling facility in order to be melted and reused.

Anchoring devices

Design :	Stakes
Material :	Steel
Recycled product	No
recyclable	yes
% of the single mat	N/A
Remarks :	Has got to be brought to a recycling place in order to be melted and reused

Design :	Textile strap with stainless fastener
Material :	Textile and Stainless steel
Recycled product	No
recyclable	Yes
% of the single mat :	N/A
Remarks :	Has got to be brought to a recycling place in order to be melted and reused

3 MOBI-MAT® Helipad A2X™ SALES REFERENCES

Year	Country	Clients	Quantity
1999	France	COMSOUT TRIDENT	600 rolls of hélipads
Juin 2001	Australia	Australian ARMY	6 Helipad A2Xs réf. 154088 5 Helipad A2Xs réf. 154092
Oct. 2001	USA	NAVAIR	22 Helipad A2Xs réf.154079
Jan. 2003	USA	NAVAIR	72 Helipad A2Xs réf. 154092
Fev. 2003	USA	USMC MIRAMAR / 3 rd MAW	100 Helipad A2Xs réf. 154092
Mar. 2003	USA	US ARMY / 101 st Airborne	12 Helipad A2Xs réf. 154092
Mars – Apr Mai. 2003	USA	US ARMY / 101 st Airborne	282 Helipad A2Xs réf. 154092
Mars. 2003	UK	DLO	10 Helipad A2Xs réf. 154088
Mars. 2003	Kuwait	Ministry of Defence	64 Helipad A2Xs réf. 154057
Mars – Apr Mai. 2003	USA	US ARMY / 101 st Airborne/ 12 Avn Bde	20 Helipad A2Xs 154066
Juin 2003	USA	USMC Cherry Point / 2 nd MAW	16 Helipad A2Xs réf. 154092
Sep. 2003	USA	US ARMY / V Corps/ 130 th Eng Bde	78 rolls Helipad A2Xs réf. 154092
Mars 2004	USA	USMC Cherry Point / 2 nd MAW	168 rolls Helipad A2Xs réf. 154092

Sept. 2005	USA	NAVAIR	224 rolls Helipad A2Xs 154230-B
Juil. 2006	USA	MARCORSYSCOM	15 Helipad A2Xs réf. 154059 07 Helipad A2Xs Réf. 154073
Nov 2007	Algeria	Ministère de la Défense Nationale (CFA)	4 Helipad A2Xs (50X50) ref. 164775
Janv. 2008	Oman	Royal Flight of Oman	4 Helipad A2Xs A2X réf. 154079
Janv. 2009	France	Direction Générale pour l'Armement (DGA)	25 helipad A2Xs réf : 164776 -B
Mai 2009	Malaysia	Malaysian Air Force	4 Helipad A2Xs Réf. 154057
Juin 2009	USA - Afghanistan	Regional Contracting Center- Sharana	2 Helipad A2Xs réf. 164775 1 Helipad A2X Réf. 164784-06
Sep.2009	USA	Naval Airwarfare Center -AD	26 rolls Helipad A2Xs réf . 154230 B
Aout 2009	USA	MICC Fort Stewart GA	4 Helipad A2Xs réf. 154092
Juin 2010	USA	Naval Airwarfare Center -AD	525 rolls Helipad A2X réf. 154230-B
Déc. 2010	USA	US ARMY	1200 rolls Helipad A2X réf. 154230-B
2011	Japan	Japan Ministry of Defence	16 Helipad A2Xs 20X16 ref :176329/1
2012	Algeria	Ministère de la Défense Nationale (CFA)	6 Helipad A2X (50X50) ref. 167669/2
2012	Germany	BAAINBw	2 Helipad A2X 30X16,80 réf. 176329
2013	Luxembourg	NSPA (NATO SUPPORT AGENCY)	14 Heliapds A2X 20X16,80 ref. 176256

2014	Germany	BAAINBw	4 Helipad A2Xs 30X16,80 réf. 176329
2015	Malta	Hill Robinson	2 Helipad A2Xs A2X 20X16,80 réf. 176256
2015	Algeria	Ministère de la Défense Nationale (CFA)	10 Helipad A2X (50X50) ref. 167669/2
2016	Germany	BAAINBw	4 Helipad A2X 30X16,80 réf. 176329
2016	Mexico	Mexican Navy	1 Helipad A2X 20X20 réf 192813
2017	France	French Air Force	1 Helipad LAX 20x20 ref 203896
2018	Belgium	Air Force (Composante Air)	2 Helipad LAX 20x20 ref 203896
2018	France	French Air Force	5 Helipad LAX 20x20 ref 203896

4 **MOBI-MAT® Helipad A2X™ TESTIMONIES**

DESCHAMPS MATS SYSTEMS Inc. did support the United States of America war effort in Irak and Afghanistan by supplying to both the United States Army and the United States Marine Corps with helicopter landing surfaces which were mainly used as Combat Outposts (COP) and Forward Arming and Refuelling Points (FARPS).

Information: The following reports or lesson learned were published on different newspapers, web sites, and therefore can be communicated.



HELIPAD A2X

From US Armed Forces.

An innovative and patented matting, Mobi-Mat®, from the U.S. company DMS Inc. (ETS A ETS A. DESCHAMPS ET FILS ET FILS subsidiary in USA), has made a real contribution in the brownout mitigation arena. A solution, which consists of 14-foot-wide with 34 foot rolls, acts as a giant carpet, making a life-saving virtue of "sweeping the dirt under the rug." Mobi-Mat® is essentially a high quality polyester mesh that allows air to pass through it. This type of mat has the ability to be manually installed, removed and repositioned rapidly with wind direction changes and as the front moves forward.

In November 2001, Mobi-Mat® was tested and selected as the lightweight/medium duty matting for rotary-wing aircraft by the Naval Air Warfare Centre, Expeditionary Airfield Team (EAF) in Lakehurst, NJ, and later won a comparative testing carried out by the 326th Engineer Battalion from the 101st Airborne Division (Air Assault) (AASLT) at Fort Campbell, KY, in April 2002. Further testing carried out in September 2002 at Cherry Point MCAS and 29 Palms, CA, in a desert environment demonstrated the capabilities of Mobi-Mat® in harsh environments and resulted in NAVAIR and Marine air wings units placing large orders of Mobi-Mat® Helipad A2X™

"The Expeditionary Airfield (EAF) Team at NAVAIR Lakehurst directly supports deployed Marines as part of both OEF and OIF with a new airfield surfacing system for rotary wing aircraft know to its developers as the Mobi-Mat®"

NAVAIR, Lakehurst NJ

"The best and fastest method to meet the demand for helipad A2Xs was to install Mobi-Mats pads. Fast to emplace and extremely effective, this material should be purchased in sufficient quantities and issued to both divisional and EAD Engineer units – PRIOR to crossing the line of departure."

COL (P) Greg Martin; Lessons Learned V Engineer Corps in OIF;

"For the cost of the four aircraft (and the blades and engines that have been unduly worn and will need replacement soon) we could have purchased enough Mobi-Mat® for both 101st and 3ID (M)"

"Discussion: Rotary aircraft were damaged and some lost due to foreign object damage to rotors and engines. Several aviation units also lost aircraft due to brownout conditions caused by sand and dust. Engineers attempted to mitigate FOD and dust using labor, time, and resource intensive methods to include fuel spraying, stabilizing cement, commercial soil stabilizers, gravel, and heavy equipment. These Tactics, Techniques and Procedures (TTPs) are not part of current doctrine and are derived from lessons learned from past conflicts.

Although some of these TTPs worked with limited success, their utility during rapid maneuver such as experienced in Operation Iraqi Freedom was questionable at best. By the time the method was employed, its location no longer supported maneuver requirements. Likewise, units had XM19 matting available but because it was excessively bulky and heavy, its use was highly



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HELIPAD A2X

constrained by an already over taxed transportation system. At the end of major combat operations, a commercially available geotextile product known as Mobi-Mat® was used with great success in reducing FOD and dust. This lightweight product was easy to install and highly flexible in its application."

US Army Engineer School: observations from Operations Iraqi Freedom

"Rapid Helipad A2X Construction and Dust Control

There was an enormous demand on engineers to rapidly construct hundreds of helipad A2Xs in the desert. The dust, dirt, and sand caused dangerous brownout conditions that damaged the aircraft and caused several crashes. The best and fastest method to meet the demand for helipad A2Xs was to install Mobi-Mat® pads. Fast to emplace and extremely effective, this material should be purchased in sufficient quantities and issued to both divisional and EAD engineer units—PRIOR to crossing the line of departure."

V Engineer Corps in Operation Iraqi Freedom

NAVAL WARFARE AIR CENTER (NAVAIR)

De : Chiodi, Bruce NAVAIR [<mailto:bruce.chiodi@navy.mil>] Envoyé : lundi 9 juin 2014 11:54 À : Burel Olivier Cc : LeBar, Jared CTR EAF, 4.8.2 Objet : RE: Testimonial

Oliver,

The following statement has been approved at the Program office level:

ETS A. DESCHAMPS ET FILS MATS SYSTEMS INC. of Cedar Grove, NJ 07009 has supplied several federal contracts to NAVAIR and the EAF team since 2001 and their product has been used by the USMC during overseas operations, specifically in Iraq and Afghanistan.

Vr/

Bruce Chiodi

EAF IPTL , PMA 251

(w) 732-323-1802

LETTRES OF REFERENCES

DESCHAMPS MATS SYSTEMS Inc. and ETS A. DESCHAMPS ET FILS France have provided many armed forces and civilian organisations with helicopter landing surfaces during the last years.



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**Bundesamt für Ausrüstung, Informationstechnik
und Nutzung der Bundeswehr**

Bundesamt für Ausrüstung, Informationstechnik und Nutzung
der Bundeswehr ■ 56057 Koblenz

ETS A. Deschamps ET FILS
Usine de Bourisson - BP 40020

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E-Mail: baainbw@bundeswehr.org

(Bitte bei Antwort angeben)
Geschäftszeichen
K 5.5

Bearbeiter/-in
Herr Kaiser

Durchwahl-Nr.
400 - 14781

Koblenz,

23.05.2017

E-Mail
RolfKaiser@bundeswehr.org

Fax - 14632

Dear Sir

With regard to your email datet 22/05/2017 I would like to send you the confirmation:

After a full technical comparative evaluation conducted in 2013, the German Bundeswehr has decided to procure light helicopter landing matting from DESCHAMPS. The Bundeswehr has purchased 10 light landing surfaces 30x16m in order to support all type of helicopters. The material is actually engaged in external operations in Mali.

Best regards,
By Order



Rolf Kaiser



NATO SUPPORT AGENCY
AGENCE OTAN DE SOUTIEN

Logistics Operations
Opérations logistiques



GENERAL SERVICES PROGRAMME
PROGRAMME SERVICE GENERAUX

LB-C/2014/CP156 RR/sd

NATO UNCLASSIFIED

06 May 2014

TO : Deschamps
Attn: Olivier Burel
Usine de Bourisson, BP 20
F-16400 La Couronne

SUBJECT : Testimony – Deschamps Helicopter Matting for Deployable Camps

REFERENCE : E-mail request to R. Roy dated 02 May 2014

1. Helicopter Matting has recently been added to the NATO equipment inventory as part of a Capability Package (CP) for Deployable Camps. This equipment was supplied by the company Deschamps from La Couronne France as part of a competitive process by the NATO Support Agency (NSPA).
2. The Deschamps Helicopter Matting equipment was successfully tested in Jul 2013 on a remote and dusty site at the Grottaglie Italian Air Base situated in southern Italy. On the occasion, members of the NSPA Southern Operation Centre (SOC) Deployment team received training on this highly deployable equipment and in the process clearly demonstrated the equipment capability with the multiple landings and take-off of ITA Helicopters (AB 212 and EH 101).
3. This equipment will greatly enhance NATO Command and Control capability. Our thanks to the company Deschamps for their excellent and timely support in providing NATO with top of the line deployable equipment.

Best regards,

R. ROY
Chief, CP Acquisition and Follow-On Support Branch
General & Cooperative Services Programme

[NATO NON CLASSIFIED]



MINISTÈRE DE LA DÉFENSE



ÉTAT-MAJOR
DE L'ARMÉE DE TERRE
Division
Plans Programmes

Paris, le 19 MAI 2014
N°568351/DEF/EMAT/PP/BPSA/AERO

Le général de division Francis AUTRAN
sous-chef plans programmes de l'état-major de l'armée de Terre

à

Monsieur le directeur général
de la société DESCHAMPS

OBJET : Piste d'atterrissage temporaire pour hélicoptères.

L'armée de Terre engage de façon continue ses hélicoptères sur des théâtres extérieurs particulièrement hostiles et dans des conditions environnementales très exigeantes. Dans ce contexte, je vous confirme qu'elle utilise depuis 2009 votre piste d'atterrissage TAHEL Mobi-Mat A2X dans ses opérations, notamment en Afghanistan et en Afrique.

Cette piste répond très bien aux besoins identifiés pour l'amélioration des conditions de poser de nos hélicoptères en zones poussiéreuses et sablonneuses.



COPIES :
- STAT
- EMAT/BCB

14, rue Saint-Dominique - 75700 PARIS SP07 - Tél : 01.42.19.46.92 - Fax : 01.42.19.76.11
alexis.durand@intradef.gouv.fr

Translation of above letter

Subject : temporary landing surface for helicopters

The French Army continuously engages his helicopters in hostile environment theatres with particularly austere environmental conditions.

According to this, I confirm that she has been using your landing mat TAHEL Mobi-Mat® A2X since 2009; especially in Afghanistan and Africa.

This landing mat responds very good to the identified need in order to ameliorate the landing conditions of our helicopters in dusty and sandy environment.