



WATERPROOFING OF DECK AND BRIDGES UNDER ASPHALT

Project: Osmangazi Bridge South Approach Viaduct
Project Owner: NÖMAYG
The Contractor: NUROL Makine
Year: 2015

TAÇ BOYA SAN TİC LTD ŞTİ
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ABOUT US

- Taç Boya ve Kimya Sanayi is a strong company that has a wide production capability in 4 main groups, namely construction, industrial, building chemicals and a special group, with its experienced engineers and technical staff who have been producing since 1981.



ABOUT US –QUALITY DETAILS

- We have ISO 9001: 2015 certificate.
- Our water-based interior and exterior paints are TS 5808 quality certified.
- Our solvent and solvent-free epoxy based paints and coatings are TS 11590 certified.
- Our exterior plaster and coating products are TS 7847 certified.
- Our ACRODECK Asphalt Waterproofing System is TS EN 1504-2, CE certified.



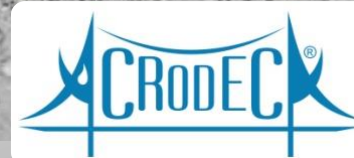
HISTORY OF PMMA

- PMMA-based waterproofing membranes have been used for waterproofing in various industrial areas such as roofs, terraces, etc. for nearly 100 years in the world, and have been used as asphalt waterproofing membranes for highway bridges and viaducts in Europe and America for the last 50 years.
- While there are only 3 companies that use and apply this product in Europe, the product has been developed with equivalent features, and a price-benefit balance has been established and it is aimed to contribute to the country's economy.



HOW ACRODECK OCCURED

- PMMA polymer is a product that has been in our raw material range for about 30 years, and we can serve as a transparent, waterproofing material that we can apply on large concrete surfaces such as aprons in airports, without making films. PMMA has been formulated by our company in various ways, making it a product as road marking paint, rapid repair mortar and various adhesives.



HOW ACRODECK OCCURED

- An R&D study of approximately 1 year was carried out in order to transform the product into membranes for use in bridges and viaducts. With the intensive work of our own R&D team, and the training and sample support provided by our German partner Evonik(Röhm), the product was developed after almost a year.




OUR PARTNERSHIP



R&D AND MECHANICAL TEST LABORATORIES



HOW ACRODECK DEVELOPED?

The product and system we have uncovered have been tested with our modern equipment in our own quality control laboratories, and their effectiveness has been reported by third party organizations.  trademark registration was obtained for the product and www.acrodeck.com.tr website was made.

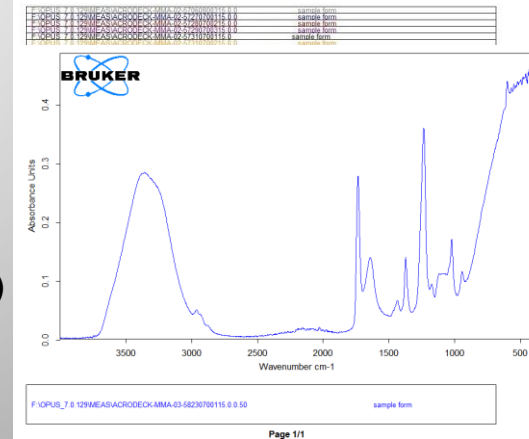
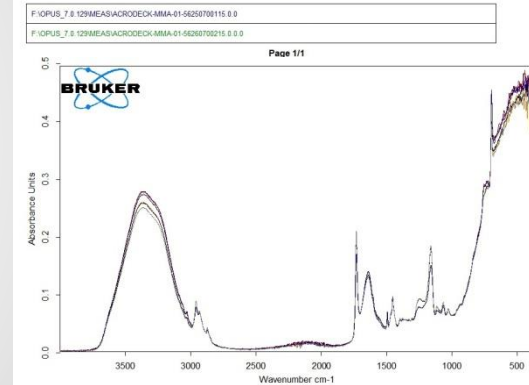
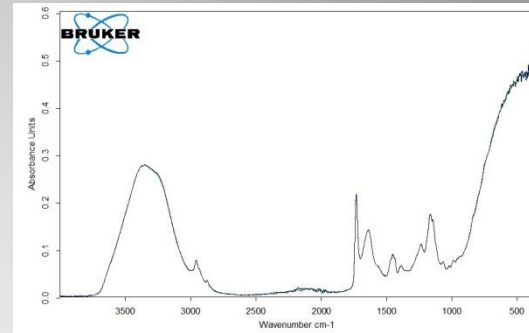


TESTS

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2- Numune Kodu : 57270700115		
İstenen Deneyler	Deney Sonuçları (Ortalama)	
	Numune Kodu : 57270700115	
	Eskitme Öncesi	Eskitme Sonrası (70°C'de 7 Gün)
Çekme Mukavemeti, (MPa) (23±2 °C ve % 45-55 Bağıl nem aralığında) (TS 3078), Hız 500 mm/dk	12,0	11,4
Çekme Uzaması, (%) (23±2 °C ve % 45-55 Bağıl nem aralığında) (TS 3078), Hız 500 mm/dk	224	212

- FTIR ANALİZİ (ASTM E 2412)
- ÇEKME MUKAVEMETİ (EN ISO 527-3)
- KOPMA UZAMASI (EN ISO 527-3)
- PULL OF – YAPIŞMA MUKAVEMETİ (ASTM D4541)
- ELASTİKİYET (TS EN ISO 1519)
- YIRTIлма DİRENÇİ (ASTM D624)
- SU EMİLİMİ (DIN EN 772-11)
- DARBEYE DAYANIM (ASTM D4272)
- YOĞUNLUK (ASTM D1475)
- VİSKOZİTE (DIN 53211)
- SERTLİK (ASTM D 2240)
- İNCELİK (ASTM D 1210)
- POTLİFE (ISO 9514 :2005)
- KATI MADDE İÇERİĞİ (ASTM D2369)
- KURUMA SÜRESİ (ASTM D 1640)
- UYGULANABİLİRLİK
- FİLM TABAKASININ GÖRÜNÜŞÜ
- PARLAKLIK (TS 4318)
- KONTRAST ORANI (TS 4318)
- CROSS CUT YAPIŞMA TESTİ (ISO 2409:2013)
- SICAKLIK AKTİVASYONU



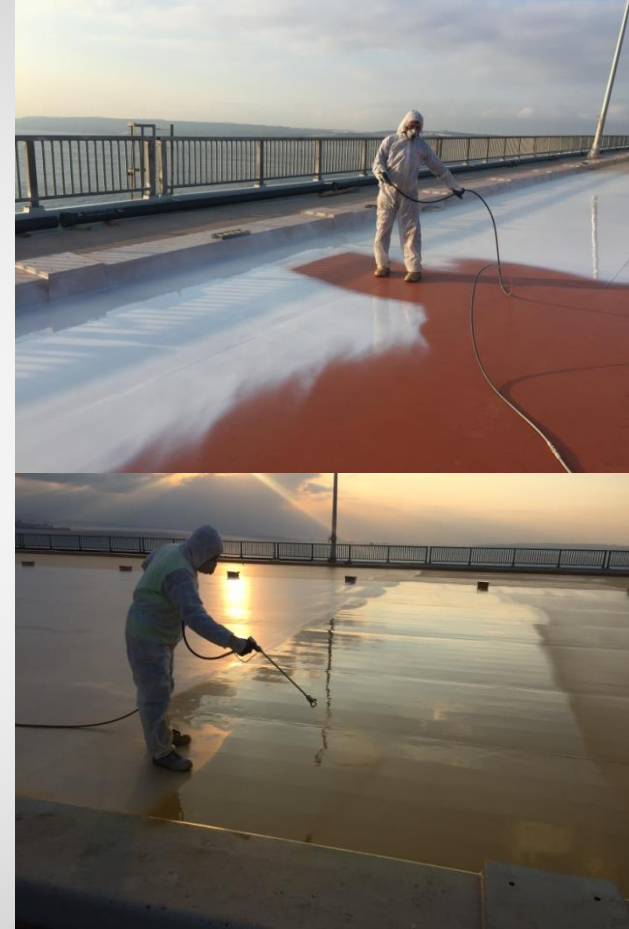
ACRODECK MMA WATERPROOFING MEMBRANE SYSTEM

- ACRODECK is a fast curing, cold liquid spray applied system and it is methyl methacrylate polymer.
- ACRODECK MMA has been developed as a waterproofing steel and concrete protection layer especially considering the ideal physical conditions of a bridge.
- It forms a solid, seamless membrane and does not contain weak joints.
- It maintains its elasticity in both hot and cold weather conditions.

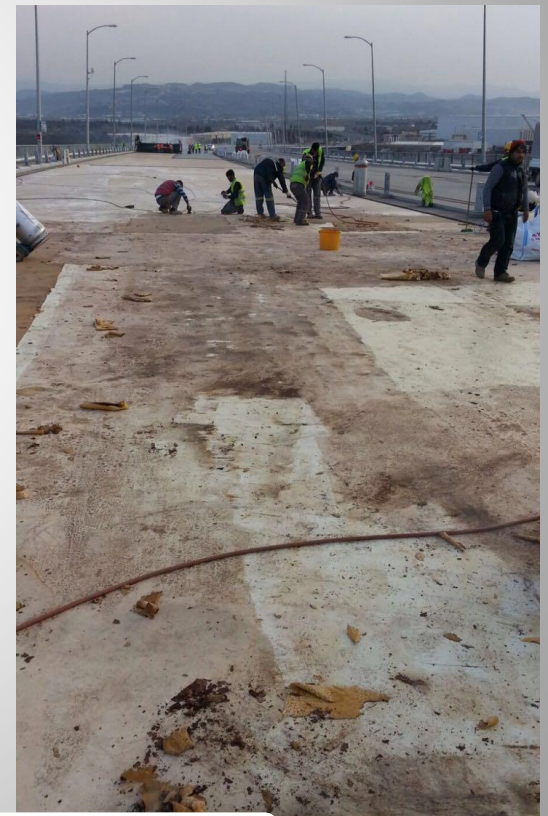


ADVANTAGES OF APPLICATION

- Ease of spray application
- Seamless application on horizontal, vertical and detailed surfaces
- Possibility to be applied in both concrete and steel bridges and viaducts
- Perfect match with old and new concrete
- Ease of repair and patching
- It is ready to load 1 hour after application.
- High humidity and temperature tolerance in application (can be applied even at -10 degrees)
- 2 man and 1 machine set, 1000 square meter application speed per day.
- Application in high thicknesses (2-4mm)
- Ease and low membrane cost in asphalt removals (the adhesion strength of the membrane to concrete and steel is much higher than the tack layer's adhesion strength to asphalt.)

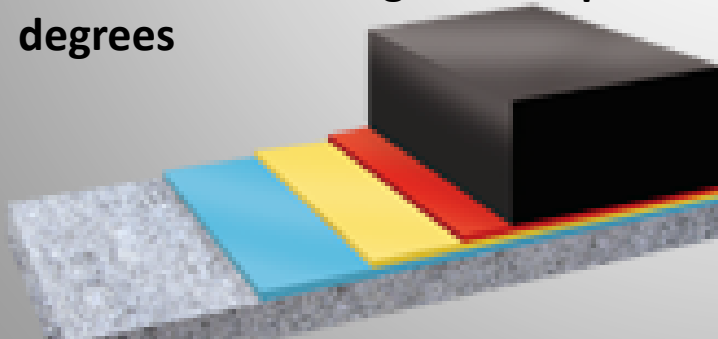


Example: Surface of membrane when the asphalt has been removed.



PERFORMANCE

- 100% effective waterproofing
- Does not allow the passage of chlorine ions ($0\text{m}^2 / \text{s}$)
- High and homogeneous tensile strength and elasticity (transverse to longitudinal).
- High and homogeneous tear and compression strength (transverse to longitudinal).
- Excellent adhesion strength to concrete, steel and asphalt
- Sturdy and durable (even after aging)
- Suitable for coating at a temperature of 250 degrees

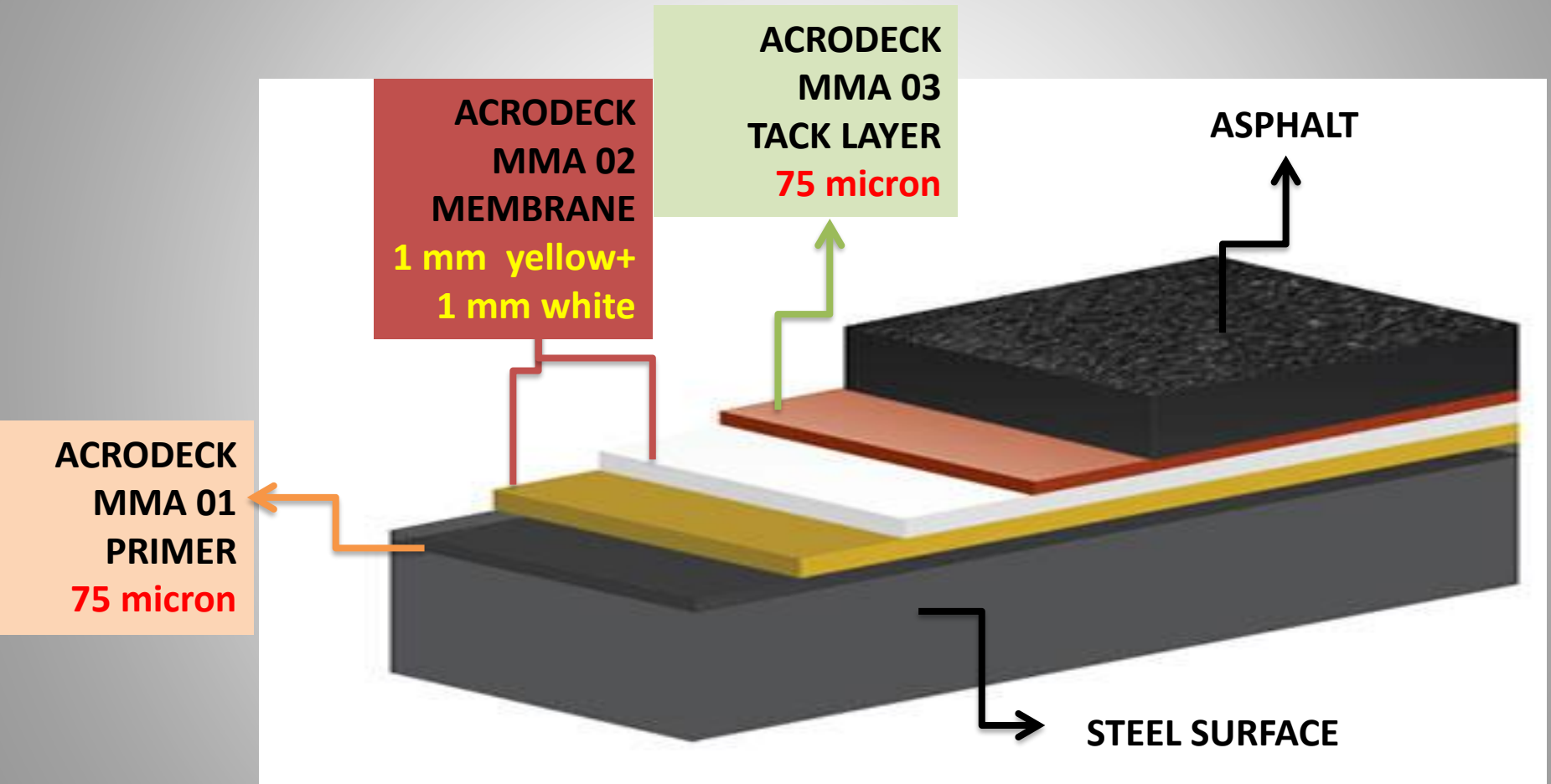


ACRODECK MMA System Components

PRIMER	DESCRIPTION
ACRODECK MMA 01	It is a two-component, solvent-free, highly reactive methacrylate resin-based transparent primer. It plays an active role in providing 100% waterproofing by penetrating deep into concrete surfaces. It tightens the surface, strengthens it and prevents its wear.
MEMBRANE	DESCRIPTION
ACRODECK MMA 02	It is a two-component, solvent-free, highly reactive methacrylate resin based waterproofing membrane layer. It consists of parts A and B. It allows application in high thicknesses.
ADHESION LAYER	DESCRIPTION
ACRODECK MMA 03	It is a one-component thermoplastic polymethylmethacrylate resin solution. It is an adhesion layer between asphalt and membrane layers and is used with asphalt aggregate. It is activated by temperature.



ACRODECK MMA SYSTEM FOR STEEL BRIDGES and VIADUCTS



• THIS SYSTEM IS USED WHEN IZMIT OSMANGAZI GULF PASS BRIDGE,
SOUTH APPROACH VIADUCT,
• COMPLETED SUCCESSFULLY, SPECIFICATION HIGHWAYS APPROVED BY
KOSOB REGIONAL OFFICE



ACRODECK MMA SYSTEM FOR STEEL BRIDGES and VIADUCTS



ACRODECK MMA 01 PRIMER



ACRODECK MMA 02 MEMBRANE WHITE



ACRODECK MMA 02 MEMBRAN YELLOW

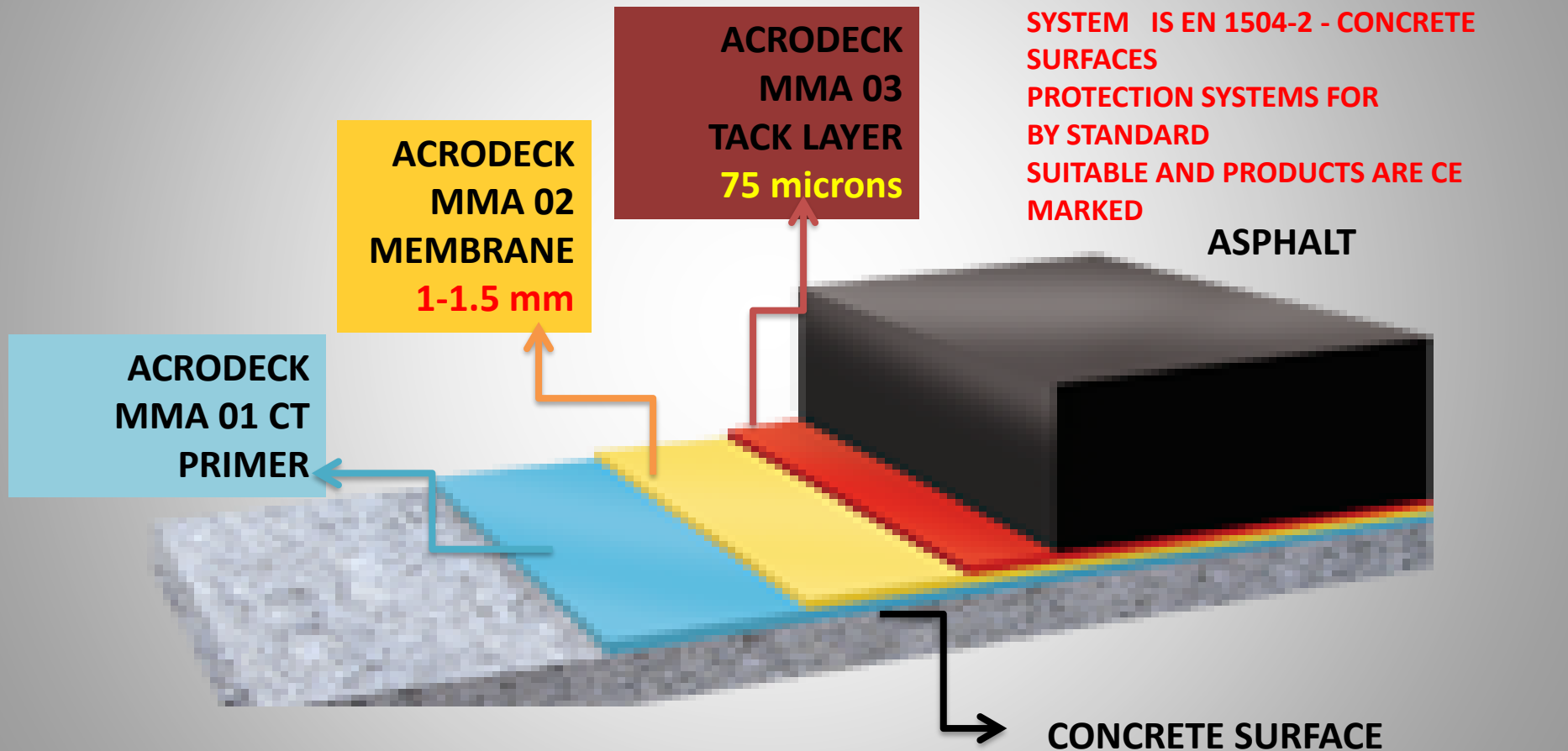


ACRODECK MMA 03 TACK

SYSTEM FOR CONCRETE SURFACES



ACRODECK MMA SYSTEM FOR CONCRETE SURFACES



SURFACE PREPERATIONS OF STEEL SURFACES BEFORE APPLICATION



STEEL SURFACE PREPERATION

Application : Abrasive Sand Blasting

Abrasive : S360 Shot

Surface Profile : 45-75 microns

Standard : ISO 8501-1 Sa 2^{1/2}



CONCRETE SURFACES PREPERATION BEFORE APPLICATION



CONCRETE SURFACE PREPERATION

Concrete must have minimum 30 N / mm² compressive strength and completed its curing. Concrete grout on the surface, burnt concrete-style playful floors, as well as concrete mold marks, concrete residues blastrac, rotto tiger and grinders etc. It must be destroyed by blasting and reaching a solid and protruding surface. Oil or diesel stains on the surface can be removed with chemical solutions and combustion method. The dust should be removed from the surface with a vacuum cleaner or compressors.



REPAIRING OF CONCRETE SURFACES



ACRODECK RM – FLEXIBLE REPAIR MORTAR

ÜRÜN ADI	TANIMI
ACRODECK RM MMA BASED FLEXIBLE REPAIR MORTAR	It is a two-component, solvent-free, highly reactive methacrylate resin based, liquid elastic repair filler. BPO is used as the initiator. It allows application in high thicknesses. It adheres perfectly to concrete and asphalt surfaces, because it is elastomeric, it is 100% compatible with the expansion shrinkage behavior of concrete. It has high impact resistance. Since it is a flexible and tough material, it does not receive impact even when it is hit with a hammer in high thickness applications. It maintains its current form. It is a new generation repair and filling material.



CONCRETE SURFACES REPAIRING SYSTEM

1. Repairs are required for large pits and surface defects.
2. The areas to be repaired should be cut with grinders and the inside should be cleaned.



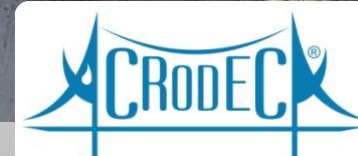
CONCRETE SURFACES REPAIRING SYSTEM

3. After mixing ACRODECK RM initiator to be used for filling,
4. It should be spread on the application surface as a primer (150-200 g per square meter) with a brush.



CONCRETE SURFACES REPAIRING SYSTEM

5. Immediately after that, aggregates of $\frac{1}{3}$ of the depth to be filled into the mixture are added,
6. It is poured into the area to be filled and smoothed with a trowel.



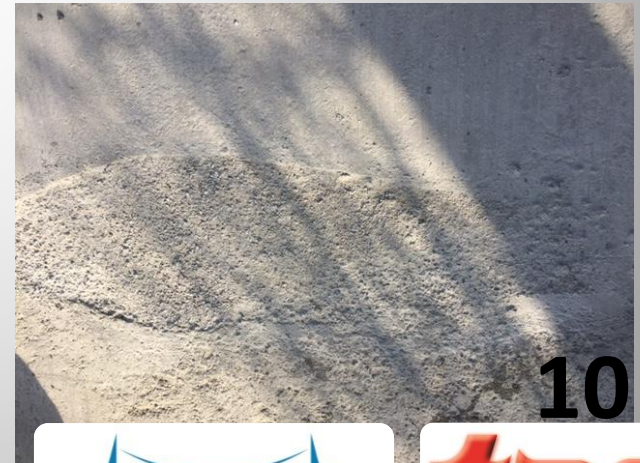
CONCRETE SURFACES REPAIRING SYSTEM

7. 8.

Aggregate is broadcast into the surface.



8.9. After drying, excess aggregate is swept from the surface.



CE acreditions


TÜRK STANDARTLARI ENSTİTÜSÜ
TURKISH STANDARDS INSTITUTION

FABRİKA ÜRETİM KONTROLÜ UYGUNLUK BELGESİ
1783-CPR-558

Avrupa Parlamentosu ve Konseyi'nin 9 Mart 2011 tarih ve 305/2011/EU sayılı Tüzüğü (Yapı Malzemeleri Tüzüğü) veya CPR) uyarınca, bu belge aşağıda belirtilen yapı malzemesini doğrular.

BETON YAPILAR- KORUMA VE TAMİR İÇİN MAMUL VE SİSTEMLER
Beton yapılar - Koruma ve tamir için mamul ve sistemler
Bölüm 2: Beton Yüzey Koruma Sistemleri

*Yabancı madde girişine karşı koruma 1.3 (C)
Ticari Model: ACRODECK MMA02-Membran

*Nem kontrolü 2.2 (C)
Ticari Model: ACRODECK MMA02- Membran

TAÇ BOYA SANAYİ VE TİCARET LTD. ŞTİ.
SAMSUN YOLU 32.KM.HASANOĞLAN YOL KAVŞAĞI HASANOĞLAN-ANKARA/TÜRKİYE
adı veya tescilli markası altında piyasaya sunulan

TAÇ BOYA SANAYİ VE TİCARET LTD. ŞTİ.
SAMSUN YOLU 32.KM.HASANOĞLAN YOL KAVŞAĞI HASANOĞLAN, ANKARA ANKARA
ve imalat tesis(ler)inde üretilmiş

Bu belge, EN 1504-2:2004 standardının ZA Eki'nde tanımlanan performansın değişmediğini doğruladığını ve doğrulanması ile ilgili tüm hükümlerin, Sistem 2'ı altında uygulandığını ve


fabrika üretim kontrolünün ilgili gereklerle uyum içerisinde olduğunu doğruladığını göstermektedir.

Bu belge ile olarak 22.06.2016 tarihinde düzenlenmiş olup, uygunluğunu standart, yapı malzemesi, PODO yöntemi ya da üretim tesisindeki kopulma çabası ölçümü doğrulamada sadece, onaylanmış fabrika üretim kontrolü belgelendirmesi kuruluşu tarafından aslıya alınmaz veya iptal edilmez ve geçerlidir.

Ankara, Rev.0, 22.05.2016


SEZAI DOĞAN
Direktifler Müdürü

www.tse.org.tr / Necatibey Cad. No: 112 Bakanlıklar - ANKARA / +90 312 416 62 00
Bu belge Türkiye'de tescilli markadır. İzinsiz veya izninizle kullanılması yasal sorumluluk, maliyet ve cezai yaptırımlara tabidir.


UYGUNLUK BEYANI

SamsunYolu 32. Km Hasanoglan
06850, ANKARA

Adresinde Yerleşik olan


TAÇ BOYA SANAYİ TİCARET LTD. ŞTİ.

Aşağıda ismi belirtilen ürünün, 89/106/EEC numaralı Avrupa Yapı Malzemeleri Direktifi kapsamında EN 1504-2 standardının ZA ekinin gereklerine uygun üretilmiş olduğunu beyan eder.

ACRODECK MMA 02

Fabrika Üretim Kontrol Sistemi
TÜRK STANDARTLARI ENSTİTÜSÜ
NO: 1783-CPR-558
ANKARA
Tarafından belgelendirilmiştir.

Genel Müdür
Ercan TOKDEMİR
26.07.2016


CE 1783

TAÇ BOYA SAN TİC LTD ŞTİ
SAMSUN YOLU 32. KM HASANOĞLAN 06850
ELMADAĞ - ANKARA


16
TS EN 1504-2

ACRODECK MMA02
Yüzey koruma mamülleri

Kaplama, Prensip 1.3(C) ve Prensip 2.2(C)

TS EN 1062-6:2011 CO₂ Geçirgenliği
S₀ = 381,772 m > 50 m
TS EN ISO 7783:2013 Su Buharı Geçirgenliği, Sınıf II
TS EN 1062-3:2010 Kapiler Su Emme ve Su Geçirgenliği, 0,007 kg/m².h^{0.5}
TS EN 1542:2001 Çekip Koparma Deneyi Yoluyla Yapışma Dayanımı, 2.3 Mpa
Yangına Tepki Sınıfı: E

Tehlikeli maddeler, Madde 5.4'e uygun


CE 1783

TAÇ BOYA SAN TİC LTD ŞTİ
SAMSUN YOLU 32. KM HASANOĞLAN 06850
ELMADAĞ - ANKARA

16
TS EN 1504-2

ACRODECK MMA01
Yüzey koruma mamülleri

Emprenye, Prensip 1.2(I)

TS EN 1062-3:2010 Kapiler Su Emme ve Su Geçirgenliği, 0,115 kg/m².h^{0.5}
TS EN 1504-2 İşleme Derinliği, 5.2 mm
Yangına Tepki Sınıfı: E

Tehlikeli maddeler, Madde 5.4'e uygun

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	DSİ TAAK DAİRESİ BAŞKANLIĞI Beton-Malzeme Laboratuvarı Şube Şefliği Ertuğrul Yolda, Çarşak Yolu Ayvırı, Başovaç ANKARA Telefon: 0312 399 27 50 Faks: 0312 399 27 45 e-posta: tahkiki@dsi.gov.tr Etilanma: A2, www.dsi.gov.tr		DSİ 15-6425 08-45
	Deney Raporu <i>Test Report</i>		
Müşterinin Adı /Adresi <i>Customer Name-Address</i> İçişleri Bakanlığı Ulaştırma Şube Numaralı Adres ve Tarifi Name and identity of test item Numaralı Kalan Tarihli The date of receipt of test item Açıklamalar Remarks	1 TAC BOYA SANAYİ TİCARET LİD. ŞTİ. (Deney Yolu 32) Kömürhanesi-Emişahı/ANKARA 14.09.2015 sayılı yazı 2 TAC Akrilikler İmmü Membran 2 Bilgileri Sa Valinin Membranı Numaralı 14.09.2015 3 Bu rapor, ilgili yazıda belirtilen numaranın üzerinde gerçekleştirilmiştir deney sonuçlarına konular.		
Deneyin Yapıldığı Tarih Date of test Raporun Sayfa Sayısı Number of pages of the Report	15.09.2015 - 08.10.2015 2		
Not: Bu rapor, laboratuvarımızdaki diğer test sonuçları ile birleştirilerek değerlendirilmelidir. Deney ve sonuçların bu sonuçların doğruluğu için diğer test sonuçları ile değerlendirilmelidir.			
The test results must be evaluated in conjunction with the measurements of applicability with confidence probability and test methods are given on the report pages which are part of this report.			
Sıhhiyet Health Güvenlik Safety İşin Tanımı Job Description	Tarih Date	Deney Numarası Project or Change of test	Laboratuvar Adres Test Laboratory
	15.09.2015	İçişleri İçişleri MDA İçişleri MDA	Ayhan KAYI Beton-Malzeme Lab. Şefi, MDA

This report, laboratory results must be evaluated in conjunction with the measurements of applicability with confidence probability and test methods are given on the report pages which are part of this report.

Not: Bu rapor, laboratuvarımızdaki diğer test sonuçları ile birleştirilerek değerlendirilmelidir. Deney ve sonuçların bu sonuçların doğruluğu için diğer test sonuçları ile değerlendirilmelidir.

P.04.00.00, Rev.10.03.2014

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RESULTS

Among the main features that distinguish MMA based membrane products from cover type and other liquid membranes are;

- Homogeneous and high tensile, compression, tear forces, high elasticity
- Excellent adhesion on concrete and steel surfaces
- Ease in asphalt repair and patch processes, minimum damage to the membrane
- 100% Chlorine Ion and water impermeability
- 100% resilient, robust and flexible waterproofing
- Resilient application opportunity on vertical and detailed surfaces
- Fast and homogeneous application, quick service, fast and economical repair and maintenance
- Less maintenance need due to high strength
- It is lighter than bituminous membranes and the load on the bridge decreases
- Extending the life of asphalt and infrastructure
- High price / benefit balance

The aforementioned features provide quality and trouble-free application and continuity to MMA based liquid membranes, especially in asphalt applications.



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Hasan İldoğan

