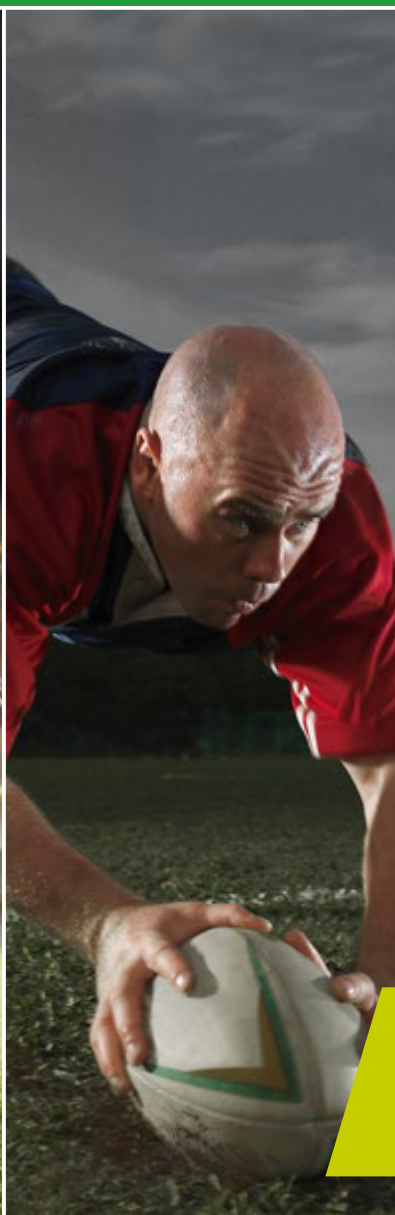


## TECHNICAL SOLUTION FOR SPORTS FIELD



Vertical and Horizontal  
Drainage Systems





I prodotti della linea REFOSPORT, di assoluta qualità costruttiva, sono sottotappeti elastici per campi da gioco e presentano caratteristiche specifiche per ciascuna disciplina sportiva. Sui campi costruiti con REFOSPORT, sicurezza e comfort sono portati al massimo livello. Il sistema è ultraleggero, veloce e facile da installare e permette di soddisfare i requisiti delle associazioni sportive professionali come FIFA, FIH, GAA, IRB

Los productos de la línea REFOSPORT, de gran calidad para la construcción, son excelentes amortiguadores elásticos para campos de juego y tienen características específicas para cada disciplina deportiva. Los campos construidos con REFOSPORT, tienen el máximo nivel de seguridad y comodidad. El sistema es ultra-ligero, rápido y de fácil instalación y permite satisfacer los requisitos de las asociaciones deportivas profesionales como FIFA, FIH, GAA, IRB.

Les produits de la ligne de REFOSPORT, construite en qualité absolue, sont sous-couches élastiques pour aire de jeux et ont caractéristiques spécifiques pour chaque sport. Sur les terrains construits avec REFOSPORT, la sécurité et le confort sont apporté au niveau maximum. Le système est léger, rapide et facile à installer et permet de répondre aux exigences des clubs sportifs professionnels comme FIFA, FIH, GAA, IRB.

Die Produktlinie REFOSPORT ist eine Elastik Schicht von hoher Qualität, für Spielfelder für Sport und wird gefertigt und geliefert nach Bedarf der jeweiligen Sportarten. Spielfelder mit REFOSPORT werden qua Komfort und Sicherheit auf höchster Ebene gebracht. Die System sind leicht von Gewicht, schnell und einfach zu verlegen und werden geliefert gemäß der erforderlichen Vorschriften des jeweilige Sportes, FIFA FIH, GAA, IRB, usw.

• Soddisfa i criteri di assorbimento shock • Indicato per aree sportive professionali e non (MUGA = Multi Usage Game Areas) • Buone proprietà biomeccaniche: riduce il rischio di danni e lesioni • Prestazioni durature garantite 25 anni • Drenaggio eccellente grazie alla foratura e ai canali realizzati meccanicamente durante il processo produttivo, garantendo sempre elevati valori prestazionali. • Ecocompatibile, alta flessibilità, non gela in inverno • Ridotti tempi e costi di installazione

• Satisface los parámetros de absorción de impacto. • Adecuado tanto para zonas deportivas profesionales como no profesionales (MUGA= Multi Usage Game Areas) • Buenas propiedades biomecánicas: reduce el peligro de daños y lesiones • Prestaciones de larga duración. Garantizadas 25 años • Drenaje excelente gracias a que el material dispone de agujeros y canales efectuados mecánicamente en el proceso de producción, asegurando siempre altas prestaciones. • Eco compatible, alta flexibilidad, no se congela en invierno. • Tiempos y costes de instalación reducidos.

• Conforme aux critères d'absorption des chocs • Adapté aux terrains de sport professionnels mais pas pour MUGA (MUGA = zones à plusieurs sports) • Bonnes propriétés biomécaniques: réduit le risque de trauma(blessures et fractures des os) • Performances durables garantis 25 ans • Excellent drainage en raison de forage et des canaux, faites mécaniquement au cours du processus de fabrication, qui assurent toujours des valeurs de haute performance. • Écologique, flexibilité haute, ne gèle pas • Réduction du temps et le coût de l'installation

• Verfüllt die Vorschriften des Kraftabbau • Geeignet auch für Multisportanlagen • Sehr gute biochemischer Eigenschaften: es verringert die Risiken von Beschädigungen und Verletzungen • Langjähriger Leistungen mit eine Garantie von 25 Jahre • Vorzüglicher Drainage Kapazitäten, dank der gebohrten Löcher und gepressten extra Abfuhr Kanäle. Diese werden mechanisch angebracht während des Produktionsprozesses für eine sichere und konsistente hohe Leistung von den Drainagewerten. • REFOSPORT ist Umweltfreundlich, mit hoher Flexibilität, und wird auch im Winter seine Arbeit leisten weil es nicht erfriert. • Der sehr schnelle Einbau garantiert eine Senkung der Installationskosten.

|        |                                                           |                                                      |                                                                                 |                                                     |
|--------|-----------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------|-----------------------------------------------------|
| R      | Materiale fornito a Rotoli                                | Material suministrado en rollo                       | Matériau, fourni en rouleaux                                                    | Rollenware                                          |
| C      | Con presenza di canali per il drenaggio                   | Con presencia de canales para el drenaje             | Avec la présence de canaux de drainage                                          | Mit gepresste Kanäle für extra Drainage             |
| S      | Misura Speciale                                           | Medida especial                                      | Mesure spécial                                                                  | Speziale Abmessungen                                |
| PE r   | Polietilene espanso rigenerato                            | Polietileno expandido regenerado.                    | Mousse de polyéthylène, régénéré                                                | Regenerierten Polyethylen Schaum                    |
| ND     | Nessun drenaggio, solo dal perimetro esterno della lastra | sin drenaje, solo del perímetro exterior de la placa | régénérée Pas de drainage, seulement à partir du périmètre extérieur du fouille | Nur Drainage entlang der Schnittflächen der Platten |
| HD     | RISCALDATO e DRENANTE                                     | CALENTADO y DRENAJE                                  | CHAUFFGE et DRAINAGE                                                            | HEIZUNG und DRAINAGE                                |
| HHC    | Alta capacità idraulica                                   | Alta Capacidad Hidráulica                            | Capacité hydraulique élevée                                                     | Hohe hydraulische Kapazität                         |
| USA cu | Misure americane personalizzate                           | USA Medidas personalizadas                           | Mesures personnalisées aux États-Unis                                           | Benutzerdefinierte Maße U.S.                        |



# FOOTBALL FIELD

The product line REFOSPORT, are regenerated PE foam pads with elastic properties for play areas and specific mechanical – hydraulic properties designed for each sport.

In the field constructed with REFOSPORT, safety and comfort are brought to the maximum level.

The system is lightweight, fast and easy to install and allows to meet the requirements of professional sports like FIFA, FIH, GAA, IRB.

- Meets the requirements of shock absorption
- Suitable for professional and non-sports areas (MUGA = Multi Usage Game Areas)
- Good biomechanical properties: it reduces the risk of damage and injuries
- Long-lasting performance guaranteed 25 years
- Drainage excellent thanks to drilling and channels made mechanically during the production process, ensuring consistently high performance values.
- Eco-friendly, highly flexible, does not freeze in winter
- Reduced time and cost of installation

## Benefits

R Material supplied in rolls  
C With presence of channels for drainage  
S Special measures (ex. REFO SPORT 12 C S)  
PE r Polyethylene foam regenerated  
ND No Drainage, only for the perimeter of the plate  
HD Heated and Drainage  
HHC High Hydraulic Capacity  
USA cu USA Customary Units

\* yd<sup>2</sup> = m Yard quadrato (American measures)

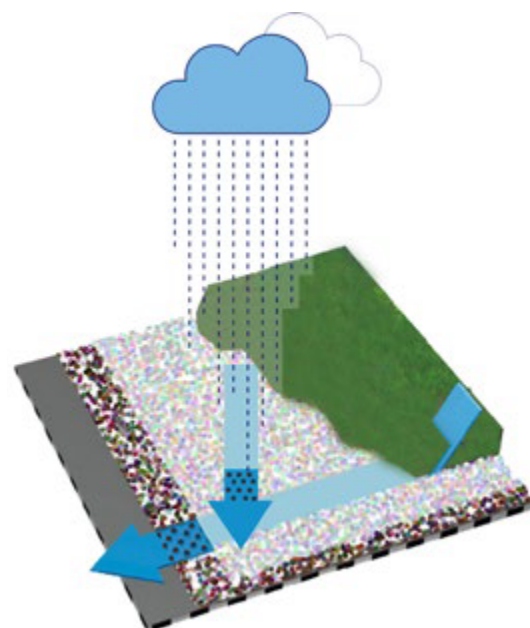
## Meanings





# REFO SPORT 12

## Vertical and Horizontal Drainage



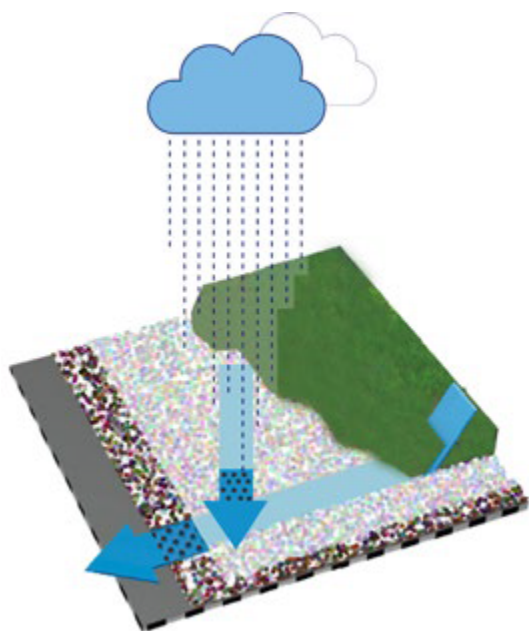
## TECHNICAL SPECIFICATIONS

Caratteristiche tecniche  
Características técnicas  
Caractéristiques techniques



| REFO SPORT 12 C USA cu         | REFO SPORT 12 C S              |
|--------------------------------|--------------------------------|
| 0,47 in                        | 12mm                           |
| Polyethylene foam regenerated  | Polyethylene foam regenerated  |
| Plates                         | Plates                         |
| 35,43 x 88,58 in               | 90 x 225 cm                    |
| 1,20 yd <sup>2</sup>           | 2,025 sqm                      |
| 80 Kg/m <sup>3</sup>           | 80 Kg/m <sup>3</sup>           |
| Vertical and horizontal        | Vertical and horizontal        |
| 46%                            | 46%                            |
| 0,35%                          | 0,35%                          |
| 0,315 in                       | 8 mm                           |
| > 118,11 in/h                  | > 3000 mm/h                    |
| > 0,050 l/(m*s)                | > 0,050 l/(m*s)                |
| Football, Hockey, Roof Gardens | Football, Hockey, Roof Gardens |
| FIFA, MUGA e FIH, LND          | FIFA, MUGA e FIH, LND          |





# REFO SPORT 16

## Vertical and Horizontal Drainage

## TECHNICAL SPECIFICATIONS

Caratteristiche tecniche  
Características técnicas  
Caractéristiques techniques



### REFO SPORT 16 C USA cu

0,63 in

Polyethylene foam  
regenerated

Plates

35,43 x 88,58 in

1,20 yd<sup>2</sup>

80 Kg/m<sup>3</sup>

Vertical and horizontal

46%

0,35%

0,35 in

> 118,11 in/h

0,283 l/(m\*s)

Football

FIFA, LND

### REFO SPORT 16 C S

16mm

Polyethylene foam  
regenerated

Plates

90 x 225 cm

2,025 sqm

120 Kg/m<sup>3</sup>

Vertical and horizontal

55%

0,47%

9 mm

> 3000 mm/h

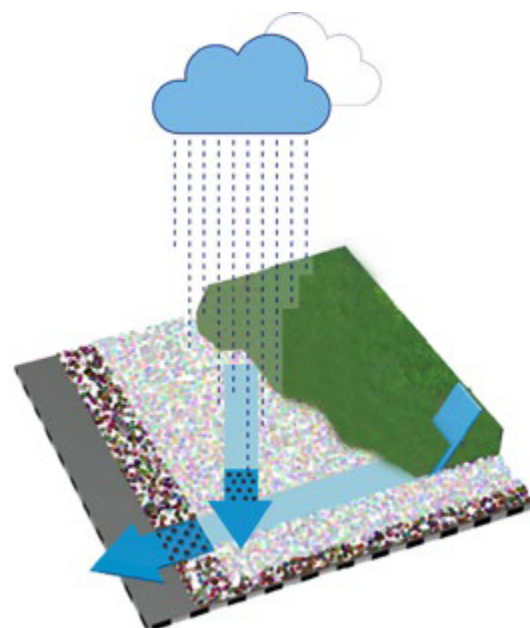
0,283 l/(m\*s)

Football

FIFA, LND

# REFO SPORT 20

## Vertical and Horizontal Drainage



## TECHNICAL SPECIFICATIONS

Caratteristiche tecniche  
Características técnicas  
Caractéristiques techniques



### REFO SPORT 20 C USA cu

0,79 in

Polyethylene foam  
regenerated

Plates

35,43 x 88,58 in

1,20 yd<sup>2</sup>

80 Kg/m<sup>3</sup>

Vertical and horizontal

46%

0,35%

0,32 in

> 118,11 in/h

0,354 l/(m\*s)

Football, Rugby, MUGA

FIFA, GAA, IRB

### REFO SPORT 20 C S

20mm

Polyethylene foam  
regenerated

Plates

90 x 225 cm

2,025 sqm

120 Kg/m<sup>3</sup>

Vertical and horizontal

58%

0,39%

8,1 mm

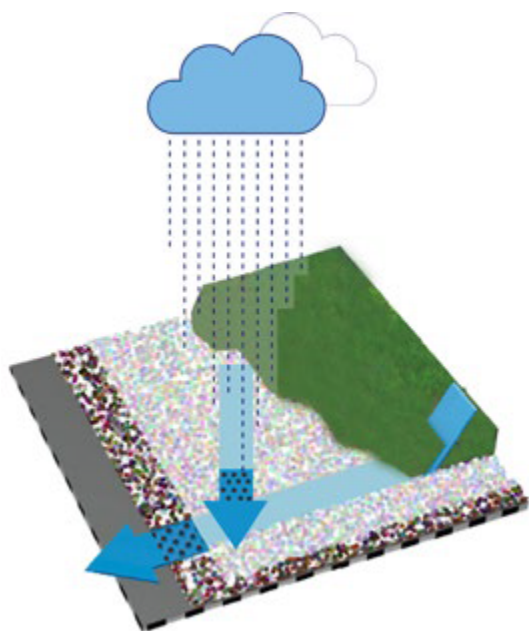
> 3000 mm/h

0,354 l/(m\*s)

Football, Rugby, MUGA

FIFA, GAA, IRB





## REFO SPORT 23

### Vertical and Horizontal Drainage



## TECHNICAL SPECIFICATIONS

Caratteristiche tecniche  
Características técnicas  
Caractéristiques techniques



#### REFO SPORT 23 C USA cu

#### REFO SPORT 23 C S

0,91 in

23mm

Polyethylene foam  
regenerated

Polyethylene foam  
regenerated

Plates

Plates

35,43 x 88,58 in

90 x 225 cm

1,20 yd<sup>2</sup>

2,025 sqm

120 Kg/m<sup>3</sup>

120 Kg/m<sup>3</sup>

Vertical and horizontal

Vertical and horizontal

64%

64%

0,36 in

9,1 mm

> 118,11 in/h

> 3000 mm/h

0,627 l/(m\*s)

0,627 l/(m\*s)

Rugby, Football, Roof  
Gardens, Playgrounds  
FIFA, GAA, American and  
Australian Football, IRB

Rugby, Football, Roof  
Gardens, Playgrounds  
FIFA, GAA, American and  
Australian Football, IRB

# REFO SPORT 12 ND

## Vertical Drainage



## TECHNICAL SPECIFICATIONS

Caratteristiche tecniche  
Características técnicas  
Caractéristiques techniques



### REFO SPORT 12 USA cu

0,49 in

Polyethylene foam,  
regenerated Plates, without  
holes

Plates

35,43 x 88,58 in

1,20 yd<sup>2</sup>

100 Kg/m<sup>3</sup>

Vertical, from the perimeter of  
the plates, from puzzle form

46%

0,39%

0,25 in

> 7,09 in/h

On the surface

Recommended for INDOOR  
installations, Hockey and  
MUGA

### REFO SPORT 12 ND

12,5mm

Polyethylene foam,  
regenerated Plates, without  
holes

Plates

90 x 225 cm

2,025 sqm

100 Kg/m<sup>3</sup>

Vertical, from the perimeter of  
the plates, from puzzle form

46%

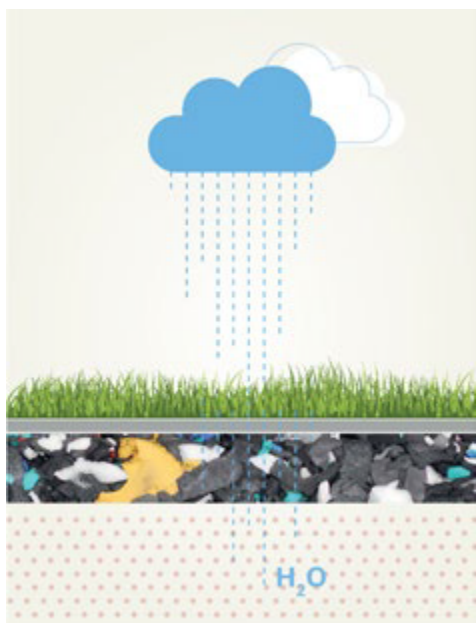
0,39%

6,3mm

> 180 mm/h

On the surface

Recommended for INDOOR  
installations, Hockey and  
MUGA



## REFO SPORT 15

### Vertical Drainage

## TECHNICAL SPECIFICATIONS

Caratteristiche tecniche  
Características técnicas  
Caractéristiques techniques



#### REFO SPORT 15 USA cu

0,59 in

Polyethylene foam  
regenerated

Plates

35,43 x 88,58 in

1,20 yd<sup>2</sup>

80 Kg/m<sup>3</sup>

Vertical

45%

0,28 in

> 118,11 in/h

0,354 l/(m\*s)

Football

FIFA, MUGA

#### REFO SPORT 15 S

15mm

Polyethylene foam  
regenerated

Plates

90 x 225 cm

2,025 sqm

80 Kg/m<sup>3</sup>

Vertical

45%

7,2 mm

> 3000 mm/h

0,354 l/(m\*s)

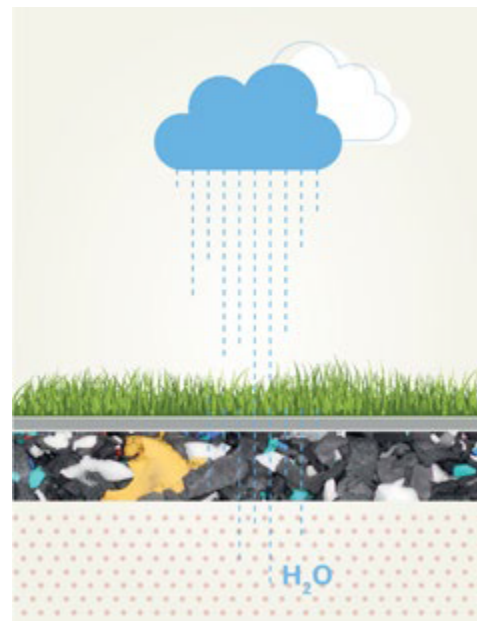
Football

FIFA, MUGA



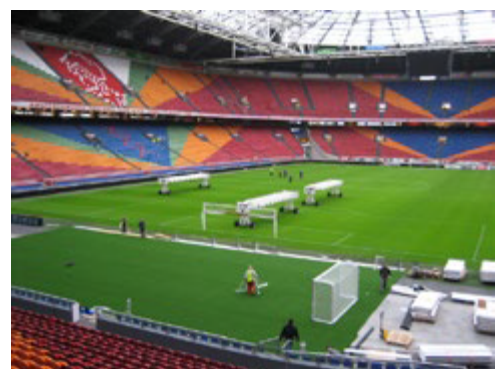
# REFO SPORT 18

## Vertical Drainage



## TECHNICAL SPECIFICATIONS

Caratteristiche tecniche  
Características técnicas  
Caractéristiques techniques



### REFO SPORT 18 USA cu

0,71 in

Polyethylene foam  
regenerated

Plates

35,43 x 88,58 in

1,20 yd<sup>2</sup>

90 Kg/m<sup>3</sup>

Vertical

57%

0,23 in

> 118,11 in/h

0,283 l/(m\*s)

Football

FIFA, MUGA

### REFO SPORT 18

18 mm

Polyethylene foam  
regenerated

Plates

90 x 225 cm

2,025 sqm

90 Kg/m<sup>3</sup>

Vertical

57%

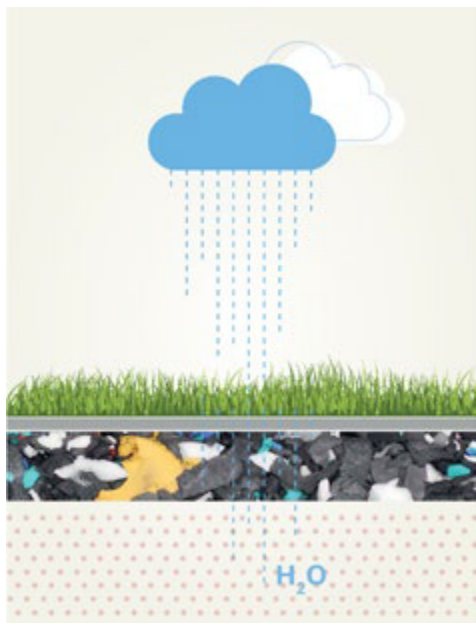
5,9mm

> 3000 mm/h

0,283 l/(m\*s)

Football

FIFA, MUGA



## REFO SPORT 20

### Vertical Drainage

## TECHNICAL SPECIFICATIONS

Caratteristiche tecniche  
Características técnicas  
Caractéristiques techniques



#### REFO SPORT 20 USA cu

0,79 in

Polyethylene foam  
regenerated

Plates

35,43 x 88,58 in

1,20 yd<sup>2</sup>

80 Kg/m<sup>3</sup>

Vertical

58%

0,39%

0,32 in

> 118,11 in/h

0,354 l/(m\*s)

Football, Rugby, MUGA

FIFA, GAA

#### REFO SPORT 20 S

20mm

Polyethylene foam  
regenerated

Plates

90 x 225 cm

2,025 sqm

80 Kg/m<sup>3</sup>

Vertical

58%

0,39%

8,1 mm

> 3000 mm/h

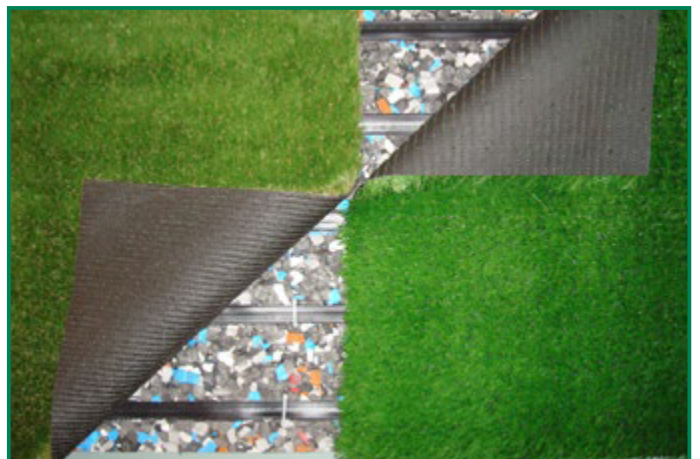
0,354 l/(m\*s)

Football, Rugby, MUGA

FIFA, GAA

# SPECIAL APPLICATIONS

## PERIMETER PROTECTION INTEGRATED SYSTEMS





## REFO PROTECT GREEN

Integrated system for protective angle



## TECHNICAL SPECIFICATIONS

Caratteristiche tecniche  
Características técnicas  
Caractéristiques techniques



### REFO PROTECT GREEN



18mm



Polyethylene foam  
regenerated



Plates



On request (max 200cm)



120 Kg/m<sup>3</sup>



Vertical and Horizontal



800mm



0,35%



8mm



Protective angle for Football  
field

# REFO SPORT 50



## TECHNICAL SPECIFICATIONS

Caratteristiche tecniche  
Características técnicas  
Caractéristiques techniques



|  | REFO SPORT 50 USA cu                                                            | REFO SPORT 50                                                                   |
|--|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
|  | 1,97 in (shock pad + synthetic grass)                                           | 50mm (shock pad + synthetic grass)                                              |
|  | Polyethylene foam regenerated, grooved and drilled coupled with synthetic grass | Polyethylene foam regenerated, grooved and drilled coupled with synthetic grass |
|  | Plates                                                                          | Plates                                                                          |
|  | 90,59 x 36,97 in                                                                | 2301 x 939mm                                                                    |
|  | 2,31 yd <sup>2</sup>                                                            | 1,93 sqm                                                                        |
|  | 120 Kg/m <sup>3</sup>                                                           | 120 Kg/m <sup>3</sup>                                                           |
|  | Vertical and Horizontal                                                         | Vertical and Horizontal                                                         |
|  | 0,453 l/(m*s)                                                                   | 0,453 l/(m*s)                                                                   |
|  | Silica sand, grade 0.5-1.0 mm, min. 80% of cylindrical shape                    | Silica sand, grade 0.5-1.0 mm, min. 80% of cylindrical shape                    |
|  | Certification report: 13/17                                                     | Certification report: 13/17                                                     |
|  | 65% - Test report LSIT.12-0577 - EN 1177 (2008)                                 | 65% - Test report LSIT.12-0577 - EN 1177 (2008)                                 |
|  | 0,35 in                                                                         | 9mm                                                                             |
|  | > 0,79 in/h                                                                     | > 180 mm/h                                                                      |
|  | Playgrounds, football fields, Green areas, fields removable, MUGA               | Playgrounds, football fields, Green areas, fields removable, MUGA               |
|  | LaboSport                                                                       | LaboSport                                                                       |



## REFO SPORT 55

### TECHNICAL SPECIFICATIONS

Caratteristiche tecniche  
Características técnicas  
Caractéristiques techniques



|  | REFO SPORT 55 USA cu                                                            | REFO SPORT 55                                                                   |
|--|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
|  | 2,17 in (shock pad + synthetic grass)                                           | 55mm (shock pad + synthetic grass)                                              |
|  | Polyethylene foam regenerated, grooved and drilled coupled with synthetic grass | Polyethylene foam regenerated, grooved and drilled coupled with synthetic grass |
|  | Plates                                                                          | Plates                                                                          |
|  | 90,59 x 36,97 in                                                                | 2301 x 939mm                                                                    |
|  | 2,31 yd <sup>2</sup>                                                            | 1,93 sqm                                                                        |
|  | 120 Kg/m <sup>3</sup>                                                           | 120 Kg/m <sup>3</sup>                                                           |
|  | Vertical and Horizontal                                                         | Vertical and Horizontal                                                         |
|  | 0,945 l/(m*s)                                                                   | 0,945 l/(m*s)                                                                   |
|  | Silica sand, grade 0.5-1.0 mm, min. 80% of cylindrical shape                    | Silica sand, grade 0.5-1.0 mm, min. 80% of cylindrical shape                    |
|  | Certification report: 13/17                                                     | Certification report: 13/17                                                     |
|  | 62%                                                                             | 62%                                                                             |
|  | 0,35 in                                                                         | 8mm                                                                             |
|  | > 0,79 in/h                                                                     | > 180 mm/h                                                                      |
|  | Playgrounds, football fields, Green areas, fields removable, MUGA               | Playgrounds, football fields, Green areas, fields removable, MUGA               |
|  | LaboSport                                                                       | LaboSport                                                                       |



# REFERENCES



# Iconography

|  |                       |                         |                         |                          |                                    |
|--|-----------------------|-------------------------|-------------------------|--------------------------|------------------------------------|
|  | Thickness             | Spessore                | Espesor                 | Epaisseur                | Dicke                              |
|  | Type of material      | Tipo di materiale       | Tipo de material        | Type de matériel         | Art der Ausrüstung                 |
|  | Material supplied     | Materiale fornito       | Material proporcionado  | Matériel fourni en       | Materialien zur Verfügung gestellt |
|  | Measures plates/rolls | Misura lastre/rotoli    | Medidas placa/rollo     | Mesures plaques/rouleaux | Messplatten / Rollen               |
|  | Profit plates/rolls   | Utile lastra/rotoli     | Util placa/rollo        | Profit feuilles/rouleaux | Profitblätter / Rollen             |
|  | Density m3            | Densità                 | Densidad                | Densité                  | Dichte                             |
|  | Type of drainage      | Tipo di drenaggio       | Tipo de drenaje         | Type de drainage         | Art der Entwässerung               |
|  | Shock absorption      | Assorbimento allo shock | Absorción impacto       | Absorption au choc       | Schockabsorption                   |
|  | Dimensional stability | Stabilità dimensionale  | Estabilidad dimensional | Stabilité dimensionnelle | Dimensionsstabilität               |
|  | Permeability          | Perm. dello shock pad   | Perm. del material      | Perm. Du choc pad        | Perm. Schock-Pad                   |
|  | Vertical deformation  | Deformazione verticale  | Deformación vertical    | Déformation verticale    | Vertikale Verformung               |
|  | Hydraulic Capacity    | Capacità Idraulica      | Capacidad hidráulica    | Capacité hydraulique     | Hydraulische Kapazität             |
|  | Field of application  | Campi di applicazione   | Campos de aplicación    | Applications             | Anwendungen                        |
|  | Certifications        | Certificazioni          | Certificaciones         | Certifications           | Zertifizierungen                   |
|  | Energy Restitution    | Energia di restituzione | Retorno de energia      | Retour énergie           | Energie zurückgeben                |
|  | Value HIC             | Valore HIC              | Valor HIC               | Valeur HIC               | HIC-Wert                           |
|  | Measures Angle        | Misura angoli           | Medidas angulares       | Angle de mesure          | Misst Winkel                       |
|  | Infill                | Intaso                  | Relleno                 | Remplissage              | Füllung                            |
|  | Fire Classification   | Certificazione al fuoco | Clasificación al fuego  | Classification au feu    | Feuerklassifizierung               |
|  | Synthetic grass       | Erba sintetica          | Hierba sintética        | Herbe synthétique        | Synthetisches gras                 |











**PANORAMA**  
 **PANAMA**

E-mail  
[Comercial@grupopanorama.com.pa](mailto:Comercial@grupopanorama.com.pa)  
Tel-What  
+507 6294-3097

[www.grupopanorama.com.pa](http://www.grupopanorama.com.pa)