

BOYD

TRUSTED INNOVATION

FOAMS · 泡沫材料



BOYD - WORLDWIDE ENGINEERED MATERIALS - SINCE 1928

BOYD NIVELLES

Located in the heart of Europe, close to Brussels, **BOYD** is a Belgian company that has been designing, manufacturing and marketing high-tech parts since 1946. Recognised as a leader on the European market in the **elastomers, cellular rubbers and expanded plastics sector**, in recent years **BOYD** has expanded its range of materials to include composites and thermoplastics. Today, this expansion of the range allows **BOYD** to cover for all **polymer-based materials** (elastomers, cellular rubbers and expanded plastics, and thermoplastics) as well as **composite materials** with thermosetting and thermoplastic matrices. Clearly, **BOYD** wants to offer its customers as large a portfolio of high-tech products as possible, covering a range of applications that is as diverse as possible.

FOAMS

THE COMPLEMENTARY RANGE TO ELASTOMERS

The range of cellular rubbers and expanded plastics (also more commonly known as 'foams') was, historically, the second range of products developed by **BOYD** in the 1960s and 70s in response to a growing demand from the market for these new flexible technical materials as well as technological advances in manufacturing methods.

BOYD NIVELLES 公司

BOYD 地处欧洲核心、毗邻布鲁塞尔, 是一家专业从事高科技部件设计、生产及销售的比利时公司, 其悠久的历史可一直追溯至 1946 年。作为弹性材料、海绵橡胶及泡沫塑料行业的欧洲市场领军企业, **BOYD** 还在近些年内大大拓宽了自身的合成及热塑材料系列产品。如今, 这一系列拓展更令 **BOYD** 的产品涵盖了所有以聚合物为基础的材料 (弹性材料、海绵橡胶、泡沫塑料及热塑材料), 并一举将全部热固及热塑性基质合成材料纳入麾下。很显然, **BOYD** 的愿望就是为客户提供覆盖多样化应用范围的全方位高科技产品系列。

泡沫材料:

弹性材料的补充系列

从历史角度来讲, 海绵橡胶及泡沫塑料系列 (更普遍的叫法是“泡沫材料”) 是 **BOYD** 在 60 至 70 年代开发出的第二款系列产品, 其旨在满足市场对于新型柔性科技材料日益增加的需求, 以及生产工艺科技进步之需。

GFOAM



Machined profile
in cellular rubber
泡沫橡胶机加工型材

In several areas of application, such as sealing and shock absorption, cellular rubbers and expanded plastics have become complementary to elastomers. This complementarity has allowed the areas of application of these two ranges of materials to be expanded.

As cellular rubbers and expanded plastics represent a sizeable part of **BOYD's** commercial activity, our materials science engineers continue to develop flexible products with ever greater mechanical, thermal and physico-chemical performances. These are intended not only for traditional industrial applications, but also for **advanced technology sectors such as the rail, aeronautical, medical and food industries**. Thanks to our partnerships with several industrial and university laboratories, our materials are accredited under several international standards, such as:

- Fire/smoke standards for railways and buildings (EN-45-545, NF F-16-101, DIN 5510, UL94, NBN EN 13501-2, etc.).
- FAR, NFL, ASTM, BOMBARDIER SMP800 standards for the aeronautical and space industries.
- Food standards (e.g. FDA: Food and Drug Administration).
- Standards for drinking water (e.g. ACS), etc.

海绵橡胶及泡沫塑料已在众多诸如密封及减震等应用领域, 成为了弹性材料的有益补充。而且, 这种互补性也进一步扩大了这两种材料系列的应用范围。

如今, 海绵橡胶及泡沫塑料已经成为了 **BOYD** 营业额中不容忽视的一个重要部分, 此刻, 我们的材料科学工程师仍在不懈开发大批机械、热效及物理化学性能均愈发卓越的柔性产品。这些产品不仅可用于传统工业应用领域, 更可满足铁路、航空、医疗及食品等尖端科技行业的各项需求。在多所工业实验室及大学实验室合作伙伴的助力之下, 我们的材料业已获得了众多国际标准的认证认可, 其中包括:

- 铁路及建筑消防-排烟标准 (EN-45-545、NF F-16-101、DIN 5510、UL94、NBN EN 13501-2、...)
- 航空航天标准 FAR、NFL、ASTM、BOMBARDIER SMP800
- 食品标准 (如 FDA: 食品药品监督管理局)
- 饮用水标准 (如 ACS)

Thermoformed safety belt
热成型安全带



THE GFOAM RANGE

OF CELLULAR RUBBERS AND EXPANDED PLASTICS

BOYD offers its customers a complete range of technical foams that can easily be identified by their product reference, which starts with the letters **GFOAM**. This range of flexible products contains all the cellular rubbers and expanded plastics most frequently used in industry. These can be divided into two categories according to their basic chemical composition (**cellular rubber or expanded plastic**) and, each one, into two sub-categories according to their type of cellularisation (**closed cells or open cells**).

GFOAM 海绵橡胶及泡沫塑料系列

BOYD 可为客户提供一整套完备的高科技泡沫材料系列产品, 其参考号均以 **GFOAM** 字母开始, 非常易于识别。而且, 这一柔性产品系列还涵盖了工业领域内各种最为常用的海绵橡胶及泡沫塑料。该系列产品可根据基础化学构成分为两大类 (海绵橡胶或泡沫塑料), 且每个类别又可根据成孔方式分为两个子类别 (闭孔或开孔)。



CLOSED-CELL CELLULAR RUBBERS:

- EPDM
- EPDM/SBR
- EPDM/CR
- Neoprene (CR)
- CR/NBR/PVC
- NR/SBR
- NBR/PVC
- EVM
- Viton (FKM)
- Silicone (Si)

OPEN-CELL CELLULAR RUBBERS:

- EPDM
- NBR/PVC
- Sponge rubber (NR)

CLOSED-CELL EXPANDED PLASTICS:

- Polyethylene (PE)
- Polypropylene (PP)
- PE/EVA
- EVA
- PVC

OPEN-CELL EXPANDED PLASTICS:

- Polyurethane (polyester or polyether)
- PVC
- Polyethylene (PE)

闭孔海绵橡胶:

- EPDM
- EPDM/SBR
- EPDM/CR
- 氯丁橡胶 (CR)
- CR/NBR/PVC
- NR/SBR
- NBR/PVC
- EVM
- 氟橡胶 (FKM)
- 硅 (Si)

开孔海绵橡胶:

- EPDM
- NBR/PVC
- 海绵橡胶 (NR)

闭孔泡沫塑料:

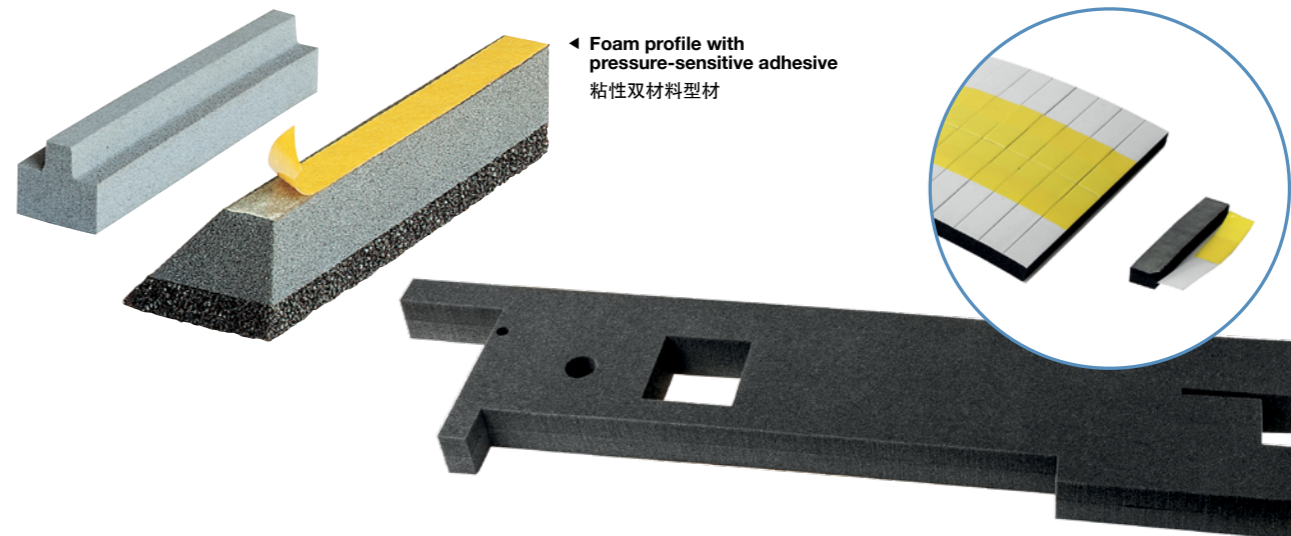
- 聚乙烯 (PE)
- 聚丙烯 (PP)
- PE/EVA
- EVA
- PVC

开孔泡沫塑料:

- 聚氨酯 (聚酯或聚醚)
- PVC
- 聚乙烯 (PE)



Cellular rubber rope
泡沫橡胶绳



◀ Foam profile with pressure-sensitive adhesive
粘性双材料型材

GFOAM ARE MAINLY USED FOR THE FOLLOWING INDUSTRIAL APPLICATIONS:

- Air and water tightness
- Air and dust tightness
- Expansion joint
- Vibration damping
- Shock absorption
- Thermal insulation
- Acoustic/ponic insulation
- Thermoforming
- Packaging...

... AND PROCESSED INTO FINISHED PRODUCTS IN VARIOUS FORMS:

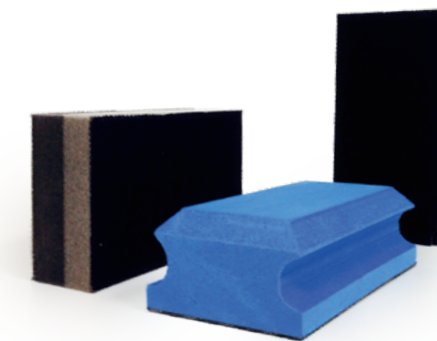
- Sealing profiles
- Expansion joints
- Flat die-cut seals
- Machined part
- Frames
- Any thermoformed part...

GFOAM 泡沫材料主要用于以下工业应用领域:

- 密封防水、防气
- 密封防气、防尘
- 膨胀接头
- 震动缓冲
- 减震
- 隔热
- 隔音
- 加热成型
- 包装...

...并可加工成以下多种式样的成品:

- 密封型材
- 膨胀接头
- 切割扁平接头
- 机加工部件
- 框架
- 以加热成型或热压方式生产的所有部件...



◀ Product range for sanding and polishing
打磨及抛光产品系列

MANUFACTURE

ULTRA-MODERN MACHINERY

Thanks to a policy of continuous investment in its machinery and industrial buildings for many years, **BOYD** is equipped with CNC machines that are among the best-performing on the market and capable of meeting the most stringent customer requirements. All parts manufactured by **BOYD** meet the quality criteria (dimensional tolerance, surface condition, etc.) required by the principal international standards as well as the customer's specifications.

Foams in the **GFOAM** range are processed into semi-finished or finished products using several manufacturing methods, chiefly **cutting, machining, thermoforming and extrusion.**

THE RESULTING PRODUCTS ARE AVAILABLE IN THE FORM OF:

- Thickness split sheets
- Thickness split rolls
- Stamped parts
- Machined parts
- Extruded profiles
- Strips

Other processing methods such as **gluing, laminating, overmoulding, gluing of corners, etc.** are regularly used in our workshops to manufacture more complex parts.

生产制造

超级现代的设备园区

多年以来, 在面向设备园区及工业厂房的持续投资政策助力之下, **BOYD** 现已拥有了市场上最为先进的数控设备 (CN), 并可满足客户最为严苛的各种要求。BOYD 生产的所有部件均严格符合主要国际标准及客户产品规格要求的质量标准 (尺寸公差、表面状态...)。

在经过切割、机械加工、加热成型及压制成型等多个主要生产工艺之后, **GFOAM** 系列泡沫材料即可被加工为半成品或成品。

且产品有以下几种方式可供选择:

- 厚度分割板
- 厚度分割滚筒
- 切割部件
- 机加工部件
- 挤压型材
- 穿孔带

此外, 我们的工厂也会经常运用粘合、络合、复制模型及角度拼接等其他加工流程来生产更为复杂的部件。

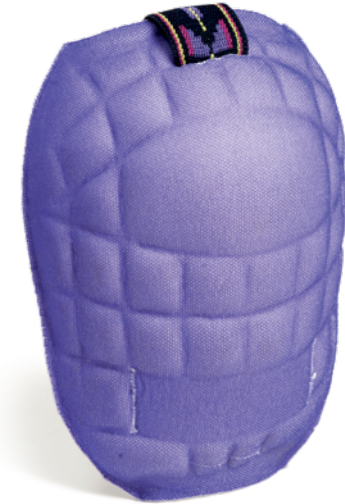


FOAM THERMOCOMPRESSION: A BOYD NICHE MARKET

Thermoforming is an industrial process that is primarily applied to **plastic materials** and to **expanded plastics that can be moulded when heated** above their glass transition temperature. Only those thermoplastics that have an amorphous or semi-crystalline structure with a low rate of crystallinity are thermoformable.

THE THERMOPLASTICS MOST COMMONLY USED FOR THIS APPLICATION ARE:

- PE
- PP
- PVC
- Polystyrene (PS)
- Polycarbonate (PC)
- Polymethyl methacrylate (PMMA)
- Acrylonitrile butadiene styrene (ABS), etc.



泡沫塑料热压: BOYD 旗下的精致领域

热成型工艺是一种经典的工业流程, 其主要适用于塑料及泡沫塑料等遇热变形的材料, 此处所述遇热即指温度超过材料软化温度之后。唯有那些具备非晶质结构或低结晶率半结晶结构特征的热塑材料, 方可用于热成型工艺。

此工艺最常使用的热塑材料包括:

- PE
- PP
- PVC
- 聚苯乙烯 (PS)
- 聚碳酸酯 (PC)
- 聚甲基丙烯酸甲酯 (PMMA)
- 丙烯腈-苯乙烯-丁二烯共聚物 (ABS)



Thermoformed parts in PE foam
PE 泡沫塑料热成型保护部件





Among the various thermoforming techniques used in industry, **BOYD** has specialised in the **thermocompression of foams** for technical applications, i.e. the heated moulding of foam by compression. Today, **BOYD** is well-known as a manufacturer of **highly technical thermoformed products** for small and medium-sized production runs. The thermocompressed materials are essentially polyolefin foams such as **PE, PP and EVA as well as certain PU foams**. This technology offers the advantage of allowing the production of items of any shape and hardness and the integration of rigid inserts during the manufacturing process. Furthermore, our thermocompression production unit is also equipped to carry out the flame lamination or bonding of different types of material onto the foam, for example fabrics, leather, vinyl, nonwoven materials, etc., as well as the necessary finishing work such as sewing, alterations and upholstery.

The applications for thermocompressed foams are vast and primarily involve sectors such as **POS advertising, personal security and protection, medical, transportation, technical packaging, as well as leather goods and luxury luggage.**

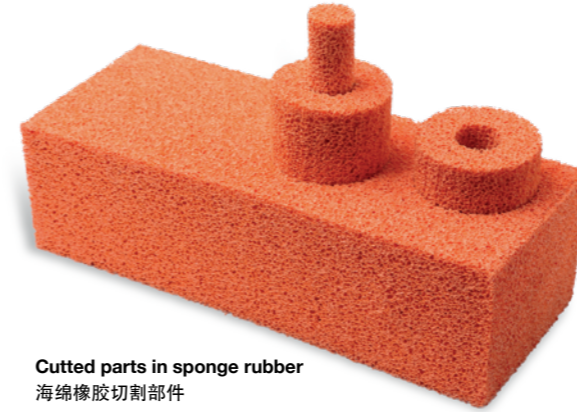
在工业领域内应用的众多热成型技术中, **BOYD** 专门从事泡沫塑料热压技术研究, 这是一种使泡沫塑料通过压缩遇热变形的先进工艺。如今, **BOYD** 业已成为了一家声名卓著的中小批量高科技热成型部件生产商。其所涵盖的热压材料主要包括 **PE、PP 及 EVA** 等聚烯烃类泡沫塑料以及部分 **PU** 泡沫塑料。这种工艺技术的突出优势是, 可生产加工各种形状及硬度的部件, 并能在生产流程中向件内植入刚性插件。

此外, 我们的热压车间更是配套完备, 不但可将织物、皮革、乙烯基或合成纤维等不同种类的材料直接种植或胶合在泡沫塑料之上, 而且还可完美实现缝纫、织补、加衬及填充等必要的精加工操作。

热压泡沫塑料的应用范围非常广泛, **PLV、个人安全与防护、医疗、运输和技术封装等领域, 以及皮制品和奢侈箱包行业, 都是热压泡沫塑料的主要针对市场。**



Thermoformed protective case in EVA foam
热成型保护箱



Cutted parts in sponge rubber
海绵橡胶切割部件

AN EXPERIENCED ENGINEERING FIRM

BOYD makes an engineering office available to its customers that is experienced in the design of any new component. Our engineers use advanced software to design any new technical part, such as **Catia, Rhinoceros, Mastercam, Autocad, etc.** With solid experience in materials engineering and staff who are highly qualified in the chemistry and physics of materials, **BOYD** undertakes to find an optimal solution to your specific technical needs.

A HIGH-END COMMERCIAL DEPARTMENT

Commercially, **BOYD** is known for its very short production lead times, the responsiveness of its after-sales service and a highly competitive price/quality ratio. These assets, among others, make it one of the market leaders in **the processing of cellular rubbers and expanded plastics.**

SATISFYING CUSTOMER NEEDS IS OUR MAIN OBJECTIVE - EVERY DAY



经验丰富的工程办公室

BOYD 拥有经验丰富的工程办公室, 能够在各类新部件的设计及构思方面为客户提供卓越服务。我们的工程师将运用先进软件(如 **Catia、Rhinoceros、Mastercam、Autocad**) 设计任何全新技术部件。而且, **BOYD** 在材料工程领域经验深厚并拥有大批材料化学及物理学科方面的高端人才, 定可为您找到满足您具体技术需求的最佳解决方案。

卓越非凡的商务部门

从商务角度来看, **BOYD** 具备生产周期超短、售后服务反应迅速以及性价比极具竞争力等诸多突出优势。这些制胜关键与其他强弱点一起, 成就了 **BOYD** 在海绵橡胶及泡沫塑料加工市场上的领军者地位。

满足客户需求是我们每天的目标

ISO 9001

QUALITY CONTROL AND ISO 9001 CERTIFICATION

Over the years, **BOYD** has equipped itself with human and material resources that guarantee systematic and strict quality control after each production run. Our internal quality control laboratory (QCL) allows us to carry out visual and dimensional checks quickly, as well as those of certain basic mechanical properties such as shore hardness, tensile strength and resistance to compression. For more detailed analyses, **BOYD** works in partnership with several industrial and university laboratories in Europe. Since 2008, **ISO 9001 certification** has been successfully renewed each year.

BOYD requires most of its suppliers to certify their products in accordance with the two European **REACH** and **RoHS** directives on the use of hazardous substances.



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质量控制与 ISO 9001 认证

多年以来, **BOYD** 始终在使用最为先进的人力及物力方法, 确保对每个生产环节进行严格而系统的质量控制。我们的内部质量控制实验室 (QCL), 可帮助操作者快速完成尺寸目测控制及诸如肖氏硬度、抗拉强度及抗压强度等某些基础机械性能测试。对于那些更为尖端的分析, **BOYD** 则会与欧洲的多所工业实验室及大学实验室合作完成。

自 2008 年以来, **BOYD** 每年都会成功通过 **ISO 9001** 认证年审。

BOYD 对大部分供应商的要求是, 其产品必须在危险品使用方面获得 **REACH** 及 **RoHS** 欧洲两大法令的认证。



CELLULAR RUBBERS
泡沫橡胶

GFOAM-9531 EPDM-SBR 135 kg/m ³	GFOAM-9521 EPDM 160 kg/m ³	GFOAM-9021I EPDM 175 kg/m ³	GFOAM-9521SF EPDM-NR-SBR 120 kg/m ³
GFOAM-9522 EPDM-SBR 140 kg/m ³	GFOAM-9523 EPDM-SBR 140 kg/m ³	GFOAM-9011 EPDM 75 kg/m ³	GFOAM-9001 EPDM 95 kg/m ³
GFOAM-9931 CR 180 kg/m ³	GFOAM-9921 CR 175 kg/m ³	GFOAM-9925 CR 200 kg/m ³	GFOAM-9820 CR-EPDM 130 kg/m ³
GFOAM-9421 CR-NBR-PVC 105 kg/m ³	GFOAM-9411 CR-NBR-PVC 70 kg/m ³	GFOAM-9721 NBR 150 kg/m ³	GFOAM-EVA100 EVA 100 kg/m ³

EXPANDED PLASTICS
泡沫塑料

GFOAM-0361SR PVC 100-125 kg/m ³	GFOAM-0134 PE-EVA 50 kg/m ³	GFOAM-0020 PE 30 kg/m ³	GFOAM-0021AS PE antistatic 30 kg/m ³
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OPEN-CELL FOAMS
开孔泡沫塑料

GFOAM-9701S NBR-PVC 60 kg/m ³	GFOAM-9011S EPDM 90 kg/m ³	GFOAM-9021S EPDM 180 kg/m ³	GFOAM-0521-45 PPI 45
GFOAM-9164 SPONGE NR FINE 350 kg/m ³	GFOAM-9134 SPONGE NR FINE 200 kg/m ³	GFOAM-9124 SPONGE NR FINE 160 kg/m ³	GFOAM-0421 PU ESTER 30 kg/m ³

TO OBTAIN THE TECHNICAL DATA SHEET OF ONE OF THE CELLULAR MATERIALS SHOWN HEREBOWE (NON-EXHAUSTIVE LIST), CONTACT US AT:
若想获得上述泡沫材料 (未列列表) 的技术资料, 敬请通过以下方式联系我们:
WWW.GRANDOGROUP.COM OR/或 INFO.NIVELLES@BOYDCORP.COM

BOYD

TRUSTED INNOVATION

BOYD AMERICAS

WEST COAST HEADQUARTERS

5960 Inglewood Dr.
Suite 125
Pleasanton CA 94588

EAST COAST HEADQUARTERS

2424 N. Federal Hwy
Suite 318
Boca Raton FL 33431

BOYD EUROPE

UNITED KINGDOM

12 Wansbeck Business Park
Ashington Northumberland
UK NE63 8QW
Tel: +44-0-1670-859-500

ITALY

VIA DEL FONDITORE 4
40138 Bologna Italy
Tel: +39-051-764011

POLAND

309 Pszczyńska 44-100
Gliwice Poland

BELGIUM

Rue du commerce 14 (Parc Industriel)
Belgium - 1400 Nivelles
Tel: +32 67 89 48 48

CZECH REPUBLIC

J. Dundra 408 273 03 Stochov
Česká republika
Tel: +420 312 651 005

GERMANY

Jakob-Lang-Straße 12
88171 Weiler-Simmerberg
Tel: +49 8387 92 300

Rudolf-Diesel-Straße 17
28857 Syke
Tel: +49-4242-692-0



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BOYD - WORLDWIDE ENGINEERED MATERIALS

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