

FP:(NPROXX)

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Machine translation

1. [3667153](#) FLUSHABLE PRESSURE VESSEL

EP - 17.06.2020

Int.Class [F17C 5/06](#) Appl.No 20150019 Applicant NPROXX B V Inventor KRONHOLZ STEPHAN

Die Erfindung betrifft einen Druckbehälter (1) mit Spüllanze (5), einen Transportcontainer (10) mit Druckbehältern (1), sowie Verfahren (100, 200) zur Befüllung dieses Druckbehälters (1) und zur Herstellung des Druckbehälters (1), der einen Innenbehälter (2), eine auf den Innenbehälter (2) aufgebrachte Außenschicht (3), ein Ventilanschlusstück (4) angeordnet auf einer der Polkappen (22a) des Innenbehälters (1) und eine hohlförmige nach außen offene Spüllanze (5) umfasst, die durch das Ventilanschlusstück (4) hindurchgeführt und darin abdichtend gehalten ist, wobei die Spüllanze (5) in das Speichervolumen (SV) hineinragt und entlang ihrer gesamten Länge (L5) bis zu einem ersten Ende (52) der Spüllanze (5) zugewandt zu der dem Ventilanschlusstück (4) gegenüberliegenden Polkappe (22b) im Speichervolumen (SV) für einen Gasaustausch mit dem Speichervolumen mit einer Perforation (51) versehen ist, wobei sich die Spüllanze (5) soweit zu der dem Ventilanschlusstück (4) gegenüberliegenden Polkappe (22b) erstreckt, dass sich der Gasaustausch bis zur gegenüberliegenden Polkappe (22b) erstreckt.

2. [WO/2018/184732](#) FIBER-REINFORCED PRESSURE VESSEL

WO - 11.10.2018

Int.Class [F17C 1/06](#) Appl.No PCT/EP2018/025078 Applicant NPROXX B.V. Inventor SONNEN, Michael

The invention relates to a fiber-reinforced pressure vessel (1) having a securely fixed fiber end (FE) and to a corresponding method (100). The pressure vessel (1) according to the invention comprises an inner vessel (2) having a cylindrical central part (21) which has a cylinder axis (ZA) and two polar caps (22) closing the cylindrical central part (21), and an outer layer (3) wound on the inner vessel (2) for reinforcement thereof, said outer layer made of composite fiber material (FVM), consisting of a plurality of layers (L1, L2 and L3) of fibers (F) arranged one atop the other, embedded in a matrix material, wherein the fiber (F) from the last wound layer (L3) is guided out of the central part (21) to a region (33) of the pressure vessel (1) which, under pressure load, exhibits at most a negligible elongation relative to the central part (21), and a last portion (FL) of the fiber (F) is fixed in said region at least by one fiber end (FE).

3. [3053051](#) POLE CAP WITH A PRESSURE PORT ELEMENT FOR PRESSURE VESSELS

CA - 30.08.2018

Int.Class [F17C 1/00](#) Appl.No 3053051 Applicant NPROXX B.V. Inventor

The invention relates to a pole cap (1) made from a plastic material for the pressure tight closure of a pressure vessel (100), a pressure vessel (100) having a pole cap (1) of this kind and a method (200, 300) for producing a pole cap (1) of this kind and for producing a pressure vessel (100) of this kind. The pole cap (1) comprises an inner face (11) for the later closure of the pressure vessel (100), an outer face (12) to be wound with a fibre composite material (3) after closure of the pressure vessel (100), a neck-shaped open through-hole (13) projecting from the outer face outwards having an inner contour (13i), each made from a plastic material, and a pressure connection element (2) connected to the through-hole (13) to close the through-hole (13), wherein the pressure connection element (2) comprises a metal sealing taper (21) having a first section (21a) projecting outwards through the through-hole (13) and having a second section (21b) tapering conically at least in the region of the through-hole (13) in the direction of the first section (21a), which second section is retained by means of a fixing means (22) arranged from the outside on the first section (21a) in a pressure tight pressed fit in the inner contour (13i).

4. [WO/2019/020597](#) FIBER-REINFORCED PRESSURE VESSEL

WO - 31.01.2019

Int.Class [F17C 13/00](#) Appl.No PCT/EP2018/069980 Applicant NPROXX B.V. Inventor MIDDENDORF, Christian

The invention relates to a pressure vessel (1) that is fiber-reinforced by means of fiber bands (FB) and to a method (100) for producing the fiber-reinforced pressure vessel (1), said pressure vessel comprising: an inner vessel (2), having a rotationally symmetrical center part (21) having an axis of symmetry (ZA) along the center part (21) and two domed pole caps (22), which close the center part (21); and an outer layer (3) of fiber composite material formed of a plurality of layers of fibers (F) arranged one over the other and embedded in a matrix material, which outer layer is wound onto the inner vessel (2) in order to reinforce the inner vessel, the layers extending over the inner vessel (2) as a fiber band (FB) of a number of fibers (F) with a location- and layer-dependent fiber course. At least in some of the layers, the fiber band (FB) enters the region of the domed pole caps (22) from the center part (21) with a particular entry fiber angle (FW) relative to the axis of symmetry (ZA) and is guided there at a particular reversal point (31) in the winding direction (WR) of the fiber band back in the direction of the center part (22). At least the fiber bands (FB) of some of the layers have at least one twist (32) in the region of the pole caps (22).

5. [WO/2019/238678](#) FLUSHABLE PRESSURE VESSEL

WO - 19.12.2019

Int.Class [F17C 5/06](#) Appl.No PCT/EP2019/065213 Applicant NPROXX B.V. Inventor KRONHOLZ, Stephan

The invention relates to a pressure vessel (1) having a flushing lance (5), to a transport container (10) containing pressure vessels (1), and to a method (100, 200) for filling said pressure vessel (1) and for producing the pressure vessel (1). Said pressure vessel comprises an inner vessel (2), an outer layer (3) applied to the inner vessel (2), a valve connection piece (4) arranged on one of the pole caps (22a) of the inner vessel (1), and a hollow, outwardly open flushing lance (5), which passes through the valve connection piece (4) and is held sealingly therein. The flushing lance (5) protrudes into the storage volume (SV) and is

provided with a perforation [51] along the entire length [L5] thereof as far as a first end [52] of the flushing lance [5] facing the pole cap [22b] opposite the valve connection piece [4] in the storage volume [SV], for gas exchange with the storage volume. The flushing lance [5] extends so far to the pole cap [22b] opposite the valve connection piece [4] that the gas exchange extends as far as the opposite pole cap [22b].

6. [3581843](#) FLUSHABLE PRESSURE VESSEL

EP - 18.12.2019

Int.Class [F17C 5/06](#) Appl.No 18177400 Applicant NPROXX B V Inventor KRONHOLZ STEPHAN

7. [3587895](#) SELF-SEALING VALVE CONNECTION FOR PRESSURE VESSEL

EP - 01.01.2020

Int.Class [F17C 13/04](#) Appl.No 18179194 Applicant NPROXX B V Inventor KRONHOLZ STEPHAN

8. [WO/2019/243413](#) SELF-SEALING VALVE CONNECTION FOR PRESSURE VESSELS

WO - 26.12.2019

Int.Class [F17C 13/04](#) Appl.No PCT/EP2019/066180 Applicant NPROXX B.V. Inventor KRONHOLZ, Stephan

The invention relates to a pressure vessel [1], comprising an inner container [2] made of an inner container material, and an outer layer [3] arranged thereon, and a valve connection piece [4] having a two-part sealing canus [41] and an outer piece [42]. The sealing canus [41] is positioned on an inner side [23i] of a bulge [23] of the inner container, and the outer piece [42] is positioned between the two-part sealing canus [41], the bulge [23], and the outer piece [42] on an outer side [23a] of the bulge [23] for generating a sealing pressure [AD]. Towards the bulge [23], the outer piece [42] is provided with a suitably shaped groove [421] having a first and second edge [421a, 421b] for receiving a sealing ring [6] that seals off under sealing pressure [AD]. The groove [421] and the sealing ring [6] are dimensioned in such a way, and the purpose of the inner container material is such that at the sealing pressure [AD] on account of its plastic deformability, first and second sealing beads [24a, 24b] projecting at least into both gaps [L1, L2] between the sealing ring [6] and the first and second edges [421a, 421b] are formed.

9. [3575668](#) SELF-SEALING VALVE CONNECTION FOR PRESSURE VESSEL


EP - 04.12.2019

Int.Class [F17C 13/04](#) Appl.No 18185283 Applicant NPROXX B V Inventor KRONHOLZ STEPHAN

10. [102018110049](#) VERFAHREN ZUR HERSTELLUNG EINES FASERVERSTÄRKTEN DRUCKBEHÄLTERS MIT POLKAPPENVERSTÄRKUNG

DE - 31.10.2019

Int.Class [F17C 1/04](#) Appl.No 102018110049 Applicant NPROXX B.V. Inventor Bäumer Tristan

Verfahren zur Herstellung eines Druckbehälters [10], umfassend einen Innenbehälter [20] und eine auf den Innenbehälter [20] gewickelte Außenschicht [34] aus einem Faserwerkstoff, gekennzeichnet durch folgende Schritte: a) Bereitstellen eines Innenbehälters [20] mit einem zylinderförmigen Mittelbereich [23], der zwei gegenüberliegende Endabschnitte aufweist, deren Öffnungen jeweils mit einem kuppelförmigen Polkappenbereich [21;22] verschlossen sind; b) Anbringen einer Haltevorrichtung mit mehreren abstehenden Halteelementen [44;45] im Bereich eines Endabschnittes des Mittelbereichs [23], wobei die Haltevorrichtung von der Öffnung des Endabschnitts axial beabstandet angebracht wird; c) Herstellen einer Polkappenverstärkung [33] durch Wickeln von Faserwerkstoff um wenigstens einen Teil des Polkappenbereiches [21;22] und den Endabschnitt mit der Haltevorrichtung, wobei der Faserwerkstoff mit Richtungsumkehr um die abstehenden Halteelemente [44;45] der Haltevorrichtung geführt wird; d) Wickeln einer Umfangswicklung [32] um den Endabschnitt mit der Polkappenverstärkung [33], wobei die Umfangswicklung [32] zwischen der Öffnung des Endabschnitts und der Haltevorrichtung liegt; e) Durchtrennen des Faserwerkstoffes der Polkappenverstärkung [33] zwischen der Haltevorrichtung und der Umfangswicklung [32]; f) Entfernen der Haltevorrichtung; g) Herstellen einer Außenschicht [34] durch Wickeln von Faserwerkstoff, wobei die Außenschicht [34] den Mittelbereich [23] und die Polkappenbereiche [21;22] des Innenbehälters [20] umschließt. 

11. [WO/2019/206959](#) METHOD FOR PRODUCING A FIBRE-REINFORCED PRESSURE VESSEL WITH POLE CAP REINFORCEMENT

WO - 31.10.2019

Int.Class [F17C 1/16](#) Appl.No PCT/EP2019/060459 Applicant NPROXX B.V. Inventor BÄUMER, Tristan

The invention relates to a method for producing a pressure vessel [10], comprising an inner vessel [20] and an outer layer [34] wound onto the inner vessel [20] and consisting of a fibre material. In the method, a holding device having multiple holding elements protruding therefrom is attached to an inner vessel [20] in order to wind a local pole cap reinforcement in a dome-shaped pole cap region [21; 22] of the inner vessel. The holding device is then removed and an outer layer [34] is produced by winding fibre material, the outer layer [34] enclosing the central region [23] and the pole cap regions [21; 22] of the inner vessel [20].

12. [201917038230](#) POLE CAP WITH PRESSURE CONNECTION ELEMENT FOR PRESSURE VESSELS

IN - 06.12.2019

Int.Class [F17C 1/00F](#) Appl.No 201917038230 Applicant NPROXX B.V. Inventor BÄUMER, Thomas

The invention relates to a pole cap [1] made from a plastic material for the pressure tight closure of a pressure vessel [100] a pressure vessel [100] having a pole cap [1] of this kind and a method [200 300] for producing a pole cap [1] of this kind and for producing a pressure vessel [100] of this kind. The pole cap [1] comprises an inner face [11] for the later closure of the pressure vessel [100] an outer face [12] to be wound with a fibre composite material [3] after closure of the pressure vessel [100] a neck-shaped open through-hole [13] projecting from the outer face outwards having an inner contour [13i] each made from a plastic material and a pressure connection element [2] connected to the through-hole [13] to close the through-hole [13] wherein the pressure connection element [2] comprises a metal sealing taper [21] having a first section [21a] projecting outwards through the through-hole [13] and having a second section [21b] tapering conically at least in the region of the through-hole [13] in the direction of the first section [21a] which second section is retained by means of a fixing means [22] arranged from the outside on the first section [21a] in a pressure tight pressed fit in the inner contour [13i].

**13. WO/2018/153779 POLE CAP WITH PRESSURE CONNECTION ELEMENT FOR PRESSURE VESSELS**

WO - 30.08.2018

Int.Class F17C 1/00 Appl.No PCT/EP2018/053860 Applicant NPROXX B.V. Inventor BÄUMER, Thomas

The invention relates to a pole cap [1] made from a plastic material for the pressure tight closure of a pressure vessel [100], a pressure vessel [100] having a pole cap [1] of this kind and a method [200, 300] for producing a pole cap [1] of this kind and for producing a pressure vessel [100] of this kind. The pole cap [1] comprises an inner face [11] for the later closure of the pressure vessel [100], an outer face [12] to be wound with a fibre composite material [3] after closure of the pressure vessel [100], a neck-shaped open through-hole [13] projecting from the outer face outwards having an inner contour [13i], each made from a plastic material, and a pressure connection element [2] connected to the through-hole [13] to close the through-hole [13], wherein the pressure connection element [2] comprises a metal sealing taper [21] having a first section [21a] projecting outwards through the through-hole [13] and having a second section [21b] tapering conically at least in the region of the through-hole [13] in the direction of the first section [21a], which second section is retained by means of a fixing means [22] arranged from the outside on the first section [21a] in a pressure tight pressed fit in the inner contour [13i].

**14. 2018226208 POLE CAP WITH PRESSURE CONNECTION ELEMENT FOR PRESSURE VESSELS**

AU - 30.08.2018

Int.Class F17C 1/00 Appl.No 2018226208 Applicant NPROXX B.V. Inventor

The invention relates to a pole cap [1] made from a plastic material for the pressure tight closure of a pressure vessel [100], a pressure vessel [100] having a pole cap [1] of this kind and a method [200, 300] for producing a pole cap [1] of this kind and for producing a pressure vessel [100] of this kind. The pole cap [1] comprises an inner face [11] for the later closure of the pressure vessel [100], an outer face [12] to be wound with a fibre composite material [3] after closure of the pressure vessel [100], a neck-shaped open through-hole [13] projecting from the outer face outwards having an inner contour [13i], each made from a plastic material, and a pressure connection element [2] connected to the through-hole [13] to close the through-hole [13], wherein the pressure connection element [2] comprises a metal sealing taper [21] having a first section [21a] projecting outwards through the through-hole [13] and having a second section [21b] tapering conically at least in the region of the through-hole [13] in the direction of the first section [21a], which second section is retained by means of a fixing means [22] arranged from the outside on the first section [21a] in a pressure tight pressed fit in the inner contour [13i].

**15. 112019017365 TAMPA DE POLO PARA O FECHAMENTO BEM VEDADO DE UM VASO DE PRESSÃO, VASO DE PRESSÃO REFORÇADO POR FIBRA, MÉTODO PARA PRODUZIR UMA TAMPA DE POLO E MÉTODO PARA PRODUZIR UM VASO DE PRESSÃO REFORÇADO POR FIBRA**

BR - 31.03.2020

Int.Class F17C 1 Appl.No 112019017365 Applicant NPROXX B.V. Inventor CLAUS CASTENHOLZ

a invenção se refere a uma tampa de polo [1] feita de um material plástico para o fechamento bem vedado de um vaso de pressão [100], um vaso de pressão [100] com tal tampa de polo [1] bem como a métodos [200, 300] para produzir tal tampa de polo [1] bem como tal vaso de pressão [100]. a tampa de polo [1] compreende um lado interno [11] para o fechamento posterior do vaso de pressão [100], um lado externo [12] para o superenrolamento com um material compósito de fibra [3] após o fechamento do vaso de pressão [100] e um duto aberto em formato de gargalo [13], o qual se projeta para fora do lado externo e tem um contorno interno [13i], cada um feito de material plástico, e compreende um elemento de porta de pressão [2] conectado ao duto [13] para o fechamento do duto [13], em que o elemento de porta de pressão [2] compreende um cone de vedação [21] feito de metal com uma primeira seção [21a] que se projeta para fora através do duto [13] e uma segunda seção [21b] que se afunila pelo menos na área do duto [13] de maneira em formato de cone na direção da primeira seção [21a], que é mantida por meio de um meio de fixação [22], disposto na primeira seção [21a] do lado de fora de um encaixe por pressão bem vedado no contorno interno [13i].

**16. 2019009905 TAPON POLAR CON UN ELEMENTO DE ORIFICIO DE PRESION PARA RECIPIENTES A PRESION.**

MX - 21.11.2019

Int.Class F17C 1/00 Appl.No 2019009905 Applicant NPROXX B.V.NPROXX B.V. Inventor Thomas BÄUMER

The invention relates to a pole cap [1] made from a plastic material for the pressure tight closure of a pressure vessel [100], a pressure vessel [100] having a pole cap [1] of this kind and a method [200, 300] for producing a pole cap [1] of this kind and for producing a pressure vessel [100] of this kind. The pole cap [1] comprises an inner face [11] for the later closure of the pressure vessel [100], an outer face [12] to be wound with a fibre composite material [3] after closure of the pressure vessel [100], a neck-shaped open through-hole [13] projecting from the outer face outwards having an inner contour [13i], each made from a plastic material, and a pressure connection element [2] connected to the through-hole [13] to close the through-hole [13], wherein the pressure connection element [2] comprises a metal sealing taper [21] having a first section [21a] projecting outwards through the through-hole [13] and having a second section [21b] tapering conically at least in the region of the through-hole [13] in the direction of the first section [21a], which second section is retained by means of a fixing means [22] arranged from the outside on the first section [21a] in a pressure tight pressed fit in the inner contour [13i].

**17. 20200088299 POLE CAP WITH PRESSURE CONNECTION ELEMENT FOR PRESSURE VESSELS**

US - 19.03.2020

Int.Class F16J 13/12 Appl.No 16488394 Applicant NPROXX B.V. Inventor Thomas Bäumer

A pole cap is disclosed made of a plastic material for the pressure-tight closure of a pressure vessel. The pole cap comprises an inner side for the later closure of the pressure vessel, an outer side for the superwinding with a fiber composite material after closure of the pressure vessel and a neck-shaped open duct, which protrudes outwardly from the outer side and has an inner contour, each made of plastic material, and comprises a pressure port element connected to the duct for the closure of the duct, wherein the pressure port element comprises a seal cone made of metal with a first section protruding outwardly through the duct and a second section tapering at least in the area of the duct in a cone-shaped manner in the direction of the first section.

**18. 2019013781 RECIPIENTE DE PRESION REFORZADO CON CASQUETES POLARES.**

MX - 13.01.2020

Int.Class F17C 1/06 Appl.No 2019013781 Applicant NPROXX B.V. Inventor Frank OTREMBA

The invention relates to a method [100] for producing a fiber-reinforced pressure container [1] with fiber-reinforced polar caps [12] and a corresponding pressure container [1] comprising said polar caps [12]. The method has the steps of applying [220] fiber composite material [FCM] onto a provided winding



body [100] in the shape of the polar caps by means of a winding process at at least one of the ends [110]; temporarily curing [230] the fiber composite material [FCM] in order to stabilize the shape, said material then remaining chemically active for a crosslinking process later; and separating [240] the fiber composite material in order to produce a polar cap reinforcement layer [32] which is released [250] from the winding body and positioned [260] on a liner support of the pressure container [1]. The polar cap reinforcement layer [32] is then crosslinked with the fiber composite material of the pressure container in order to produce the pressure container reinforcement layer [3].

19. [20200240586](#) POLAR CAP-REINFORCED PRESSURE CONTAINER

US - 30.07.2020

Int.Class [F17C 1/06](#) Appl.No 16614641 Applicant NPROXX B.V. Inventor Michael Sonnen

The invention relates to a method for manufacturing a fibre-reinforced pressure vessel having fibre-reinforced polar caps as well as a corresponding pressure vessel having these polar caps. Therein, the method comprises the steps of applying fibre composite material onto a provided winding body having the shape of the polar caps at at least one of the ends, using a winding process; of intermediately curing the fibre composite material for dimensional stabilisation, said fibre composite material, however, subsequently still remaining chemically active for later cross-linking; of severing the fibre composite material for producing a polar cap reinforcing layer which is detached from the winding body and placed onto a liner underlay of the pressure vessel. Subsequently, the polar cap reinforcing layer is cross-linked with the fibre composite material of the pressure vessel for producing the pressure vessel reinforcing layer.

20. [2018268783](#) POLAR CAP-REINFORCED PRESSURE CONTAINER

AU - 22.11.2018

Int.Class [F17C 1/06](#) Appl.No 2018268783 Applicant NPROXX B.V. Inventor

The invention relates to a method [100] for producing a fiber-reinforced pressure container [1] with fiber-reinforced polar caps [12] and a corresponding pressure container [1] comprising said polar caps [12]. The method has the steps of applying [220] fiber composite material [FCM] onto a provided winding body [100] in the shape of the polar caps by means of a winding process at at least one of the ends [110]; temporarily curing [230] the fiber composite material [FCM] in order to stabilize the shape, said material then remaining chemically active for a crosslinking process later; and separating [240] the fiber composite material in order to produce a polar cap reinforcement layer [32] which is released [250] from the winding body and positioned [260] on a liner support of the pressure container [1]. The polar cap reinforcement layer [32] is then crosslinked with the fiber composite material of the pressure container in order to produce the pressure container reinforcement layer [3].

21. [110662918](#) POLAR CAP-REINFORCED PRESSURE CONTAINER

CN - 07.01.2020

Int.Class [F17C 1/06](#) Appl.No 201880032943.9 Applicant NPROXX B.V. Inventor SONNEN MICHAEL

The invention relates to a method [100] for producing a fiber-reinforced pressure container [1] with fiber-reinforced polar caps [12] and a corresponding pressure container [1] comprising the polar caps [12]. The method has the steps of applying [220] fiber composite material [FCM] onto a provided winding body [100] in the shape of the polar caps by means of a winding process at at least one of the ends [110]; temporarily curing [230] the fiber composite material [FCM] in order to stabilize the shape, the material then remaining chemically active for a crosslinking process later; and separating [240] the fiber composite material in order to produce a polar cap reinforcement layer [32] which is released [250] from the winding body and positioned [260] on a liner support of the pressure container [1]. The polar cap reinforcement layer [32] is then crosslinked with the fiber composite material of the pressure container in order to produce the pressure container reinforcement layer [3].

22. [3062410](#) POLAR-CAP-REINFORCED PRESSURE VESSEL

CA - 26.11.2019

Int.Class [F17C 1/06](#) Appl.No 3062410 Applicant NPROXX B.V. Inventor

The invention relates to a method [100] for manufacturing a fibre-reinforced pressure vessel [1] having fibre-reinforced polar caps [12] as well as a corresponding pressure vessel [1] having these polar caps [12]. Therein, the method comprises the steps of applying [220] fibre composite material [FVM] onto a provided winding body [100] having the shape of the polar caps at at least one of the ends [110], using a winding process; of intermediately curing [230] the fibre composite material [FVM] for dimensional stabilisation, said fibre composite material [FVM], however, subsequently still remaining chemically active for later cross-linking; of severing [240] the fibre composite material for producing a polar cap reinforcing layer [32] which is detached [250] from the winding body and placed [260] onto a liner underlay of the pressure vessel [1]. Subsequently, the polar cap reinforcing layer [32] is cross-linked with the fibre composite material of the pressure vessel for producing the pressure vessel reinforcing layer [3].

23. [3625497](#) POLAR CAP-REINFORCED PRESSURE CONTAINER

EP - 25.03.2020

Int.Class [F17C 1/06](#) Appl.No 18723474 Applicant NPROXX B.V. Inventor SONNEN MICHAEL

The invention relates to a method [100] for producing a fiber-reinforced pressure container [1] with fiber-reinforced polar caps [12] and a corresponding pressure container [1] comprising said polar caps [12]. The method has the steps of applying [220] fiber composite material [FCM] onto a provided winding body [100] in the shape of the polar caps by means of a winding process at at least one of the ends [110]; temporarily curing [230] the fiber composite material [FCM] in order to stabilize the shape, said material then remaining chemically active for a crosslinking process later; and separating [240] the fiber composite material in order to produce a polar cap reinforcement layer [32] which is released [250] from the winding body and positioned [260] on a liner support of the pressure container [1]. The polar cap reinforcement layer [32] is then crosslinked with the fiber composite material of the pressure container in order to produce the pressure container reinforcement layer [3].

24. [201917051421](#) POLAR CAP-REINFORCED PRESSURE CONTAINER

IN - 24.01.2020

Int.Class [F17C 1/06](#) Appl.No 201917051421 Applicant NPROXX B.V. Inventor SONNEN, Michael

The invention relates to a method [100] for producing a fiber-reinforced pressure container [1] with fiber-reinforced polar caps [12] and a corresponding pressure container [1] comprising said polar caps [12]. The method has the steps of applying [220] fiber composite material [FCM] onto a provided winding body [100] in the shape of the polar caps by means of a winding process at at least one of the ends [110]; temporarily curing [230] the fiber composite material [FCM] in order to stabilize the shape, said material then remaining chemically active for a crosslinking process later; and separating [240] the fiber composite material in order to produce a polar cap reinforcement layer [32] which is released [250] from the winding body and positioned [260] on a liner support of the pressure container [1]. The polar cap reinforcement layer [32] is then crosslinked with the fiber composite material of the pressure container in order to produce the pressure container reinforcement layer [3].

25. [112019024421](#) MÉTODO PARA UMA FABRICAÇÃO DE UM RECIPIENTE DE PRESSÃO REFORÇADO E RECIPIENTE DE PRESSÃO

BR - 16.06.2020

Int.Class [F17C 1](#) Appl.No 112019024421 Applicant NPROXX B.V. Inventor CHRISTIAN MIDDENDORF

a invenção refere-se a um método [100] para produzir um recipiente de pressão reforçado com fibras [1] que tem tampas polares reforçadas com fibra [12] e um recipiente de pressão [1] correspondente que compreende as ditas tampas polares [12]. o método compreende as etapas de aplicar [220] material compósito de fibra [fvm] em um corpo de enrolamento [100] fornecido no formato das tampas polares por meio de um processo de enrolamento em pelo menos um das extremidades [110]; curar temporariamente [230] o material compósito de fibra [fvm] a fim de estabilizar o formato, sendo que o dito material compósito de fibra [fvm] permanece, então, quimicamente ativo para processo de reticulação posterior; e separar [240] o material compósito de fibra a fim de produzir uma camada de reforço da tampa polar [32] que é liberada [250] do corpo de enrolamento e posicionada [260] em um apoio de revestimento do recipiente de pressão [1]. a camada de reforço da tampa polar [32] é, então, com o material compósito de fibra do recipiente de pressão a fim de produzir a camada de reforço de recipiente de pressão [3].

26. [WO/2018/210606](#) POLAR CAP-REINFORCED PRESSURE CONTAINER

WO - 22.11.2018

Int.Class [F17C 1/06](#) Appl.No PCT/EP2018/061774 Applicant NPROXX B.V. Inventor SONNEN, Michael

The invention relates to a method [100] for producing a fiber-reinforced pressure container [1] with fiber-reinforced polar caps [12] and a corresponding pressure container [1] comprising said polar caps [12]. The method has the steps of applying [220] fiber composite material [FCM] onto a provided winding body [100] in the shape of the polar caps by means of a winding process at at least one of the ends [110]; temporarily curing [230] the fiber composite material [FCM] in order to stabilize the shape, said material then remaining chemically active for a crosslinking process later; and separating [240] the fiber composite material in order to produce a polar cap reinforcement layer [32] which is released [250] from the winding body and positioned [260] on a liner support of the pressure container [1]. The polar cap reinforcement layer [32] is then crosslinked with the fiber composite material of the pressure container in order to produce the pressure container reinforcement layer [3].

27. [102017208492](#) POLKAPPENVERSTÄRKTER DRUCKBEHÄLTER

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Ein Verfahren [200] zur Herstellung eines verstärkten Druckbehälters [1] mit einem zylindrischen Mittelabschnitt [11] und den Mittelabschnitt [11] beidseitig verschließenden Polkappen [12] umfassend eine Liner-Unterlage [2] und ein auf die Liner-Unterlage [2] als Druckbehälterverstärkungsschicht [3] aufgebracht Faserverbundmaterial [FVM], umfassend die Schritte - Bereitstellen [210] eines ersten Wickelkörpers [100] umfassend mindestens ein einer Form der Liner-Unterlage [2] der Polkappen [12] entsprechendes kuppelförmiges Ende [110] und eine an das Ende [110] angrenzende zylindrische Mittelteilauflage [120]; - Aufbringen [220] des Faserverbundmaterials [FVM] mittels eines Wickelprozesses zumindest auf das Ende [110] und die Mittelteilauflage [120] des ersten Wickelkörpers [100]; - Nachfolgend Anwenden eines geeigneten Zwischenaushärtungsprozesses [230] zur Formstabilisierung des gewickelten Faserverbundmaterials [FVM], ; - Durchtrennen [240] zumindest des Faserverbundmaterials [FVM] zwischen Ende [110] und Mittelteilauflage [120] mittels eines geeigneten Trennprozesses zur Herstellung einer Polkappenverstärkungsschicht [32]; - Ablösen [250] der Polkappenverstärkungsschicht [32] vom ersten Wickelkörper [100] und Aufsetzen [260] der abgelösten Polkappenverstärkungsschicht [32] auf die jeweilige Liner-Unterlage [2] der Polkappe [12] des späteren Druckbehälters [1]; - Aufbringen des Faserverbundmaterials [FVM] mittels eines Wickelprozesses auf den mit den separat gefertigten Polkappenverstärkungsschichten [32] belegten Liner [2]; und - Vernetzen der Polkappenverstärkungsschicht [32] und des Weiteren Faserverbundmaterials [FVM]. 