

TRANSLATION FROM THE GERMAN ORIGINAL

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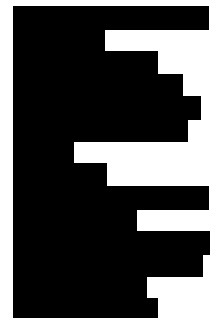
**Arnsberg Regional Administration**  
 Department 6, Mines and Energy in North  
 Rhine-Westphalia

<Coat of Arms of  
 North-Rhine  
 Westphalia>

**Approval notification**  
**for the**

**Strata Bond**

**two-component - polyurethane resin system**

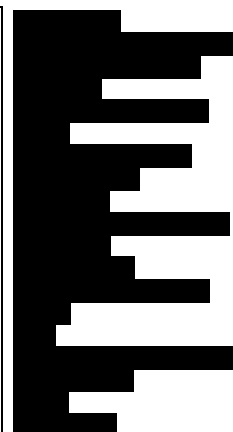


On the basis of Section (§) 4, Para. 1, Point 2 of the Mining Regulation for the protection of workers' health ("GesBergV") in the currently valid version, the following decision has been made:

1. DYWIDAG Systems International GmbH,  
 Destouchesstrasse 68, D-80796 Munich, is granted a  
 general permit for underground activities with the above  
 mentioned product (described in further detail below) in  
 response to the request of 25 July 2014:

1.1 **Product designation/brief description:**

Product designation	<p><b>Strata Bond</b></p> <p><b>two-component - polyurethane resin system</b></p> <p>Polyol - (A -) component:          Specification:          Strata Bond A</p> <p>Isocyanat - Komponente:          Specification:</p>
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Important note (because of further digital post-processing):  
 Please do not clip, staple or glue documents, and send in DIN A4 format where possible.

	Strata Bond B
Marketing authorization holder:	DYWIDAG Systems International GmbH Destouchesstrasse 68 D-80796 Munich
Brief description / information on the composition and type and size of packages:	<p>It is a two-component system that is pressed into holes premixed into drilled holes and which forms a polyurethane resin by reaction of the components. It serves the purpose of rock strengthening, injection anchoring and sealing against gas and water.</p> <p>The components are supplied in the following packages:</p> <ul style="list-style-type: none"> <li>• Plastic containers of up to 30 litres</li> <li>• Tinsplate containers of up to 30 litres</li> <li>• Rolled rim barrel, contents up to 220 l</li> <li>• Reusable container, contents up to 1000 l</li> </ul> <p><b>Permitted combinations of components:</b></p> <ul style="list-style-type: none"> <li>• Strata Bond A / Strata Bond B</li> </ul> <p><b>Maximum reaction temperature as per Test arrangement: 146.53 ° C</b> <i>(Measured values based on 30°C preheating)</i></p> <p><b>Formulation: Polyol-(A-) component:</b> Yellowish liquid with specific odour, essentially of polyol</p>

	<p><b>Formulation: Isocyanate-(A-) component:</b> Brown liquid with specific odour, essentially of isocyanate</p> <p><b>Mixing ratio:</b> The volumes are mixed in a ratio of 1:1 (volumetrically)</p>
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### 1.2 Delivery and use according to the marketing authorization holder:

- The product is filled as two components, separated by the producer.
- At the point of use, the components in processing facilities provided for this purpose in accordance with the mixing ratio specified by the manufacturer, and pressed into the rock through drilled holes.
- The product hardens due to the reaction that begins upon mixing.
- The reaction product of the two components is a polyurethane synthetic resin. It serves the purpose of rock strengthening, injection anchoring, and sealing against gas and water.
- The reaction proceeds giving off heat. It is influenced by water.
- The volume increases as the reaction proceeds.

2. This decision is based on the following documents

2.1 Application of 25 July 2014

2.2.1 Safety Data Sheets on

- Strata Bond A from 16 May 2014, as of 19 May 2014
  - Strata Bond B from 3 January 2013, as of 21.03.2014
- 2.1.2 Technical Data Sheet on
- Strata Bond B from 20 December 2012, as of 31 March 2014
- 2.1.3 Test reports from the Hygiene Institute of the Ruhr Area, Gelsenkirchen
- 11.07.2014 - A - 245 807 - 14 - Bi -
  - 19.08.2014 - A - 247 121 - 14 - Bi -
- 2.1.4 Test report of DEKRA EXAM GmbH, specialist unit for respiratory protection, Essen, of 23 June 2014 - No. 8208 / 2014 / 3 -.
- 2.1.5 Test report of DMT GmbH, Institute for Fire Protection, Dortmund, of 20 May 2014 - 206 437 30-10 - GS - BS - Mö / Man
- 2.1.6 Beckmann, Uwe: “MDI – haltige Gebirgskleber im deutschen Steinkohlenbergbau (Polyurethan – und Silikatinjektionsharze)”, “Kompass” Journal, Editions 5 and 6, 2005, P. 18-20, in connection with the Test Report of the “Institut für Gefahrstoff – Forschung) Institute of Hazardous Substances - Research (IGF) of the Bergbau Berufsgenossenschaft (mining industry trade association) Bochum, of 18 June 2004 - A 5898/04

### 3. Incidental provisions

Without prejudice to the provisions of the Gefahrstoffverordnung (Hazardous Substances Ordinance) on the packaging and labelling of dangerous substances, this authorization is granted with the following additional incidental provisions:

#### 3.1 General

- 3.1.1 The authorization holder shall notify the users, in full and promptly and in an appropriate manner, of the requirements related to this approval for activity with the product.

3.1.2 We reserve the right to take samples of the product or its components in order to investigate correspondence with the approved composition and the terms of the approval notification. In the case of reported significant deviations, the authorization holder shall bear the expenses incurred by the authority in connection with sampling and testing.

3.1.3 This approval may only be further distributed in its entirety.

### 3.2 Requirements of the product, labelling, and packaging

3.2.1 The product referred to in the specifications as per No. 1.1, as well as permissible combinations of the components may only be distributed or used in the composition referred to in the documentation as per point No. 2.

3.2.2 The approval ceases to be valid, if

- Any change is made to the composition or nature of the components used in the product,
- There is a change in the name of the product or
- The manufacturer or business concerned does not correspond with the manufacturer or business specified as authorization holder.

3.2.3 The delivery package for the components must bear at least the following permanent labels (this information must be adjusted accordingly in the event of any change to the labelling requirements):

- **Polyol-(A-) component:**

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Name of the authorization holder:	DYWIDAG Systems International GmbH Destouchesstrasse 68  D - 80796 München
Certification mark of the Arnsberg Regional Administration, Dept. 6, Mines and Energy in North Rhine-Westphalia - .*	E 62.12.22.67 - 2014 - 3
Designation of the component	<b>Strata Bond</b>
Designation of the component	<b>Strata Bond A</b>
Manufacturing / filling month and year *.	(For example, 09/14 - Shelf-life specification or equivalent batch encoding)
_*	Do not spray.
Xn	Hazardous to health
R 22	Hazardous to health if swallowed.
S 46	If swallowed, seek medical advice / medical attention immediately. Display the packaging or label.

Future inscriptions in accordance with Regulation (EC) No. 1272 / 2008:

Name of the authorization holder:	DYWIDAG Systems International GmbH Destouchesstrasse 68  D - 80796 München
Certification mark of the Arnsberg Regional Administration, Dept. 6, Mines and Energy in North Rhine-Westphalia - _*	E 62.12.22.67 - 2014 - 3

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Product designation:	<b>Strata Bond</b>
Designation of the component	<b>Strata Bond A</b>
Manufacturing / filling month / year	For example, 09/14 - Shelf-life specification or equivalent batch encoding)
*	Do not spray.
GHS 07	
Signal word	Attention
H 302	Harmful if swallowed.
P 101	Keep the product container or label at hand in the event of medical advice being needed.

• **Isocyanate – (B–) component:**

Name of the authorization holder:	DYWIDAG Systems International GmbH Destouchesstrasse 68 D - 80796 München
Certification mark of the Arnsberg Regional Administration, Dept. 6, Mines and Energy in North Rhine-Westphalia — :*	E 62.12.22.67 - 2014 - 3

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Product designation:	<b>Strata Bond</b>
Designation of the component	<b>Strata Bond B</b>
Manufacturing / filling month and year *.	(For example, 09/14 - Shelf-life specification or equivalent batch encoding)
—*	Do not spray.
—*	Contains diphenyl - 4,4'- diisocyanate
*	Follow the manufacturer's instructions.
Xn	= Hazardous to health
R 20	Harmful if inhaled.
R 36 / 37 / 38	Irritates eyes, respiratory organs and skin.
R 40	Suspected carcinogenic effect.
R 42 / 43	Sensitization though skin contact possible
R 48 / 20	Harmful to health: may cause severe health damage following prolonged exposure by ingestion.
S 23	Do not inhale vapour or droplets.
S 24 / 25*	Avoid skin and eye contact.





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S 26	In case of contact with eyes rinse immediately and thoroughly with plenty of water, and consult a physician.
S 28*	After contact with skin, wash with plenty of water
S 36 / 37 / 39*	At work, wear suitable protective clothing, gloves and eye/face protection.
S 38*	Wear suitable respiratory equipment if there is insufficient ventilation.
S 45	In case of accident or feelings of sickness, seek medical advice immediately (show this label, if possible).

Future inscriptions in accordance with Regulation (EC) No. 1272 / 2008:

Name of approval holder:	DYWIDAG Systems International GmbH Destouchesstrasse 68  D-80796 Munich
Certification mark of the Arnsberg District, Arnsberg Regional Administration, Dept. 6, Mines and Energy in North Rhine-Westphalia*	E 62.12.22.67 - 2014 - 3
Product designation:	<b>Strata Bond</b>
Designation of the component	<b>Strata Bond B</b>
Manufacturing / filling month and year	(For example, 09/14 - Shelf-life specification or equivalent batch encoding)

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* —*	Do not spray.
* —*	Follow the manufacturer's instructions.
GHS 08	<i>(Symbol)</i>
GHS 07	
Signal word	Danger
EUH 204*	Contains isocyanates. May provoke allergic reactions.
H 315	Causes skin irritation.
H 317	May cause allergic skin reactions.
H 319	Causes severe eye irritation.
H 332	Harmful if inhaled.
H 334	If inhaled, may cause allergy, asthma-like symptoms or breathing difficulties.
H 335	May be irritating to the respiratory tract.
H 351	Suspected of being carcinogenic.



H 373	May cause damage to the lungs through prolonged or repeated exposure.
P 261	Avoid inhalation of vapours and droplets.
P 280	Wear protective gloves / protective clothing / eye protection / face protection.
P 285	In case of insufficient ventilation, wear respiratory protection
P 302 + P 352	In the event of contact with skin, wash with plenty of water and soap
P 314	If you feel unwell, seek medical advice / medical attention.
P 305 + P 351 + P 338	In case of contact with the eyes: carefully wash with water for a few minutes. If possible, remove contact lenses (where applicable). Continue rinsing.

\* = additional information in terms of Art. 17, Para. 1 letter H; and  
25 Para. 3 of Directive (EC) No. 1272 / 2008

### 3.3 Requirements for technical and/or organizational measures during work below ground

During underground activities with the product, the following requirements must be met; the authorization holder must inform the users of these in accordance with point No. 3.1.1:

#### 3.3.1 General restrictions on activity:

- The product may only be used by the authorization holder for its intended purpose.

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- The product may only in be used in approved combinations of specifications in accordance with point No. 1.1.
- The product must only be applied in rocks in which no major open surfaces can be formed.
- The product must not be used for coating surfaces.
- The individual components must be kept so that they do exceed a temperature of 15°C during processing.

The above restrictions form part of the publication in accordance with point No. 4.8.

3.3.2 If other containers are used underground instead of the delivery package, they must be marked in accordance with point No. 3.2.3. In working areas, storage containers must be kept in clearly visible places with panels with permanent and easily legible text in accordance with point No. 3.2.3.

Exemptions from the labelling requirements may be permitted by the competent mining authority provided an equivalent level of protection is ensured.

3.3.3 The liquid components of the product must be used underground in transport and processing systems that are kept closed whenever possible.

This includes in particular:

- Suitable borehole seals that are firmly clamped into the drilled holes and that remain there after compression

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- Protective devices on the pump processing containers that prevent splashing or overfilling of the components during filling and
- Pressure relief devices in the injection system that allow a pressure-free release of the hoses after compression.

3.3.4 Spraying of the liquid components and of the product itself must be avoided. This must be ensured, in particular through regular maintenance and repair of the injection system, especially of the hose lines. Pressure hose lines should be checked for leaks at least once a day prior to starting compression work.

3.3.5 When using the product, the drilled holes must be sealed in order to prevent leakage of the resin from the hole. The suitability of borehole seals must be confirmed by a certificate from a suitable technical authority.

3.3.6 Any volumes of resin exceeding 0.8 kg per meter that should nevertheless escape from the well or from rock fissures must be removed from the pit.

3.3.7 No isolated metal parts that are visible from the outside may be embedded in the resin.

3.3.8 To avoid any unacceptable electrostatic charges, any quantities of resin that may possibly emerge from the cracks and crevices should not form a surface area larger than 400 cm<sup>2</sup>, unless the maximum width of such a surface is not greater than 10 cm at any point.

3.3.9 To avoid pollutant emissions, the two component polyurethane resin system may be applied only at points where no major open surfaces can be formed.

3.3.10 During any activities with the product, it must be ensured that the limit for the following substance is in line with the state of the art:

- Isocyanate (current limit 0.005 ml per l or 0.05 mg/m<sup>3</sup>, taking the TRGS 430 specification into account)

**Note:**

Measurements of the Institut für Gefahrstoff - Forschung (Institute of Hazardous Substances – Research; cf. point 2.2) have shown that during proper use, the concentration of isocyanates resulting from release from max. permitted resin mass is below the limit of detection as per point No. 3.3.6 per drilled hole is a ventilated volumetric flow of 55 m<sup>3</sup>. The concentrations measured in an underground field test showed that the limit was not achieved even when large amounts were released as a result of an operational malfunction.

3.3.11 Contamination of the skin and contact with the eyes must be avoided with the liquid components or the ready-to-use mixed product. Do not breathe any vapours or fumes given off. Soiled and soaked work clothes must be changed immediately.

3.3.12 Employees involved in applying the product must take a sufficient supply of water (e.g. a bottle of eye wash) along with them or keep a supply in place so that eyes can be immediately rinsed in the event of contamination. There must be a water pipe with a water extraction point or a sufficient water supply in containers near the place of work in order to permit cleaning of the skin with water in the event of skin contact. A physician must be consulted in the event of accident or feelings of sickness.

- 3.3.13 The physician who performs the occupational medical health screening must be made aware of the use of the product.
- 3.3.14 The liquid components may only be transported and stored in the packaging supplied by the manufacturer. Upon presentation of a report by the Hygiene Institute of the Ruhr Area, Gelsenkirchen, on the hygienic safety in the mine (for reusable containers, for example) other regulations may be permitted in the operational planning process by the competent authority .
- 3.3.15 Underground storage of the product's components may only be performed in special storage rooms.
- 3.3.16 Near the respective place of use, the components of the product may only be made available for use in a quantity needed to meet operational requirements, usually the amount needed for one week (on-going operations).
- 3.3.17 Suitable fire extinguishers must be kept in sufficient numbers near the place of work, in accordance with fire protection plan.

#### 4. Notes

4.1 Attention is drawn to Section (§) 4, Para. 4 of the Mining Regulation for the protection of workers' health ("GesBergV"): Such authorization may be revoked without any compensation if the secondary stipulations of this approval are violated or if the product is sold or used in a composition and texture that deviate from those set out in the authorization or materials subsequently become available with a demonstrably lower health risk or if it is subsequently discovered that use of the product is linked to significant health hazards. The Arnsberg Regional Administration, Dept. 6 - Mines and Energy in NRW - reserves the right to adopt additional or supplementary restrictions in the event that the technical or legal situation changes.

4.2 This product and/or its components may only be taken underground and transported, kept or stored underground in containers that are of sufficient resistance, both mechanically and chemically. The mechanical and chemical requirements also apply to any corresponding removal and processing systems (e.g. pumps, hoses, and mixers).

When used in rooms and areas that are subject to the risk of explosions, as well as in mines that are endangered by firedamp (mine gas), the following apply:

- The containers and (where applicable) the extraction and processing facilities must have a sufficient level of electrical conductivity;

The containers and (where applicable) the extraction and processing facilities must meet the requirements for plastic equipment (containers, pumps, hoses, mixers or packaging made of plastics or items coated with plastics) in accordance with DIN 22100, Part 7;



- The containers and (where applicable) the extraction and processing facilities must not possess any exposed components made of light metal alloys.

- 4.3 Appropriate personal protective equipment (protective clothing, face protection/goggles, and safety gloves) and suitable materials for skin protection must be selected that take into account the identified risks, the specific nature of the workplace, the duration of use, the frequency of exposure and the ergonomic requirements. This must be assessed for each respective application and made available for the employees concerned in all activities involving the product or its components.
- 4.4 Employees concerned in all activities involving the product or its components must be instructed orally at least once a year and in a workplace-specific way. These instructions must refer to the processing information, hazards occurring when working with the product, the necessary protective measures and codes of conduct, as well as first aid.
- 4.5 First aid measures must be taken.
- 4.6 This approval does not replace the operating plan approval from the competent authority that is needed for use. The necessary minimum protective measures listed in the instructions are binding, and must take the specific local conditions in the operating plan into account.

4.7 No decision has been made on possible uses, environmental concerns (particularly regarding waste) and water management aspects, and the technological areas of application through this approval. The necessary definitions in accordance with local conditions must be regulated in the operational planning process. The rights of third parties are not affected by this approval.

4.8 This approval is published in the collective list of approved substances in accordance with Section (§) 4, of the Mining Regulation for the protection of workers' health ("GesBergV").

**5. Administrative fee**

A fee is charged for this approval in accordance with tariff heading 3.3.5 of the General Ordinance on Administrative Fees for the federal state of North Rhine Westphalia (NRW AVwGebO). A separate fee assessment is issued.

**6. Legal remedies available**

You may institute proceedings against this decision within one month of notification / delivery. The proceedings must be declared admissible in writing or for record to the clerk of the court at the Arnsberg Verwaltungsgericht (*administrative court*), Jägerstrasse 1, 59821 Arnsberg, Germany. The proceedings can also be submitted in electronic form in accordance with the regulation on the electronic legal transactions with the administrative courts and tax courts in the federal state of North Rhine Westphalia (ERVVO VG / FG) of 7 November 2012 (GV.NRW.2012, P. 548).

In this case, the electronic document must be provided with a qualified signature according to Section § 2 No. 3 of the signature law of 16 May 2001 (Federal Law Gazette I, p. 876) in the respective applicable version and must be submitted to the Court's electronic mailroom. If the deadline is missed due to the fault of a person authorized by you, his or her fault would be attributed to you.

(Signed)

on behalf of

Mr. Lempert