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European Technical Assessment

ETA-19/0222 of 12th august 2019

English translation prepared by CSTB - Original version in French language

General Part

Nom commercial *Trade name*	Colorseal VHE
Famille de produit *Product family*	**Produits de compartimentage et de calfeutrement au feu :** **- Joints d'Etanchéité Linéaires** ***Fire Stopping and Sealing Product :*** ***- Linear Joint and Gap Seals***
Titulaire *Manufacturer*	EMSEAL Joint Systems Ltd. 25 Bridle Lane Westborough, MA 01581 - U.S.A
Usine de fabrication *Manufacturing plant*	Plant 1
Cette evaluation contient: *This Assessment contains*	10 pages incluant 5 pages d'annexes qui font partie intégrante de cette évaluation. L'annexe C (pages 11 à 16 de la version française seulement) contient des informations confidentielles qui ne sont pas incluses dans l'Evaluation Technique Européenne quand elle est disponible au public. 10 *pages including* 5 *pages of annexes which form an integral part of this assessment. The annex C (pages* 11 to 16 *of the french version only) contains confidential information and is not included in the European Technical Assessment when that assessment is publicly available*
Base de l'ETE *Basis of ETA*	DEE 350141-00-1106 - Produits de compartimentage et de calfeutrement au feu : Joints d'Etanchéité Linéaires *EAD 350141-00-1106 - Fire Stopping and Sealing Product :* *Linear joint and gap seals*

Specific Part

1 Technical description of the product

Colorseal VHE is a fire rated expansion joint used for different applications :

- joint seal in a floor or as horizontal wall joint abutting a floor, ceiling or roof (configurations A and D in figure 1 in EAD 350141-00-1106).
- vertical joint seal in a wall (configuration B in figure 1 in EAD 350141-00-1106).

Joints are made of dual-sided silicone sealing surfaces adhered to a fire-retardant impregnated polyurethane foam backing.

Colorseal VHE must be applied using the component listed in table 1.1 below according to the installation described in annex A :

Name	Trade reference	Characteristics	Supplier
EPOXY ADHESIVE PART A and B (on the concrete substrate walls)	SIKADUR 31 EF	Density = 1,7 Kg/l 2-3mm of thickness	SIKA FRANCE
Linear joint	Colorseal VHE	polyurethane density (initial compression rate) = 280 kg/m^3, silicone density = 1122 kg/m^3 Silicone thickness on each side = 2,5 to 4 mm (valleys : 1,5 mm +/- 0.5mm) total width and total thickness at initial compression rate (see table 1.2 under)	EMSEAL Joint Systems Ltd
Silicone sealant (interface between the joints and peripherical sealing)	SIKASIL WS 295	4-6mm diameter	SIKA

Table 1.1 : Component list

Colourseal VHE sizes																										
Joint nominal width (mm)	**12**	**19**	**25**	**30**	**40**	**45**	**50**	**55**	**65**	**70**	**75**	**85**	**90**	**95**	**100**	**110**	**115**	**120**	**125**	**135**	**140**	**145**	**150**	**165**	**175**	**190**	**200**
Joint thickness (mm)	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**70**	**75**	**90**	**95**	**95**	**105**	**115**	**115**	**125**	**135**	**140**	**145**	**145**	**145**	**150**	**165**	**175**	**190**	**200**

Tableau 1.2 : joints sizes

The seal is not sold as a kit, only Colorseal VHE joints are covered by the ETA. It is the responsibility of the installer to obtain the other components for incorporation into the assembled system.

2 Specification of the intended use

2.1 Intended use

The intended use of fire rated linear joints Colorseal VHE is to reinstate the fire resistance performance of separating building elements when they are interrupted.

1) In the following specified constructions Colorseal VHE may be used for sealing horizontal linear joints in floors, vertical linear joints in walls or horizontal linear joint abutting a floor, ceiling or roof, as follows:

Rigid floors :	For the joints with a movement capacity 100% (+/- 50%)* with lateral displacement of joint induced by the mechanically action (dynamic), the floors must have a minimum thickness of 200 mm of comprise concrete or reinforced concrete, with a minimum density of 2200 kg/m^3
Rigid walls :	For the joints with a movement capacity 100% (+/- 50%)* with lateral displacement of joint induced by the mechanically action (dynamic), the walls must have a minimum thickness of 200 mm of comprise concrete or reinforced concrete, with a minimum density of 2200 kg/m^3

* Maximum movement capacity according to the compression ratio (supplied size/nominal size)

2) The firestop linear joint seals Colorseal VHE are not intended for load transmission.

3) Colorseal VHE can be used to form a linear joint with a maximum permitted initial joint width from 12 mm to 200 mm (thicknesses are given in table 1.2 above).

4) The performances given in section 3 are only valid if the joint is used in compliance with:
   - The specifications and conditions given in Annex B;
   - The manufacturer's instructions according to Annex A.

2.2 Working life

The provisions made in this European Technical Assessment are based on an assumed working life of Colorseal VHE firestop joints of 10 years, provided that the conditions laid down in the manufacturers datasheet and instructions for the packaging / transport / storage / installation / use are met.

The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

The real working life might be, in normal use conditions, considerably longer without major degradation affecting the basic requirements for construction works.

3 Performance of the product and references to the methods used for its assessment

3.1 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class according to EN 13501-1 : E
Resistance to fire	Class according to EN 13501-2 See Annex B

3.2 Hygiene, health and the environment (BWR 3)

Essential characteristic	Performance
Release of dangerous substances	The emission of dangerous substances was not assessed. No performance assessed
Air permeability	According to EN 1026 (tested with the other components listed in part 1) No leakage was measured
Water permeability	According to EN 12155 (tested with the other components listed in part 1) No leakage was measured

3.3 Safety and accessibility in use (BWR 4)

No performance assessed

3.4 Protection against noise (BWR 5)

Essential characteristic	Performance
Airborne sound insulation	According to EN 10140-2 (tested with the other components listed in part 1) The airborne sound insulation, expressed in accordance with EN ISO 717-1, is : $R_{s,w}$ (C, Ctr) ≥ 46 (-1; -3) for two seals of length 1000mm and width 100mm (initial compression width) arranged side by side in the length and tested with the other components listed in part 1.

3.5 Energy economy and heat retention (BWR 6)

No performance assessed

3.6 General aspects relating to fitness for use

Essential characteristic	Performance
Durability and serviceability	Type X : intended for use in conditions exposed to weathering

4 Assessment and verification of constancy of performance (AVCP)

According to the Decision 1999/454/EC of the European Commission[1], the system of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) given in the following table applies.

Product	Intended use	Level or class	System
Fire Stopping and Fire Sealing Products	For fire compartmentation and/or fire protection or fire performance	any	1

5 Technical details necessary for the implementation of the AVCP system, as planned in the relevant EAD

Technical details necessary for the implementation of the Assessment and verification of constancy of performance (AVCP) system are laid down in the control plan deposited at Centre Scientifique et Technique du Bâtiment.

The control plan including confidential informations, it is not included in the published part of this ETA.

The manufacturer shall, on the basis of a contract, involve a notified body approved in the field of fire stopping and sealing products for issuing the certificate of conformity CE based on the control plan.

The Notified Body shall visit the factory at least twice a year for surveillance of the manufacturer.

The original French version is signed by the CSTB's technical director

1 Official Journal of the European Communities L 178/52 of 14.7.1999

INSTALL DATA **COLOURSEAL-VHE**

Vertical and Horizontal Installation

A SIKA COMPANY

Vertical and Horizontal Installations are the same methods. The orientation of this installation guide is vertical, but the same methods should be applied for horizontal applications.

DO NOT OPEN ANY PACKAGES or install this material until all members of your crew have read and understand these instructions as well as all relevant SDS sheets. This document does not purport to address all of the safety concerns, if any, associated with this product's use. It is the responsibility of the user of this document to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use. The use of a dust mask, safety goggles and gloves is recommended. Keep out of reach of children.

IMPORTANT: This product cannot perform its intended function if not properly installed.

1. Equipment and Material Storage

Equipment Checklist:

- ☐ Tape measure
- ☐ Heavy duty, plug-in, low speed, high torque drill
- ☐ Minimum 2 each 1 1/2-inch diameter "jiffy mixers"
- ☐ Caulking gun or 10-oz silicone tubes provided
- ☐ Long-bladed, serrated bread knife
- ☐ Hacksaw
- ☐ Spray bottle with water
- ☐ Masking Tape (2 1/2 times the length of joint)
- ☐ Spatula to scrape epoxy from can
- ☐ Chemical-resistant gloves
- ☐ 2-inch wide (50mm) margin trowels for applying epoxy adhesive on the substrate.
- ☐ 1/2-inch and 1-inch caulk knives for tooling sealant bands
- ☐ Acetone* for cleaning joint-faces, trowels and mixer tools
- ☐ Clean lint-free, 100% cotton rags

Cold Days – Store Sealant, off the floor, inside at above 20°C (68°F). It will recover slower when cold and faster when warm.

Very Hot Days – Keep sealant out of direct sun when the temperature is greater than 15°C (60°F) until immediately prior to installation into joint.

**Solvents mentioned or referred to are toxic and flammable. Observe solvent manufacturer's precautions and refer to Safety Data Sheets as well as local and federal requirements for same handling and use.*

2. Prepare and Solvent-Wipe Joint Faces

Concrete:

- Remove loose particles and weak or unsound concrete or other substrate material to ensure a solid, sound substrate. Spalls, chipped edges and uneven surfaces must be repaired using proper material and methods to ensure maintenance of the fire-rated wall-assembly construction. Joint faces must be parallel.
- Joints must have unobstructed depth greater than or equal to the full depth of the largest material supplied plus 6mm (1/2-inch).
- Dry all wet surfaces.
- Wipe joint faces with dampened, lint-free rags to remove all concrete dust and contaminants.

Metal:

- Solvent-wipe immediately prior to applying epoxy.

IMPORTANT: Ensure that there is no oxidation (rust) on metal substrates before the epoxy is applied.

Other Substrates – Contact EMSEAL.

3. Measure Joint Width and Find Correct Size Material

- Measure joint width at wall/deck surface and inside of the gap to ensure joint faces are parallel.
- Material has been supplied to suit your mean temperature field-measured joint widths. Widths of material supplied are marked on each stick of material. Find correct box and open it.
- Compare width of material supplied as marked on each stick against mean joint width. Actual width of material as measured between hardboard will be slightly less than marked size because material is over- compressed for ease of installation.

NOTE – If unsure of correct material selection, consult EMSEAL.

IMPORTANT: Do not remove outer plastic packaging until you have read and understand the rest of these instructions as material may expand before you can get it into the joint.

4. Mask Walls/Decks and Mix Epoxy Adhesive

- Tape off the walls/decks on both sides of the joint.

Mix Epoxy

- EMSEAL epoxy adhesive may be used in the 5°C (41°F) to 35°C (95°F) temperature range.
- Using a trowel, transfer the entire contents of Part B (hardener) into the contents of Part A (base) .
- Mix the material thoroughly with a drill and mixing paddle. Scrape the walls and bottom of the container to ensure uniform and complete mixing.
- Always mix component B (hardener) into component A (base). Ensure that a uniform gray color with no black or white streaks is obtained.

IMPORTANT: DO NOT thin the epoxy.

Installation conditions	**Annex A**

Precaution: Wear chemical-resistant gloves and/or barrier hand cream when handling liquid sealant or epoxy. Remove promptly from skin with a commercial hand cleaner before eating or smoking. Avoid inhaling vapors.

5. Apply Epoxy to Substrate, Unwrap Foam Stick

Ensure that the mixed epoxy adhesive is applied to the substrate before the pot life has expired (10 – 30 minutes depending on the ambient temperature).

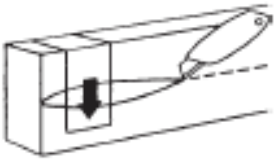
WARNING – Epoxy will harden more quickly when left in the pot. Apply it onto the joint face as soon as possible.

IMPORTANT: The epoxy must still be uncured when installing Colourseal-VHE foam into the joint-gap.

If the epoxy cures before installing the foam then reapply new epoxy. If work is interrupted for more than 2 hours after initial cure then grind the old epoxy, solvent wipe, and apply new wet epoxy.

IMPORTANT: While one or more workers are applying epoxy to the joint faces, others should prepare the W/DFR foam. The Colourseal-VHE foam is kept under compression by plastic wrapping and hardboard on both sides.

- Slit the plastic packing by cutting on the hardboard and remove hardboard and inner release liner. DO NOT cut along the silicone bellows.



IMPORTANT: Work quickly and deliberately after cutting the shrink- wrap to avoid material expanding beyond a usable size.

6. Wipe Release Agent Off Silicone Facing

- For packaging and production reasons, the silicone facing is coated in the factory with a powdered release agent.
- Prior to installation, this agent must be wiped off in order for the injected sealant bands described in Step #9 to adhere to the silicone facing and to avoid contamination of the substrate at this point.
- To remove the release agent, lightly, quickly and thoroughly wipe the cured silicone facing with a lint-free rag made damp with water.

7. Apply Silicone to Bellows Face and Install First Foam Length Into Joint

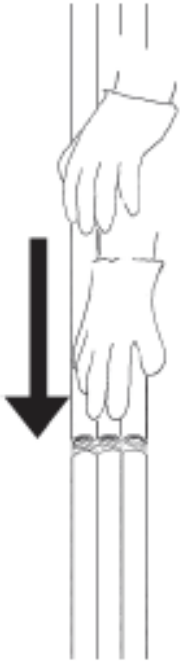
- On the end of the first stick, using a caulk gun and the tubes of silicone provided, apply the liquid silicone to the exposed faces of the silicone bellows.

- Starting at the bottom of the joint, install the Colourseal-VHE foam into the joint. Ensure that the epoxy on the joint face has not cured.

  NOTE – When material is correctly expanded for a snug fit it will support its own weight in the joint.
- Feed material into joint, starting from one end. The material should fit snugly and must be eased into the joint with steady, firm pressure.
- When installed, the Colourseal-VHE foam must be recessed so that the top of the outward-facing bellows is flush or slightly set back from the wall/deck surface.
- Repeat step 6 for each new stick.

8. Install Next Length. Repeat.

- Work in one direction towards the previously installed length or end of joint. Do not stretch material.
- Coat the top end of the next step with silicone caulk as described in Step 7 above.
- Insert the uncoated bottom end of the stick into the joint and line it up with the previously installed stick.
- Push Hard on the stick to compress the join firmly together. Ensure there are no voids at joins.
- During low temperature installation, provide as much ambient heat as possible around installed Colourseal-VHE foam to accelerate recovery.
- Using a caulk knife, tool any silicone that squeezes out of the join and blend it into the precured silicone bellows. Be sure not to fill in the valleys of the bellows as this will constrain movement.

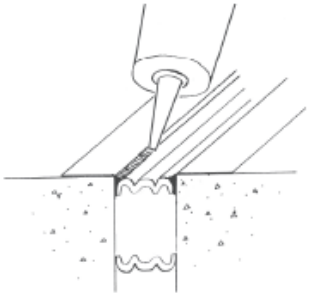


Installation conditions

Annex A

9. Inject Silicone Sealant Bands at Substrates and Tool Excess Silicone

- Wipe any excess epoxy from the face of material using a clean rag.
- Before the epoxy cures, force the tip of the silicone caulk tube between the substrate and the Colourseal-VHE foam. Inject a 20mm (3/4 inch) deep silicone sealant band between the foam, cured silicone facing and the joint-face.
- Tool the freshly applied silicone firmly to blend with the substrates and cured silicone facing, and to ensure a proper bond and seamless appearance.
- Where Colourseal-VHE foam meets at butt joins, tool the excess silicone that squeezes out from the top and between the bellows.



IMPORTANT: Silicone left between the wrinkles of the bellows could constrain movement — using a caulk knife, remove excess sealant and blend what remains into the bellows.

NOTE – Silicone sealant band is only applied to the weather side of the W/DFR foam. No sealant band is needed on the other side.

SILICONE-COAT ANY EXPOSED FOAM ENDS:

IMPORTANT: Any stick of Colourseal-VHE which finishes with an open end, not terminating into another stick or structural termination, must be lightly coated on the exposed foam end using the liquid silicone sealant provided.

FIRE RESISTANCE

Colorseal VHE joints were tested according to EAD 350141-00-1106 clause 2.2.2 and EN 1366-4. Based upon the gained results and the field of application specified within EN 1366-4, the joints Colorseal VHE have been classified according to EN 13501-2 : 2016-07.

The fire resistance classes of the linear joints Colorseal VHE in the relevant separating elements are valid for a lateral displacement of 50% maximum of the initial width and if they are installed according to annex A of the ETA.

1 - Colorseal VHE joints in a floor or as horizontal wall joint abutting a floor

Colorseal VHE is used as joint seal in a floor or as horizontal wall joint abutting a floor, ceiling or roof (configurations A and D in figure 1 in EAD 350141-00-1106)

Minimum density of the supporting construction in which Colorseal VHE is used for linear joint:

Supporting construction	Minimum density
Rigid concrete floors	≥ 2200 kg/m^3

Minimum thickness of the supporting construction in which Colorseal VHE used for linear joint:

Supporting construction	Minimum thickness
Rigid concrete floors	≥ 200 mm of concrete

Lateral movement capability of Colorseal VHE :

Movement capability	Linear joint
± 50 %	Colorseal VHE

Installation and dimensions:

Dimensions	Position of joint
Colorseal VHE joint with a maximum initial joint width from 12 mm to 200 mm and thickness of 70mm to 200mm	The joint can be installed on any side of the gap
Installation stages (according to annex A) :	
1/ Epoxy Adhesive glue on substrate walls 2/ Colorseal VHE joints installation 3/ Silicone “SIKASIL WS 295” applied between two joints and for peripherical sealing	

Classification
Colorseal VHE (12mm width /70mm thickness) : EI 60 – H – M50 – M – W 12 **Colorseal VHE (200mm width /200mm thickness) : EI 45 – H – M50 – M – W 200**

The classement is only valid with conditions :
- Respect the arrangement and corresponding installation parameters;
- Fire is under the concrete floor
- Respect configurations A and D in figure 1 in EAD 350141-00-1106 only
- Density and thickness of the supporting construction must be those required
- Respect the compression ratio of sealing joint.

2 - Colorseal VHE joints in walls

Colorseal VHE is used as vertical joint seal in a wall (configurations B in figure 1 of EAD 350141-00-1106)

Minimum density of the supporting construction in which Colorseal VHE is used for linear joint :

Supporting construction	Minimum density
Rigid concrete walls	≥ 2200 kg/m^3

Minimum thickness of the supporting construction in which Colorseal VHE used for linear joint :

Supporting construction	Minimum thickness
Rigid concrete walls	≥ 200 mm of concrete

Lateral movement capability of Colorseal VHE :

Movement capability	Linear joint
± 50 %	Colorseal VHE

Installation and dimensions:

Dimensions	Position of joint
Colorseal VHE joint with a maximum initial joint width from 12 mm to 200 mm and thickness from 70 mm to 200mm	The joint is installed on the top or on the unexposed side level of the gap
Installation stages (according to annex A) :	
1/ Epoxy Adhesive glue on substrate walls 2/ Colorseal VHE joints installation 3/ Silicone “SIKASIL WS 295” applied between two joints and for peripherical sealing	

Classification
EI 90 – V – M50 – M – W 12 à 200

The classement is only valid with conditions :
- Respect the arrangement and corresponding installation parameters;
- Respect configuration B in figure 1 in EAD 350141-00-1106 only
- Density and thickness of the supporting construction must be those required
- Respect the compression ratio of sealing joint.