Planning and Community Development Department
2880 International Circle
Colorado Springs, Colorado 80910
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DEVIATION REQUEST AND DECISION FORM

Updated: 6/26/2019

PROJECT INFORMATION

PCD File No. DEV263

Project Name :	SF224: The Ridge at Lorson Ranch Filing 1
Schedule No.(s) :	#:5500000367, 5500000368, 5500000369, 5500000370, 5500000371
Legal Description :	A PARCEL OF LAND IN THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 13 AND THE NORTHEAST QUARTER (NE 1/4) OF SECTION 24, T15S, R65W OF THE 6th P.M., EL PASO COUNTY, COLORADO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS; BEGINNING AT THE SOUTHEAST CORNER OF THE EASTERLY RIGHT OF WAY LINE OF WALLEYE DRIVE AS SHOWN ON THE PLAT OF "THE HILLS AT LORSON RANCH FILING NO. 1" AS RECORDED UNDER RECEPTION NO. 221714880 IN THE EL PASO COUNTY, COLORADO RECORDS; THENCE ALONG SAID EASTERLY LINE THE FOLLOWING TWENTY (20) COURSES: 1) THENCE N33°01'53"E A DISTANCE OF 64.00 FEET; 2) THENCE N13°07'56"W A DISTANCE OF 27.70 FEET; 3) THENCE N30°42'15"E A DISTANCE OF 26.72 FEET TO A POINT OF CURVE; 4) THENCE 90.69 FEET ALONG A CURVE TO THE LEFT, SAID CURVE HAVING A RADIUS OF 632.00 FEET, A CENTRAL ANGLE OF 8°13'18", THE CHORD OF 90.61 FEET BEARS N26°35'36"E TO A POINT OF TANGENT; 5) THENCE N22°28'57"E A DISTANCE OF 349.86 FEET TO A POINT OF CURVE; 6) THENCE 62.79 FEET ALONG A CURVE TO THE LEFT, SAID CURVE HAVING A RADIUS OF 1,032.00 FEET, A CENTRAL ANGLE OF 3°29'10", THE CHORD OF 62.78 FEET BEARS N20°44'22"E TO A POINT OF TANGENT; 7) THENCE N18°59'47"E A DISTANCE OF 134.57 FEET; 8) THENCE N61°45'15"E A DISTANCE OF 29.46 FEET; 9) THENCE N18°59'47"E A DISTANCE OF 50.00 FEET; 10) THENCE N23°45'41"W A DISTANCE OF 29.46 FEET; 11) THENCE N18°59'47"E A DISTANCE OF 396.74 FEET; 12) THENCE N61°45'15"E A DISTANCE OF 29.46 FEET; 13) THENCE N18°59'47"E A DISTANCE OF 50.00 FEET; 14) THENCE N23°45'41"W A DISTANCE OF 29.46 FEET; 15) THENCE N18°59'47"E A DISTANCE OF 307.87 FEET; 16) THENCE N23°17'08"E A DISTANCE OF 106.97 FEET; 17) THENCE N18°59'47"E A DISTANCE OF 119.41 FEET; 18) THENCE N63°59'47"E A DISTANCE OF 25.46 FEET; 19) THENCE N18°59'47"E A DISTANCE OF 93.91 FEET; 20) THENCE N26°00'13"W A DISTANCE OF 36.77 FEET; THENCE S71°00'13"E A DISTANCE OF 278.84 FEET TO A POINT OF CURVE; THENCE 501.42 FEET ALONG THE ARC OF A CURVE TO THE LEFT, SAID CURVE HAVING A RADIUS OF 1,434.73 FEET, A CENTRAL ANGLE OF 20°01'27", THE CHORD OF 498.87 FEET BEARS S81°00'56"E TO A POINT OF TANGENT; THENCE N88°58'20"E A DISTANCE OF 260.16 FEET; THENCE N43°58'20"E A DISTANCE OF 7.07 FEET; THENCE N88°58'20"E A DISTANCE OF 50.00 FEET; THENCE S46°01'40"E A DISTANCE OF 7.07 FEET; THENCE N88°58'20"E A DISTANCE OF 457.00 FEET; THENCE S01°01'40"E A DISTANCE OF 20.00 FEET; THENCE N88°58'20"E A DISTANCE OF 289.60 FEET TO THE EAST LINE THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 13; THENCE S00°13'35"E ALONG SAID EAST LINE A DISTANCE OF 91.50 FEET TO THE SECTION

CORNER COMMON TO SECTIONS 13 AND 24, T15S, R65W OF THE 6th P.M. AND SECTIONS 18 AND 19, T15S, R64W OF THE 6th P.M.;
THENCE S00°11'19"E ALONG THE EASTERLY LINE OF AFORESAID NORTHEAST QUARTER (NE 1/4) SECTION 24 A DISTANCE OF 2,011.91 FEET THENCE S89°25'43"W A DISTANCE OF 380.07 FEET;
THENCE S00°34'17"E A DISTANCE OF 76.83 FEET;
THENCE S89°25'43"W A DISTANCE OF 46.97 FEET;
THENCE N60°34'17"W A DISTANCE OF 40.00 FEET;
THENCE S89°25'43"W A DISTANCE OF 787.32 FEET;
THENCE S61°29'50"W A DISTANCE OF 40.94 FEET;
THENCE N88°30'10"W A DISTANCE OF 44.27 FEET THENCE N58°30'10"W A DISTANCE OF 41.38 FEET TO A NON-TANGENT CURVE;
THENCE 319.29 FEET ALONG THE ARC OF A CURVE TO THE RIGHT, SAID CURVE HAVING A RADIUS OF 1,030.00 FEET, A CENTRAL ANGLE OF 17°45'40", THE CHORD OF 318.01 FEET BEARS N76°23'53"W TO A POINT OF TANGENT;
THENCE N67°31'03"W A DISTANCE OF 663.92 FEET TO A POINT OF CURVE;
THENCE 189.64 FEET ALONG THE ARC OF A CURVE TO THE RIGHT, SAID CURVE HAVING A RADIUS OF 1,030.00 FEET, A CENTRAL ANGLE OF 10°32'56", THE CHORD OF 189.37 FEET BEARS N62°14'35"W;
THENCE N58°24'55"W, NON-TANGENT TO THE PREVIOUS COURSE, 79.22 FEET TO THE POINT OF BEGINNING.

SAID PARCEL CONTAINS 4,696,623 SQUARE FEET (107.820 ACRES, MORE OR LESS)

APPLICANT INFORMATION

Company :	Eagle Development Company
Name :	Jeff Mark
	☒ Owner ☐ Consultant ☐ Contractor
Mailing Address :	212 N. Wasatch Avenue, Suite 301, Colorado Springs, CO 80903
Phone Number :	(303) 210-7747
FAX Number :	
Email Address :	jmark@landhuisco.com

ENGINEER INFORMATION

Company :	Basecamp AEC, Inc.		
Name :	Steven Meiggs, PE	Colorado P.E. Number :	64496
Mailing Address :	PO Box 2196, Edwards, CO 81632 600 Corporate Circle, Suite A, Golden, CO 80401		
Phone Number :	813-422-0931		
FAX Number :			
Email Address :	steve@basecampaec.com		

OWNER, APPLICANT, AND ENGINEER DECLARATION

To the best of my knowledge, the information on this application and all additional or supplemental documentation is true, factual and complete. I am fully aware that any misrepresentation of any information on this application may be grounds for denial. I have familiarized myself with the rules, regulations and procedures with respect to preparing and filing this application. I also understand that an incorrect submittal will be cause to have the project removed from the agenda of the Planning Commission, Board of County Commissioners and/or Board of Adjustment or delay review until corrections are made, and that any approval of this application is based on the representations made in the application and may be revoked on any breach of representation or condition(s) of approval.

Signature of owner (or authorized representative) — Date: 08/14/2026

Engineer's Seal, Signature
And Date of Signature

8/14/2026

DEVIATION REQUEST (Attach diagrams, figures, and other documentation to clarify request)

A deviation from the standards of or in Section **El Paso County Standard Drawing of the Engineering Criteria Manual (ECM) Detail SD_4-20,** is requested.

Identify the specific ECM standard which a deviation is requested:

The ECM manual does not include chemical grout as a repair method for roadways and utility trenches. Currently, the ECM standard drawings, previously found in Appendix F, Detail SD_4-20, outline the process for utility trench repair in asphalt pavement. This process involves excavating down to the bottom of the utility line, compacting the soil in 6-inch lifts, and then placing a new base course followed by new pavement.

State the reason for the requested deviation:

Deviation request for the use of the chemical grout to stabilize the soils within the roadway and utility trenches where settlement and distress were observed and to lift and relevel pavement, concrete flatwork, and stormwater catch basins. The deviation request is requested for The Ridge at Lorson Ranch Filing 1 (File# SF224)

Explain the proposed alternative and compare to the ECM standards (May provide applicable regional or national standards used as basis):

The proposed alternative of chemical grouting to stabilize the observed settlement/distress is a less invasive methodology that doesn't require excavation and replacement of asphalt, sidewalks, or curb/gutters. El Paso County – Engineering Criteria Manual, Revision 6. December 13, 2016, utility trench repair detail for asphalt pavement (File name SD_4-20) was utilized in the northern half of Lorson Ranch Hills Filing 1. However, more than half of the repaired locations are exhibiting ongoing settlement. The proposed chemical grout injection alternative addresses the settlement by injecting an initial stabilizing layer/lens at a depth of approximately 4', approximately 1' above the existing water lateral, and a second lifting layer/lens at approximately a depth of 1.5' to 2'. The initial stabilizing layer minimizes overburden pressure/stresses from further compacting the soils below 4'. The second lifting injection works similarly but also mitigates surficial dynamic loads from further compacting underlying soils. Together, the multiple layers of injection, when controlled and monitored, can effectively stabilize, lift, and relevel pavement, stormwater structures, and concrete flatwork in minimal time without excavation and its associated disturbance and disruption. Chemical grout injection as a repair method to stabilize soils and lift/relevel foundations/roads/concrete has been utilized in the construction industry since the 1980s and is considered common and customary.

The chemical grout injection should be high-density polymer resins that, when mixed, will create a rapidly expanding (full rise time of between approximately 15 to 30 seconds or less at the intended injection temperature [115 to 130 degrees Fahrenheit]) polyurethane foam that can lift, realign, and fill voids under concrete slabs and asphalt being supported by base soils. Hydrophilic or permeation-type chemical grouts should not be utilized. In addition, the resulting polyurethane foam should be a closed-cell material that is hydro-insensitive and should have an unconfined expansion ratio of between 15:1 and 20:1 and 4-5 pounds per cubic foot (pcf) free rise density. Once injected, the recommended resin mixture should rapidly expand into the composite material (foam), binding and densifying soils, filling voids, and exerting a controlled compressive uplift force under a limited area of the slab/pavement. The foam should then cure to 90 percent of its compressive strength within 25 minutes of injection into a stable replacement base material.

The chemical grout should initially be injected approximately 4 feet on center within the utility trenches through a 1/2" injection rod advanced to a depth no greater than 4 feet below land surface (bls) through 5/8" diameter drilled holes. After an initial stabilizing injection volume that will be determined on a case-by-case basis, the injection rod tip will be raised to approximately 1.5' to 2' bls or within 0' to 1' ft bls of the base of the cement-treated subgrade (CTS) to lift and relevel the concrete slabs or pavement. When being utilized to relevel installed stormwater vaults, concrete sidewalks, or concrete curbs, the material will be injected directly beneath the concrete. The elevations of the pavement/slabs should be monitored continuously during the chemical grouting

Explain the proposed alternative and compare to the ECM standards (May provide applicable regional or national standards used as basis):

process.

The proposed materials will consist of Utah Foam Products, Inc., AT-840-8 or AT-840-10, or NCFI Polyurethanes NCFI-4RH (formerly 24-003). The material utilized will depend on the outside temperature, pavement temperature (colder pavement will deflect/bend less), the presence/absence of CTS, and/or product availability. Note that the rate of expansion can be adjusted via the injection plant preheating temperature, with high temperatures resulting in quicker reaction/rise times. The contractor is offering a two-year warranty on the injected areas, such that if some additional settlement of significance occurs, the contractor will return to reinject that area. The 2-year warranty shall also be for the County to execute should there be any additional settlement. The intent is for the developer and the County to be able to call on the contractor for any issues. A copy of the Concrete Stabilization Technologies (CST) Method & Deep Injection Process Overview and Warranty will be attached along with all the materials' cutsheets and specifications, which states:

"*Project Warranty – For a period of two (2) years following work completion, CST warrants that the lifted pavements will not settle more than ½". For additional settlement of the injected area CST shall re-lift the subject pavements one time during the warranty period, by drilling and re-injecting material below the pavement, free of charge. If settlement occurs more than once in the injected areas, or in deeper or other untreated soils during the warranty period, CST will reinject at the original contract price during the warranty period.*

The soil injection process entails injecting expanding structural polymer through multiple probes at directly below the pavement and into the 4' zone of soils to increase the bearing capacity of the soils where injected.

If additional settlement occurs due to improper drainage of water, a water leak of any kind, or excessive weight put on the pavements, this warranty is void.

Material Warranty – For a period of two (2) years following work completion, CST warranties the polyurethane material against significant shrinkage or deterioration. During the warranty period, CST shall replace by re-injection any materials that fail to perform as warranted including, shrinkage, or deterioration.

All original CST contract agreement language and terms and conditions apply in any warranty work.

CST does NOT warrant that its process or material will prevent or control erosion of non-treated surrounding soils. Further, CST assumes no liability for pavement movement caused by non-treated soil settlement."

Contacts for Warranty:

Clint Mathis
Phone: 303-306-9191
Fax: 303-306-9099
Email: cmathis@cststabilization.com
Project: Lorson Ranch, East NO. 2&3, Skyline NO. 1, The Hills, The Ridge

The roadway load capacity will be increased/strengthened by using this product. The placed and cured material (polyurethane) is generally considered non-reactive. Polyurethane material injected below the surface of the soil will remain as injected, and any degradation would be negligible. Under normal conditions, when buried in soil or beneath pavement/concrete, the material will not degrade. The polyurethane material will not degrade unless exposed to UV light.

LIMITS OF CONSIDERATION
(At least one of the conditions listed below must be met for this deviation request to be considered.)

☐ The ECM standard is inapplicable to the particular situation.
☐ Topography, right-of-way, or other geographical conditions or impediments impose an undue hardship and an equivalent alternative that can accomplish the same design objective is available and does not compromise public safety or accessibility.
☒ A change to a standard is required to address a specific design or construction problem, and if not modified, the standard will impose an undue hardship on the applicant with little or no material benefit to the public.

Provide justification:

The proposed alternative of chemical grouting to stabilize the observed settlement/distress is much quicker and less invasive methodology that doesn't require excavation and replacement of asphalt, sidewalks, or curb/gutters. El Paso County – Engineering Criteria Manual, Revision 6. December 13, 2016, utility trench repair detail for asphalt pavement (File name SD_4-20) was utilized in the northern half of Lorson Ranch Hills Filing 1. However, more than half of the repaired locations are exhibiting ongoing settlement.

CRITERIA FOR APPROVAL

Per ECM section 5.8.7 the request for a deviation may be considered if the request is **not based exclusively on financial considerations**. The deviation must not be detrimental to public safety or surrounding property. The applicant must include supporting information demonstrating compliance with **all of the following criteria**:

The deviation will achieve the intended result with a comparable or superior design and quality of improvement.

The requested deviation will achieve the intended results of repair by stabilizing and lifting/releveling roadways, concrete flatwork, and stormwater structures to meet criteria and the approved plans that have been affected by ground settlement with a reduced risk to the underlying utilities when compared to the current standard of excavation and backfill. Additionally, the requested deviation will be accomplished in far less time (hours compared to days), with minimal disturbance to the public.

The deviation will not adversely affect safety or operations.

The deviation will not affect safety or operations. The chemical grout repair is non-invasive and causes minimal disturbance to the public. The injected material (structural polyurethane foam) is safe (inert and non-reactive) and can be excavated, by hand, or machine, if necessary, and disposed of as normal waste.

The deviation will not adversely affect maintenance and its associated cost.

The deviation will not affect maintenance and its associated cost. The chemical grout can be hand-excavated and excavated without issues and can be disposed as normal waste

The deviation will not adversely affect aesthetic appearance.

The deviation will not affect aesthetic appearance. The chemical grout is injected into the subsurface soils and helps reduce observed settlement by re-leveling roadways and sidewalks. This method will reduce the number of locations that will require surficial patching and, therefore, will improve aesthetic appearance when compared to the current method of excavation and patching.

The deviation meets the design intent and purpose of the ECM standards.

The deviation is a common industry repair and stabilization method and, based on previous attempts of repair by the design content of Detail SD_4-20 that still show signs of ongoing settlement, will improve upon the intent and purpose of the ECM standard.

The deviation meets the control measure requirements of Part I.E.3 and Part I.E.4 of the County's MS4 permit, as applicable.

Not Applicable

REVIEW AND RECOMMENDATION:

Approved by the ECM Administrator
This request has been determined to have met the criteria for approval. A deviation from Section Detail SD_4-20 of the ECM is hereby granted based on the justification provided.

Daniel Torres, P.E.

Digitally signed by Daniel Torres, P.E.
Reason: Authorized signatory as County Engineer designee
Date: 2026.09.09 22:01:30-06'00'

Denied by the ECM Administrator
This request has been determined not to have met criteria for approval. A deviation from Section _____ of the ECM is hereby denied.

ECM ADMINISTRATOR COMMENTS/CONDITIONS:

- A Work-in-the-ROW permit and notice to proceed shall be obtained prior to the installation of the chemical grout.
- EPC inspections staff shall be present at each application of the chemical grout.

1.1. PURPOSE

The purpose of this resource is to provide a form for documenting the findings and decision by the ECM Administrator concerning a deviation request. The form is used to document the review and decision concerning a requested deviation. The request and decision concerning each deviation from a specific section of the ECM shall be recorded on a separate form.

1.2. BACKGROUND

A deviation is a critical aspect of the review process and needs to be documented to ensure that the deviations granted are applied to a specific development application in conformance with the criteria for approval and that the action is documented as such requests can point to potential needed revisions to the ECM.

1.3. APPLICABLE STATUTES AND REGULATIONS

Section 5.8 of the ECM establishes a mechanism whereby an engineering design standard can be modified when if strictly adhered to, would cause unnecessary hardship or unsafe design because of topographical or other conditions particular to the site, and that a departure may be made without destroying the intent of such provision.

1.4. APPLICABILITY

All provisions of the ECM are subject to deviation by the ECM Administrator provided that one of the following conditions is met:

- The ECM standard is inapplicable to a particular situation.
- Topography, right-of-way, or other geographical conditions or impediments impose an undue hardship on the applicant, and an equivalent alternative that can accomplish the same design objective is available and does not compromise public safety or accessibility.
- A change to a standard is required to address a specific design or construction problem, and if not modified, the standard will impose an undue hardship on the applicant with little or no material benefit to the public.

1.5. TECHNICAL GUIDANCE

The review shall ensure all criteria for approval are adequately considered and that justification for the deviation is properly documented.

1.6. LIMITS OF APPROVAL

Whether a request for deviation is approved as proposed or with conditions, the approval is for project-specific use and shall not constitute a precedent or general deviation from these Standards.

1.7. REVIEW FEES

A Deviation Review Fee shall be paid in full at the time of submission of a request for deviation. The fee for Deviation Review shall be as determined by resolution of the BoCC.

Exhibit showing Chemical Grout Locations on The Ridge at Lorson Ranch Filing 1

- Minimum 1/2" pavement deflection - area to be treated with chemical grout
- Heave
- Site not inspected (car parked)

SEE SHEET C3.3

N

60 30 0 60 120

SCALE: 1"=60'

FONTAINE BLVD

BUCKNER WAY

FORAKER LN

LOOKOUT PEAK LN

LAKE TROUT DR

LOST PEAK LN

PEARSTOL ST. (NORTH)

NYSTROM TER

RAVEN RIDGE TER

DRAGONTAIL TER

SPLAKE ST

tract L

tract M

tract N

tract O

1" IRRIGATION TAP

SEE SHEET C3.5

AS-BUILT
SAN-WTM
FEB 2, 2024

CORE ENGINEERING GROUP
15004 1ST AVENUE S.
BURNSVILLE, MN 55306
PH: 719.570.1100
CONTACT: RICHARD L. SCHINDLER, P.E.
EMAIL: Rich@ceg1.com

PREPARED FOR:
LORSON, LLC
212 N. WAHSATCH AVE, SUITE 301
COLORADO SPRINGS, COLORADO 80903
(719) 635-3200
CONTACT: JEFF MARK

PROJECT:
THE RIDGE AT LORSON RANCH
FONTAENN BLVD - WALLEYE DR
COLORADO SPRINGS, COLORADO

NO. | DESCRIPTION | DATE

DRAWN: RLS
DESIGNED: RLS
CHECKED: RLS

THE RIDGE AT LORSON RANCH
UTILITY SERVICES PLAN
SOUTH HALF

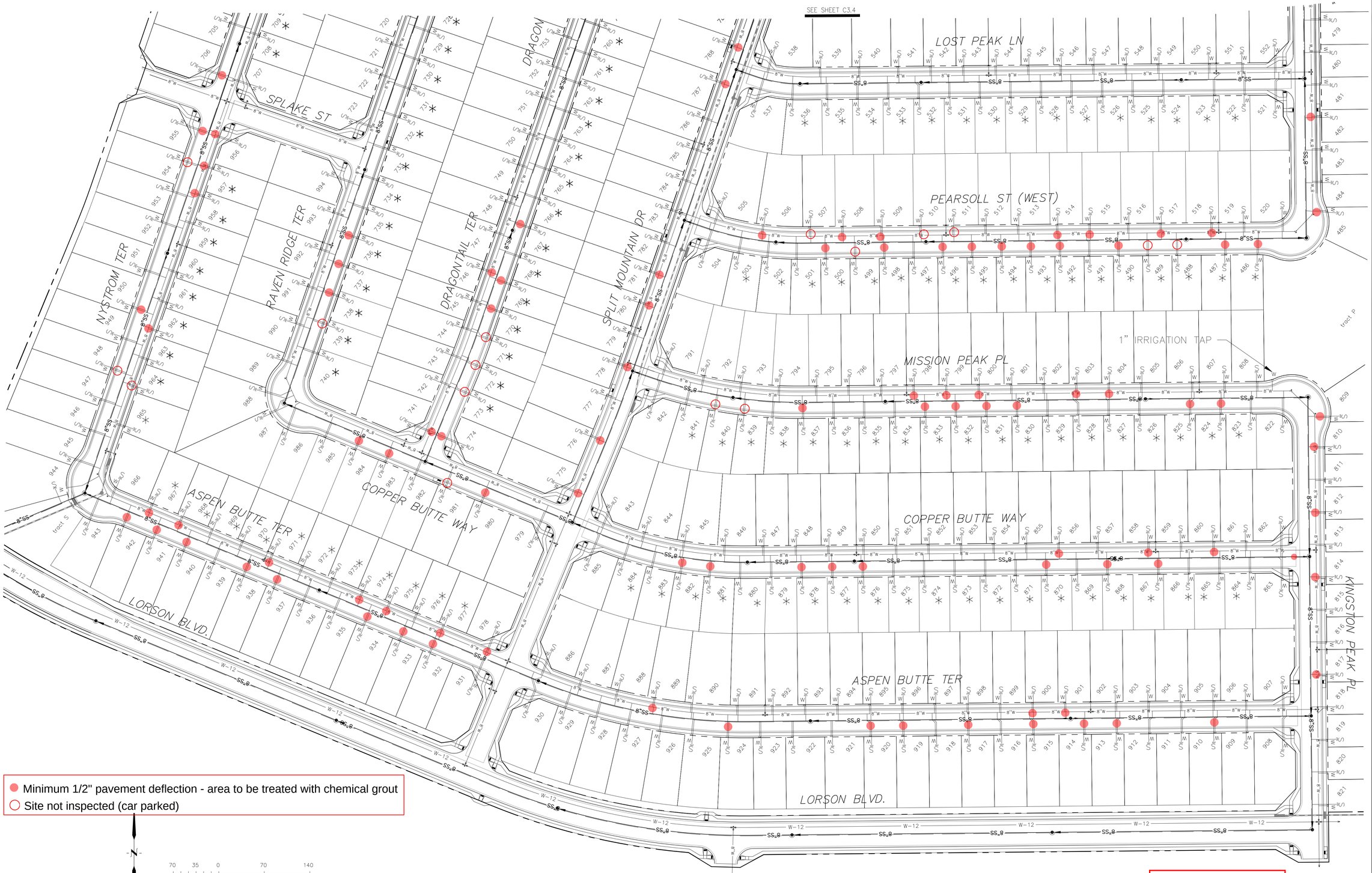
COLORADO REGISTERED PROFESSIONAL ENGINEER 33997 11/15/2021

DATE: NOV 5, 2021

PROJECT NO. 100.064

SHEET NUMBER C3.4

TOTAL SHEETS: 75



- Minimum 1/2" pavement deflection - area to be treated with chemical grout
- Site not inspected (car parked)

N

70 35 0 70 140

SCALE: 1"=70'

AS-BUILT
SAN-WTM
FEB 2, 2024

CORE ENGINEERING GROUP
15004 1ST AVENUE S.
BURNSVILLE, MN 55306
PH: (719.570.1100
CONTACT: RICHARD L. SCHINDLER, P.E.
EMAIL: Rich@ceg1.com

PREPARED FOR:
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212 N. WAHSATCH AVE, SUITE 301
COLORADO SPRINGS, COLORADO 80903
(719) 635-3200
CONTACT: JEFF MARK

NO. | DESCRIPTION | DATE

PROJECT:
THE RIDGE AT LORSON RANCH
FONTAENI BLVD - WALLEYE DR
COLORADO SPRINGS, COLORADO

DRAWN: RLS
DESIGNED: RLS
CHECKED: RLS

THE RIDGE AT LORSON RANCH
UTILITY SERVICES PLAN
SOUTH HALF

COLORADO LICENSED 33997 PROFESSIONAL ENGINEER
11/5/2021

DATE: NOV 5, 2021
PROJECT NO. 100.064
SHEET NUMBER C3.5
TOTAL SHEETS: 75

Concrete Stabilization Technologies

8500 East Warren Avenue • Denver, CO 80231 • (303) 306-9191 • (303) 306-9099 Fax
WWW.CSTSTABILIZATION.COM

Method & Deep Injection Process
Overview and Warranty

Project Information:

Name of Owner/Customer	**The Landhuis Company / El Paso County**
Location Address **City, State, Zip** **Technician Name** **Completion Date**	**Lorson Ranch / East 2 & 3, Skyline, The Hills, Ridge 1 & 3,** **Colorado Springs, CO 80925**

Project Warranty – For a period of two (2) years following work completion, CST warrants that the lifted pavements will not settle more than ½". For additional settlement of the injected area CST shall re-lift the subject pavements one time during the warranty period, by drilling and re-injecting material below the pavement, free of charge. If settlement occurs more than once in the injected areas, or in deeper or other untreated soils during the warranty period, CST will reinject at the original contract price during the warranty period.

The soil injection process entails injecting expanding structural polymer through multiple probes at directly below the pavement and into the 4' zone of soils to increase the bearing capacity of the soils where injected.

If additional settlement occurs due to improper drainage of water, a water leak of any kind, or excessive weight put on the pavements, this warranty is void.

Material Warranty – For a period of two (2) years following work completion, CST warranties the polyurethane material against significant shrinkage or deterioration. During the warranty period, CST shall replace by re-injection any materials that fail to perform as warranted including, shrinkage, or deterioration.

All original CST contract agreement language and terms and conditions apply in any warranty work.

CST does NOT warrant that its process or material will prevent or control erosion of non-treated surrounding soils. Further, CST assumes no liability for pavement movement caused by non-treated soil settlement.

SAFETY DATA SHEET

A Component, all Isocyanates, excluding Aquacast

Section 1. Identification

GHS product identifier : A COMPONENT

Product code : All Isocyanates, excluding Aquacast System

Other means of identification : Not available.

Product type : Liquid.

Material uses : Component of a Polyurethane System

Supplier's details :

UTAH FOAM PRODUCTS, INC.
3609 South 700 West
Salt Lake City, UT 84119
801-269-0600

UTAH FOAM PRODUCTS, INC.
295 West 400 South
Nephi, UT 84648
435-623-1515

e-mail address of person responsible for this SDS : CANDACE@UTAHFOAM.COM

Emergency telephone number (24h/7day) : Chemtrec: (800) 424-9300 or (703) 527-3887

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture :

ACUTE TOXICITY: INHALATION - Category 4
SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2B
RESPIRATORY SENSITIZATION - Category 1
SKIN SENSITIZATION - Category 1
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [Respiratory tract irritation] - Category 3

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements :

Harmful if inhaled.
Causes skin and eye irritation.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause an allergic skin reaction.
May cause respiratory irritation.

Section 2. Hazards identification

Precautionary statements : Wear protective gloves: > 8 hours (breakthrough time): butyl rubber, Ethyl Vinyl Alcohol Laminate (EVAL). Wear eye or face protection. In case of inadequate ventilation wear respiratory protection. Use only outdoors or in a well-ventilated area. Avoid breathing vapor. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. If experiencing respiratory symptoms: Call a POISON CENTER or physician. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention. Store locked up. Dispose of contents and container in accordance with all local, regional, national and international regulations.

Other hazards which do not result in classification : Not available.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Ingredient name	%	CAS number
Isocyanic acid, polymethylenepolyphenylene ester	60 - 100	9016-87-9
Diphenylmethane 4,4'-diisocyanate	30 - 60	101-68-8

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

~~Description of necessary first aid measures~~

Eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.

Inhalation : Move exposed person to fresh air. Get medical attention immediately. Treatment is symptomatic for primary irritation or bronchospasm. If breathing is laboured, oxygen should be administered by qualified personnel.

Skin contact : After contact with skin, wash immediately with plenty of warm soapy water: Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. An MDI study has demonstrated that a polyglycol-based skin cleanser (such as D-TamTM, PEG-400) or corn oil may be more effective than soap and water. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Provided the patient is conscious, wash out mouth with water. Get medical attention if symptoms appear.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes eye irritation.

Section 4. First aid measures

Inhalation : Harmful if inhaled. May cause respiratory irritation. This product is a respiratory irritant and potential respiratory sensitiser: repeated inhalation of vapour or aerosol at levels above the occupational exposure limit could cause respiratory sensitisation. Symptoms may include irritation to the eyes, nose, throat and lungs, possibly combined with dryness of the throat, tightness of chest and difficulty in breathing. The onset of the respiratory symptoms may be delayed for several hours after exposure. A hyper-reactive response to even minimal concentrations of MDI may develop in sensitised persons. LC50 (rat) : ca. 490 mg/m³ (4 hours) : using experimentally produced respirable aerosol having aerodynamic diameter <5microns.

Skin contact : Causes skin irritation. May cause sensitization by skin contact. Animal studies have shown that respiratory sensitisation can be induced by skin contact with known respiratory sensitisers including diisocyanates. These results emphasize the need for protective clothing including gloves to be worn at all times when handling these chemicals or in maintenance work.

Ingestion : Low oral toxicity, but ingestion may cause irritation of the gastrointestinal tract.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing
wheezing and breathing difficulties
asthma

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Symptomatic treatment and supportive therapy as indicated. Following severe exposure the patient should be kept under medical review for at least 48 hours.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Flash point : Closed cup: >150°C (>302°F)
Open cup: 230°C (446°F)

Extinguishing media

Suitable extinguishing media : Foam, CO2 or dry powder.

Unsuitable extinguishing media : Water may be used if no other available and then in copious quantities. Reaction between water and hot isocyanate may be vigorous. Prevent washings from entering water courses, keep fire exposed containers cool by spraying with water.

Section 5. Fire-fighting measures

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous thermal decomposition products : Combustion products may include: carbon monoxide, carbon dioxide, nitrogen oxides, hydrocarbons and HCN.

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. PVC boots, gloves, safety helmet and protective clothing should be worn.

Remark : Due to reaction with water producing CO2-gas, a hazardous build-up of pressure could result if contaminated containers are re-sealed. Containers may burst if overheated.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up : If the product is in its solid form: Spilled MDI flakes should be picked up carefully. The area should be vacuum cleaned to remove remaining dust particles completely. If the product is in its liquid form: Absorb spillages onto sand, earth or any suitable adsorbent material. Leave to react for at least 30 minutes. Shovel into open-top drums for further decontamination. Wash the spillage area with water. Test atmosphere for MDI vapour. Neutralise small spillages with decontaminant. Remove and dispose of residues. The compositions of liquid decontaminants are given in Section 16. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures :

Section 7. Handling and storage

Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Keep container tightly closed in a cool, well-ventilated place. Keep away from moisture. Due to reaction with water producing CO2-gas, a hazardous build-up of pressure could result if contaminated containers are re-sealed. Do not reseal contaminated containers. Uncontaminated containers, free of moisture, may be resealed only after placing under a nitrogen blanket. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. Unsuitable containers: Do not store in containers made of copper, copper alloys or galvanized surfaces.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
4,4'-Methylenediphenyl diisocyanate	**ACGIH TLV (United States, 6/2013).** TWA: 0.005 ppm 8 hours. **OSHA PEL (United States, 2/2013).** CEIL: 0.02 ppm CEIL: 0.2 mg/m³

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. Diisocyanates can only be smelled if the occupational exposure limit has been exceeded considerably.

Medical supervision of all employees who handle or come in contact with respiratory sensitisers is recommended. Personnel with a history of asthma-type conditions, bronchitis or skin sensitisation conditions should not work with MDI based products. The Occupational Exposure Limits listed do not apply to previously sensitised individuals. Sensitised individuals should be removed from any further exposure.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Section 8. Exposure controls/personal protection

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Hand protection : Use chemical resistant gloves classified under Standard EN374: protective gloves against chemicals and microorganisms.Examples of glove materials that might provide suitable protection include :Butyl rubber, Chlorinated polyethylene, Polyethylene, Ethyl vinyl alcohol copolymers laminated ("EVAL"), Polychloroprene (Neoprene*), Nitrile/butadiene rubber ("nitrile" or "NBR"), Polyvinyl chloride ("PVC" or "vinyl"), Fluoroelastomer (Viton*).

When prolonged or frequently repeated contact may occur, a glove with protection class of 5 or higher (breakthrough time greater then 240 minutes according to EN374) is recommended.

Contaminated gloves should be decontaminated and disposed of.
Notice: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all requisite workplace factors such as, but not limited to : other chemicals that may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), as well as instructions/ specifications provided by the glove supplier. Protective gloves should be worn when handling freshly made polyurethane products to avoid contact with trace residual materials which may be hazardous in contact with skin.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Recommended: Overall (preferably heavy cotton) or Tyvek-Pro Tech 'C' , Tyvek-Pro 'F' disposable coverall.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Thermal hazards : Not available.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid.

Color : Not available.

Odor : Not available.

Odor threshold : Not available.

pH : Not available.

Melting point/Freezing point : Not available.

Boiling/condensation point : >300°C decomposes

Flash point : Closed cup: >150°C (>302°F)
Open cup: 230°C (446°F)

Evaporation rate : Not available.

Section 9. Physical and chemical properties

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : Not available.

Vapor density : Not available.

Relative density : Not available.

Solubility in water : Not available.

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : >600°C

Decomposition temperature : Not available.

Viscosity : Not available.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : Stable at room temperature.

Possibility of hazardous reactions : Reaction with water (moisture) produces CO2-gas. Exothermic reaction with materials containing active hydrogen groups. The reaction becomes progressively more vigorous and can be violent at higher temperatures if the miscibility of the reaction partners is good or is supported by stirring or by the presence of solvents. MDI is insoluble with, and heavier than water and sinks to the bottom but reacts slowly at the interface. A solid water-insoluble layer of polyurea is formed at the interface by liberating carbon dioxide gas.

Conditions to avoid : Avoid high temperatures.

Incompatible materials : Water, alcohols, amines, bases, and acids.

Hazardous decomposition products : Combustion products may include: carbon oxides (CO, CO_2) nitrogen oxides (NO, NO_2 etc.) hydrocarbons and HCN

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Test	Endpoint	Species	Result
Isocyanic acid, polymethylenepolyphenylene ester	OECD 403 Acute Inhalation Toxicity	LC50 Inhalation Dusts and mists	Rat - Male, Female	0.49 mg/l
	OECD 402 Acute Dermal Toxicity	LD50 Dermal	Rabbit - Male, Female	>9400 mg/kg
	OECD 401 Acute Oral Toxicity	LD50 Oral	Rat - Male	>10000 mg/kg
4,4'-Methylenediphenyl diisocyanate	OECD 403 Acute Inhalation Toxicity	LC50 Inhalation Dusts and mists	Rat - Male, Female	0.49 mg/l
	OECD 402 Acute Dermal Toxicity	LD50 Dermal	Rabbit - Male, Female	>9400 mg/kg

Section 11. Toxicological information

	OECD 401 Acute Oral Toxicity	LD50 Oral	Rat - Male	>10000 mg/kg

Conclusion/Summary :

4,4'-Methylenediphenyl diisocyanate	Irritating to respiratory system.

Irritation/Corrosion

Product/ingredient name	Test	Species	Result
Isocyanic acid, polymethylenepolyphenylene ester	OECD 404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Mild irritant
	OECD 405 Acute Eye Irritation/ Corrosion	Rabbit	Eyes - Non-irritant.
Diphenylmethane 4,4'-diisocyanate	OECD 404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Irritant
	OECD 405 Acute Eye Irritation/ Corrosion	Rabbit	Eyes - Non-irritant.

Conclusion/Summary

Skin :	Isocyanic acid, polymethylenepolyphenylene ester	Irritating to skin.
	Diphenylmethane 4,4'-diisocyanate	Irritating to skin.
Eyes :	Isocyanic acid, polymethylenepolyphenylene ester	Based on the human occupational exposure data, this substance is considered as irritating to eyes.
	Diphenylmethane 4,4'-diisocyanate	Based on the human occupational exposure data, this substance is considered as irritating to eyes.
Respiratory :	Isocyanic acid, polymethylenepolyphenylene ester	No additional information.
	Diphenylmethane 4,4'-diisocyanate	No additional information.

Sensitization

Product/ingredient name	Test	Route of exposure	Species	Result
Isocyanic acid, polymethylenepolyphenylene ester	OECD 406 Skin Sensitization	skin	Guinea pig	Not sensitizing
	No official guidelines	Respiratory	Rat	Sensitizing
	-	skin	Guinea pig	Sensitizing
Diphenylmethane 4,4'-diisocyanate	OECD 429 Skin Sensitization: Local Lymph Node Assay	skin	Mouse	Sensitizing
	OECD 406 Skin Sensitization	skin	Guinea pig	Not sensitizing
	No official guidelines	Respiratory	Guinea pig	Sensitizing

Mutagenicity

Section 11. Toxicological information

Product/ingredient name	Test	Result
Isocyanic acid, polymethylenepolyphenylene ester	Experiment: In vitro Subject: Bacteria Metabolic activation: +/-	Negative
	Experiment: In vivo Subject: Mammalian-Animal	Negative
	Experiment: In vivo Subject: Mammalian-Human	Equivocal
Diphenylmethane 4,4'-diisocyanate	Experiment: In vitro Subject: Bacteria Metabolic activation: +/-	Negative
	Experiment: In vivo Subject: Mammalian-Animal	Negative

Conclusion/Summary :

Isocyanic acid, polymethylenepolyphenylene ester	No mutagenic effect.
4,4'-Methylenediphenyl diisocyanate	No mutagenic effect.

Carcinogenicity

Product/ingredient name	Test	Species	Dose	Exposure	Result/Result type
Isocyanic acid, polymethylenepolyphenylene ester	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Rat - Male, Female	1 mg/m³	2 years; 5 days per week	Negative - Inhalation - NOAEL
4,4'-Methylenediphenyl diisocyanate	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Rat - Male, Female	1 mg/m³	2 years; 5 days per week	Positive - Inhalation - NOAEL

Carcinogenic class

Product/ingredient name	IARC	OSHA
Isocyanic acid, polymethylenepolyphenylene ester	3	-
4,4'-Methylenediphenyl diisocyanate	3	-

Reproductive toxicity

Product/ingredient name	Test	Species	Maternal toxicity	Fertility	Developmental effects
Isocyanic acid, polymethylenepolyphenylene ester	OECD 414 Prenatal Developmental Toxicity Study	Rat - Male, Female	Negative	Negative	Negative

Conclusion/Summary :

Section 11. Toxicological information

Isocyanic acid, polymethylenepolyphenylene ester	No known significant effects or critical hazards.
4,4'-Methylenediphenyl diisocyanate	No known significant effects or critical hazards.

Teratogenicity

Product/ingredient name	Test	Species	Result/Result type
Isocyanic acid, polymethylenepolyphenylene ester	OECD 414 Prenatal Developmental Toxicity Study	Rat - Male, Female	Negative - Inhalation
	OECD 414 Prenatal Developmental Toxicity Study	Rat - Male, Female	Negative - Inhalation
Diphenylmethane 4,4'-diisocyanate	OECD 414 Prenatal Developmental Toxicity Study	Rat - Female	Negative - Inhalation

Conclusion/Summary :

Isocyanic acid, polymethylenepolyphenylene ester	No known significant effects or critical hazards.
4,4'-Methylenediphenyl diisocyanate	No known significant effects or critical hazards.

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
Isocyanic acid, polymethylenepolyphenylene ester	Category 3	Not applicable.	Respiratory tract irritation
Diphenylmethane 4,4'-diisocyanate	Category 3	Not applicable.	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes eye irritation.

Inhalation : Harmful if inhaled. May cause respiratory irritation. This product is a respiratory irritant and potential respiratory sensitiser: repeated inhalation of vapour or aerosol at levels above the occupational exposure limit could cause respiratory sensitisation. Symptoms may include irritation to the eyes, nose, throat and lungs, possibly combined with dryness of the throat, tightness of chest and difficulty in breathing. The onset of the respiratory symptoms may be delayed for several hours after exposure. A hyper-reactive response to even minimal concentrations of MDI may develop in sensitised persons. LC50 (rat) : ca. 490 mg/m³ (4 hours) : using experimentally produced respirable aerosol having aerodynamic diameter <5microns.

Section 11. Toxicological information

Skin contact : Causes skin irritation. May cause sensitization by skin contact. Animal studies have shown that respiratory sensitisation can be induced by skin contact with known respiratory sensitisers including diisocyanates. These results emphasize the need for protective clothing including gloves to be worn at all times when handling these chemicals or in maintenance work.

Ingestion : Low oral toxicity, but ingestion may cause irritation of the gastrointestinal tract.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing
wheezing and breathing difficulties
asthma

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Product/ingredient name	Test	Endpoint	Species	Result
Isocyanic acid, polymethylenepolyphenylene ester	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Chronic NOEC Inhalation Dusts and mists	Rat - Male, Female	0.2 mg/m³

General : May cause damage to organs through prolonged or repeated exposure if inhaled. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : Rats have been exposed for two years to a respirable aerosol of polymeric MDI which resulted in chronic pulmonary irritation at high concentrations. Only at the top level (6 mg/m3), there was a significant incidence of a benign tumour of the lung (adenoma) and one malignant tumour (adenocarcinoma). There were no lung tumours at 1 mg/m3 and no effects at 0.2 mg/m3. Overall, the tumour incidence, both benign and malignant, and the number of animals with the tumours were not different from controls. The increased incidence of lung tumours is associated with prolonged respiratory irritation and the concurrent accumulation of yellow material in the lung, which occurred throughout the study. In the absence of prolonged exposure to high concentrations leading to chronic irritation and lung damage, it is highly unlikely that

Section 11. Toxicological information

tumour formation will occur.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No birth defects were seen in two independant animal (rat) studies. Fetotoxicity was observed at doses that were extremely toxic (including lethal) to the mother. Fetotoxicity was not observed at doses that were not maternally toxic. The doses used in these studies were maximal, respirable concentrations, which are well in excess of defined occupational exposure limits.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Route	ATE value
Inhalation (dusts and mists)	1.5 mg/l

Other information : Not available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Test	Endpoint		Exposure	Species	Result	
Isocyanic acid, polymethylenepolyphenylene ester	OECD 201 Alga, Growth Inhibition Test	Acute	EC50	72 hours Static	Algae	>1640	mg/l
	OECD 209 Activated Sludge, Respiration Inhibition Test	Acute	EC50	3 hours Static	Bacteria	>100	mg/l
	OECD 202 *Daphnia* sp. Acute Immobilisation Test	Acute	EC50	24 hours Static	Daphnia	>1000	mg/l
	-	Acute	LC0	96 hours	Fish	>1000	mg/l
	OECD 203 Fish, Acute Toxicity Test	Acute	LC50	96 hours Static	Fish	>1000	mg/l
	OECD 211 *Daphnia Magna* Reproduction Test	Chronic	NOEC	21 days Semi-static	Daphnia	>=10	mg/l
	OECD 201 Alga, Growth Inhibition Test	Chronic	NOECr	72 hours Static	Algae	1640	mg/l
4,4'-Methylenediphenyl diisocyanate	OECD 202 *Daphnia* sp. Acute Immobilisation Test	Acute	EC50	24 hours Static	Daphnia	>1000	mg/l
	OECD 203 Fish, Acute Toxicity Test	Acute	LC50	96 hours Static	Fish	>1000	mg/l
	OECD 211 *Daphnia Magna* Reproduction Test	Chronic	NOEC	21 days Semi-static	Daphnia	>=10	mg/l
	OECD 201 Alga, Growth Inhibition Test	Chronic	NOECr	72 hours Static	Algae	1640	mg/l

Persistence and degradability

Section 12. Ecological information

Product/ingredient name	Test	Period	Result
Isocyanic acid, polymethylenepolyphenylene ester	OECD 302C Inherent Biodegradability: Modified MITI Test (II)	28 days	0 %
4,4'-Methylenediphenyl diisocyanate	OECD 302C Inherent Biodegradability: Modified MITI Test (II)	28 days	0 %

Conclusion/Summary : Isocyanic acid, polymethylenepolyphenylene ester — Not biodegradable

4,4'-Methylenediphenyl diisocyanate — Not biodegradable

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Isocyanic acid, polymethylenepolyphenylene ester	Fresh water 0.8 days	-	Not readily
Diphenylmethane 4,4'-diisocyanate	Fresh water 0.83 days	-	Not readily

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Isocyanic acid, polymethylenepolyphenylene ester	-	200	low
Diphenylmethane 4,4'-diisocyanate	4.51	200	low

Mobility in soil

Mobility : By considering the production and use of the substance, it is unlikely that significant environmental exposure in the air or water will arise. Immiscible with water, but will react with water to produce inert and non-biodegradable solids. Conversion to soluble products, including diamino- diphenylmethane (MDA), is very low under the optimal laboratory conditions of good dispersion and low concentration. In air, the predominant degradation process is predicted to be a relatively rapid OH radical attack, by calculation and by analogy with related diisocyanates.

Other adverse effects : No known significant effects or critical hazards.

Other ecological information

BOD5 : Not determined.

COD : Not determined.

TOC : Not determined.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Section 14. Transport information

Proper shipping name

DOT : OTHER REGULATED SUBSTANCES, LIQUID, N.O.S. (Methylene Diphenyl Diisocyanate)

TDG : Not regulated.

IMDG : Not regulated.

IATA : Not regulated.

Regulatory information	UN number	Classes	PG*	Label	Additional information
DOT Classification	NA3082	9	III		**Reportable quantity5000 lbs. (2270 kg)** Single containers less than 5,000 lbs. are not regulated.
TDG Classification	Not regulated.	-	-		-
IMDG Classification	Not regulated.	-	-		-
IATA Classification	Not regulated.	-	-		-

PG* : Packing group

Section 15. Regulatory information

Safety, health and environmental regulations specific for the product

United States Regulations

TSCA 8(b) inventory : All components are listed or exempted.

TSCA 5(a)2 final significant new use rule (SNUR) : No ingredients listed.

Section 15. Regulatory information

TSCA 5(e) substance consent order : No ingredients listed.

TSCA 12(b) export notification : No ingredients listed.

SARA 311/312 : Immediate (acute) health hazard

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) :

Product name	Concentration %
4,4'-Methylenediphenyl diisocyanate	36 - 42

Clean Air Act - Ozone Depleting Substances (ODS) : This product does not contain nor is it manufactured with ozone depleting substances.

SARA 313 Form R - Reporting requirements :

Product name	Concentration %
Methylenediphenyldiisocyanate, isomers and homologues	51.5 - 62
Diphenylmethane 4,4'-diisocyanate	36 - 42

CERCLA Hazardous substances :

Ingredient name	%	Section 304 CERCLA Hazardous Substance	CERCLA Reportable Quantity (Lbs)	Product Reportable Quantity (Lbs)
Diphenylmethane 4,4' diisocyanate	42	Listed	5000	11905

State regulations

PENNSYLVANIA - RTK : 4,4'-Methylenediphenyl diisocyanate

California Prop 65 : This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

Canadian regulations

CEPA DSL : All components are listed or exempted.

WHMIS Classes : WHMIS Class D-2A: Material causing other toxic effects (Very toxic).
WHMIS Class D-2B: Material causing other toxic effects (Toxic).

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Brazil Regulations

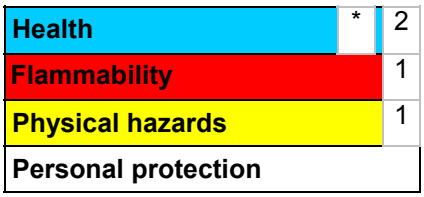
Classification system used : **Norma ABNT-NBR 14725-2:2012**

Section 15. Regulatory information

International lists : **Australia inventory (AICS)**: All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: All components are listed or exempted.
Korea inventory: All components are listed or exempted.
Malaysia Inventory (EHS Register): All components are listed or exempted.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.
Taiwan inventory (CSNN): All components are listed or exempted.

Section 16. Other information

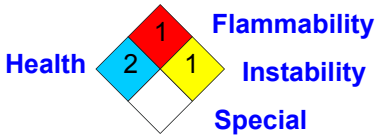
Hazardous Material Information System (U.S.A.) :



The customer is responsible for determining the PPE code for this material.

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

National Fire Protection Association (U.S.A.) :



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Date of printing : **8/25/2014.**
Date of issue : 8/25/2014.
Date of previous issue : 01/05/2011
Version : 7

Indicates information that has changed from previously issued version.

Section 16. Other information

Liquid decontaminants (percentages by weight or volume) :
Decontaminant 1 : *- sodium carbonate : 5 - 10 % *- liquid detergent : 0.2 - 2 % *- water : to make up to 100 %
Decontaminant 2 : *- concentrated ammonia solution : 3 - 8 % *- liquid detergent : 0.2 - 2 % *- water : to make up to 100 %
Decontaminant 1 reacts slower with diisocyanates but is more environmentally friendly than decontaminant 2.
Decontaminant 2 contains ammonia. Ammonia presents health hazards. (See supplier safety information.)
Literature reference: PU 193-1 : 'MDI-Based Compositions : Hazards and Safe Handling Procedures.'
PU 181-15 : Recommended melting procedures for MDI-based isocyanates.
ISOPA Guidelines for safe Loading/Unloading, Transportation, Storage of TDI and MDI , Ref.03-96 PSC-0005-GUIDL.
SPI PMDI User Guidelines for the Chemical Protective Clothing Selection.
References of methods used in the Physico-Chemical Properties section are reported in Annex V part A to Commission Directive 92/69/EEC of 31 July 1992 adapting to technical progress for the Seventeenth time Council Directive 67/548/EEC.

Notice to reader

While the information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

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UTAH FOAM PRODUCTS, INC

Aquathane AT 400 – AT800 Series and all ATX B component Polyol

Safety Data Sheet

Date of issue: 04/17/2015 Revision date: 02/10/2023 Supersedes: 09/29/2014

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Mixture

Trade name : Aquathane AT400 – AT800 Series and all ATX prefixes Polyol Resin B COMPONENT

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Component of Polyurethane System

1.3. Details of the supplier of the safety data sheet

Utah Foam Products, Inc.
P.O. Box 70838
3609 South 700 West
Salt Lake City, UT 84170
T (801)269-0600
www.utahfoam.com

Utah Foam Products, Inc. (Plant)
295 West 400 South
Nephi, Utah 84648

Admin (435)-623-1515 Plant

1.4. Emergency telephone number

Emergency number : 24 HR CHEMTREC:1-800-424-9300; 24 HR Emergency Assistance: 1-270-422-6860

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (GHS-US)

Not classified

2.2. Label elements

GHS-US labeling

No labeling applicable

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%	Classification (GHS-US)
PROPOXYLATED SUCROSE	(CAS No) Proprietary	46 - 63	Not classified
Polyether Triol	(CAS No) 25791-96-2	28 - 44	Not classified
OXYPROPYLATED ALIPHATIC AMINE	(CAS No) 35176-06-8	9 - 10	Not classified
Diethylene glycol	(Cas No) 111-46-6	0 -10	Not classified

Full text of H-phrases: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation : Allow victim to breathe fresh air. Allow the victim to rest.

First-aid measures after skin contact : Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse.

First-aid measures after eye contact : Rinse immediately with plenty of water. Obtain medical attention if pain, blinking or redness persist.

First-aid measures after ingestion : Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant hazard under anticipated conditions of normal use.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Foam. Dry powder. Carbon dioxide. Water spray. Sand.

Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

No additional information available

5.3. Advice for firefighters

Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire-fighting water from entering environment.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : Equip cleanup crew with proper protection.

Emergency procedures : Ventilate area.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect spillage. Store away from other materials.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapor.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Keep only in the original container in a cool, well ventilated place away from : Ignition sources. Keep container closed when not in use.

Incompatible products : Strong bases. Strong acids.

Incompatible materials : Sources of ignition. Direct sunlight.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

POLY-G® 71-360	
ACGIH	Not applicable
OSHA	Not applicable
OXYPROPYLATED ALIPHATIC AMINE (35176-06-8)	
ACGIH	Not applicable
OSHA	Not applicable

Polyether Triol (25791-96-2)	
ACGIH	Not applicable

Polyether Triol (25791-96-2)	
OSHA	Not applicable

PROPOXYLATED SUCROSE (Proprietary)	
ACGIH	Not applicable
OSHA	Not applicable

8.2. Exposure controls

Personal protective equipment : Avoid all unnecessary exposure.

Hand protection : Wear protective gloves.
Eye protection : Chemical goggles or safety glasses.
Respiratory protection : Wear appropriate mask.
Other information : Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Liquid
Appearance : Pale yellow or milk white
Color : may be pigmented
Odor : Amine-like - slight
Odor threshold : No data available
pH : 8 - 10 10/6 Isopropanol / water (@ 25 Deg. C)
Melting point : No data available
Freezing point : No data available
Boiling point : No data available
Flash point : > 200 °C (Open cup)
Relative evaporation rate (butyl acetate=1) : No data available
Flammability (solid, gas) : No data available
Explosion limits : No data available
Explosive properties : No data available
Oxidizing properties : No data available
Vapor pressure : 0.1 mm Hg (@ 25 Deg. C)
Relative density : 1.1 - 1.15
Relative vapor density at 20 °C : No data available
Specific gravity / density : 9 - 9.2 lb/gal
Solubility : Soluble in water.
Log Pow : No data available
Log Kow : No data available
Auto-ignition temperature : No data available
Decomposition temperature : No data available
Viscosity : No data available
Viscosity, kinematic : No data available
Viscosity, dynamic : No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Not established.

10.3. Possibility of hazardous reactions

Not established.

10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures.

10.5. Incompatible materials

Strong acids. Strong bases.

10.6. Hazardous decomposition products

fume. Carbon monoxide. Carbon dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

OXYPROPYLATED ALIPHATIC AMINE (35176-06-8)	
LD50 oral rat	> 5000 mg/kg
LD50 dermal rabbit	> 2000 mg/kg
Polyether Triol (25791-96-2)	
LD50 oral rat	4600 mg/kg
LD50 dermal rabbit	> 2000 mg/kg
LC50 inhalation rat (mg/l)	> 200 mg/l 1hr
ATE US (oral)	4600.000 mg/kg body weight

Skin corrosion/irritation : Not classified
pH: 8 - 10 10/6 Isopropanol / water (@ 25 Deg. C)

Serious eye damage/irritation : Not classified
pH: 8 - 10 10/6 Isopropanol / water (@ 25 Deg. C)

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

Potential Adverse human health effects and symptoms : Based on available data, the classification criteria are not met.

SECTION 12: Ecological information

12.1. Toxicity

OXYPROPYLATED ALIPHATIC AMINE (35176-06-8)	
LC50 fish 1	> 100 mg/l
Polyether Triol (25791-96-2)	
LC50 fish 1	> 100 mg/l

12.2. Persistence and degradability

POLY-G® 71-360	
Persistence and degradability	Not established.
OXYPROPYLATED ALIPHATIC AMINE (35176-06-8)	
Persistence and degradability	Not established.
Polyether Triol (25791-96-2)	
Persistence and degradability	Not established.

12.3. Bioaccumulative potential

POLY-G® 71-360	
Bioaccumulative potential	Not established.
OXYPROPYLATED ALIPHATIC AMINE (35176-06-8)	
Bioaccumulative potential	Not established.
Polyether Triol (25791-96-2)	
Bioaccumulative potential	Not established.

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Effect on the global warming : No known ecological damage caused by this product.

Other information : Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations : Dispose in a safe manner in accordance with local/national regulations.

Ecology - waste materials : Avoid release to the environment.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Not regulated for transport

Additional information

Other information : No supplementary information available.

ADR

No additional information available

Transport by sea

No additional information available

Air transport

No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

OXYPROPYLATED ALIPHATIC AMINE (35176-06-8)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Polyether Triol (25791-96-2)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
PROPOXYLATED SUCROSE (Proprietary)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations

CANADA

OXYPROPYLATED ALIPHATIC AMINE (35176-06-8)
Listed on the Canadian DSL (Domestic Substances List)
Polyether Triol (25791-96-2)
Listed on the Canadian DSL (Domestic substances List)
PROPOXYLATED SUCROSE (Proprietary)
Listed on the Canadian DSL (Domestic substances List)

EU-Regulations

OXYPROPYLATED ALIPHATIC AMINE (35176-06-8)
Listed on the EU NLP (No Longer Polymers) inventory

Polyether Triol (25791-96-2)
Listed on the EU NLP (No Longer Polymers) inventory

PROPOXYLATED SUCROSE (Proprietary)
Listed on the EU NLP (No Longer Polymers) inventory

Classification according to Regulation (EC) No. 1272/2008 [CLP]
No additional information available

Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]
Not classified

National regulations

OXYPROPYLATED ALIPHATIC AMINE (35176-06-8)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory Listed on the Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals)

Polyether Triol (25791-96-2)
Listed on the AICS (Australian Inventory of Chemical Substances) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory Listed on the Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Listed on Turkish inventory of chemical

PROPOXYLATED SUCROSE (Proprietary)
Listed on the AICS (Australian Inventory of Chemical Substances) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory Listed on the Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

15.3. US State regulations

SECTION 16: Other information

Revision date : 04/10/2015

Other information : None.

SDS US (GHS HazCom 2012)

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NCFI
Dual Component System

NCFI-4RH
Formerly 24-003
Technical Data Sheet

Material Characteristics

NCFI-4RH is a 4lb hydrophobic / hydro-insensitive, MDI-based, water blown system that is designed for exceptional spread and lifting capacity. The hydrophobic nature of NCFI-4RH allows it to maintain exceptional physical properties even in saturated conditions. This system is typically selected for DOT and roadwork and is also typically used for void filling, concrete lifting, and deep soil injection applications. Certified to NSF/ANSI/CAN 61 upon request.

Applications

Bridge Approaches and Departures
Highways and Streets
Airport Runways and Taxiways
Concrete Slab Lifting
Joint Matching
Void Filling
Deep Soil Injection

ALS
NSF/ANSI/CAN 61 - 5".
*Upon Request

Unique Advantages

Hydrophobic / Hydro-Insensitive
Contains No Solvents
Strengthens Loose Soil
Water Blown System

Reactivity at 110°F

Cream Time	5-8 seconds
Gel Time	11-15 seconds
Tack Free Time	16-19 seconds
Rise Time	25-30 seconds
Cure Time	95% @ 30min. Full cure at 24hrs

Chemical Resistance

Solvents…	Excellent
Mold and Mildew…	Excellent

Performance

Wet Environments…	Excellent
Lifting Capacity…	Excellent

Physical Properties

Physical Properties	Test Method	Free Rise	Restrained
Density	ASTM D1622	4 pcf	5 – 6 pcf
Compressive Strength	ASTM D1621	80 psi	80 – 100 psi
Compressive Modulus	ASTM D1621	1900 psi	3000 psi
Tensile Strength	ASTM D1623	117 psi	120 – 135 psi
Tensile Modulus	ASTM D1623	1446 psi	3100 psi
Water Absorption	ASTM D2842	≤0.04lbs/ft²	≤0.04lbs/ft²
Closed Cell Content	ASTM D6226	>92%	>92%
Max Service Temp		200°F	200°F
Elongation	ASTM D1623	5.1%	
Shear Strength	ASTM C273	52 psi	90 psi
Shear Modulus	ASTM C273	602 psi	677 psi
Flexural Strength	ASTM D790	87 psi	139 psi
Flexural Modulus	ASTM D790	1625 psi	3147 psi

NCFI Dual Component System

NCFI-4RH
Formerly 24-003
Technical Data Sheet

Special Testing

NYDOT Hydro-Insensitivity test, GTP-9	**>96% density retention >94% comp strength retention**

Dimensional Stability, % volume change, 28 days aging (ASTM D-2126)	Heat age at 158ºF	Freezer at -20ºF	Humid age at 100% RH & 120ºF
	-1.5%	-0.1%	-1.0%

Component Properties

Component	B-NCFI-4RH	A2-000
Appearance	Transparent Liquid	Clear Brown Liquid
Brookfield Viscosity @20rpm	750 cps at 72ºF	200 cps at 72ºF
Specific Gravity	1.05	1.24
Weight per Gallon	8.76 lbs	10.3 lbs
Storage Temperature	50-100ºF	50-100ºF

Mix Ratio

By weight… 118 parts A-side: 100 parts B-side
By volume… 100 parts A-side: 100 parts B-side

Processing Parameters

A-side Temperatures	100 – 120ºF
B-side Temperatures	100 – 120ºF
Mixing Pressure	1000 psi static 800 psi dynamic

Storage and Handling

For optimum shelf life, the recommended storage temperature is 50°F to 100°F. **Do not expose A-side to lower temperatures – freezing may occur.** Avoid moisture contamination during storage, handling, and processing. After opening, pad the containers and day tanks with either nitrogen or dry air (desiccant cartridge or air dryer @ -40°F dew point). Store components at 70°F to 90°F for several days prior to use to minimize viscosity issues. Shelf life of B-side is 6 months and A-side is 2 years for factory sealed containers.

Application Cautions

Careful consideration should be given to selection and application of any NCFI Polyurethane foam system where excessive foam mass build-up can occur. Excessive polyurethane foam lift thickness will result in high internal temperatures within the injected foam, which can result in degraded foam properties, or in extreme cases, fire or spontaneous combustion. **Any flammability rating contained in this literature is not intended to reflect hazards presented by this or any other material under actual fire conditions.** Each person, firm or corporation engaged in the application, installation or use of any polyurethane product should carefully determine whether there is a potential fire hazard associated with such product in a specific usage and utilize all appropriate precautionary and safety measures. Please consult NCFI Polyurethanes for safety considerations, polyurethane system selection and application recommendations.

SAFETY DATA SHEET According to GHS

PO Box 1528 • Mount Airy, NC 27030-1528
800.346.8229 • Fax 336.789.9586 • www.NCFI.com

Houston, TX Mt. Airy, NC

Section 1: Identification

Product Identifier

Trade Name: B-NCFI-4RH
Chemical Name: Polyurethane Resin
Recommended Use: Component for the manufacture of Polyurethanes
Restrictions on Use:

Chemical Manufacturer Information

Name: NCFI Polyurethanes
Address: 1515 Carter St Mount Airy, NC 27030
Website: www.NCFI.com
Phone: (800) 346-8229
Fax: (336) 789-9586
Emergency Phone: CHEMTREC: 800-424-9300

Section 2: Hazard Identification

Classification of the substance or mixture:

GHS Classification:	
• Skin irritation, Category 3	• Eye irritation, Category 2

GHS Labeling:

WARNING

Hazard Statements:	
• May cause skin irritation	• May cause eye irritation
• May cause respiratory irritation	

Precautionary Statements:	
• Do not breathe fume/gas/mist/vapors/spray	• Wear protective gloves/eye protection/face protection
• IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.	• IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
• IF ON SKIN: Wash with plenty of soap and water	

Section 3: Composition

Hazardous Components

Type of product: Mixture

CAS#	Weight %	Name
Proprietary	<4	Tertiary amine catalysts

Section 4: First Aid Measures

Inhalation:	Move to fresh air if symptoms develop. If breathing is difficult, give oxygen and call physician.
Eye Contact:	Flush with water for at least 15 minutes. See a physician if irritation develops.

Ingestion:	Induce vomiting; get medical attention
Most Important symptoms and effects, acute and delayed:	May cause skin or eye irritation upon contact. Avoid breathing vapors. The dense vapors can displace and reduce breathing air in confined or unventilated spaces causing asphyxiation. Overexposure may cause tremors, confusion, irritation, and may result in cardiac sensitization.
Indication of immediate medical attention and special treatment, if applicable:	N/A
Skin Contact:	Wash with soap and water at first opportunity.

Section 5: Fire-Fighting Measures

Suitable extinguishing media:	Water, dry chemicals, CO_2
Unsuitable extinguishing media:	None
Special hazards arising from the chemical:	Overheated containers may rupture due to pressure produced by $CF_3CH_2CHF_2$. $CF_3CH_2CHF_2$ burns to form acids and noxious gases.
Precautions for fire-fighters:	A self-contained breathing apparatus should be worn to protect against toxic and irritating vapors.

Section 6: Accidental Release Measures

Personal precautions, protective equipment, and emergency procedures:	Clear area. Ensure adequate ventilation. Wear suitable personal protective clothing and equipment.
Environmental precautions:	Do not discharge into drains/surface waters/groundwater
Methods and material for containment and cleanup:	Absorb with sawdust, etc., and shovel into container. Waste material should be disposed of under conditions which meet federal, state, and local environmental regulations.

Section 7: Handling and Storage

Precautions for safe handling:	Store between 50°F and 100°F out of sunlight. Relieve pressure slowly when opening container. Under no circumstances should empty drums be burned or cut open with an electric or gas torch.
Conditions for safe storage, including any incompatibilities:	Keep tightly sealed.

Section 8: Exposure Controls and PPE

Exposure Limits

Component:	**Type**	**Value**
Tertiary Amine Catalysts[1]	TWA	None established
1,1,1,3,3-Pentafluoropropane [1] ($CF_3CH_2CHF_2$ or HFC-245fa)	TWA	300 ppm recommended

[1]Not listed as a carcinogen (NTA, IARC, OSHA)

Exposure Controls

Respiratory Protection:	The specific respirator selected must be based on contamination levels of this material found in the workplace and the working limits of the respirator. A supplied air, full-face mask, positive pressure or continuous flow respirator or a supplied air hood is required when airborne concentrations are unknown or exceed threshold limit values. A positive pressure, self-contained breathing apparatus can be used in emergencies or other unusual situations. Full-face air purifying respirators equipped with organic vapor cartridges can be used in certain situations***, see OSHA standard 29CFR 1910.134***. All equipment must be NIOSH approved and maintained.

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Hand, eye, skin, body protection:	Wear goggles or chemical safety glasses and chemically resistant rubber or plastic gloves. Avoid eye and skin contact. Eye wash system and showers should be available.

Section 9: Physical and Chemical Properties

Basic chemical and physical properties

Appearance:	Liquid	**Flammability:**	No
Color:	Amber to light Brown	**Upper/lower flammability or explosive limits:**	N/A
Odor:	Ethereal odor	**Vapor pressure:**	N/A
Odor threshold:	N/A	**Vapor density:**	N/A
pH:	N/A	**Relative density:**	1.08g/mL
Melting pt/freezing pt:	<32°F	**Solubility(ies):**	Slightly soluble in water
Boiling pt/boiling range:	>200°F	**Partition coefficient (n-octanol/water):**	N/A
Flash point:	>200°F	**Auto-ignition temperature:**	>500°F
Evaporation rate:	Slower than ether	**Decomposition temperature:**	>500°F

Section 10: Stability and Reactivity

Chemical stability:	Stable
Possibility of hazardous reactions:	N/A
Conditions to avoid:	Temperatures over 85°F
Incompatible materials:	Isocyanates and other chemicals that react with hydroxyl groups.
Hazardous decomposition products:	When burned, CO, CO_2, NO_x aliphatic fragments, halogens, halogen acids and possibly carbonyl halides.

Section 11: Toxicological Information

Acute toxicity:	May cause skin irritation
Chronic toxicity:	Not available
Likely routes of exposure:	Skin
Symptoms related to physical, chemical and toxicological characteristics:	May cause skin irritation
Delayed and immediate effects and chronic effects from short and long-term exposure:	May cause skin irritation; avoid contact with eyes
Numerical toxicity measures:	Not available

Section 12: Ecological Information

Ecotoxicity:	Not a marine pollutant
Persistence and degradability:	No known significant effects
Bioaccumulative potential:	Does not bioaccumulate
Mobility in soil:	

Section 13: Disposal

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Waste disposal:	R component drums can be sent to drum reconditioners or disposed of as ordinary industrial waste in compliance with pertinent regulations

Section 14: Transport

UN number:	Not regulated
UN Proper shipping name:	Not regulated
Transport Hazard class(es):	Not regulated
Packing group, if applicable:	Not regulated
Marine pollutant (YorN):	N
Special precautions:	None

Section 15: Regulatory

Relevant safety, health, and environmental regulations

Inventory Status:	All components TSCA listed
US Regulations:	No ingredients listed
US Superfund Amendments and Reauthorization Act (SARA) Title III Section 313 information:	No ingredients listed

Section 16: Other

SDS Preparation Date:	06/25/2014
Revision Date:	07/09/2015
Revision 2 Date:	10/30/2017
Revision 3 Date:	03/22/2019
Revision 4 Date:	02/27/2025

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ALS Group USA, Corp.
10450 Stancliff Rd. Suite 210 Houston, Texas 77099

Certified Product Listing

For:
Drinking Water System Components – Health Effects

Company:
NCFI Polyurethanes
1515 Carter St
Mt. Airy, NC 27030, United States

Plant Location:
Missouri City, Texas, United States

Standards:
NSF/ANSI/CAN 61 - 2024

Certificate:
Issued Date: 11/03/2025

Material/Product:
Geotechnical Foam System.

Contact Temperature:
23 ± 2°C

Models:
NCFI 24-003
NCFI-4RH

Material Characteristics:

Minimum tank size (gallons): 400

Maximum tank surface area/volume ratio (sq in/L): 8.2

Number of coats: 1

Is additional coating required (e.g. top coat, primer, intermediate coat)? (Y/N): No

Total cure time and temperature: 24 hours/23Â°C

Final cure time: 24 hours

Mix ratio: 1:1 by Volume

Colors: Gray

Is this paint/coating system intended to be applied to a pipe? (Y/N): No

Additional comments:

Product water contact should not exceed 5% of total wetted surface area.

Utah Foam Products, Inc.

AT-840

Two-component structural polyurethane foam

STORAGE & CLEAN UP

Storage: Store between 50 and 75F to minimize container pressure. Take care to open containers, loosen closure to relieve pressure slowly before fully opening. Shelf Life: 1 year from date of manufacture in unopened containers properly stored. Protect from moisture.
Clean Up: Clean off of skin with soap and water. To clean uncured resin from the gun, flush with acetone.

ENVIRONMENTAL PROTECTION

Cured material is environmentally safe. Dispose of in according to appropriate regulations. Clean up any spilled catalyzed liquid material and add a small amount of water to cure unreacted material.

HEALTH & SAFETY

Safety: Use OSHA-approved personal protective equipment (PPE), including safety glasses, gloves and confined space equipment/ procedures if applicable. Avoid skin contact; do not ingest. See SDS for complete safety precautions. For professional use only.

FIRST AID

Eye Contact: Immediately flush with large amounts of water. Seek medical attention.
Inhalation: Move to fresh air if symptoms occur. If breathing is difficult, seek medical attention.
Ingestion: Seek medical attention immediately.
Skin Contact: Wipe off contaminated area and wash with soap and water immediately.

MANUFACTURING

Products are manufactured by Utah Foam Products in the U.S.A. under strict quality assurance practices at our Salt Lake City, UT plant.

SHIPPING

Shipping Class: Motor Freight Class 60 Hazard
Classification: Not Hazardous

WARRANTY & DISCLAIMER

Utah Foam Products Inc. warrants its products to be free from manufacturing defects and those products meet the published characteristics when tested in accordance with ASTM and Utah Foam Products standards. No other warranties by Utah Foam Products are expressed or implied, including no warranty of merchantability or fitness for a particular purpose. Utah Foam Products will not be liable for damages of any sort resulting from any claimed breach of warranty. Utah Foam Products' liability under this warranty is limited to replacement of material or refund of sales price of the material. There are no warranties on any product that has exceeded the "shelf life" or "expiration date" printed on the package label.

3609 S 700 W, Salt Lake City, UT 84119 | 801-269-0600 | INQUIRIES@UTAHFOAM.COM | UTAHFOAM.COM

Utah Foam Products, Inc.

AT-840

Two-component structural polyurethane foam

TESTING DATA

Physical Properties - Cured	Results	Test Method
Compressive Strength	95-105 psi	ASTM D-1621
Compressive Modulus	1800 psi	ASTM D-1621
Density	4 lbs./cubic ft (=/- .25)	ASTM D-1622
Tensile Strength	100-110 psi	ASTM D-1623
Shrinkage	Negligible	ASTM D-1042
Water Absorption lbs/ft2	<0.10	ASTM D-2842
Closed Cell Content %	>90.0	ASTM D-6226
Shear Strength	35-40 psi	ASTM C-273
Flexural Strength	55-60 psi	ASTM D-790
Shear Modulus	550	ASTM C-273
Flexural Modulus	810 psi	ASTM D-790

Reaction Times				
Product	*840-3	*840-8	*840-12	*840-20
Cream Time (sec)	3-4	8-10	10-12	18-20
Rise Time (sec)	11-12	20-22	24-26	75-85
Tack Free Time (sec)	9-10	14-18	20-24	50-70
90% Strength (min)	15	20	25	30

DIMENSIONAL STABILITY (ASTM D-2126)	
Volume Change @ -40°F	< 2%
Volume Change @ +200°F	< 2%

DIRECTIONS FOR USE

Mixing Ratio: A:B 1:1 by volume

Material Preparation: Store material overnight to precondition to 70-80°F (21-27°C) prior to use. Pre-mix the "B" component prior to combining. "B" component contains chemicals that settle over time. Failure to properly pre-mix will result in uncured or improperly cured material. Dispense using a two-component proportioner pump with heated hoses and impingement-style gun. Call Utah Foam Products for details. *Limitations: Cold temperatures will slow down reaction time and increase viscosity. pH below 3 or above 10 may adversely affect foam properties. Adjustments for altitude density may also be required.*

Utah Foam

Utah Foam

Phone:
FAX:
email:

Tuesday, July 7, 2026

CST
Clint Mathis

Clint,
Our urethane systems, AT-840-8 & AT-840-10, are very stable robust products. They both have over a 90% closed cell content. As with all (most) rigid urethane systems when reacted are inert and stable. Off gasing or leaching will not be a problem.

The foamed material will be effected by UV from the sun.

Any questions, please advise.

Duane Robinson
Technical Sales
UTAH FOAM PRODUCTS