The background of the slide is a photograph of a beach scene. In the foreground, there is a sandy beach with several tall palm trees. In the middle ground, there is a wooden fence and a set of stairs leading up to a building. In the background, there are several multi-story buildings, some of which appear to be under construction, with cranes visible. The sky is bright and slightly hazy.

A Comparison of Liquid Applied Rough Opening Prep and Air Barrier Chemistry, Performance, Capabilities and Applications

SEABEC

18JAN18

Presented by
Dave Kimball

Phone: 800-255-4255

Fax: 800-877-2700

www.prosoco.com

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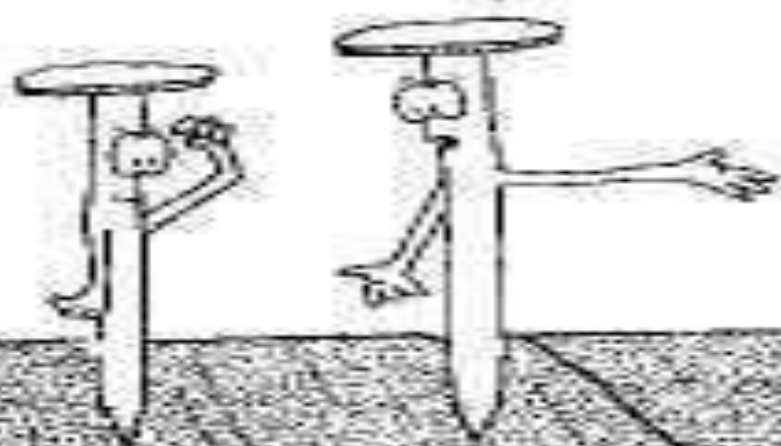
Learning Objectives

1. A basic overview of how Fluid Applied Rough Opening Preparations and WRB's came into being – a little history of how we arrived here.
2. A high level view of the different Fluid Applied Rough Opening Preparations and WRB's on the market today.
3. Discuss some of the advantages and disadvantages of all chemistries.
4. Walk away with a better understanding of your options.



ATLANTIC FEATURE ©1995 MARK PARISI

... AND THEN I HEARD A
LOUD BANG AND WHEN I
TURNED BACK HE WAS GONE!



What is an Air Barrier?

- Air Barrier – the primary material preventing or reducing the unintended passage of air through the building enclosure
- Because most air barrier materials are water resistant, by managing air flow we are also managing liquid water, which is especially important in any part of the country
- Air Barriers function as a “system”, not individual components, so Rough Opening Preparation is CRITICAL.

Air Movement Laws

- Air Movement Law #1 – Hot Air Rises
- Air Movement Law # 2 – High Pressure to Low Pressure
- Air Movement Law # 3 – Air Blows AND Sucks

Air Movement Law # 1

Hot Air Rises



Air Movement Law # 1

Air Density

Air Density Table

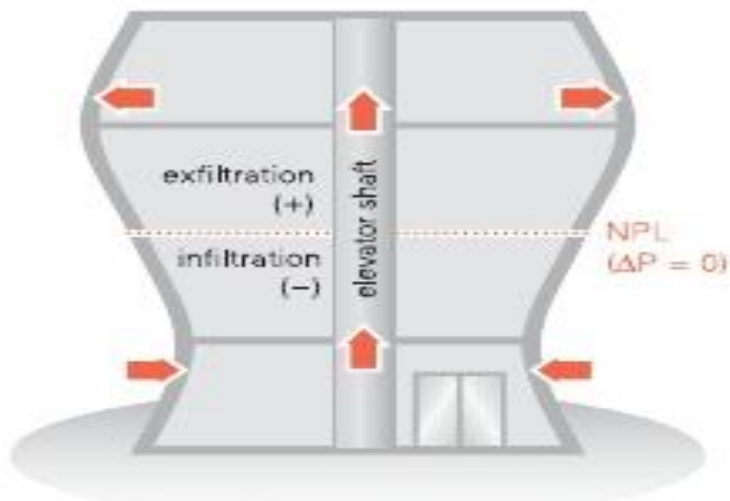
Temperature (°F)

Air Density Pounds / ft³

- 4	0.0871
14	0.0838
32	0.0807
50	0.0778
68	0.0752
86	0.0727
104	0.0704
122	0.0682
140	0.0662
158	0.0642
176	0.0624
194	0.0607
212	0.0591

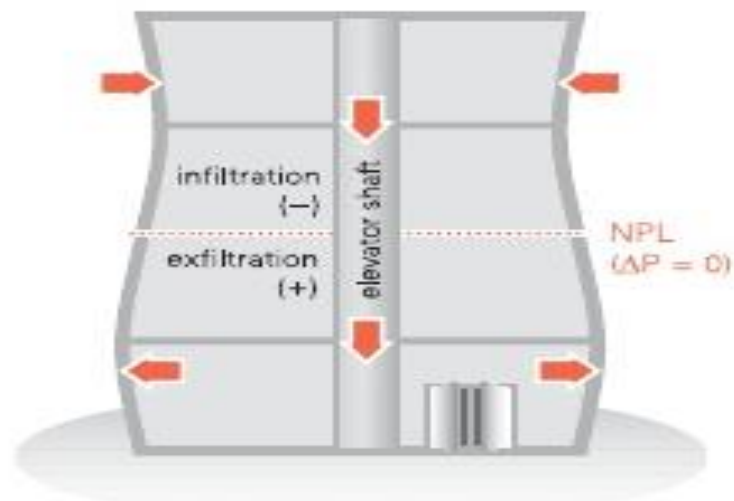
Air Movement Law # 1 – Example

Stack Effect



Winter (normal) stack effect

- Inward-swinging doors may not latch
- Exfiltrating indoor air drives moisture into building envelope

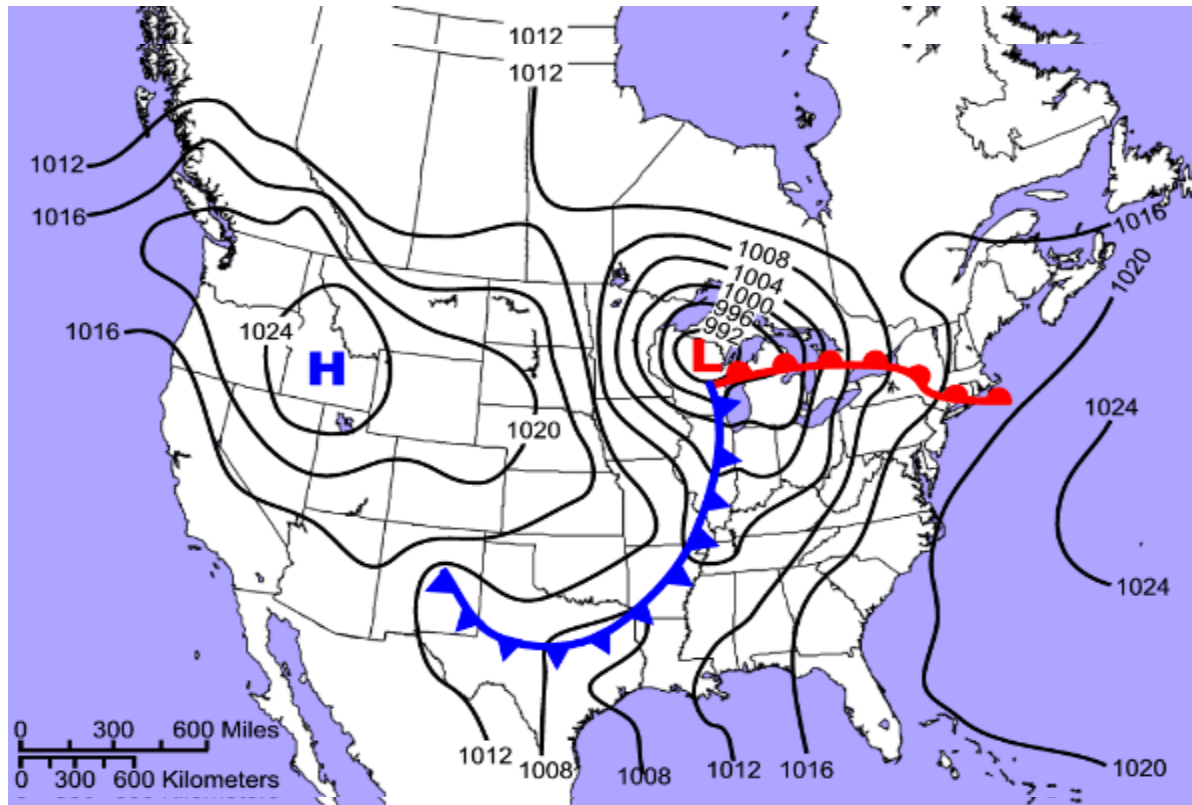


Summer (reverse) stack effect

- Outward-swinging doors may stand open
- Infiltrating outdoor air drives moisture into building envelope

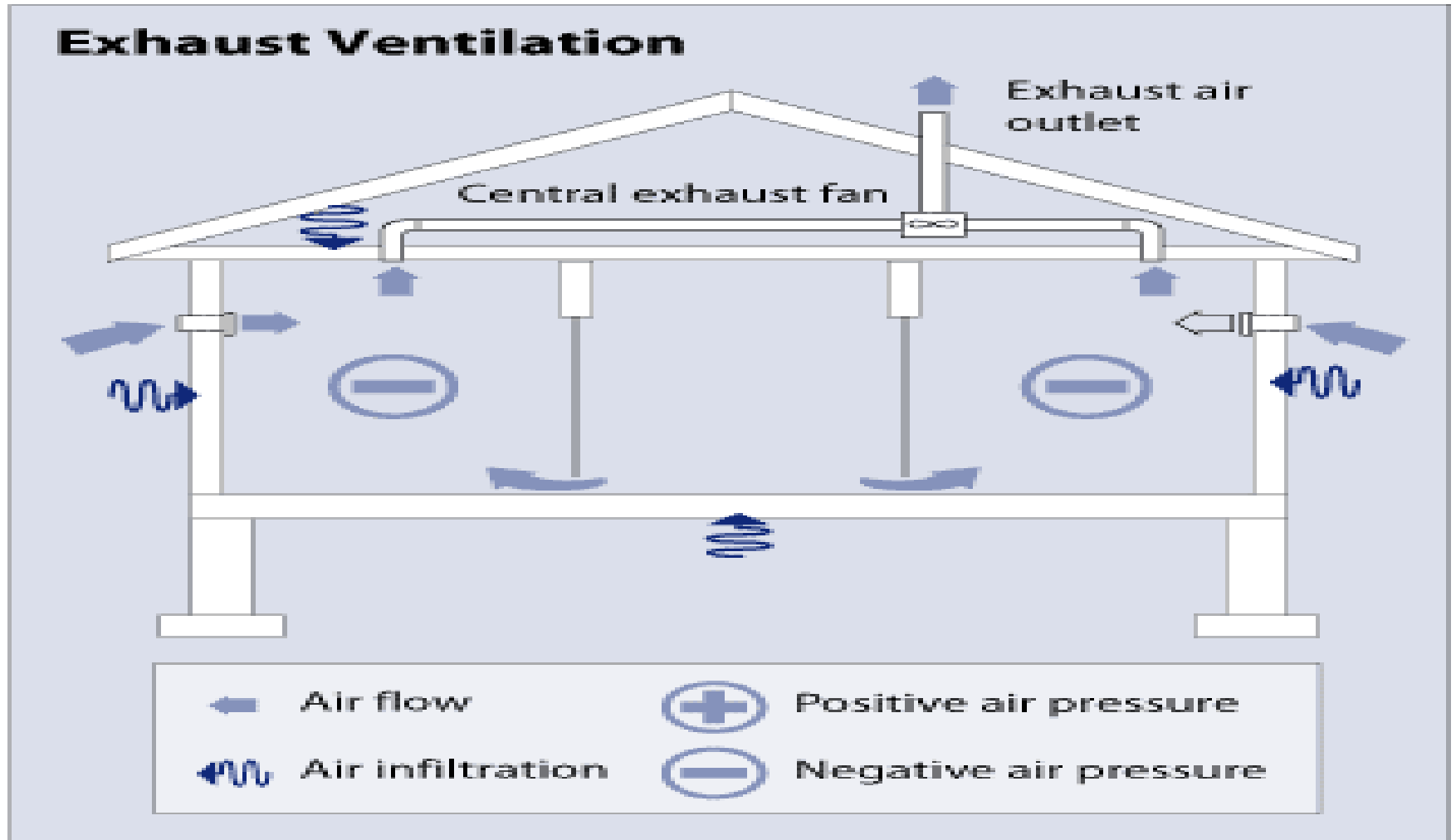
Air Movement Law # 2

Air moves from High Pressure to Low Pressure



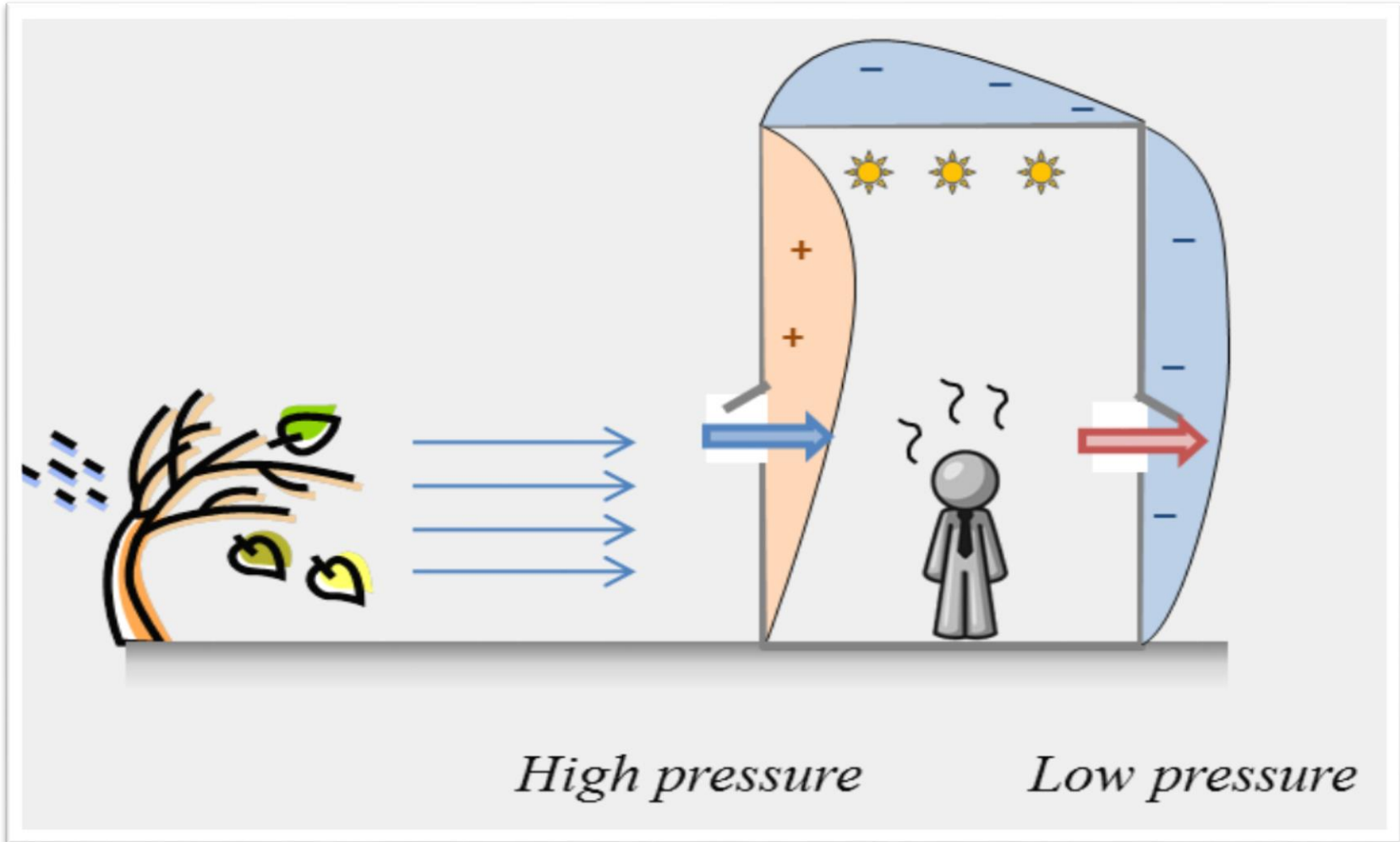
Air Movement Law # 2

Air moves from High Pressure to Low Pressure



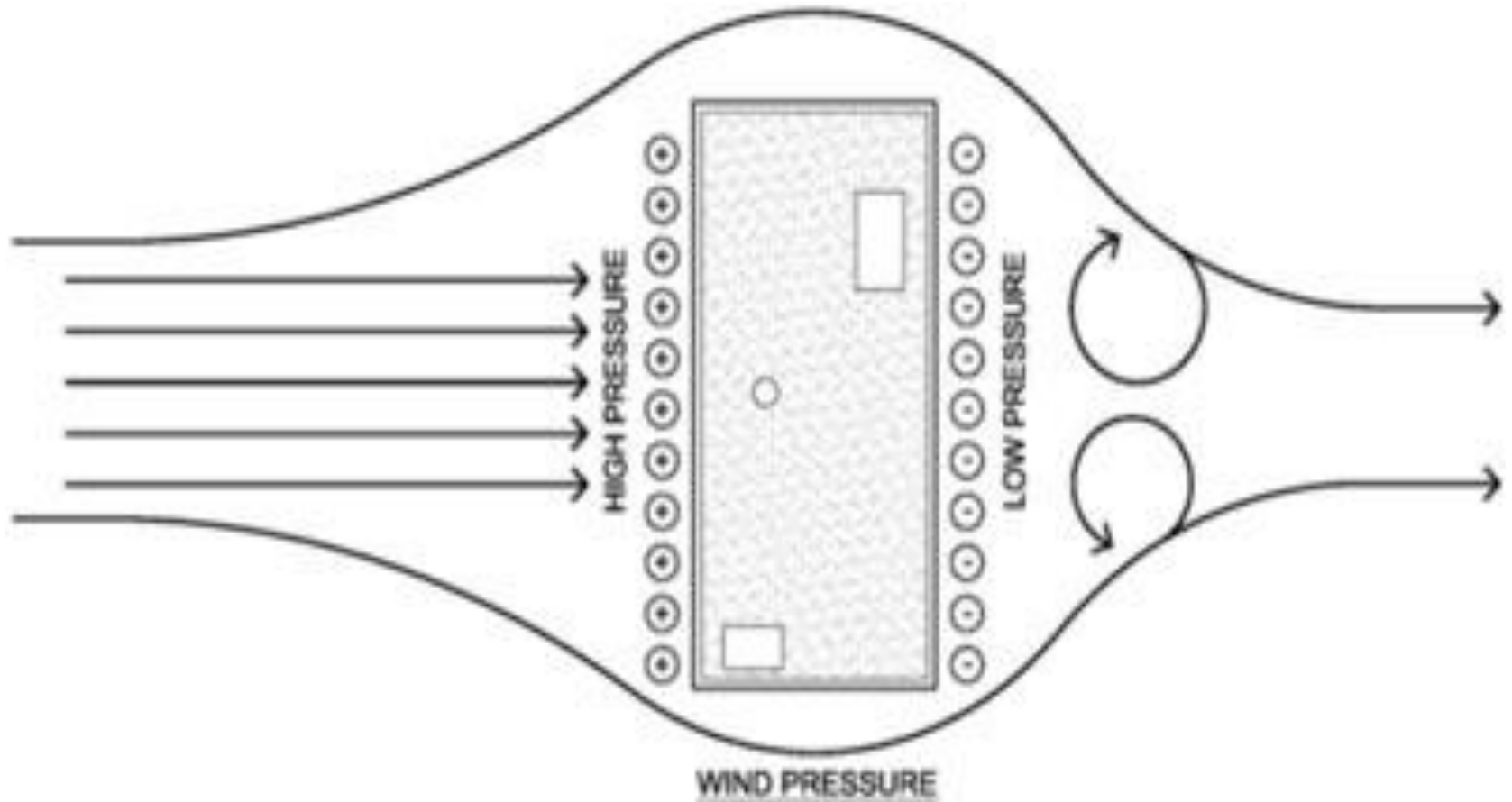
Air Movement Law # 3

Air Blows AND Sucks

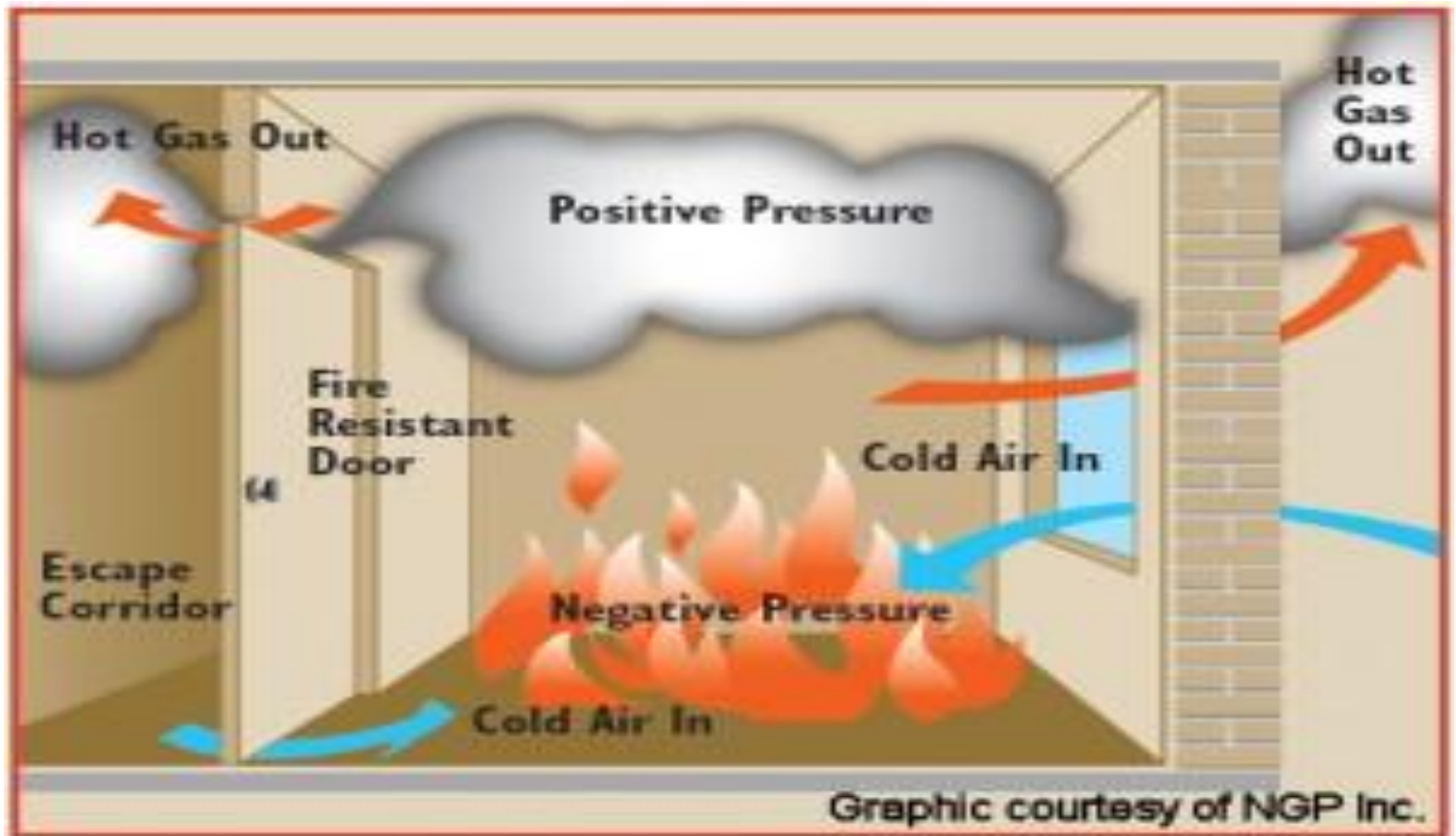


Air Movement Law # 3

Air Blows AND Sucks



Air Movement in a FIRE!!



Air Movement Review

- hot air rises
- air moves from high pressure to low pressure
- air blows & sucks

Moisture Movement Laws

- Moisture Movement Law # 1 - Liquid Water Falls Down
- Moisture Movement Law # 2 – Water can move in any direction (capillary, wind, other)
- Moisture Movement Law # 3 – When Air moves, it takes moisture with it
- Moisture Movement Law # 4 – Moisture can move without the movement of air

Moisture Movement Law # 1

Liquid Water Falls Down



Moisture Movement Law # 2

Water can move in ANY direction



Moisture Movement Law # 2

Water can move in ANY direction

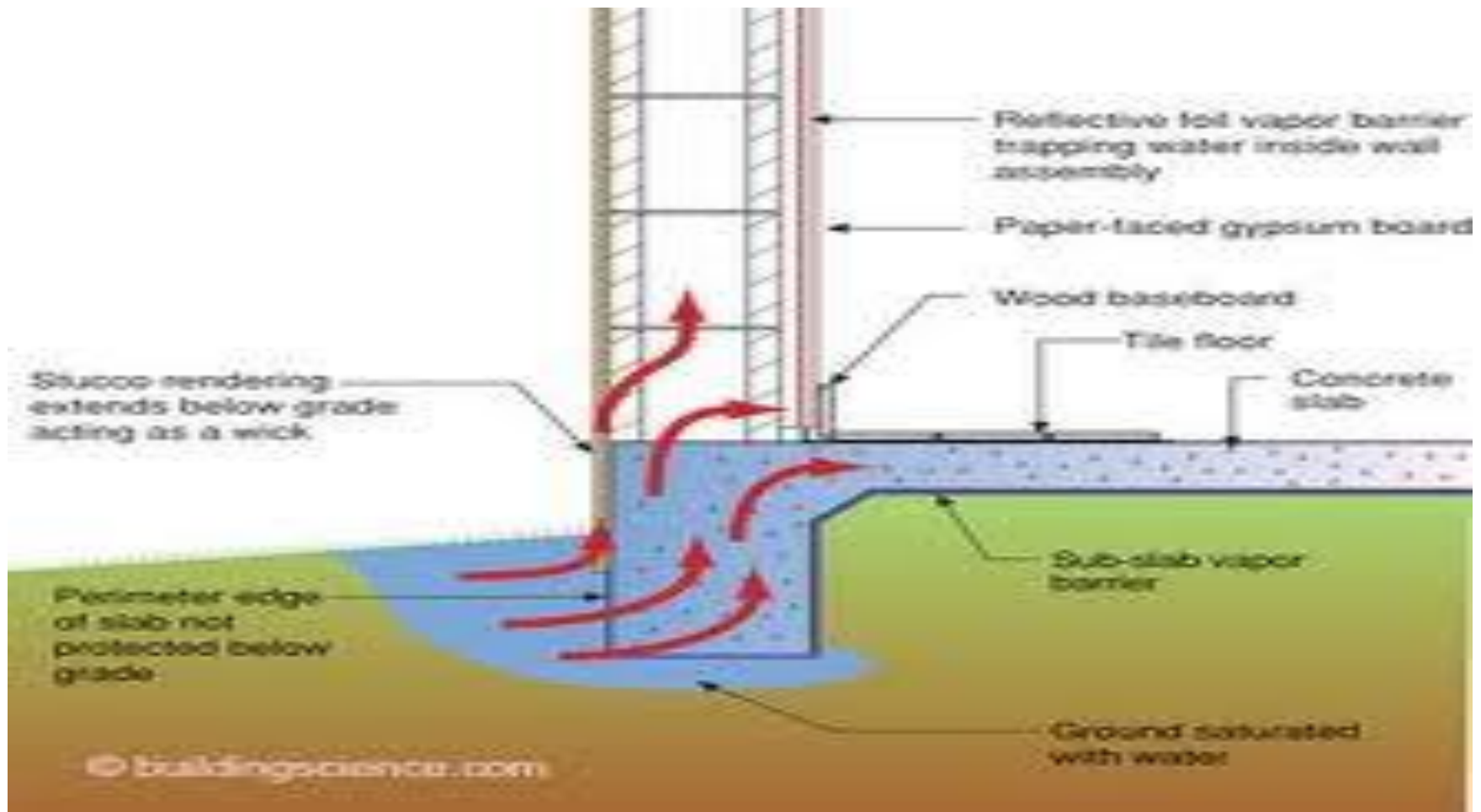
Capillary Action



Moisture Movement Law # 2

Water can move in ANY direction

Capillary Action



Moisture Movement Law # 2

Water can be blown uphill by wind



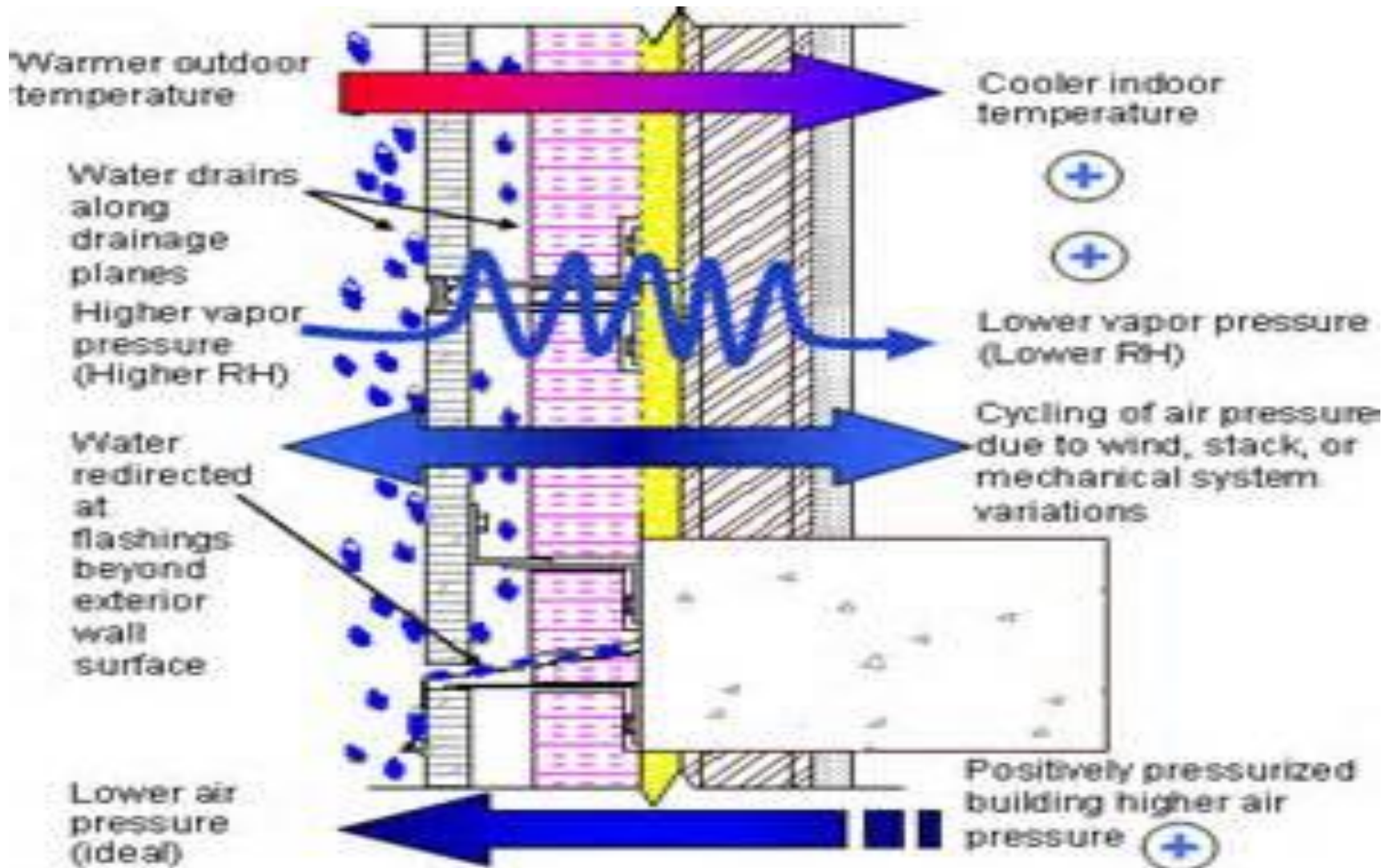
Moisture Movement Law # 3

When Air moves it take Moisture along



Moisture Movement Law # 3

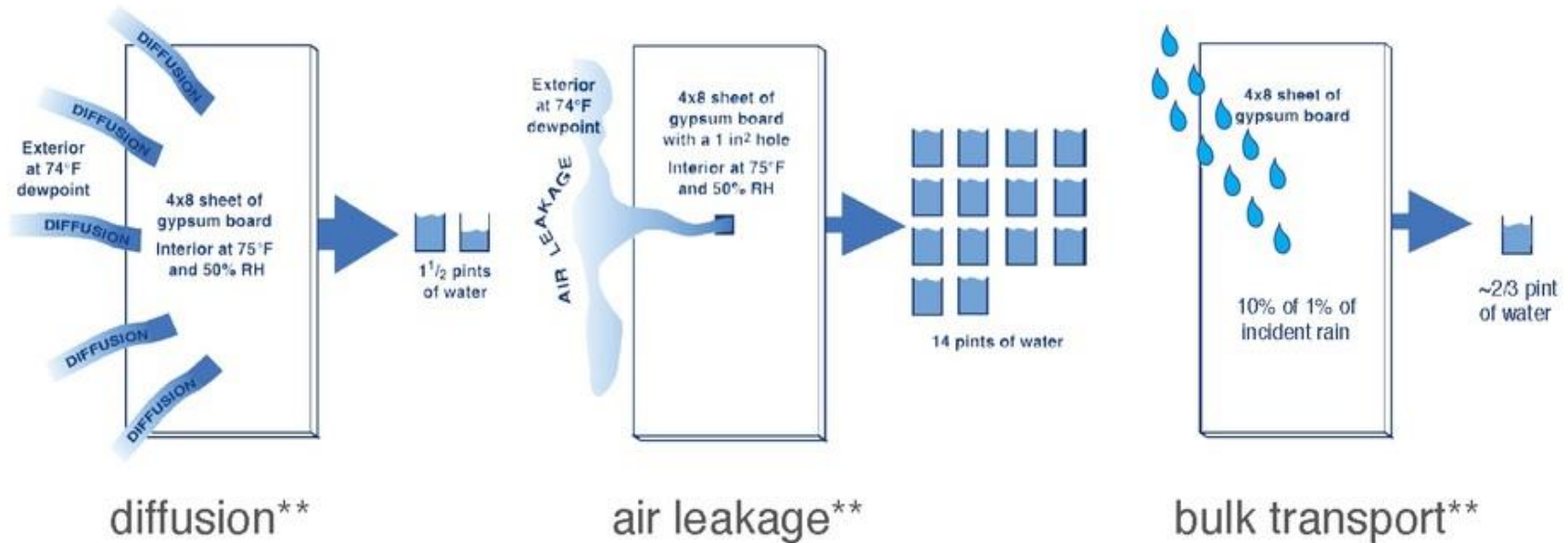
When Air moves it takes Moisture along



Moisture Movement Law # 4

Moisture can move without the movement of air

Diffusion vs Air Leakage vs Bulk Transport



*Diffusion & air leakage graphic courtesy of Lstiburek, "Builder's Guide to Hot Humid Climates" (2006); bulk transport graphic from C. Cronin, approximation based on 1% incident rain penetrating cladding (ASHRAE 160P) and 10% of that entering the wall cavity. Calculations (all cases) based on climate data for Atlanta, GA.

** Note that in the case vapor diffusion moisture is passed from one side of our 4x8 sheet of gypsum to the other over its entire 32sf area over an entire season, while moisture transmission due to air leakage and bulk transport is more concentrated.

Diffuse Flow vs. Orifice Flow

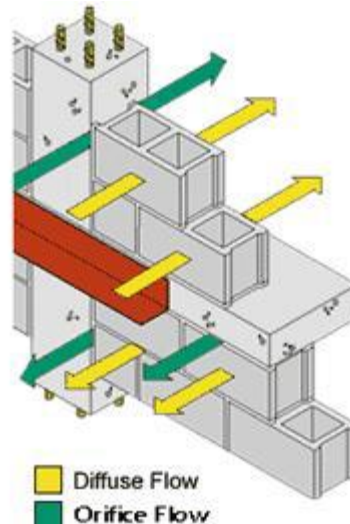
Vapor Diffusion Air Leakage

* slow

* fast

* low volume

* high volume



Moisture Transfer Study

- * 1 square meter wall board
- * 1 month
- * air diffusion thru wall board (no openings) = 0.00158 gal.
- * air leakage thru wall board with 1 inch 2 net opening = 3.7 gal.
- * **2,333x** more moisture transfer with opening !
- * other studies, **100x** to **5,000,000x** more

Institute for Research
in Construction,
National Research
Council, Canada





Disney

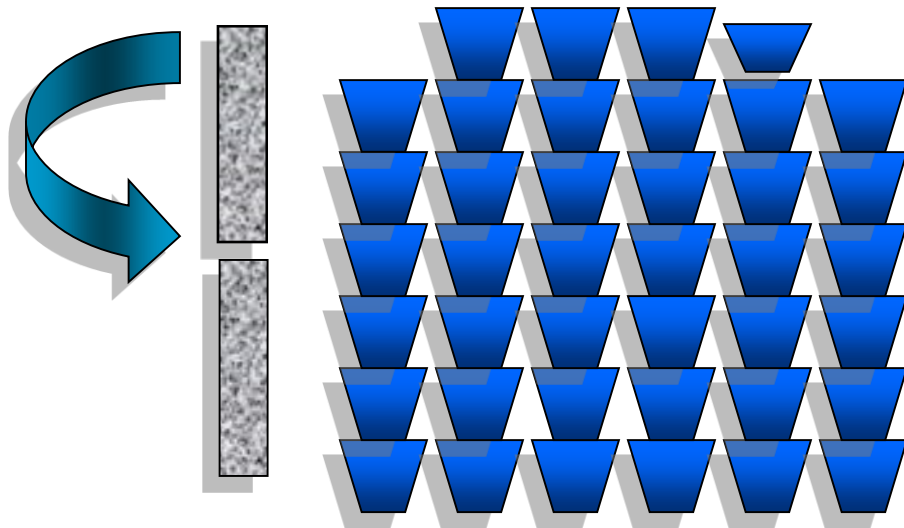
Water Vapor Transfer Study

CH2M Hill

- ✓ 3/4" hole (1/16" crack 1' long)
- ✓ 500 square foot wall
- ✓ Water vapor via air leak: 80 oz/day

Disney

Water Vapor Transfer Study



(annualized data)

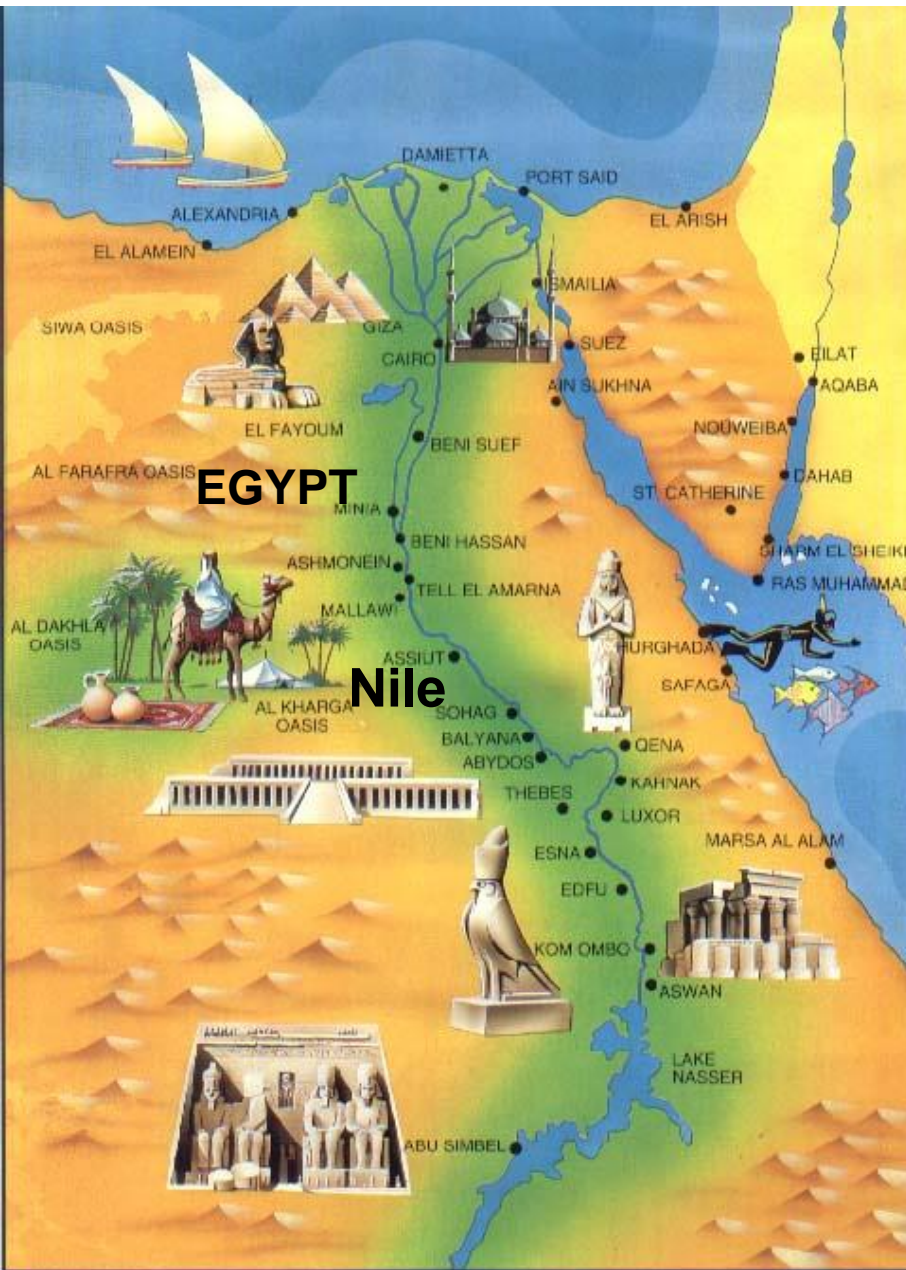
228 Gallons
(45.6 x 5 gal. buckets)

Moisture Movement Review

- water falls down
- water can move in any direction
- when air moves it takes moisture with it
- moisture can move without the movement of air
- a lot more moisture is transferred with air leakage compared to vapor diffusion

Walls that manage air and water go a long way toward providing occupants with a **healthy environment**.





U.S EPA's BASE study of 100 randomly selected U.S. office buildings found that 43% of the buildings had current water leaks, and 85% experienced previous water leaks.

A man with a beard and dark hair is holding a magnifying glass over his right eye. The magnifying glass is positioned so that his eye is significantly enlarged. A semi-transparent grey rectangular box is overlaid on the center of the image, containing the text "THESE ARE JUST THE ONES WE CAN SEE!!" in white, bold, sans-serif capital letters. The background shows an office setting with a white door, a calendar on the wall, and some papers pinned to a bulletin board.

**THESE ARE JUST THE ONES WE
CAN SEE!!**

BASE Study findings

somegeerintn.com



LEAKS COST MONEY AND WASTE ENERGY!!



BASE Study findings



Age: 3 years

Project Owner

Seattle Heights Homeowner's
Association

Project Architect:

Simpson Gumpertz & Heger Inc.

Project Size:

\$9,500,000 Exterior

\$2,500,000 Interior

Liquid detailing membrane

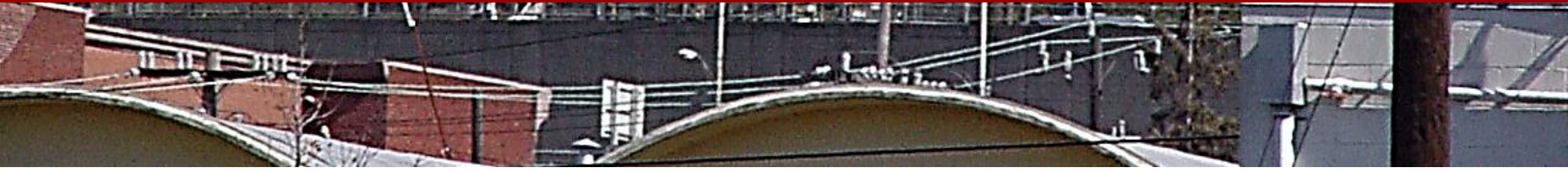
Age: 5 Years

Scope: Remove cladding, repair, replace windows, re-clad

Value: \$3 Million



Liquid detailing membrane



Age: 4 Years

Scope: Remove cladding, repair, replace windows, re-clad

Value: \$4.5 Million



Liquid detailing membrane



Age: 3 Years

Scope:

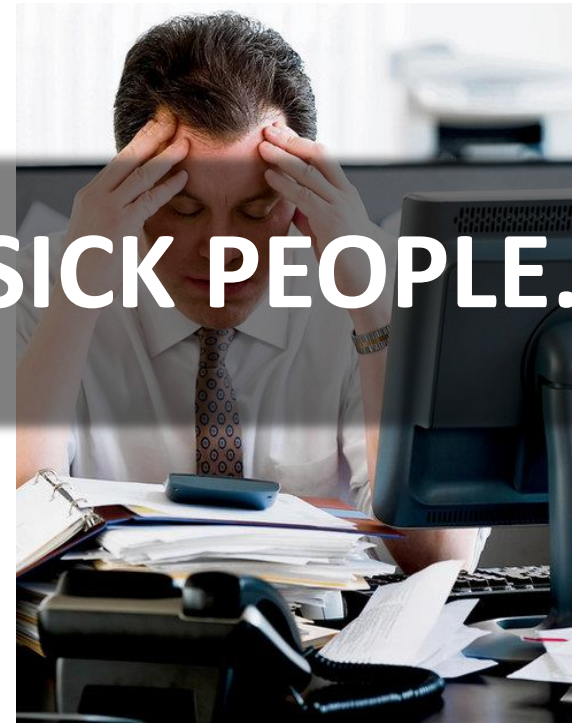
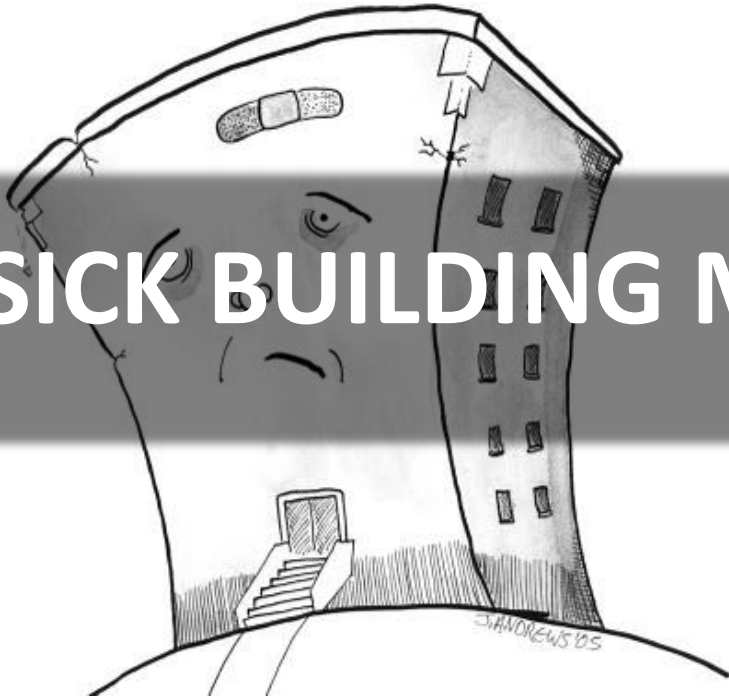
- *Remove cladding*
- *structural repair*
- *replace windows*
- *re-clad*

Value: \$14 Million

Liquid detailing membrane

Window replacement and cladding rebuild. \$14 million. Three years old at start of project.

SICK BUILDING MAKE SICK PEOPLE...



Liquid detailing membrane



SO WHAT'S THE ANSWER?
***HOW DO WE DESIGN & BUILD
BETTER BUILDINGS?***

Liquid detailing membrane

**One Building
Repair Contractor
Began with a
waterproofing
Product Wish List**

- ✓ Fluid applied (goes anywhere)
- ✓ **Bonds to damp surfaces**
- ✓ Adheres without a primer
- ✓ 100% solids to avoid shrinkage
- ✓ VOC Complaint – minimal odor
- ✓ **Immediately waterproof – withstands rain**
- ✓ Opaque when target thickness is achieved
- ✓ Can be exposed for up to 12 months
- ✓ Paintable / compatible
- ✓ Vapor permeable
- ✓ Reduces steps/saves time
- ✓ Easily repaired
- ✓ Self seals around fasteners

Liquid detailing membrane

Seattle, WA
Original Rough Opening
Prep materials failed after
ONLY 4 years. STP Based
products have been
performing since 2005!

Wall was opened in 2010 and
again in 2015 – products are
performing wonderfully.

STP Based Sealants and
adhesives have been used in
Asia and Europe for more
than 35 years and are gaining
wider acceptance in North
America.





701 Dexter Avenue N, Suite 301, Seattle, WA 98109
206.285.4300 : main 206.285.4371 : fax
www.oacsvcs.com

March 5, 2015

Tatley – Grund, Inc.
Building Repair Specialists
1115 No. 97th Street
Seattle, WA 98103

Attn: Stace Grund, President

Re: Renaissance Condominiums – Seattle, WA

Dear Mr. Grund:

OAC Services, Inc. (OAC), per your request, has visited the above reference site to review the installation of the fluid applied flashing system incorporated into this project. We first visited the site on June 1, 2009 and provided a report of our findings dated July 24, 2009. We visited the site again on February 17, 2015 to review the current condition of the flashing system. During our recent visit we met with the Tatley-Grund, Inc. crew performing the investigation and based on our observations we offer the following information.

Advantages of Fluid Applied

1. No laps or seams – monolithic.
2. No “fish mouths” or reverse lapping.
3. Easier Installation, successful installation with minimal training ... no origami.
4. Applied to opacity – easy quality control (thickness).
5. Easy protection of penetrations (Vent pipes, Plumbing pipes, electrical conduit, etc.).
6. Easily Repaired.
7. Minimal reduction of Rough Opening tolerances.
8. Can go onto Wet Substrates (NOT ALL PRODUCTS!!).
9. No Primers (NOT ALL PRODUCTS!!).

Disadvantages of Fluid Applied

1. Less control of thickness (compared to a peel and stick).
2. Less recognition by Architects, Engineers, Contractors and others in the Market.
3. Application Temperature? Some are 32 F and rising.
4. Material costs (per square foot) can be higher (although applied cost – including labor – are often lower).

Rough Opening Preparations

1. Asphaltic Emulsion
2. Acrylic
3. Polyurethane
4. Silicone
5. STPU
6. STPe

Asphaltic Emulsion

From their data sheets:

- + Easy to apply, potentially sprayable
- + Water based means easier clean up
- Water loss during cure means shrinkage
- Some are High Coating thickness (30 to 50 wet mils), some are low thickness (10)
- requires fabric (MOST)
- limited lower temperature application (some) (35 F)
- Operating temperature range (?)
- Not sure about Immediate waterproofing, opaque at target thickness, moisture vapor permeability, paintable / compatible, allowable exposure time, operating temperature range, ability to be repaired, self sealability

Asphaltic Emulsion

From Industry Knowledge:

1. Degradation of Asphaltic materials by environmental conditions (UV, heat, and moisture) on planet Earth has been well documented over the last 50 years. Once the material is covered by the window / door / exterior façade, there is no longer UV, but still heat and moisture.
2. An Asphaltic Emulsion would tend to soften with water immersion – therefore, not recommend for the Rough Opening itself.
3. Significant water content means shrinkage, it also means built in stress at the cured asphaltic / substrate interface.
4. Asphaltic materials tend to have poor movement capability when “new”, including the shrink factor problem, and tend to get harder / stiffer / and less rubbery as they age.
5. Before complete cure, there are concerns about wash off in the event of a rain.
6. Using the product close to freezing temperatures is problematic.
7. What is the melting point of the cured emulsion?

Acrylic

From their data sheets:

- + Easy to apply, potentially sprayable
- + Water based means easier clean up
- 50 % solids means shrinkage
- High Coating thickness (30 to 50 wet mils) required
- requires fabric (MOST, not all)
- limited lower temperature application (35 F)
- Operating temperature range (?)
- Not sure about Immediate waterproofing, opaque at target thickness, moisture vapor permeability, paintable / compatible, allowable exposure time, operating temperature range, ability to be repaired, self sealability

Acrylic

From Industry Knowledge:

1. Degradation of Acrylic coatings and sealants by environmental conditions (UV, heat, and moisture) on planet Earth has been well documented over the last 30 years. Once the material is covered by the window / door / exterior façade, there is no longer UV, but still heat and moisture.
2. Acrylics tend to soften with water immersion – therefore, not recommend for the Rough Opening itself.
3. 50 % solids means shrinkage, it also means built in stress at the acrylic / substrate interface.
4. Acrylics tend to have poor movement capability when “new”, including the shrink factor problem, and tend to get harder / stiffer / and less rubbery as they age.
5. Before complete cure, there are concerns about wash off in the event of a rain.
6. Using the product close to freezing temperatures is problematic.

Polyurethane

From their Data Sheets:

- + Recognized material in the Construction Market / broadly available.
- + multiple colors available (advantage?).
- Heavy film thickness required (40 mils)
- Application temperature 32 F and rising.
- Upper temperature operating limit 180 F.
- Low moisture vapor permeability
- Mesh required?
- Not sure about Immediate waterproofing, opaque at target thickness, moisture vapor permeability, paintable / compatible, ability to be repaired, self sealability, crack spanning

Polyurethane

From their Industry Knowledge:

1. Degradation of Polyurethane sealants by environmental conditions (UV, heat, and moisture) on planet Earth has been well documented over the last 30 years. Once the material is covered by the window / door / exterior façade, there is no longer UV, but still heat and moisture.
2. In many parts of the country a 32 F installation temperature is a real problem.
3. 180 F maximum operating temperature is simply not enough, temperatures will get higher than that in many cavities, in many parts of the Country.
4. Trapping moisture in the wall with a low moisture vapor permeable product is not a good idea.
5. Polyurethanes are crosslinked with Isocyanates – nasty chemicals.

Silicone

From their Data Sheets:

- + Recognized material in the Construction Market / broadly available.
- + multiple colors available – some manufacturers (advantage?).
- + excellent weather resistance.
- + low VOC / low odor.
- + inherently moisture vapor permeable.
- + excellent application temperature range (- 20 F to 120 F)
- + excellent operating temperature range (typically – 60 F to 300 F)
- + compatible (some)
- + long tooling time (some)
- + high durometer for abrasion resistance (some)

- Not recommended for application to wet substrates

- Generally not for single family residences or wood substrates

- Generally NOT paintable

- Not sure about Immediate waterproofing, opaque at target thickness, ability to be repaired, self sealability, crack spanning

Silicone

From Industry Knowledge:

1. Generally, once you go silicone, you can't go back (not an issue in the wall).
2. Not paintable.
3. Doesn't always play nice with other chemistries.

STPU

From their Data Sheets:

- + Bonds to damp surfaces
- + No primer
- + High Solids / VOC Compliant / very low odor
- + Paintable / compatible
- + easily repaired
- Not sure about Immediate waterproofing, opaque at target thickness, moisture vapor permeability, paintable / compatible, allowable exposure time, application temperature range, operating temperature range, repairability, self sealability, crack spanning
- not for water immersion
- 20 – 40 mils application thickness

STPU

From Industry Knowledge:

1. Related to, but not as well known as STPe's
2. Not much in the way of proven performance

STP(e)

From their Data Sheets:

- + Bonds to damp surfaces (most)
- + No primer (most)
- + High Solids / VOC Compliant / very low odor / no shrinkage (most)
- + Immediately Waterproof (some)
- + Opaque at target thickness (some)
- + Moisture vapor permeable (some)
- + Paintable / compatible (some)
- + 12 months exposure allowed (6 months for some)
- + Broad application temperature (for some)
- + good operating temperature (generally -50 F [or lower] to 300 F)
- + easily repaired (some)
- + self seals around fasteners (some)
- + 12 – 15 mils required thickness (some, others are thicker)
- - not for water immersion (generally, although versions are available)

STP(e)

From Industry Knowledge:

1. Not all STPe's are created equal.
2. Properties, especially UV performance, are totally based on the formulation
3. Some products have 10 years or more proven performance, others have very little
4. For some Manufacturers STPe is their workhorse and their focal point, for others it is to fill out the line

SUMMARY

By now, you should:

1. Have a little more Basic Air Barrier Knowledge.
2. Have a better understanding of the available Rough Opening Preparation and Air Barrier Chemistries.
3. Be able to differentiate between the different chemistries (advantages and disadvantages).
4. Be able to make a more informed decision on Rough Opening Preparation and Air Barrier Products and Chemistries.

This is the end of the AIA Presentation

Rough Opening Preparations

Now we name names

1. Asphaltic Emulsion → Tremco EnviroDri
2. Acrylic → Dow LiquidArmor, DryVit AquaFlash System, ProtectoWrap LWM200
3. Polyurethane → Tremco Dymonic 100, Sika 11 FC
4. Silicone → Dow Corning 778, Momentive Silpruf
5. STPU → Pecora XL-Flash
6. STPe → DuPont Tyvek Fluid Applied Flashing & Joint Compound, Henry Air-Bloc LF, StoGuard RapidSeal, VaproShield VaproLiqui-Flash, Zip System Liquid Flash, W.R Meadows Air-Shield Liquid Flashing (?), PROSOCO Joint & Seam Filler PROSOCO FastFlash

Air / Water Barriers

Now we name names

1. Asphaltic Emulsion → Tremco EnviroDri
2. Acrylic → Dow LiquidArmor (, DryVit AquaFlash System, ProtectoWrap LWM200, Tremco ExoAir 230, Henry AirBloc 31MR, STO EmeraldCoat, Carlisle FR Barritech VP, PROSOCO SprayWrap MVP, PROSOCO VB
3. Polyurethane → None
4. Silicone → Dow Corning DefendAir 200, Momentive GE Elemax 2600
5. STPU → Pecora XL-Perm Ultra VP
6. STPe → DuPont Liquid Tyvek, 3M Liquid Air Barrier 2085 VP, PROSOCO Cat 5

Rough Opening Preparations

What is important?

- + Bonds to damp surfaces
- + No primer
- + High Solids / VOC Compliant / very low odor / no shrinkage
- + Immediately Waterproof
- + Opaque at target thickness
- + Moisture vapor permeable
- + Paintable / compatible
- + 12 months exposure allowed
- + Broad application temperature
- + good operating temperature
- + easily repaired
- + self seals around fasteners
- + 12 – 15 mils required thickness
- + Proven Performance

Air / Water Barriers

What is important?

- + Bonds to damp surfaces
- + No primer
- + High Solids / VOC Compliant / very low odor / no shrinkage
- + Immediately Waterproof
- + Opaque at target thickness
- + Moisture vapor permeable
- + Compatible
- + 12 months exposure allowed
- + Broad application temperature
- + good operating temperature
- + easily repaired
- + self seals around fasteners
- + 12 – 15 mils required thickness
- + Proven Performance

Rough Opening Preparations

Asphaltic Emulsion

Tremco EnviroDri (others?)

NOTE: This information is from Product Data Sheets from the Internet, other information may be available.

- Bonds to damp surfaces? No, substrate must be clean and dry
- + No primer? Yes
- High Solids / VOC Compliant / very low odor? No. Could not find solids content, but likely 60 to 80 %. This will mean shrinkage and bond line stress.
- Immediately Waterproof? Definitely not. Will wash off if not cured.
- + Opaque at target thickness? Yes.
- + Moisture vapor permeable? Reasonable, 12 Perms.
- Paintable / compatible? Not addressed.
- 12 months exposure? 120 days.
- + Broad application temperature? 0 F is claimed, below 130 F wall temperature.
- good operating temperature? Is not addressed. Asphalt melts at a relatively low temperature
- easily repaired? Not addressed.
- self seals around fasteners? Not addressed.
- 12 – 15 mils required thickness? Less than 10 mils, they say 12 – 15 wet ... then shrinkage.????
- Able to span cracks? Not addressed.
- Proven Performance? Unknown.
- Contains Asphalt, mineral spirits (solvent), Potassium Hydroxide, 1,2,4 Trimethyl Benzene, Ammonium Hydroxide, Asphalt will burn!!

Rough Opening Preparations

Acrylics

Dow LiquidArmor, DryVit AquaFlash Liquid, ProtectoWrap LWM200

NOTE: This information is from Product Data Sheets from the Internet, other information may be available.

- + Bonds to damp surfaces? ProtectoWraps (PW) says yes, the others do not address
- + No primer? Yes
- High Solids / VOC Compliant / very low odor? No. 50 – 75 % solids means shrinkage.
- Immediately Waterproof? Definitely not. Wash off if not cured. Rain resistant?
- + Opaque at target thickness? Yes.
- + Moisture vapor permeable? Reasonable, 4 to 14 Perms.
- Paintable / compatible? Not addressed.
- 12 months exposure? PW says 90 days, others do not address.
- Broad application temperature? 35 F (Dow) or 40 F (others) and rising, below 120 F.
- good operating temperature? PW says 0 F to 180 F, others do not address.
- easily repaired? Not addressed.
- self seals around fasteners? Not addressed.
- 12 – 15 mils required thickness? PW: 30 mils wet, Dow: 50 mils wet, DryVit: 2 coats to imbed the mesh.
- + Able to span cracks? PW: 1/16" larger must be addressed, Dow: 1/4", larger, foam it, DryVit: over 1/4" must be addressed
- Proven Performance? Unknown.

Rough Opening Preparations Polyurethanes

Tremco Dymonic 100, Sika 11 FC

NOTE: This information is from Product Data Sheets from the Internet, other information may be available.

- Bonds to damp surfaces? Tremco says yes, but ... Sika says no.
- + No primer? Yes
- + High Solids / VOC Compliant / very low odor? Low VOC's. Some solvent odor.
- Immediately Waterproof? Not addressed.
- Opaque at target thickness? One would think so, but not addressed.
- Moisture vapor permeable? Not addressed, but generally quite low.
- + Paintable / compatible? Not addressed, but should be okay.
- + 12 months exposure? Tremco says "no limit", Sika does not address.
- Broad application temperature? 32 F (Tremco) or 25 F (Sika) and rising, below 100 F.
- + good operating temperature? Tremco says - 40 F to 180 F, Sika does not address.
- easily repaired? Not addressed.
- self seals around fasteners? Not addressed.
- 12 – 15 mils required thickness? Tremco: 40 mils wet, Sika does not address.
- Able to span cracks? Neither specifically address.
- Proven Performance? Unknown.

Rough Opening Preparations

Silicones

Dow Corning 778, Momentive GE Elemax 5000

NOTE: This information is from Product Data Sheets from the Internet, other information may be available.

- Bonds to damp surfaces? Not addressed.
- + No primer? Yes
- + High Solids / VOC Compliant / very low odor? Yes.
- Immediately Waterproof? Not address, but should be.
- Opaque at target thickness? Not addressed, but at target thicknesses, it should be.
- + Moisture vapor permeable? Not addressed, but silicones should be okay.
- Paintable / compatible? Not addressed ... silicones are (generally)not paintable, but should be compatible. Neither company mentions wood.
- + 12 months exposure? Not addressed, but should not be a problem for silicone.
- + Broad application temperature? - 20 F to 120 F.
- + good operating temperature? Not addressed, but generally – 50 F to 300 F.
- easily repaired? Not addressed.
- self seals around fasteners? Not addressed.
- 12 – 15 mils required thickness? Dow Corning: 20 - 50 mils wet, Momentive: Not addressed.
- Able to span cracks? Not addressed.
- Proven Performance? Unknown.

Rough Opening Preparations

STPU

Percora XL-Flash

NOTE: This information is from Product Data Sheets from the Internet, other information may be available.

- + Bonds to damp surfaces? Yes
- + No primer? Yes (most substrates).
- + High Solids / VOC Compliant / very low odor? Yes.
- Immediately Waterproof? Not addressed.
- Opaque at target thickness? Not addressed.
- Moisture vapor permeable? Not addressed.
- Paintable / compatible? Not addressed.
- 12 months exposure? Not addressed.
- Broad application temperature? Not addressed.
- good operating temperature? Not addressed.
- easily repaired? Not addressed.
- self seals around fasteners? Not addressed.
- 12 – 15 mils required thickness? 20 – 40 mils wet.
- Able to span cracks? Not addressed.
- Proven Performance? Unknown.

Rough Opening Preparations

STPe

NOTE: This information is from Product Data Sheets from the Internet, other information may be available.

DuPont Tyvek Fluid Applied Flashing & Joint Compound

- + Bonds to damp surfaces? Yes.
- + High Solids / VOC Compliant / very low odor? Yes.
- + Immediately Waterproof? Yes.
- + Opaque at target thickness? Yes.
- + Moisture vapor permeable? Reasonable, 25 Perms at 25 mils.
- Paintable / compatible? Not addressed.
- 12 months exposure? Nine (9) months.
- Broad application temperature? 25 F and rising, below 140 F.
- good operating temperature? Not addressed.
- easily repaired? Not addressed.
- self seals around fasteners? Not addressed.
- 12 – 15 mils required thickness? 25 mils.
- + Able to span cracks? Up to ¼", if greater cover with mesh, then cover with product.
- Proven Performance? Unknown.

Rough Opening Preparations

STPe

NOTE: This information is from Product Data Sheets from the Internet, other information may be available.

Henry Air-Bloc LF

- + Bonds to damp surfaces? Yes.
- + High Solids / VOC Compliant / very low odor? Yes.
- + Immediately Waterproof? Yes.
- Opaque at target thickness? Not addressed, but likely yes.
- + Moisture vapor permeable? Reasonable, 21.8 Perms at 25 mils.
- Paintable / compatible? Not addressed.
- 12 months exposure? Not addressed.
- Broad application temperature? 20 F and rising, below 110 F.
- + good operating temperature? - 40 F to 200 F..
- easily repaired? Not addressed.
- + self seals around fasteners? Yes.
- 12 – 15 mils required thickness? Never specifically say ... 12 – 40 mils.
- + Able to span cracks? Up to 1/8", if greater fill with 925 BES, or Air-Bloc LF, then cover with product.
- Proven Performance? Unknown.

Rough Opening Preparations

STPe

NOTE: This information is from Product Data Sheets from the Internet, other information may be available.

StoGuard RapidSeal

- + Bonds to damp surfaces? Yes.
- + High Solids / VOC Compliant / very low odor? Yes.
- + Immediately Waterproof? Yes.
- + Opaque at target thickness? Yes.
- + Moisture vapor permeable? Reasonable, 21 Perms
- Paintable / compatible? Not addressed.
- 12 months exposure? Not addressed.
- Broad application temperature? 33 F and rising, below 100 F.
- good operating temperature? Not addressed.
- easily repaired? Not addressed.
- self seals around fasteners? Not addressed.
- + 12 – 15 mils required thickness? 12 mils.
- + Able to span cracks? Up to ¼", if greater cover with mesh, then cover with product.
- Proven Performance? Unknown.

Rough Opening Preparations

STPe

NOTE: This information is from Product Data Sheets from the Internet, other information may be available.

VaproShield VaproLiqui-Flash

- + Bonds to damp surfaces? Yes.
- + High Solids / VOC Compliant / very low odor? Yes.
- + Immediately Waterproof? Yes.
- + Opaque at target thickness? Yes.
- + Moisture vapor permeable? Reasonable, 14 Perms at 12 mils.
- Paintable / compatible? Paintable not addressed. Compatible: Yes.
- 12 months exposure? Six (6) months.
- Broad application temperature? 35 F and rising, below 100 F.
- + good operating temperature? - 50 F to 350 F.
- easily repaired? Not addressed.
- self seals around fasteners? Not addressed.
- + 12 – 15 mils required thickness? 12 to 15 mils.
- Able to span cracks? Not addressed.
- Proven Performance? Unknown.

Rough Opening Preparations

STPe

NOTE: This information is from Product Data Sheets from the Internet, other information may be available.

Zip System Liquid Flash

- + Bonds to damp surfaces? Yes.
- + High Solids / VOC Compliant / very low odor? Yes.
- + Immediately Waterproof? Yes.
- + Opaque at target thickness? Yes.
- + Moisture vapor permeable? Reasonable, 25 at 25 mils.
- Paintable / compatible? Not addressed.
- 12 months exposure? Six (6) months.
- Broad application temperature? 35 F and rising, below 110 F.
- good operating temperature? Not addressed.
- easily repaired? Not addressed.
- self seals around fasteners? Not addressed.
- + 12 – 15 mils required thickness? Not addressed.
- + Able to span cracks? Up to 1/2", if greater fill space, then cover with product.
- Proven Performance? Unknown.

Rough Opening Preparations

STPe

NOTE: This information is from Product Data Sheets from the Internet, other information may be available.

W.R. Meadows Air-Shield Liquid Flashing

- + Bonds to damp surfaces? Yes.
- + High Solids / VOC Compliant / very low odor? Yes.
- + Immediately Waterproof? Not addressed.
- + Opaque at target thickness? Yes.
- Moisture vapor permeable? Not addressed.
- + Paintable / compatible? Paintable, yes. Compatible with other WRM Products.
- + 12 months exposure? Yes.
- Broad application temperature? Greater than 32 F (upper limit not provided).
- good operating temperature? - 20 F to 200 F.
- easily repaired? Not addressed.
- self seals around fasteners? Not addressed.
- + 12 – 15 mils required thickness? 12 to 15 mils.
- + Able to span cracks? Up to ¼", if greater prefill gaps, allow to skin, then cover with product.
- Proven Performance? Unknown.

Rough Opening Preparations

STP(e)

NOTE: This information is from Product Data Sheets from the Internet, other information may be available.

PROSOCO FastFlash

- + Bonds to damp surfaces? Yes.
- + High Solids / VOC Compliant / very low odor? Yes.
- + Immediately Waterproof? Yes.
- + Opaque at target thickness? Yes.
- + Moisture vapor permeable? Reasonable, 21 perms at 12 mils.
- + Paintable / compatible? Yes.
- + 12 months exposure? Yes.
- + Broad application temperature? Can be applied below 32 F (experience = - 10 F), but limited cure until above 32 F. High end, if above 95 F, only apply in the shade.
- + good operating temperature? - 75 F to 300 F .
- + easily repaired? Yes.
- + self seals around fasteners? Yes.
- + 12 – 15 mils required thickness? Yes.
- + Able to span cracks? Up to ¼", ¼" to ½" use backer rod (or other) cover with product. Over ½" consult with company.
- + Proven Performance? Yes.

Air / Water Barriers

Now we name names

1. Asphaltic Emulsion → Tremco EnviroDri
2. Acrylic → Dow LiquidArmor (, DryVit AquaFlash System, ProtectoWrap LWM200, Tremco ExoAir 230, Henry AirBloc 31MR, STO EmeraldCoat, Carlisle FR Barritech VP, PROSOCO SprayWrap MVP
3. Polyurethane → None
4. Silicone → Dow Corning DefendAir 200, Momentive GE Elemax 2600
5. STPU → Pecora XL-Perm Ultra VP
6. STPe → DuPont Liquid Tyvek, 3M Liquid Air Barrier 2085 VP, PROSOCO Cat 5

Air Barriers

Asphaltic Emulsion

Tremco EnviroDri (others?)

NOTE: This information is from Product Data Sheets from the Internet, other information may be available.

- Bonds to damp surfaces? No, substrate must be clean and dry
- + No primer? Yes
- High Solids / VOC Compliant / very low odor? No. Could not find solids content, but likely 60 to 80 %. This will mean shrinkage and bond line stress.
- Immediately Waterproof? Definitely not. Will wash off if not cured.
- + Opaque at target thickness? Yes.
- + Moisture vapor permeable? Reasonable, 12 Perms.
- Paintable / compatible? Not addressed.
- 12 months exposure? 120 days.
- + Broad application temperature? 0 F is claimed, below 130 F wall temperature.
- good operating temperature? Is not addressed. Asphalt melts at a relatively low temperature
- easily repaired? Not addressed.
- self seals around fasteners? Not addressed.
- 12 – 15 mils required thickness? Less than 10 mils, they say 12 – 15 wet ... then shrinkage.????
- Able to span cracks? Not addressed.
- Proven Performance? Unknown.
- Contains Asphalt, mineral spirits (solvent), Potassium Hydroxide, 1,2,4 Trimethyl Benzene, Ammonium Hydroxide, Asphalt will burn!!

Air Barriers

Acrylics

NOTE: This information is from Product Data Sheets from the Internet, other information may be available.

Dow LiquidArmor (, DryVit AquaFlash System, ProtectoWrap LWM200, Tremco ExoAir 230, Henry AirBloc 31MR, STO EmeraldCoat, Carlisle FR Barritech VP, PROSOCO SprayWrap MVP

- + Bonds to damp surfaces? ProtectoWraps (PW) says yes, the others do not address
- + No primer? Yes
- High Solids / VOC Compliant / very low odor? No. 50 – 75 % solids means shrinkage.
- Immediately Waterproof? Definitely not. Wash off if not cured. Rain resistant?
- + Opaque at target thickness? Yes (generally)
- + Moisture vapor permeable? Reasonable, 4 to 34 Perms.
- Paintable / compatible? Not addressed.
- 12 months exposure? PW says 90 days, others do not address.
- Broad application temperature? 35 F (Dow) or 40 F (others) and rising, below 120 F.
- good operating temperature? PW says 0 F to 180 F, others do not address.
- easily repaired? Not addressed.
- self seals around fasteners? Not addressed.
- 12 – 15 mils required thickness? PW: 30 mils wet, Dow: 50 mils wet, DryVit: 2 coats to imbed the mesh.
- + Able to span cracks? PW: 1/16" larger must be addressed, Dow: ¼", larger, foam it, DryVit: over ¼" must be addressed
- Proven Performance? Unknown.

Air Barriers

Polyurethanes

None

NOTE: This information is from Product Data Sheets from the Internet, other information may be available.

- + Bonds to damp surfaces?
- + No primer?
- + High Solids / VOC Compliant / very low odor
- + Immediately Waterproof?
- + Opaque at target thickness?
- + Moisture vapor permeable?
- + Paintable / compatible?
- + 12 months exposure?
- + Broad application temperature?
- + good operating temperature?
- + easily repaired?
- + self seals around fasteners?
- + 12 – 15 mils required thickness?
- + Able to span cracks?
- + Proven Performance?

Air Barriers

Silicones

Dow Corning DefendAir 200, Momentive GE Elemax 2600

NOTE: This information is from Product Data Sheets from the Internet, other information may be available.

- Bonds to damp surfaces? Not addressed. DefendAir 200 is water based
- + No primer? Yes
- High Solids / VOC Compliant / very low odor? DefendAir 200 is water based.
- Immediately Waterproof? DefendAir 200 – No. Elemax 2600 is solvent based – 30 minutes
- + Moisture vapor permeable? DefendAir 200 24.2, Elemax 2600: 10.5
- Paintable / compatible? Not addressed ... silicones are (generally)not paintable, but should be compatible. Neither company mentions wood.
- + 12 months exposure? Not addressed, but should not be a problem for silicone.
- Broad application temperature? DefendAir 200: 40 F to 100 F Elemax 2600: 0 F to 150 F
- + good operating temperature? DefendAir 200: -15 F to 300 F Elemax 2600: - 40 F to 300 F
- easily repaired? Not addressed.
- self seals around fasteners? Not addressed.
- + 12 – 15 mils required thickness? DefendAir 200: 30 mils wet (15 mils dry), Momentive: 10 mils dry, minimum
- Able to span cracks? Not addressed.
- Proven Performance? Unknown.

Air Barriers

STPU

Pecora XL-Perm Ultra VP

NOTE: This information is from Product Data Sheets from the Internet, other information may be available.

- + Bonds to damp surfaces? Yes
- + No primer? Yes (most substrates).
- High Solids / VOC Compliant / very low odor? 78 % solids.
- Immediately Waterproof? Not addressed.
- Opaque at target thickness? Not addressed.
- + Moisture vapor permeable? 11.42
- Paintable / compatible? Not addressed.
- 12 months exposure? Not addressed.
- Broad application temperature? Not addressed.
- good operating temperature? Not addressed.
- easily repaired? Not addressed.
- + self seals around fasteners? yes
- 12 – 15 mils required thickness? 8 – 12 mils dry.
- Able to span cracks? Not addressed.
- Proven Performance? Unknown.

Air Barriers

STPe

NOTE: This information is from Product Data Sheets from the Internet, other information may be available.

DuPont Tyvek Fluid Applied WB+

- + Bonds to damp surfaces? Yes.
- + High Solids / VOC Compliant / very low odor? Yes.
- + Immediately Waterproof? Yes.
- + Opaque at target thickness? Yes.
- + Moisture vapor permeable? Reasonable, 25 Perms at 25 mils.
- Paintable / compatible? Not addressed.
- 12 months exposure? Nine (9) months.
- Broad application temperature? 25 F and rising, below 140 F.
- good operating temperature? Not addressed.
- easily repaired? Not addressed.
- self seals around fasteners? Not addressed.
- 12 – 15 mils required thickness? 25 mils.
- + Able to span cracks? Up to ¼", if greater cover with mesh, then cover with product.
- Proven Performance? Unknown.

Air Barriers

STPe

NOTE: This information is from Product Data Sheets from the Internet, other information may be available.

3M Liquid Air Barrier 2085 VP

- + Bonds to damp surfaces? Yes.
- High Solids / VOC Compliant / very low odor? 93% Solids
- + Immediately Waterproof? Yes.
- + Opaque at target thickness? Yes.
- + Moisture vapor permeable? Reasonable, 18.3 perms
- Paintable / compatible? Not addressed.
- 12 months exposure? Not addressed.
- Broad application temperature? 25 F to 100 F.
- good operating temperature? Not addressed.
- easily repaired? Not addressed.
- self seals around fasteners? Not addressed.
- 12 – 15 mils required thickness? 26 – 35 mils (wet) depending on substrate
- Able to span cracks? Not addressed.
- Proven Performance? Unknown.

Air Barriers

STPe

NOTE: This information is from Product Data Sheets from the Internet, other information may be available.

PROSOCO Cat 5

- + Bonds to damp surfaces? Yes.
- + High Solids / VOC Compliant / very low odor? Yes. 99 % solids.
- + Immediately Waterproof? Yes.
- + Opaque at target thickness? Yes.
- + Moisture vapor permeable? Yes. 18 perms
- + Paintable / compatible? Yes.
- + 12 months exposure? Yes.
- + Broad application temperature? Below 32 F allowed to 110 F.
- + good operating temperature? - 75 F to 300 F.
- + easily repaired? Yes.
- + self seals around fasteners? Yes.
- + 12 – 15 mils required thickness? Yes.
- + Able to span cracks? Yes.
- + Proven Performance? Yes.

Rough Opening Preparations / Air Barrier - Other Considerations

- + NFPA 285 and other Fire Testing (ASTM E84)
- + ICC-ES AC212 Acceptance Criteria for Water-Resistive Coatings used as Water- Resistive Barriers over Sheathing (ASTM C297, ICC-ES AC212, ASTM D2247, ASTM E331, AATCC 127).
- + ABAA Acceptance Criteria for Liquid Applied Membranes (ASTM E2357).
- + Other?