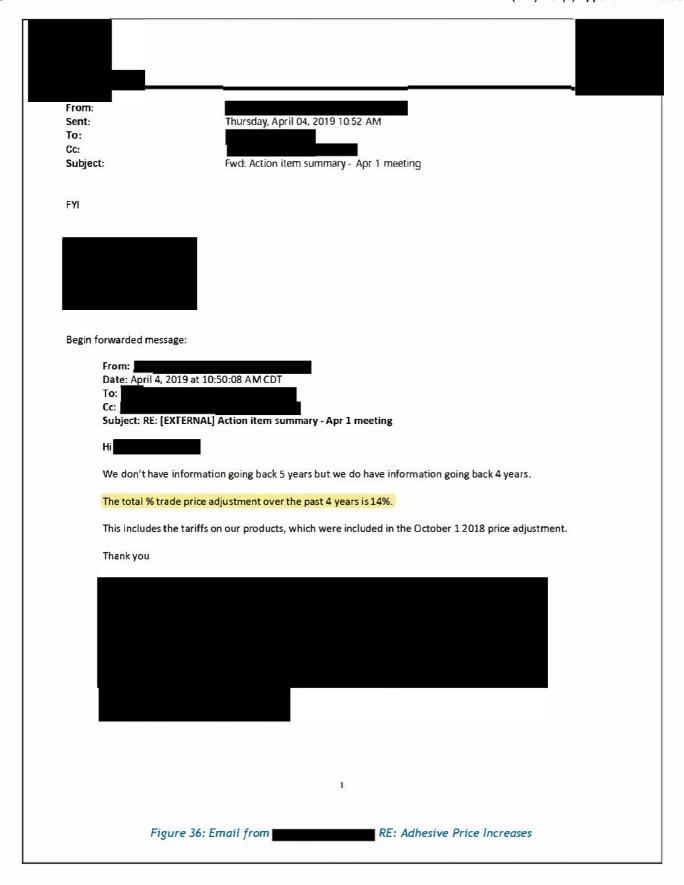
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Sent:

Monday, March 11, 2019 2:58 PM

To: Subject:

RE: Panel Bond/Structural Adhesives - Usage Info.

Follow Up Flag: Flag Status: Follow up Flagged

This is a common question and there are some variables to keep in mind such as:

- Is the adhesive being used to "butter" or "prime" the surface before the bonding bead?
- What size is the bead?
 - In our current instructions for our acrylic adhesive we state to apply a 3/8" to 1/2" bead this allows for adequate squeeze out to cover all bare metal.
 - In our instructions for our epoxy adhesive we state to apply some adhesive to both sides of the joint and spread out as a "primer" (typically referred to as buttering) and then apply a ¼" to 3/8" bonding bead.
 - One of our competitors states to "prime" first and then apply a 1/8" bonding bead which, in my experience, is slightly inadequate.
- Optimum bondline thickness is set by glass beads within the product, but panel flange irregularities can lead to increased material need.
- There will be a couple of "inches" of waste per package for leveling the pistons and purging the mixer.

This chart is from our industrial folks

BEAD LENGTH ESTIMATOR - FEET (M)

Linear Coverage: Use the table below to determine the length of adhesive bead that can be obtained from a cartridge of adhesives.

			BEAD D	AMETER - In (c)	m)		
		0.125 (0.30)	0.188 (0.48)	0 250 (0.60)	0.313 (0.80)	0.375 (0.95)	0.500 (1.30)
	40	17 (5,00)	7.4 (2.20)	4,1 (1.30)	2 7 (0.80)	1 8 (0 60)	1.0 (0 30)
(JE)	50	21 (6.30)	9.2 (2 80)	5.2 (1.60)	3.3 (1 00)	2.3 (0.70)	1 3 (0 40)
TOME	200	63 (25.20)	37 (11,20)	21 (6 30)	13 (4 00)	9 (2.80)	5.2 (1.80)
TOA B	375	155 (47 20)	69 (21,00)	39 (11 80)	25 (7.60)	17 (5.20)	10 (3.10)
CARTRIDGE VOLUME	400	166 (50.40)	74 (22.40)	41 (12.60)	27 (8.10)	18 (5.60)	10 (3.10)
O	485	201 (61 10)	89 (27-20)	60 (15.30)	32 (9 80)	22 (6 00)	13 (3 60)
	600	249 (76 60)	111 (33.60)	62 (18.70)	40 (12.10)	28 (8.40)	16 (4.70)

This is more realistic using our package sizes

Fusor	Size (Ratio)	.125"	.188"	.250"	.313"	.375"	.500"

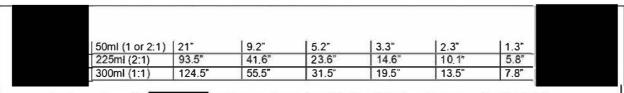
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Figure 37: Email from

RE: Adhesive Usage by Repair Type (pg. 1)

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As shown above, the has three package sizes (50, 225, 300 ml) and two mix ratios (1:1 & 2:1). Most other adhesive suppliers have "200 ml" (which be 200, 210, 220 ml or in between...). My point being that if "kits" are being discussed we need to know what is actually being used. Also, squeeze out is the preferred end result to confirm adequate adhesive is in the joint...

Now my thoughts on the original question with comments

- Door Skin I generally say estimate for .5 of a cartridge.
- Rear Quarter Panel size of the panel comes into play but typically estimate 1 1.5 cartridges.
- Roof depends on how the sides will mate if weld bonded flat to flat then less adhesive than if a bond-only "edge into pile" (FCA laser brazed roof replacement uses this process for repair).
- Side Panel/Aperture for a front aperture 1-1.5, and for a rear with quarter 1.5 2.0 cartridges.
- Box Side (truck) bed length and bond zones play into this but 1.0-1.5 cartridges.
- Floor Panel not sure on this one but if it were a "spare tire well" I would say 1.0-1.5 cartridges

So, there is a lot to this topic. One competitor has a measuring tool to calculate perimeter inches and then convert to usage – interesting but I'm hearing more of a dust collector.

To stir it up more there is the seam sealing topic which aligns identically with cartridge content and bead size but sealing can eat up a lot more material than bonding as there is no bond-line thickness to achieve but instead a shape to match the original. Some of the more challenging beads such as "stacked dimes" will also have a "set-up and test" factor to dial in the replacement bead...

Hope this helps!!!



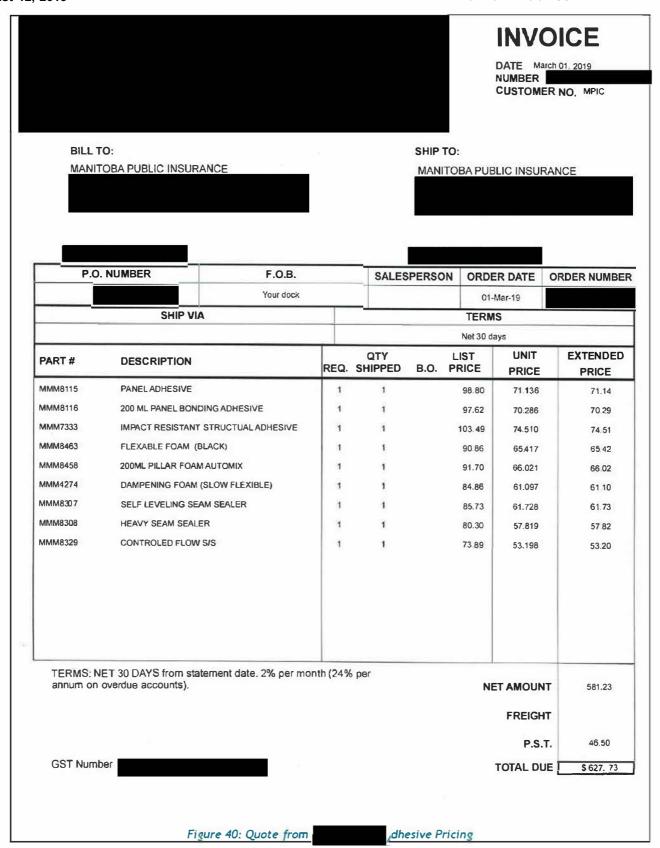
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Figure 38: Email from

RE: Adhesive Usage Ly Repair Type (pg. 2)

revised September 25, 2019 August 12, 2019 **CONFIDENTIAL**

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