



**FACSIMILE TRANSMISSION**

June 14, 1999

**To:** Jingslink Marketing

**Attn:** Chan A-Lam

**Re:** Slant/Shear Testing

Dear A-Lam,

The test that you are referring to is ASTM C882-78 "Bond Strength of Epoxy Resin Systems Used With Concrete" with the modification that Xypex is used in place of epoxy as the bonding mortar. This test was run for a client in Wisconsin, USA, who wanted to use Xypex as a waterproofing layer between the structural slab of concrete bridges and new topping slabs.

The transportation authority did not want any lateral load transfer from the highway pavement to the bridge topping (under traffic) to cause loss of bond between the structural elements. For this reason we conducted the slant/shear test. The test does not have a specific value for a pass/fail number attached to it in terms of bond strength and is only relative to the particular use intended. There is no good, average or bad relation between the bond of two concrete members except as it relates to the engineering and structural requirement.

The 9.1 Mpa figure is the average of the force exerted divided by the area to which it is applied. In the specific case of this test it took a force of 9.1 Mpa to fracture the bond between Xypex and the concrete when the load was applied at an angle of 30 degrees to the longitudinal surface. The test only tries to give a representative bond figure where "slip" may occur between two structural elements.

Regarding your question about what is an acceptable shear strength there is no statistical table that I am aware of that will give you this number. As mentioned before the required figure is project and application specific.

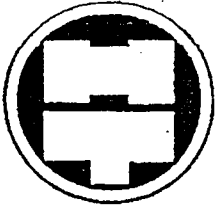
Best regards,

A handwritten signature in black ink, appearing to read "Dave Ross", is written over the "Best regards," text.

Dave Ross  
Technical Services Manager

**CONCRETE WATERPROOFING BY CRYSTALLIZATION**

13731 Mayfield Place, Richmond, British Columbia, Canada V6V 2G9  
Tel: 604 273-5265 Fax: 604 270-0451

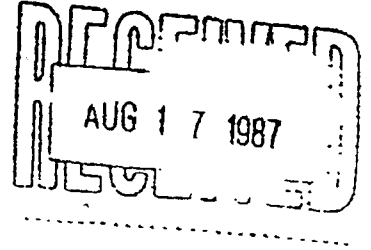


# Hardy BBT Limited

CONSULTING ENGINEERING & PROFESSIONAL SERVICES

Our Project No. VA-00960  
Your Reference No.

August 12, 1987



XYPEX CHEMICAL CORPORATION,  
12520 Vickers Way,  
RICHMOND, B.C.  
V6V 1H9

ATTENTION: Mr. David Ross

Dear Sirs:

Re: Slant Shear Testing of Xypex

As requested by telephone on May 21, 1987 a study of Xypex Concentrate has been completed by Hardy BBT Limited. The object of the study was to determine the ability of Xypex Concentrate to bond new concrete to old.

The ASTM C882-78 "Bond Strength of Epoxy Resin Systems Used With Concrete", test procedure was followed, except that Xypex Concentrate was used as bonding agent.

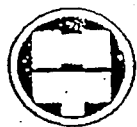
Cylindrical specimens 101.6 mm in diameter by 203.2 mm in length were cast from a premixed concrete and allowed to cure under standard fog room conditions. These specimens were subsequently sawcut into two pieces at an angle of 30° to the longitudinal axis. The sawcut faces were further prepared by sandblasting to expose the aggregate on the face to a depth of approximately 3 mm. The specimens were wetted to a saturated surface dry condition and the bonding agent was applied to the prepared surface. New concrete was placed to finish the casting of the cylindrical specimens. The specimens were cured under either air drying or fog room conditions and tested in compression at various ages.

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BONDING AGENT	CURING CONDITIONS
Xypex Concentrate Xypex Concentrate	air dry fog room
Xypex Concentrate; 4 hours drying	air dry fog room
Xypex Concentrate; 20 hours drying	air dry fog room
Xypex Concentrate; retempered with fresh Concentrate	air dry fog room

The Xypex Concentrate bonding agent was mixed in the volumetric proportions of 5 parts Xypex Concentrate to 2 parts water, as recommended in Section 4.5 of the Contractors' Manual for a coverage of 1.5 lbs/sq.yd. Some specimens were finished immediately by topping with new concrete, while in other instances, Xypex Concentrate was allowed to dry on the specimen for either 4 or 20 hours prior to concrete placement. Also Xypex Concentrate was allowed to pot age for 4 hours, was then retempered in 1 to 1 proportions with fresh Xypex Concentrate. This retempered Xypex Concentrate was then applied to prepared slant surfaces concrete placed immediately.



# Hardy BBT Limited

CONSULTING ENGINEERING & PROFESSIONAL SERVICES

## TECHNICAL REPORT

To: XYPEX CHEMICAL CORPORATION,  
12520 Vickers Way,  
RICHMOND, B.C. V6V 1H9  
ATTENTION: Mr. David Ross

FILE VA-00960  
DATE 87-08-12  
CLIENT P.O.  
C.C.

PROJECT:

SUBJECT:

TABLE 1: SLANT SHEAR TEST RESULTS  
VA00960

SPECIMEN NUMBER	BONDING AGENT	CURING CONDITIONS	AGE AT TEST (DAYS)	ULTIMATE LOAD (kN)	ULTIMATE STRESS (MPa)
1	XYPEX	FOG	3	22.0	2.7
5	XYPEX	AIR	3	23.5	2.9
9	RETEMP XY	FOG	3	21.7	2.7
13	RETEMP XY	AIR	3	21.8	2.7
25	XY-4	FOG	3	14.5	1.8
29	XY-4	AIR	3	14.0	1.7
17	XY-20	AIR	3	13.5	1.7
21	XY-20	FOG	3	7.5	0.9
2	XYPEX	FOG	7	26.2	3.2
6	XYPEX	AIR	7	31.8	3.9
10	RETEMP XY	FOG	7	30.6	3.8
14	RETEMP XY	AIR	7	15.0	1.9
26	XY-4	FOG	6	14.4	1.8
30	XY-4	AIR	6	17.0	2.1
18	XY-20	AIR	7	17.5	2.2
22	XY-20	FOG	7	18.0	2.2
3	XYPEX	FOG	28	43.4	5.4
4	XYPEX	FOG	28	54.4	6.7
7	XYPEX	AIR	28	61.8	7.6
8	XYPEX	AIR	28	74.1	9.1*
11	RETEMP XY	FOG	28	70.6	8.7
12	RETEMP XY	FOG	28	68.4	8.4
15	RETEMP XY	AIR	28	55.6	6.9
16	RETEMP XY	AIR	28	57.8	7.1
27	XY-4	FOG	27	55.6	6.9
28	XY-4	FOG	27	36.3	4.5
31	XY-4	AIR	27	32.0	3.9
19	XY-20	AIR	27	35.7	4.4
20	XY-20	AIR	27	30.0	3.7
23	XY-20	FOG	27	55.2	6.8
24	XY-20	FOG	27	48.3	6.0

CERTIFIED BY:

*A.J. Kirkness*  
A.J. Kirkness, P. Eng.,  
Senior Materials Engineer

TECHNICIAN: K. Ogloff, E.I.T.

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