INSTITUTE OF CIVIL ENGINEERING TECHNOLOGY AND TESTING
State testing station SKTC-105, Bratislava, Studená [Street] 3

REPORT No. 15/94

on the tests of impermeability and resistance of the coating material XYPEX to: gasoline
diesel
transformer oil
silage juices
pressurized water

Date: July 1994

Branch office: Prešov

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Start of the tests: March 31, 1994

End of the tests: July 6, 1994

Drawing up of the report: by July 15, 1994

2. INTRODUCTION

The firm HYDROSTOP s.r.o. Poprad submitted to TSÚS*, branch office in Tatranská Štrba, an application for certification of XYPEX - a pressure crystalline hydroinsulation of concrete constructions. On the basis of the business contract No. 18/94 with the firm Hydrostop s.r.o., Poprad and in cooperation with the branch office of TSÚS in Tartanská Štrba, TSÚS, branch office in Prešov, has performed tests of impermeability and resistance of the coating material XYPEX to:
gasoline (octane class "special"),
diesel,
transformer oil ITO 100
silage juices
pressurized water.
The gasoline (octane class "special"), diesel, transformer oil ITO 100 and silage juices were supplied by the organization performing the tests.
The results of the tests indicated in this Report No. 15/94 are part of the documentation for the final protocol of the certification of XYPEX - a pressure crystalline hydroinsulation material for concrete constructions.

3. TESTS

3.1 Preparation of samples for testing

101 pieces of concrete samples of the dimensions 150x150x150 mm and 12 pieces of concrete samples of a round shape of a diameter of 260 mm and a height of 150 mm were manufactured for the purpose of tests of the coating material XYPEX as well as for comparative tests. The cement mixture was made for

the concrete of the class B 20 according to ČSN 73 2400. At the beginning of the manufacture of samples and at the end of the manufacture of samples for the testing of XYPEX and for comparative tests, 6 pieces and 3 pieces of concrete cubes of the dimensions 150x150x150 mm were made for testing the concrete for compression strength as well as for the verification of the proposed cement mixture for the concrete of the class B 20. The samples to be tested for impermeability and resistance, for comparative tests, as well as for the compression strengh of the concrete, were placed, immediately after their manufacture, in a conditioning chamber at the temperature of 20°C and a relative humidity of 95% for the time period of 24 hours. After 24 hours, the samples to be covered with the coating material were taken out of the mould and their surface was roughened with a steel wire brush. The surface so prepared was then coated, by means of a brush, with the material XYPEX; the thickness of the coating was about 1.2 mm. The XYPEX mixing ratio was 3 : 1, that is 3 parts of XYPEX and one part of water. A second coating of XYPEX was applied on the samples after another 24 hours. After the second coating was applied, the samples were placed in a conditioning chamber and in containers filled with water so that the surface facing the surface with the coating was submerged; the water level was about 10 cm. Before the coating material XYPEX was applied, the surface of the samples was moistened. The samples coated with XYPEX were sprinkled with water 3 times a day for three days. Samples made for comparative tests and for tests of compression strength, that is samples without any coating (marked S) were kept in a conditioning chamber for the time period of 28 days.

Markings of the samples:

K1 - one coating of XYPEX CONCENTRATE

K2 - two coatings of XYPEX CONCENTRATE

M1 - one coating of XYPEX MODIFIED

M2 - two coatings of XYPEX MODIFIED

KM1 - one coating of XYPEX CONCENTRATE + one coating of XYPEX MODIFIED

$KM1_z$ - one coating of XYPEX CONCENTRATE + one coating of XYPEX MODIFIED, but 1 mm of the XYPEX MODIFIED coating was ground away before the test

S - samples without coating

Markings of the media:

N - diesel

B - gasoline (octane class "special")

O - transformer oil ITO 100

ŠŤ - silage juices

HV8 - grade of water tightness

HV12 - grade of water tightness

3.2 Technology of the tests

The samples with a coating of XYPEX to be tested for impermeability and resistance of the coating material XYPEX to gasoline, diesel, transformer oil a silage juices, were, after the preparation described under 3.1, left in a conditioning chamber in the water for the time period of 14 days. After 14 days, the samples were taken out of the water, dried, and on the following day, tubes made of Novodur® of a height of 1500 mm and a diameter of 100 mm were glued with the glue EPOXY CHS 371 and EPOXY CHS 1200 to the surface coated with XYPEX. After the glue hardened up, EPOXY TAR PAINT was applied. Thereafter, the tubes were filled with the individual media up to the height of 1400 mm which exerted a pressure of 14 kPa on the surface of the samples. The individual tubes were covered with a cardboard paper to prevent evaporation or volatilization of the media. The height of the level of the individual media was checked on a regular basis. After 14, 21 and 28 days of exposure to individual media the samples were broken in a press by means of a steel wedge and the percolation in the samples was measured.
These tests are shown in the Figure No. 1 - enclosure No. 1.
The samples without any coating (marked S), to be tested for impermeability and resistance to gasoline, diesel, transformer oil and silage juices (tests for comparison), were, after their manufacture, placed in a conditioning chamber and, after 24 hours, taken out of the mould.

Afterwards they were left in the conditioning chamber for the time period of 25 days. After 26 days they were taken out of the conditioning chamber, dried up and, on the following day, tubes made of Novodur* of a height of 1500 mm and a diameter of 100 mm were glued with the glue EPOXY CHS 371 and EPOXY CHS 1200 to their surface. After the glue hardened up, EPOXY TAR PAINT was applied. Thereafter, the tubes were filled with the individual media up to the height of 1400 mm which exerted a pressure of 14 kPa on the surface of the samples.
The individual tubes were covered with a cardboard paper to prevent evaporation or volatilization of the individual media.
The height of the level of crude oil was checked on a regular basis. After 28 days of exposure to the individual media, the samples were broken in a press by means of a steel wedge and the percolation in the samples was measured.
These tests are shown in the Figure No. 1 - enclosure No. 1.

The samples with a coating of XYPEX to be tested for impermeability and resistance of the coating material XYPEX to pressurized water, were, after the preparation described under 3.1, left in a conditioning chamber in the water for the time period of 26 days. Afterwards, the samples were taken out of the water, dried up and on the 28th day, the tests were carried out. The tests were performed on samples of the dimensions 150x150x150 mm and on samples of a round shape of a diameter of 260 mm and a height of 150 mm, by means of a water pressing stand, which reaches the pressure of 1.2 MPa and allows 6 samples to be tested at the same time. An overall view of the samples set up on the stand during the test is shown in the Figure No.2 - enclosure No. 1.
The loading of the test samples with water pressure was done according to the requirements of ČSN 73 1321, that is the concrete surface coated with XYPEX is loaded with the pressure of 0.2 MPa for the first 24 hours, thereafter the pressure is increased to 0.4 MPa, 0.8 MPa, 1.2 MPa every 24 hours, depending on the required water tightness of the concrete. Our samples were tested for the pressures of 0.8 MPa and 1.2 MPa.

Out of six samples with an applied coating of XYPEX KM1, on three samples the outer coating of XYPEX MODIFIED was ground away by about 1 mm and three samples were tested without this previous grinding. The test results are indicated in the following chapter. A view of the tested samples is shown in Figure No. 3 - enclosure No. 2 and in Figure No. 4 - enclosure No. 2.

Afterwards they were left in the conditioning chamber for the time period of 25 days. After 26 days they were taken out of the conditioning chamber, dried up and, on the following day, tubes made of Novodur® of a height of 1500 mm and a diameter of 100 mm were glued with the glue EPOXY CHS 371 and EPOXY CHS 1200 to their surface. After the glue hardened up, EPOXY TAR PAINT was applied. Thereafter, the tubes were filled with the individual media up to the height of 1400 mm which exerted a pressure of 14 kPa on the surface of the samples.
The individual tubes were covered with a cardboard paper to prevent evaporation or volatilization of the individual media. The height of the level of crude oil was checked on a regular basis. After 28 days of exposure to the individual media, the samples were broken in a press by means of a steel wedge and the percolation in the samples was measured.
These tests are shown in the Figure No. 1 - enclosure No. 1.

The samples with a coating of XYPEX to be tested for impermeability and resistance of the coating material XYPEX to pressurized water, were, after the preparation described under 3.1, left in a conditioning chamber in the water for the time period of 26 days. Afterwards, the samples were taken out of the water, dried up and on the 28th day, the tests were carried out. The tests were performed on samples of the dimensions 150x150x150 mm and on samples of a round shape of a diameter of 260 mm and a height of 150 mm, by means of a water pressing stand, which reaches the pressure of 1.2 MPa and allows 6 samples to be tested at the same time. An overall view of the samples set up on the stand during the test is shown in the Figure No.2 - enclosure No. 1.
The loading of the test samples with water pressure was done according to the requirements of ČSN 73 1321, that is the concrete surface coated with XYPEX is loaded with the pressure of 0.2 MPa for the first 24 hours, thereafter the pressure is increased to 0.4 MPa, 0.8 MPa, 1.2 MPa every 24 hours, depending on the required water tightness of the concrete. Our samples were tested for the pressures of 0.8 MPa and 1.2 MPa.

Out of six samples with an applied coating of XYPEX KM1, on three samples the outer coating of XYPEX MODIFIED was ground away by about 1 mm and three samples were tested without this previous grinding. The test results are indicated in the following chapter. A view of the tested samples is shown in Figure No. 3 - enclosure No. 2 and in Figure No. 4 - enclosure No. 2.

The samples were tested for the pressure of 1.2 MPa which corresponds with the grade of water tightness HV12. To find out the efficiency of XYPEX and the creation of its crystalline structure in the concrete matter, two out of three samples were tested on the stand so that the water pressure was exerted on the surface coated with XYPEX and with one of the samples the water pressure was exerted on the opposite surface, that is the surface on which no coating was applied - see the arrows in Figure No. 5 - enclosure No. 3. Figure No. 6 - enclosure No. 3 shows the samples K1 after tests for water tightness under the pressure of 1.2 MPa - HV12.

Figures No. 7 and 8 - enclosure No. 4 show standard samples KM1 and K2 after tests for water tightness, grade HV12, or HV8 which corresponds with the pressure of 1.2 MPa or 0.8 MPa respectively. The test was done according to the requirements of ČSN 73 1321. The test results are indicated in the following chapter.

After the completion of the tests the samples were broken in a press by means of a steel wedge and the percolation in the samples was measured.

The samples without any coating marked S (comparative tests), to be tested for water tightness - resistance to pressurized water, were, after their manufacture, placed in a conditioning chamber and, after 24 hours, taken out of the mould. Afterwards they were left in the conditioning chamber for the time period of 26 days. After 27 days they were taken out of the conditioning chamber, dried up and, on the following day, they were tested on the stand for water tightness HV12, which corresponds with the pressure of 1.2 MPa. The tests were preformed according to the requirements of ČSN 73 1321. Further tests for water tightness grade HV12, which corresponds with the pressure of 1.2 MPa, were performed on samples maturing in a conditioning chamber 7, 14, 21 and 28 days. After the completion of the tests the samples were broken in a press by means of a steel wedge and the percolation in the samples was measured. The test results are indicated in the following chapter.

3.3 Results of the tests of concrete cubes for compression strength

The tests were performed on test cubes of the dimensions of 150x150x150 mm. The cement mixture was proposed for the concrete of the class B 20 according to ČSN 73 2400. The samples were manufactured at the beginning and at the end of the manufacture of samples for the individual tests. The tests were performed in the press TONI in the TSÚS branch laboratory in Prešov.

Table 1 shows the results of the tests for compression strength (after 28 days) of the concrete cubes manufactured at the beginning of the sample manufacture.

Table 1

Item	Sample marking Date of manufacture	Weight in kg	Volume weight in $kg.m^{-3}$	Compression force in kN	Compression strength of the concrete cubes in MPa	Diameter MPa
1	S 31.3.94	7.70	2251	665	29.2	
2	S 31.3.94	7.70	2271	662	29.3	29.3
3	S 31.3.94	7.60	2248	660	29.3	
4	S 31.3.94	7.50	2232	651	29.1	
5	S 31.3.94	7.80	2261	703	30.6	29.9
6	S 31.3.94	7.60	2248	672	29.9	

Table 2 shows the results of the tests for compression strength (after 28 days) of the concrete cubes manufactured at the end of the sample manufacture.

Table 2

Item	Sample marking date of manufacture	Weight in kg	Volume weight in $kg.m^{-3}$	Compression force in kN	Compression strength of the concrete cubes in MPa	Diameter MPa
1	S 12.4.94	7.80	2308	638	28.4	
2	S 12.4.94	7.70	2278	645	28.7	28.6
3	S 12.4.94	7.80	2294	655	29.0	
4	S 12.4.94	7.80	2294	642	28.4	

On the basis of the results the concrete mentioned can be classified as class B 20 according to ČSN 73 2400.

3.4 Results of the tests of the coating material XYPEX for impermeability and resistance to: gasoline [octane class of] Special

Table 3

Kind of sample and coating	Item number	Testing after the following number of days	Percolation (mm)	Note
K1	1 2 3	14 21 28	0 0 0	
M1	1 2 3	14 21 28	0 0 0	
KM1	1 2 3	14 21 28	0 0 0	

Table 4

Kind of sample and coating	Item number	Testing after the following number of days	Percolation (mm)	Note
K1	1 2	28	0 0	
K2	1 2	28	0 0	
M1	1 2	28	0 0	
M2	1 2	28	0 0	

Table 5 shows the results of the tests of concrete cubes without a coating of XYPEX for impermeability and resistance to gasoline [octane grade of] Special.

Table 5

Kind of sample without coating	Item Number	Testing after the following number of days	Percolation (mm)	Note
S	1 2	28	60 45	See Figure No. 9 left in the enclosure No. 5

3.5 Results of the tests of the coating material XYPEX for impermeability and resistance to: diesel

Table 6

Kind of sample and coating	Item number	Testing after the following number of days	Percolation (mm)	Note
K1	1	14	10	See Figure 10 left in the enclosure 5
	2	21	60	See Figure 10 right in the enclosure 5
	3	28	60	- " - " -
M1	1	14	20	
	2	21	50	
	3	28	65	
KM1	1	14	15	
	2	21	25	
	3	28	40	

Table 7

Kind of sample and coating	Item number	Testing after the following number of days	Percolation (mm)	Note
K1	1	28	40	
	2		50	
K2	1	28	5	See Figure 11 left in enclosure 6
	2		5	
M1	1	28	0	
	2		0	
M2	1	28	0	
	2		0	

Table 8 shows the results of the tests of concrete cubes without a coating of XYPEX for impermeability and resistance to diesel.

Table 8

Kind of sample without coating	Item Number	Testing after the following number of days	Percolation (mm)	Note
S	1	28	140	See Figure No.12 left in the enclosure No. 6
	2		140	

3.6 Results of the tests of the coating material XYPEX for impermeability and resistance to: Transformer oil ITO 100

Table 9

Kind of sample and coating	Item number	Testing after the following number of days	Percolation (mm)	Note
K1	1	14	0	
	2	21	0	
	3	28	8	
M1	1	14	0	
	2	21	0	
	3	28	6	
KM1	1	14	0	
	2	21	0	
	3	28	4	

Table 10

Kind of sample and coating	Item number	Testing after the following number of days	Percolation (mm)	Note
K1	1 2	28	5 10	
K2	1 2	28	2 2	
M1	1 2	28	5 5	
M2	1 2	28	3 5	

Table 11 shows the results of the tests of concrete cubes without a coating of XYPEX for impermeability and resistance to transformer oil ITO 100.

Table 11

Kind of sample without coating	Item Number	Testing after the following number of days	Percolation (mm)	Note
S	1 2	28	60 55	See Figure No.12 right in the enclosure No. 6 - " - " -

3.7 Results of the tests of the coating material XYPEX for impermeability and resistance to: silage juices

Table 12

Kind of sample and coating	Item number	Testing after the following number of days	Percolation (mm)	Note
K1	1 2 3	14 21 28	0 0 6	
M1	1 2 3	14 21 28	0 2 0	
KM1	1 2 3	14 21 28	0 10 8	

Table 13

Kind of sample and coating	Item number	Testing after the following number of days	Percolation (mm)	Note
K1	1 2	28	7 10	
K2	1 2	28	0 0	
M1	1 2	28	0 0	
M2	1 2	28	0 0	

Table 14 shows the results of the tests of concrete cubes without a coating of XYPEX for impermeability and resistance to silage juices.

3.7 Results of the tests of the coating material XYPEX for impermeability and resistance to: silage juices

Table 12

Kind of sample and coating	Item number	Testing after the following number of days	Percolation (mm)	Note
K1	1 2 3	14 21 28	0 0 6	
M1	1 2 3	14 21 28	0 2 0	
KM1	1 2 3	14 21 28	0 10 8	

Table 13

Kind of sample and coating	Item number	Testing after the following number of days	Percolation (mm)	Note
K1	1 2	28	7 10	
K2	1 2	28	0 0	
M1	1 2	28	0 0	
M2	1 2	28	0 0	

Table 14 shows the results of the tests of concrete cubes without a coating of XYPEX for impermeability and resistance to silage juices.

Table 14

Kind of sample without coating	Item Number	Testing after the following number of days	Percolation (mm)	Note
S	1	28	70	See Figure No. 9 right in the enclosure No. 5
	2		75	- " - " -

3.8 Results of the tests of the coating material XYPEX, applied on samples of the dimensions of 150x150x150 mm, for impermeability and resistance to: PRESSURIZED WATER

Table 15

Item number	Kind of sample and coating	Grade of water tightness maximum pressure (MPa)	Percolation (mm)	Note
1	K1	HV12-1.2 MPa	45	See Fig.6 in enclosure 3
2			45	
3			35	
1	M1	HV12-1.2 MPa	60	
2			40	
3			60	
1	KM1	HV12-1.2 MPa	40	See Fig. 3 in enclosure 2
2			50	- " -
3			40	- " -
1	KM1z	HV12-1.2 MPa	50	See Fig. 4 in enclosure 2
2	ground away 1 mm MODIF.		60	- " - - " -
3			60	- " - - " -

The samples K2 and KM1 were tested for impermeability and resistance of the coating material XYPEX as well as for the

building of a crystalline structure of in the concrete so that with two samples K2 and KM1 the pressurized water of the stand exerted its pressure on the surface with a coating of XYPEX and with one sample K2 and KM1 the pressurized water of the stand exerted its pressure on the opposite surface, e.i. where no coating of XYPEX was applied (samples with the item number 3). Table 16 shows the results of the tests.

Table 16

Sample -item number	Kind of sample and coating	Grade of water tightness maximum pressure (MPa)	Percolation (mm)	Note
1	K2-pressure on XYPEX	HV12 - 1.2 MPa	45	See Fig. 5 in enclosure 3 - arrows
2	K2-pressure on XYPEX	HV12 - 1.2 MPa	40	
3	K2-pressure on opposite side	" "	70	See Fig. 5 in enclosure 3 - arrows
1	KM1-pressure on XYPEX	" "	60	See Fig. 5 in enclosure 3 - arrows
2	KM1-pressure on XYPEX	" "	55	
3	KM1-pressure on opposite side	" "	70	See Fig. 5 in enclosure 3 - arrows

Table 17 shows the results of the tests of concrete samples without a coating of XYPEX for impermeability and resistance to pressurized water.

Table 17

Item number of sample	Kind of sample - without XYPEX coating	Grade of water tightness maximum pressure (MPa)	Percolation (mm)	Tests performed after the following days
1	S	HV12 - 1.2 MPa	145	7
2	S	HV12 - 1.2 MPa	150	14
3	S	" "	150	21
4	S	" "	135	28
1	S	HV12 - 1.2 MPa	120	28
2	S	" "	135	28
3	S	" "	120	28

3.9 Results of the tests of the coating material XYPEX, applied on standard samples of a round shape of a diameter of 260 mm and a height of 150 mm, for impermeability and resistance to: PRESSURIZED WATER

Table 18

Sample item number	Kind of sample and coating	Grade of water tightness maximum pressure (MPa)	Percolation (mm)	Diameter (mm)	Note
1	K2	HV8-0.8 MPa	15		See Fig.8 in
2	K2	HV8-0.8 MPa	10	13	enclosure 4
3	K2	HV8-0.8 MPa	15		
1	KM1	HV8-0.8 MPa	15		See Fig.8 in enclosure 4
2					
3	KM1	HV8-0.8 MPa	20	17	
	KM1	HV8-0.8 MPa	15		See Fig.8 in enclosure 4
1	K2	HV12-1.2 MPa	25		
2	K2	HV12-1.2 MPa	40	30	
3	K2	HV12-1.2 MPa	25		
1	KM1	HV12-1.2 MPa	25		See Fig.7 in enclosure 2
2	KM1	HV12-1.2 MPa	20	23	See Fig.7 in enclosure 2
3	KM1	HV12-1.2 MPa	25		See Fig.7 in enclosure 2

4. CONCLUSION

Based on the results obtained by the tests of impermeability and resistance of the concrete samples with a coating of the material XYPEX, and their comparison with the results of the tests of concrete samples without a coating of XYPEX, it is possible to state that the coating material XYPEX applied on a concrete surface enhances its resistance and it provides an effective protection against permeability and effects of:
gasoline Special,
diesel,
transformer oil ITO 100
silage juices,
pressurized water.

The tests of impermeability and resistance of the coating material XYPEX to diesel have established that the most efficient protection is provided by the samples with a double application of the coating material XYPEX CONCENTRATE - K2 or samples with a double application of the coating material XYPEX MODIFIED - M2. The results of the tests in Table 16 - samples with the item number 3 - compared to the results of the tests in Table 17 confirm the creation or growth of a crystalline formation of dentric fibres which prevent the molecules of water from passing but allow the passing of air so that the concrete can breathe. The comparison of the results indicated in Table 15 with the results indicated in Table 17 clearly confirms an effective protection from pressurized water provided by the coating material XYPEX. The performing of the tests and the results of the tests indicated in Table 18 fulfill the requirements and criteria of the [Czechoslovak State Industrial Standard] ČSN 73 1209 and ČSN 73 1321 for the grade of water tightness HV8 and HV12 which confirms the effectiveness [of protection] of the coating material XYPEX against pressurized water at a maximum pressure of 0.8 MPa and 1.2 MPa.

5. LIST OF ENCLOSURE

Enclosure No. 1 - Figure 1 - A view of the setup for the tests of impermeability and resistance of the coating material XYPEX to gasoline, diesel, transformer oil and silage juices.

Enclosure No. 1 - Figure 2 - A view of the water-pressing stand on which the tests of impermeability and resistance to pressurized water were carried out.

Enclosure No. 2 - Figure 3 - A view of the samples KM1 after the tests of impermeability and resistance to a maximum water pressure of 1.2 MPa.

Enclosure No. 2 - Figure 4 - A view of the samples KM1 after the tests of impermeability and resistance to a maximum water pressure of 1.2 MPa. Before the tests 1 mm of the outer coating of XYPEX MODIFIED was ground away.

Enclosure No. 3 - Figure 5 - A view of the samples KM1 and K2 prepared for verification of the creation or growth of a crystalline formation of dentric fibres in the concrete at a maximum water pressure of 1.2 MPa.

Enclosure No. 3 - Figure 6 - A view of the samples K1 after the tests of impermeability and resistance to a maximum water pressure of 1.2 MPa.

Enclosure No. 4 - Figure 7 - A view of the standard samples KM1 after the tests of impermeability and resistance to a maximum water pressure of 1.2 MPa.

Enclosure No. 4 - Figure 8 - A view of the standard samples K2 and KM1 after the tests of impermeability and resistance to a maximum water pressure of 0.8 MPa.

Enclosure No. 5 - Figure 9 - A view of the samples, on which no coating of XYPEX was applied, after the tests of impermeability and resistance to gasoline (left) and silage juices (right).

Enclosure No. 5 - Figure 10 - A view of the samples, on which one coating of XYPEX CONCENTRATE was applied, after the tests of impermeability and resistance to diesel after 14 days (left picture) and after 21 days (right picture).

Enclosure No. 6 - Figure 11 - A view of the samples, on which two coatings of XYPEX CONCENTRATE were applied (left picture) or one coating of XYPEX MODIFIED was applied (right picture), after the tests of impermeability and resistance to diesel.

Enclosure No. 6 - Figure 12 - A view of the samples, on which no coating of XYPEX was applied, after the tests of impermeability and resistance to diesel (left picture) and transformer oil (right picture).

In Prešov, on July 12, 1994

Report drawn up by: Ing. R. Köhler

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[Official round stamp of]
Institute of Civil Engineering
Technology and Testing
Accredited Testing Laboratory
Branch Office in Prešov

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.....

Ing. Bohumil Magdič
Director
TSÚS Prešov

Enclosure 1

[Picture]

Picture 1 - A view of the setup for the tests of impermeability and resistance of the coating material XYPEX to gasoline, diesel, transformer oil and silage juices.

[Picture]

Picture 2 - A view of the water-pressing stand on which the tests of impermeability and resistance to pressurized water were carried out.

[Picture]

Picture 3 A view of the samples KM1 after the tests of impermeability and resistance to a maximum water pressure of 1.2 MPa.

[Picture]

Picture 4 - A view of the samples KM1 after the tests of impermeability and resistance to a maximum water pressure of 1.2 MPa. Before the tests 1 mm of the outer coating of XYPEX MODIFIED was ground away.

[Picture]

Picture 5 - A view of the samples KM1 and K2 prepared for verification of the creation or growth of a crystalline formation of dentric fibres in the concrete at a maximum water pressure of 1.2 MPa.

[Picture]

Picture 6 - A view of the samples K1 after the tests of impermeability and resistance to a maximum water pressure of 1.2 MPa.

[Picture]

Picture 7 - A view of the standard samples KM1 after the tests of impermeability and resistance to a maximum water pressure of 1.2 MPa.

[Picture]

Picture 8 - A view of the standard samples K2 and KM1 after the tests of impermeability and resistance to a maximum water pressure of 0.8 MPa.

[Picture]

Picture 9 - A view of the samples, on which no coating of XYPEX was applied, after the tests of impermeability and resistance to gasoline (left) and silage juices (right).

[Picture]

Picture 10 - A view of the samples, on which one coating of XYPEX CONCENTRATE was applied, after the tests of impermeability and resistance to diesel after 14 days (left picture) and after 21 days (right picture).

Enclosure 6

[Picture]

Picture 11 - A view of the samples, on which two coatings of XYPEX CONCENTRATE were applied (left picture) or one coating of XYPEX MODIFIED was applied (right picture), after the tests of impermeability and resistance to diesel.

[Picture]

Picture 12 - A view of the samples, on which no coating of XYPEX was applied, after the tests of impermeability and resistance to diesel (left picture) and transformer oil (right picture).