

# **FIRE OF TRANSFORMER'S OIL IN DISTRIBUTION TRANSFORMERS STATION**

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Transition

## **REPORT**

**No.: P 319/00-530-1**

**ABOUT RESEARCH  
of fire extinction efficiency of oil-fire with**

**Automatic fire extinguishing system BONPET**

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**Ordered by: BONPET d.o.o., Ravne 100, 8281 SENOVO**

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**Order/contract: No. 3/2000 from 06.03.2000**

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- 1. PRODUCT:** Automatic fire extinguisher BONPET
- 2. SUPPLIER:** BONPET d.o.o, Ravne 100, 8281 SENOVO
- 3. PRODUCER:** Kaiko Kogy Co. Ltd. TAD Corporation, Japan
- 4. SAMPLING:** Samples delivered and mounted by suppliers representative

## **5. DESCRIPTION OF FIRE EXTINGUISHER BONPET**

BONPET extinguishing liquid is filled in glass ampoules dimensions Ø60 x 280 mm. Liquid is transparent pink coloured. By increased temperature (85 - 90)<sup>o</sup>C) inner pressure in the ampoule causes burst of it and liquid sprays into space. Ampoules are fixed in special tin holders that should be mounted in room according to producer's instructions. To put the fire off in transformer case with disconnectors in distribution transformer-station three BONPET ampoules should be mounted.

## **6. SAMPLE'S CONDITIONING**

Not necessary.

Date of test: 08/03/2000, environment temperature 14<sup>o</sup>C, relative air humidity: 43%.

## **7. TESTING PROCEDURE**

Standard procedure for testing is not available for testing extinguishing expedients in distribution transformer-stations therefore test was done in a tin box of the same size as transformer case with disconnectors. Cross-section of vertically placed box was set to 100 x 70 cm, height 2m. Test box was closed at the bottom (small opening left), at the top wide opened, same as transformer case with disconnectors. On the front wall is opening caa 40 x 30 cm. Three BONPET ampoules were placed on the box walls. Each ampoule is placed on the wall of it's own.

Test should show if BONPET extinguishes fire caused with ignition of transformer's oil used in transformer case with disconnectors for cooling. Usually fire starts after explosion or overheating of disconnector. Each disconnector is filled with 1,67l of transformer's oil. We preheated the same amount of oil on caa 100<sup>o</sup>C and splashed it all over test box walls. At first attempt we found out that transformer's oil is difficult to ignite therefore we mixed the oil with 0,3l of gasoline for the second try.

Draft of the test box is in enclosure No.1

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## **8. TEST OBSERVATIONS**

### **1. test**

Immediately after ignition of transformer's oil we crashed BONPET ampoule on the back wall of the test box. Intensity of the fire in the box was low because fire source for ignition was bad (a piece of burning cotton-wool) and partly because BONPET liquid covered the bottom of test box and some kind of protection layer was formed by BONPET that prevented transformer's oil to burn with more intensity. After 23 min fire is extinguished.

### **2. test**

We mixed transformer's oil with gasoline to accelerate fire intensity. After 1min 23 sec when temperature in the box reached about 380 °C BONPET ampoule activated itself. Immediate decrease of fire intensity followed, after 15 sec the fire is extinguished.

## **9. TESTING RESULTS**

Bot of tests indicated that BONPET ampoules efficiently extinguishes a fire of transformer's oil in transformer case with disconnectors regardless if fire starts as a consequence of explosion in transformer's case and BONPET ampoule is crashed within this explosion or the fire is ignited by overheating and ampoules bursts when overheated.

## **10. ENCLOSURES**

1. ... draft of the test box

2. photos
1. view at test box
  2. view through the opening in to the test box. Ampoule on the left side of the photo (on the back side of the test box) was crashed when fire started
  3. 4. fire at its highest level (second test)
  5. activation of BONPET ampoule
  6. after 15 sec fire is extinguished

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