



INVESTIGATION OF THE AGING CHARACTERISTICS OF CST TERMINATION MADE OF SILICONE RUBBER AT CONTAMINATION AREA



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ABSTRACT

The CST (Cold Shrink Tube) termination made of silicone rubber has been supplied to practical use in the contamination area since 1996. The accident has not occurred until now. But we think that we should verify the long-term performance of the CST termination. We collect the CST termination used in actual field, and report on the result of the survey of the aging characteristics.

KEYWORDS

CST Termination, Silicone Rubber, Long-term Performance, Heavy Contamination

1. INTRODUCTION

The termination for heavy contamination area made of porcelain that had been used up to now in 6600V distribution line had high reliability. However, because it was very heavy, the workability was bad, and expensive. Therefore, we developed the cable termination that used CST made of silicone rubber. It is light weight, and not expensive. We verified the long-term reliability by the verification of the basic electric performance and the accelerated aging test, and have been using the CST termination since 1996. [1]

The accident has not occurred until today after beginning to use the CST termination. However, we think that we should clarify the tendency of the aged deterioration of this termination, and should estimate an actual long-term performance for stable electric power supplies. In this thesis, we compare and report on the result of the evaluation about the performance of a CST termination used for about nine years in a real field and an initial CST termination. The test items are partial discharge, AC breakdown voltage, lightning impulse breakdown voltage, and chemical composition analysis, etc.

2. DESIGN OF THE CST TERMINATION

Design of the CST termination is shown in Figure 1 and Table 1.

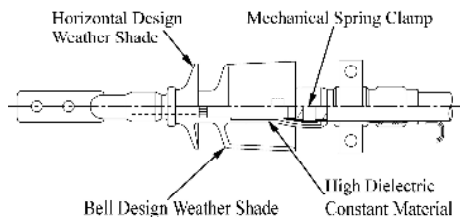


Figure 1: Design of the CST Termination

Table 1: Composition of CST Termination

Item	Description
Insulator material	High tracking resistance silicone rubber
Electrical stress control method	High dielectric constant material stress control
Insulator and weather shade design	Horizontal + Bell design weather shade
Waterproofing concept	Rubber seal stress by CST insulator

3. TEST SAMPLE AND CONDITION

3.1 Samples

Test terminations were collected from the following area located in Chubu district of Japan.

Table 2: Test Sample

Contamination area	Location	Period used	
General contamination (General)	A	4yr 3mo	9yr 3mo
	B	4yr 2mo	9yr 9mo
	C	4yr 7mo	9yr 7mo
Coarse particulate (Coarse)	D	3yr 11mo	9yr 5mo
	E	3yr 11mo	9yr 6mo
	F	4yr 1mo	9yr 7mo
Calcium chloride spraying(CaCl2)	G	4yr 3mo	9yr 8mo
	H	4yr 3mo	9yr 8mo
	I	4yr 6mo	9yr 7mo

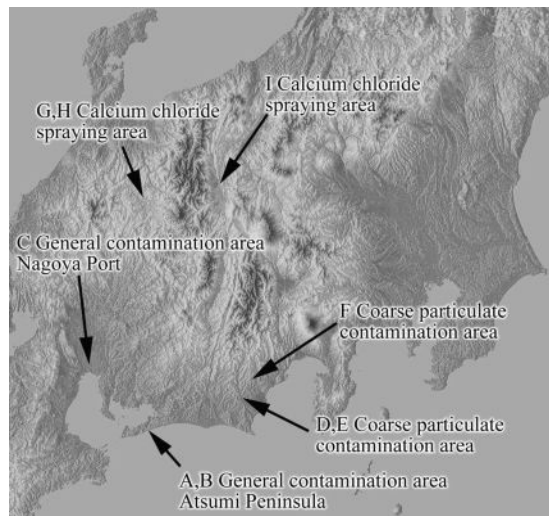


Figure 2: Collecting location