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### **A.5.3.**

#### **Development of cold shrinkable joints for 110~220 kV XLPE cable**

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Tape-wrapped joints(TJs) have been mostly used for the 66/77 kV XLPE cable systems over 30 years in Japan after its development. However, TJs require the certain jointing skills, times for assembly, and the special tools.

Cold shrinkable joints of one piece type consisted of silicone or ethylene-propylene rubber are being rapidly used widely in Japan and abroad, and it is extending to the extra high voltage class because of its compact and skill-free merit.

Here, three types of rubber mould joint have been already developed. One is the type of pre-expanded rubber mould in the factory, which can easily assembly by pulling spiral core at site. Another one is the type of rubber mould joint which assembly after expansion at site. The last one is, the direct insertion type to the cable insulator.

Pre-expanded rubber mould joint have the great merit which shortens the assembly time without the special tools only by pulling the spiral core compared with the another type joints. And, it is more compact than the conventional TJs.

We have developed the 110~161 kV and 220 kV cold shrinkable joints using the pre-expanded block insulator made of high-heatproof silicone rubber. Now, we are developing the 400 kV silicone rubber mould joint.