

**A10.2****Development of recyclable low-voltage insulated cable**

YUKAWA H., OHASHI T., SAKASHITA H., KAMINO K., The Kansai Electric Power Co. Inc., Osaka, Japan  
 HIURA T., SHIRATSUCHI N., Sumito Electric Industries Ltd., Osaka, Japan

**Résumé**

Alors que les problèmes posés par le traitement des déchets industriels deviennent plus sérieux au Japon, les fabricants sont contraints de prendre des mesures rapides pour la réduction de ces déchets. Dans le cadre de recherches sur le recyclage des câbles isolés au chlorure de polyvinyle (PVC) que l'on utilise en masse pour les lignes électriques, nous venons de mettre au point un câble pratique et économique isolé au PVC recyclé. De plus, nous avons pu déterminer la durée de vie de ce câble ainsi que l'effet de l'addition de polyéthylène. Par ailleurs, grâce à la méthode LCA, nous avons calculé expérimentalement l'effet quantitatif de l'adoption du câble isolé au PVC recyclé sur la réduction de la pollution de l'environnement global.

**Abstract**

Problems surrounding the processing of industrial waste in Japan are growing more serious, and manufacturers are being pressed with the need to quickly address the issue of reducing industrial waste. Through research on recycling of the PVC insulated cable used in large quantities in power lines, we have developed a practical, low-cost recycled PVC insulated cable, and have also obtained insights into the lifetime of such cable and the effect of inclusion of polyethylene. In addition, the quantitative effect in alleviating the global environmental burden through adoption of recycled PVC insulated cable has been trial-calculated using the LCA procedure, and adoption was confirmed to have an effect in reducing the environmental burden.

**Foreword**

Global environmental problems are today the focus of intense debates in the world community, and in Japan especially close attention is being paid to the problem of industrial waste processing. Japan's industrial waste is thought to be as much as 400 million tons annually, and problems surrounding waste processing such as the emission of dioxin and other toxic gases, and the dwindling capacity of our waste processing facilities, which are said to have capacity remaining for only three more years' worth of waste, are growing in urgency. Thus corporations are being faced with the need to take early steps to reduce their industrial waste generation. [1]

On the other hand, Kansai Electric Power is going on with practical uses for removed articles for power distribution both to use resources effectively and protect the global environment and attain cost reductions by the following order of priority.

1. reuse itself
2. reuse after repairing
3. reuse after recycling
4. effective use by recycling to other items

There are many examples of case No.4 in usual recycling, but there are few examples of case No.3 except metal goods because of the problem of high

costs and so on. But development of recycling technics in case No.3, which enables closed cycles and cost reductions, is necessary to continue to recycle items.

We therefore adopted as our initial target recycled PVC insulated cable, which is used in large quantities in power grids and is currently the focus of intense debate in connection with generation of dioxin. We studied and developed recycled PVC low-voltage insulated cable which enables cost reductions, and evaluated the effect of its use in reducing greenhouse gas emissions and otherwise alleviating global environmental problems. Herein we report the details of our work.

**Current Status of PVC Insulated Cable Processing**

Among the cable removed from within the service area of Kansai Electric Power, PVC insulated cable totals approx. 9000 km, or about 50% of all such cable; the scrap PVC coating from this cable amounts to about 560 tons.

The method currently used to process PVC insulated cable is shown in Fig. 1. There are two processing methods, disassembly and crushing; when the removed cable is long, disassembly is employed, and when it is short crushing is used. In disassembly, the cable covering is stripped away to