HV Insulators, HV Bushings, Spacers & Dampers Report
Ed 3 - 2017

HV insulators and bushings constitute one of the most importance components of electricity supply systems. The failure of either an insulator or a bushing can cause catastrophic damage to equipment, injury and loss of life.

THE MARKETS FOR HV INSULATORS, HV BUSHINGS, SPACERS & DAMPERS
The report gives market sizes and predicts future market trends in value for each of the three product groups. The markets for each product group are tabulated in $ value annually for a 5 year forecast period from 2016 to 2021, with the following analysis;
- Global totals, totals of 11 regions, national markets of 75 countries

END USE SEGMENT
The market for HV insulators is analysed by end use – transmission and distribution
- Global totals, totals of 11 regions, national markets of 75 countries

THE TECHNOLOGY
HV insulators are analysed by technology, material and core.
- With a global break by the materials—glass, ceramic and composite;
- With analysis by value for OIP (oil impregnated paper) and RIP (resin impregnated paper), globally, for every region and for each of 75 countries.
The OIP and RIP technologies are described, with advantages and disadvantages of each technology.

INSULATORS, SPACERS AND DAMPERS, TYPES AND APPLICATIONS
The many different variants of insulator, spacer and damper are described, with details of their applications and with plentiful illustrations. Transmission and distribution networks are discussed and applications of the products in the networks reviewed.

VALUE CHAIN
The value chain for the electrical sector is analysed from the BOM (bill of materials) to the end market price, installed cost, and capex. Off-take of insulators and bushings operate at different levels in the value chain. This affects comparability of market demand for the two products.

MANUFACTURERS
The manufacturing landscape is discussed, and trends of globalisation pinpointed. Brief outlines of the 17 major manufacturers are provided.

85 pages, 52 figures, 43 tables
1. EXECUTIVE SUMMARY

Chapter 2 - HV INSULATORS, HV BUSHINGS, SPACERS AND DAMPERS

The four categories, insulators, bushings, spacers and dampers are defined. High voltage insulators and bushings are critical in electricity transportation. Although they are a relatively small cost within total manufacturing cost the consequences of failure are disproportionately large.

Chapter 3 - THE MARKET FOR HV INSULATORS BY TECHNOLOGY - OIP and RIP

The market for HV insulators is estimated for 2016 and projected to 2021, with country analysis.

Chapter 4 - THE MARKET FOR HV INSULATORS BY TECHNOLOGY - OIP and RIP

Oil-impregnated paper (OIP) and resin impregnated paper (RIP) are the two main technologies for high-voltage insulators and bushings. Usage and geographical penetration are analysed.

Chapter 5 - THE MARKET FOR HV INSULATORS BY END USERS

Usage is analysed by transmission and distribution.

Chapter 6 - THE MARKET FOR HV BUSHINGS

The market for HV bushings is estimated for 2016 and projected to 2021.

Chapter 7 - INSULATOR AND BUSHING TYPES BY SHARE

There are two main categories in considering the type of an insulator or bushing; the technology of the insulation and the material of the housing. Both fundamental qualities are outlined with the differences and options. The development of the technologies is outlined.

Chapter 8 - INSULATORS, TYPES AND CHARACTERISTICS

Insulators have both a mechanical and an electrical function. They must support the conductors and withstand both the normal operating voltage and surges due to switching and lightning. Insulators are broadly classified as either: pin-type/station/line post insulators, which support the conductor above or horizontal to the structure; or suspension type, where the conductor hangs below the structure. Insulators are usually made of wet-process porcelain or toughened glass, with increasing use of glass-reinforced polymer insulators.

Chapter 9 - THE MARKET FOR SPACERS AND DAMPERS AND OTHER COMPONENTS

The market for spacers and dampers is estimated for 2016 and projected to 2021.

Chapter 10 - INSULATOR AND BUSHING MANUFACTURERS

The number of manufacturers of high voltage insulators and bushings is on the increase but there are many more makers of small low voltage ones. The insulator and bushings industry started with small pioneering companies, often launched by engineers with visionary ambitions. These have been taken over by the electrical multinationals and now ABB, Siemens, Alstom and GE are leading the field with their subsidiaries. The leading companies are profiled.
Chapter 11 - THE VALUE CHAIN – FROM MATERIALS TO CAPEX

The cost of any product such as insulators and bushings, cable, transformers or circuit breakers can be measured in a number of ways, from being a piece of unworked metal, to its final installation in working order and finally as a constituent of total capital expenditure. Different price levels are important in this supply chain, and the point of interest in the chain depends on the business to which the value is being applied. Six points in the value chain are analysed, with mark-ups.

Chapter 12 - TRANSMISSION AND DISTRIBUTION LINE CONFIGURATIONS

The components which make up transmission and distribution networks vary in type and usage according to circumstances. Each component is included to serve a specific purpose and that depends on the other parts of the system. This section of the report outlines these components, their purpose and when they are used.

Chapter 13 - CONDUCTORS

The number of conductors between towers or poles in a transmission or distribution network can vary enormously. The minimum is one conductor, and at the other extreme the largest number of conductors per span that we have encountered is a line which has no less than 36 conductors between towers. This has an enormous effect on the numbers of insulators required in a network.

Chapter 14 - MOTION CONTROL, SPACERS AND DAMPERS

Bundle conductors consist of three or four conductors for each phase. The conductors are separated from each other by means of spacers at regular intervals. There are many different types of spacer and various functions.

Chapter 15 - DAMPERS, JUMPERS AND CLAMPS

A vibration damper is an energy dissipation device for removing the energy of vibration imparted to a conductor by wind. Conductor vibration induces a relative motion between the clamp and the inertia weights which causes flexure of the steel cable, resulting in dissipation of mechanical energy by friction between the strands of the damper cable.

Chapter 15 - WORKING METHODS

Working on transmission lines is a hazardous occupation and a great deal of care must be exercised if linemen are not to be electrocuted or fall from heights. Despite all precautions there are fatalities every year. In general, there are four methods of live-line working which help workers avoid the considerable hazards.
# HV Insulators, HV Bushings, Spacers & Dampers Report Ed 3 - 2017

**Table of Contents**

1. EXECUTIVE SUMMARY ........................................................................................................ 9
   - HV Bushings ..................................................................................................................... 11
   - Spacers ............................................................................................................................. 11
   - Dampers ........................................................................................................................... 11

2. HV INSULATORS, HV BUSHINGS, SPACERS AND DAMPERS ........................................... 13
   - Insulators ......................................................................................................................... 13
   - Bushings .......................................................................................................................... 13
   - Spacers ............................................................................................................................ 11
   - Dampers ........................................................................................................................... 13

3. THE MARKET FOR HV INSULATORS .................................................................................. 14

4. THE MARKET FOR HV INSULATORS BY TECHNOLOGY - OIP and RIP ............................. 18

5. THE MARKET FOR HV INSULATORS BY END USERS ...................................................... 22

6. THE MARKET FOR HV BUSHINGS ..................................................................................... 26
   - Logistics .......................................................................................................................... 26

7. INSULATOR AND BUSHING TYPES BY SHARE ............................................................. 30
   - Insulation technology – OIP and RIP ............................................................................... 30
   - New insulator technology – RIS Resin impregnated synthetic ....................................... 30
   - Material of the housing ................................................................................................. 31
   - Technology development ............................................................................................... 33

8. INSULATORS, TYPES AND CHARACTERISTICS .......................................................... 34
   - Pin-type insulator .......................................................................................................... 34
   - Station or line post insulators ....................................................................................... 35
   - Suspension insulators .................................................................................................... 38
   - Strain type insulators ..................................................................................................... 41
   - Shackle type insulators .................................................................................................. 41
   - Stay insulators ............................................................................................................... 41
   - Insulator types used in transmission and distribution .................................................. 41
   - Transmission lines ........................................................................................................ 42
   - Distribution lines .......................................................................................................... 42
HV Insulators, HV Bushings, Spacers & Dampers Report Ed 3 - 2017

Table of Contents

Porcelain versus composite insulators ................................................................. 42
NCI’s general structure: ....................................................................................... 43
9. THE MARKET FOR SPACERS AND DAMPERS AND OTHER COMPONENTS .......... 45
10. INSULATOR AND BUSHING MANUFACTURERS ........................................... 49
    NGK, Japan / Locke Insulators ......................................................................... 49
    HSP & Trench Bushings Group - Siemens ......................................................... 50
    ABB .................................................................................................................. 50
    PNR Resin Impregnated Paper Bushings - Alstom ........................................... 50
    Lapp, USA and Germany - Pfisterer ................................................................. 50
    Seves Group, France ......................................................................................... 51
    Von Roll ............................................................................................................ 51
    K-LINE INSULATORS LTD. ............................................................................. 51
    P Core Electric .................................................................................................. 51
    Gruppo Bonomi .................................................................................................. 51
    CERALEP .......................................................................................................... 52
    Aditya Birla Nuovo Ltd, India ........................................................................... 52
    Victor Insulators, Inc ........................................................................................ 52
    Zhengzhou Orient Power Co Ltd ..................................................................... 52
    TE Connectivity .................................................................................................. 52
    Sicame ............................................................................................................... 53
11. THE VALUE CHAIN – FROM MATERIALS TO CAPEX ................................... 54
    The value chain at 6 levels ................................................................................ 54
12. TRANSMISSION AND DISTRIBUTION LINE CONFIGURATIONS ............ 57
    Overview of infrastructure ................................................................................ 57
    Line configurations ............................................................................................ 58
13. CONDUCTORS ................................................................................................. 60
    Circuits, phases and conductors ....................................................................... 60
    Covered conductors (CC) ................................................................................. 61
    XLPE/HDPE Covered conductors ..................................................................... 62
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerial cables</td>
<td>63</td>
</tr>
<tr>
<td>Spacer cable systems</td>
<td>63</td>
</tr>
<tr>
<td>Bundled conductors</td>
<td>63</td>
</tr>
<tr>
<td>Aerial bundled cable (ABC)</td>
<td>64</td>
</tr>
<tr>
<td>Three Phase, Single Phase and Single Wire Earth Return Systems</td>
<td>64</td>
</tr>
<tr>
<td>SWER</td>
<td>65</td>
</tr>
<tr>
<td>14. MOTION CONTROL, SPACERS AND DAMPERS</td>
<td>66</td>
</tr>
<tr>
<td>Spacers</td>
<td>66</td>
</tr>
<tr>
<td>Rigid spacers</td>
<td>66</td>
</tr>
<tr>
<td>Semi-rigid spacers</td>
<td>67</td>
</tr>
<tr>
<td>Flexible spacers</td>
<td>67</td>
</tr>
<tr>
<td>Articulated spacers</td>
<td>68</td>
</tr>
<tr>
<td>Hendrix spacers</td>
<td>70</td>
</tr>
<tr>
<td>Spacer for six conductors</td>
<td>72</td>
</tr>
<tr>
<td>15. DAMPERS, JUMPERS AND CLAMPS</td>
<td>73</td>
</tr>
<tr>
<td>Stockbridge damper</td>
<td>73</td>
</tr>
<tr>
<td>Spacer dampers</td>
<td>75</td>
</tr>
<tr>
<td>System fittings, clamps, jumpers, connectors, etc.</td>
<td>75</td>
</tr>
<tr>
<td>Jumpers</td>
<td>75</td>
</tr>
<tr>
<td>Spacer clamps</td>
<td>77</td>
</tr>
<tr>
<td>PG clamp</td>
<td>78</td>
</tr>
<tr>
<td>Preformed line products</td>
<td>78</td>
</tr>
<tr>
<td>15. WORKING METHODS</td>
<td>80</td>
</tr>
<tr>
<td>Overview</td>
<td>80</td>
</tr>
<tr>
<td>Hot stick</td>
<td>80</td>
</tr>
<tr>
<td>Insulating gloves or Rubber gloves</td>
<td>81</td>
</tr>
<tr>
<td>Bare hand</td>
<td>82</td>
</tr>
<tr>
<td>Helicopter</td>
<td>84</td>
</tr>
</tbody>
</table>
HV Insulators, HV Bushings, Spacers & Dampers Report Ed 3 - 2017

Figures

Figure 1: Global sales of HV insulators, nominal $ million, 2016 - 2021 ............................................. 14
Figure 2: World market for HV insulators by region, current $, 2016 - 2021 ........................................... 14
Figure 3: Global market for HV insulators by technology % shares, OIP and RIP, 2016 ........... 18
Figure 4: Global market for HV insulators by end use, transmission & distribution, $ 2015 .... 22
Figure 5: Global sales of HV bushings, nominal $ million, 2016 - 2021................................. 26
Figure 6: Pin type insulator .................................................................................................................. 34
Figure 7: Horizontal line post insulator ............................................................................................... 35
Figure 8: Braced angular line post insulator ......................................................................................... 35
Figure 9: Vertical line post insulator ................................................................................................. 36
Figure 10: The world’s largest HVDC transformer at Xiangjiaba, China, 2009 .................... 37
Figure 11: HVDC transformer at Three Gorges Dam, China, 2009 .............................................. 37
Figure 12: Outdoor bushings for a 550 kV transformer ................................................................. 38
Figure 13: Suspension insulator strings in 345kV power transmission lines ....................... 39
Figure 14: NKG Locke suspension insulators ..................................................................................... 40
Figure 15: Low voltage suspension insulators ..................................................................................... 40
Figure 16: Strain insulators on high voltage power lines ........................................................... 41
Figure 17: Global sales of spacers and dampers, nominal $ million, 2016-2021.................. 41
Figure 18: World market for spacers and dampers by region, nominal $ million, 2016-2021. 45
Figure 19: Configuration of a 400 kV transmission line with 2 bundled conductors per phase 58
Figure 20: Traditional single conductor per phase, double circuit transmission line .......... 61
Figure 21: Typical condition faced by MV lines in Finland during wintertime ....................... 62
Figure 22: Snow laden branches on a 2 circuit CC line in Sweden, no interruption to supply .. 64
Figure 23: Rigid spacer ......................................................................................................................... 66
Figure 24: Semi-rigid spacer .............................................................................................................. 67
Figure 25: Flexible spacer ................................................................................................................ 67
Figure 26: Articulated spacer for two conductors ........................................................................... 68
Figure 27: Articulated spacer for four conductors .......................................................................... 68
Figure 28: Spacers in a double circuit line, with three conductors per phase ......................... 69
Figure 29: Spacers on conductors and jumpers ............................................................................. 69
Figure 30: Spacer mounted at a pole for a CC system in the UK ............................................... 70
HV Insulators, HV Bushings, Spacers & Dampers Report Ed 3 - 2017

Figures

Figure 31: Spacer cable strung at a UK test site along with other CC and bare wire systems ........................................... 71
Figure 32: Hendrix spacers in the US .......................................................................................................................... 71
Figure 33: Close up of spacers .................................................................................................................................... 72
Figure 34: Spacers for six conductors per phase, two three phase circuits ................................................................. 72
Figure 35: Stockbridge damper ...................................................................................................................................... 73
Figure 36: Stockbridge damper in use .......................................................................................................................... 74
Figure 37: Vibration dampers in use ............................................................................................................................ 74
Figure 38: Quad spacer damper ..................................................................................................................................... 75
Figure 39: Jumpers connecting two conductors .............................................................................................................. 76
Figure 40: Jumper support insulator ............................................................................................................................ 76
Figure 41: Cantilever single-bolted ............................................................................................................................... 77
Figure 42: Nut-cracker single-bolted ............................................................................................................................. 77
Figure 43: Nut-cracker spring loaded ............................................................................................................................. 77
Figure 44: Parallel Grove (PG) Clamp ........................................................................................................................... 78
Figure 45: Installing a PG Clamp on ACCR .................................................................................................................... 78
Figure 46: Installing the outer layer of rods on the cable................................................................................................. 79
Figure 47: The end result, completed PLP Suspension assembly ..................................................................................... 79
Figure 48: Using a hot stick .............................................................................................................................................. 81
Figure 49: “Extreme Safety” gloves .............................................................................................................................. 82
Figure 50: Line man delivered by helicopter for bare hand work on a 345 kV line ......................................................... 84
Figure 51: Bare hand work on a 500 kV conductor .......................................................................................................... 85
### HV Insulators, HV Bushings, Spacers & Dampers Report Ed 3 - 2017

#### Tables

- **Table 1**: Global HV insulator market by region, nominal $, 2016 - 2021 ........................................ 15
- **Table 2**: North American HV insulator market by country, nominal $, 2016 - 2021 ......................... 15
- **Table 3**: European HV insulator market by country, nominal $, 2016 - 2021 ................................. 15
- **Table 4**: CIS HV insulator market by country, nominal $, 2016 - 2021 ........................................... 16
- **Table 5**: Middle East and African HV insulator market by country, nominal $, 2016 - 2021 ....... 16
- **Table 6**: Asia Pacific HV insulator market by country, nominal $, 2016 - 2021 ............................. 17
- **Table 7**: LAC HV insulator market by country, nominal $, 2016 - 2021 ......................................... 17
- **Table 8**: HV insulator market by region and technology % shares, OIP and RIP, 2016 .............. 18
- **Table 9**: North American HV insulator market by country and technology shares, OIP and RIP, $2016 .............................................................. 18
- **Table 10**: European and CIS HV insulator market by country and technology shares, OIP and RIP, $2016 .............................................................. 19
- **Table 11**: CIS HV insulator market by country and technology shares, OIP and RIP, $2016 ..... 19
- **Table 12**: Middle East and African HV insulator market by country and technology shares, ..... 20
- **Table 13**: Asia Pacific HV insulator market by country and technology shares, OIP and RIP, $2016 .............................................................. 21
- **Table 14**: LAC HV insulator market by country and technology, OIP and RIP, $2016 .......... 21
- **Table 15**: HV insulator market by end use % shares, T&D, 2016 ..................................................... 22
- **Table 16**: North American HV insulator market by end use, T&D, $2016 ................................. 22
- **Table 17**: European HV bushings market by end use shares, T&D, $2016 ............................. 23
- **Table 18**: CIS HV bushings market by end use shares, T&D, $2016 ........................................... 23
- **Table 19**: Middle East and African HV insulator market by end use shares, ......................... 24
- **Table 20**: Asia Pacific HV insulator market by end use shares, T&D, $2016 ........................... 25
- **Table 21**: LAC HV insulator market by end use shares, $2016 ..................................................... 25
- **Table 22**: Global HV bushings market by region, nominal $, 2016 - 2021 ............................. 27
- **Table 23**: North American HV bushings market by country, nominal $, 2016 - 2021 .......... 27
- **Table 24**: European HV bushings market by country, nominal $, 2016 - 2021 .................... 27
- **Table 25**: CIS HV bushings market by country, nominal $, 2016 - 2021 .............................. 28
Tables

Table 26: Middle East and African HV bushings market by country, nominal $, 2016 - 2021.. 28
Table 27: Asia Pacific HV bushings market by country, nominal $, 2016 - 2021 ................... 29
Table 28: LAC HV bushings market by country, nominal $, 2016 - 2021................................. 29
Table 29: Global share of glass, ceramic and composite bushings................................. 32
Table 30: The structure of NCIs.......................................................................................... 43
Table 31: Advantages and disadvantages of composite versus porcelain insulators .......... 44
Table 32: Global spacer and damper market by region, nominal $ million, 2016-2021........ 46
Table 33: North American spacer and damper market by country, nominal $ million, 2016-21.......................................................... 46
Table 34: European spacer and damper market by country, nominal $ million, 2016-2021 ... 46
Table 35: CIS spacer and damper market by country, nominal $ million, 2016-2021........... 47
Table 36: Middle East and African spacer and damper market by country, nominal $ million, 2016-2021............................................................................ 47
Table 37: Asia Pacific spacer and damper market by country, nominal $ million, 2016-2021.48
Table 38: LAC spacer and damper market by country, nominal $ million, 2016-2021........ 48
Table 39: Sales of NGK insulators, 2013 to 2018 ................................................................. 49
Table 40: Sales of Von Roll insulators ............................................................................... 51
Table 41: Production of insulators by company ................................................................. 53
Table 42: Costs and mark-up from Bill of Materials to Capex.......................................... 55
Table 43: Use of insulators, spacers and dampers by conductor configuration.................. 59
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