



**Vibrations :  
Have you ever  
evaluated this risk?**

**FCI : The expertise  
adapted to your  
overhead lines ...**

**Vibration on overhead lines**



# **TO PREVENT YOUR TRANSMISSION LINE FROM AEOLIAN VIBRATIONS**



## **WE CAN TEST THE SELF-DAMPING OF THE CABLE**

To evaluate the capacity of the cable to absorb by itself the vibrations

## **NECESSITY OF DAMPING SYSTEM**

The self-damping of the cable is often very weak and not sufficient to reduce the level of vibration

## **FCI DAMPING SOLUTIONS TESTS**

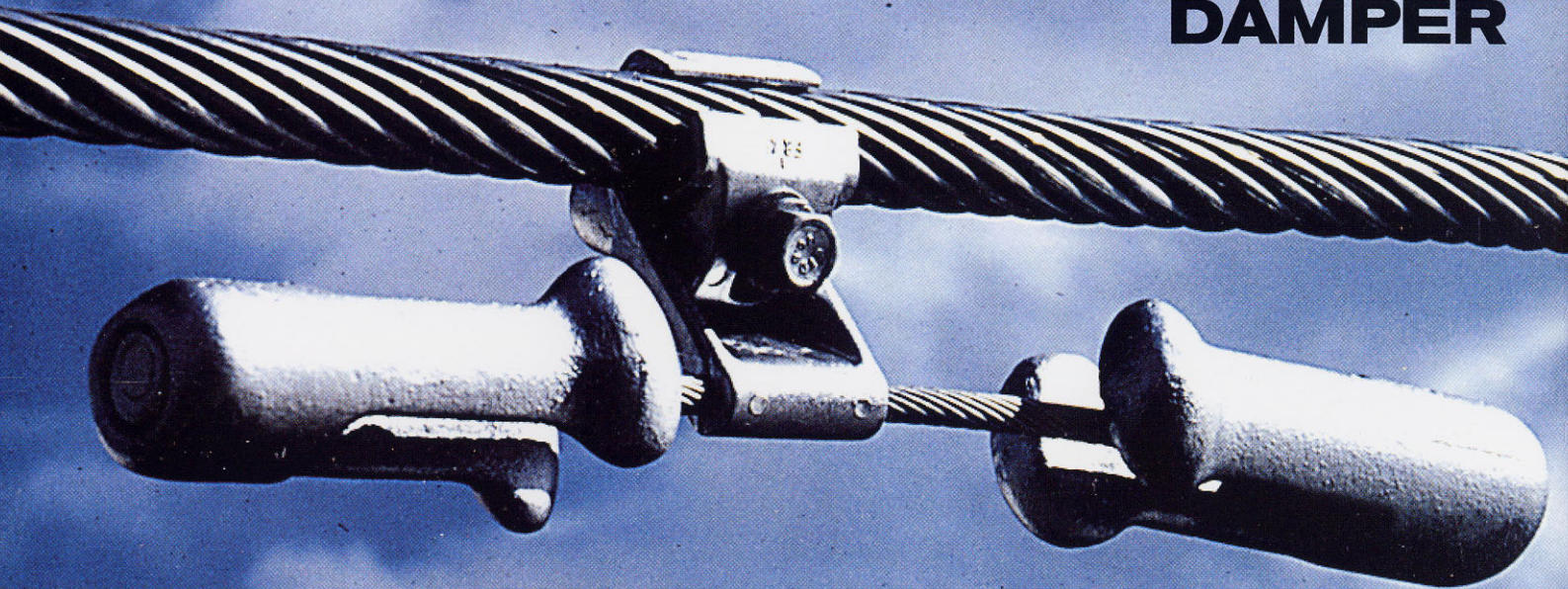
Our damping systems are tested according to the IEC standards :

IEC 61897 - Requirements and tests for Stockbridge type aeolian vibration dampers

IEC 61854 - Requirements and tests for spacers



# STOCKBRIDGE DAMPER



Damper with  
4 resonance frequencies

## LABORATORY EQUIPPED FOR :

### MECHANICAL TESTS

- clamp slip test
- attachment of weights to messenger cable
- attachment of clamp to messenger cable

### VIBRATION TESTS

- damping characteristics test
- fatigue test

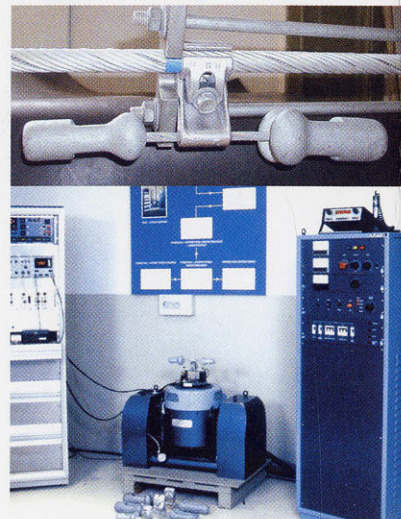
## GUARANTEE OF DAMPING EFFICIENCY WITH :

20 YEARS OF EXPERIENCE

PROTECTION ON THE WHOLE  
RANGE OF AEOLIAN VIBRATION  
FREQUENCY

SIMULATION OF VIBRATORY  
PHENOMENA

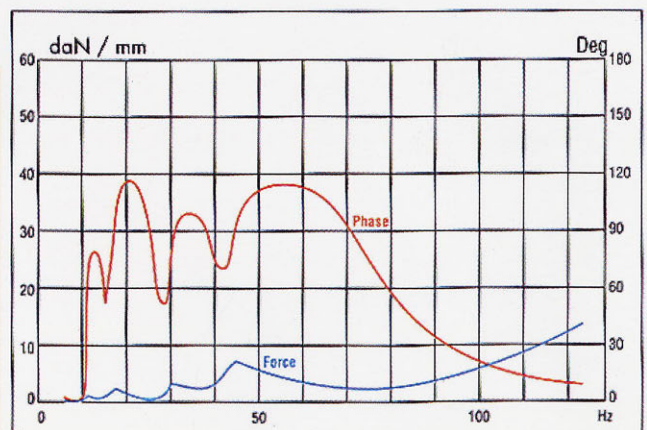
- to optimize the use of damper
- to supply the location drawing of damper



**A**  
**FCI**

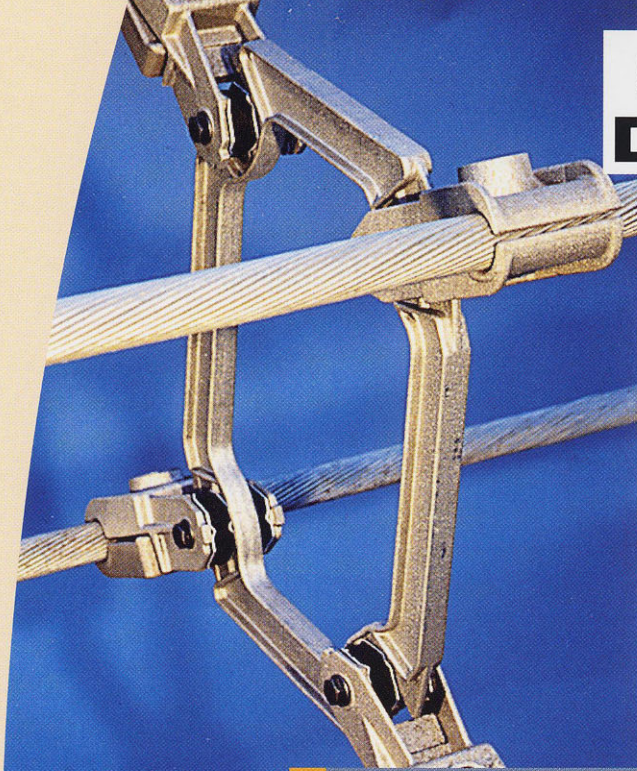
## OUR PRODUCT

CATALOGUE	CONDUCTOR DIAMETER (mm)	WEIGHT
FR20	6 mm - 15.5 mm	1.700 kg
FR35	15 mm - 26 mm	2.750 kg
FR40	21 mm - 31 mm	4.600 kg
FR45	31 mm - 38 mm	5.000 kg





# SPACER DAMPER



To prevent from vibration  
on bundle conductors

## DAMPING FUNCTION GUARANTEED WITH :

THE ELASTOMER PART IN ARTICULATIONS

A GOOD REPARTITION OF THE SPACER  
ALONG THE SPAN FOR MORE EFFICIENCY

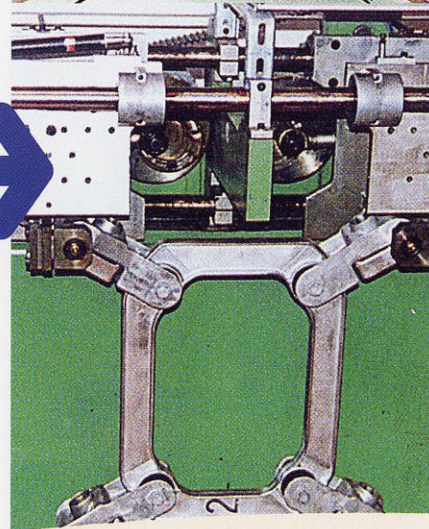
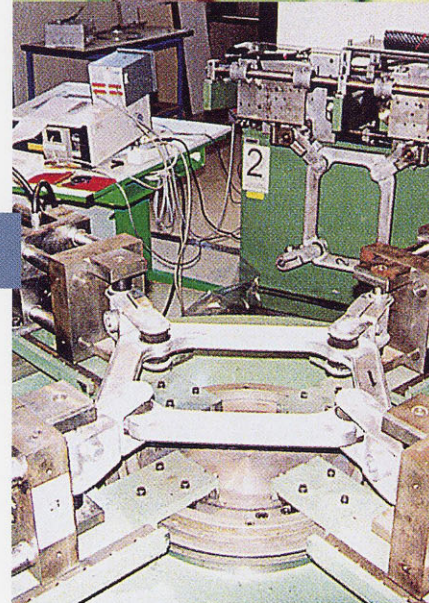
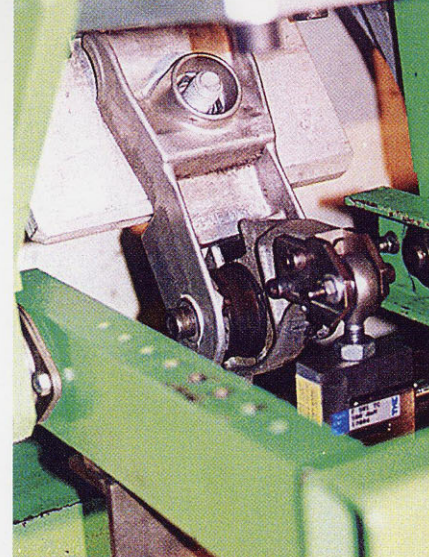
## LABORATORY EQUIPPED FOR :

### MECHANICAL TESTS

- CLAMP SLIP TEST
- SHORT CIRCUIT SIMULATION TEST

### VIBRATION TESTS

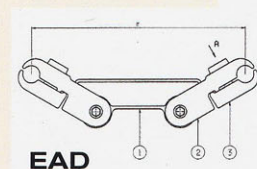
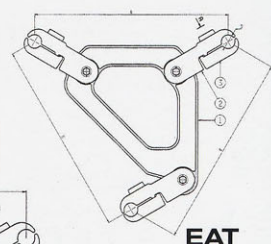
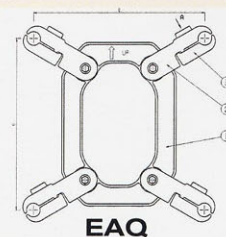
- DAMPING CHARACTERISTIC TEST
- FATIGUE TEST



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**FCI**

## OUR PRODUCT

CATALOGUE	NB CONDUCTOR	CONDUCTOR DIAMETER (MM)	SPACING E (MM)
EAD 33 D 26.5	2	26,5	330
EAD 40 D 26.5	2	26,5	400
EAD 40 D 32	2	32	400
EAD 46 D 23.5	2	23,5	460
EAT 40 D 26.5	3	26,5	400
EAT 45 D 26.5	3	26,5	450
EAQ 45 D 26.5	4	26,5	450
EAQ 45 D 32	4	32	450



Adaptable to spacing, bundle and conductor range



# VIBRATION RECORDERS

To obtain information  
directly from the line

By recorder vibrations  
during several weeks

## ANALYSIS OF THE LINE

To evaluate risks due  
to vibration on the line

To define characteris-  
tics of the vibration  
appearing on the  
conductor

To confirm perfor-  
mance of a damping  
system installed on  
the line.



**FIELD  
TEST**



**FCI**

**OUR EXPERIENCE**

In Poland (400 kV)

In Malaysia (500 kV)  
to guarantee the efficiency of the FCI spacer damper

In Chile (220 kV)  
to analyze the kind of vibration that appears on the line



>> Created in 1989, FCI - an Areva Group company - rapidly secured its place among the world's top three manufacturers of connectors and interconnect systems. With a turnover of 1.34 billion Euros in 2003, FCI currently operates in 18 countries where it covers the following markets: communications, data, consumer, industrial, automotive and electrical power interconnect. The company employs 12,500 staff worldwide.

For more information: [www.fciconnect.com](http://www.fciconnect.com)

## SOME REFERENCES

ABENGOA CHILE - Chile  
AL ABDULKARIM TRADING - Arabia  
ALCATEL CABLE FRANCE - France  
ALSTOM/AREVA T&D - France  
B.BOSCH SA - Chile  
DRAKA NK CABLES - Finland  
DRAKA TELEKOM GMBH & CO KG - Deutschland  
ELECTRICAS DE MEDELLIN LTDA - Colombia  
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AL ELEC - Algeria  
I.C.E. - Costa Rica  
KAHRIF - Algeria  
KIPREOS Y CIA LTDA - Chile  
LEC LATVIJAS ENERGOCELTNIEKS - Latvia  
NEXANS BENELUX N.V. - Belgium  
NKT CABLES GMBH - Deutschland  
NORELEC VIETNAM - Vietnam  
SADEVEN INDUSTRIAS C.A. - Venezuela  
SAE SP. Z.O.O. - Poland  
THE FURUKAWA ELECTRIC CO.LTD - Japan  
TRANSELEC - Chile  
TRAVOSIT - Algeria  
UGUR TURKYURT - Turkey  
COLBUN - Chile



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