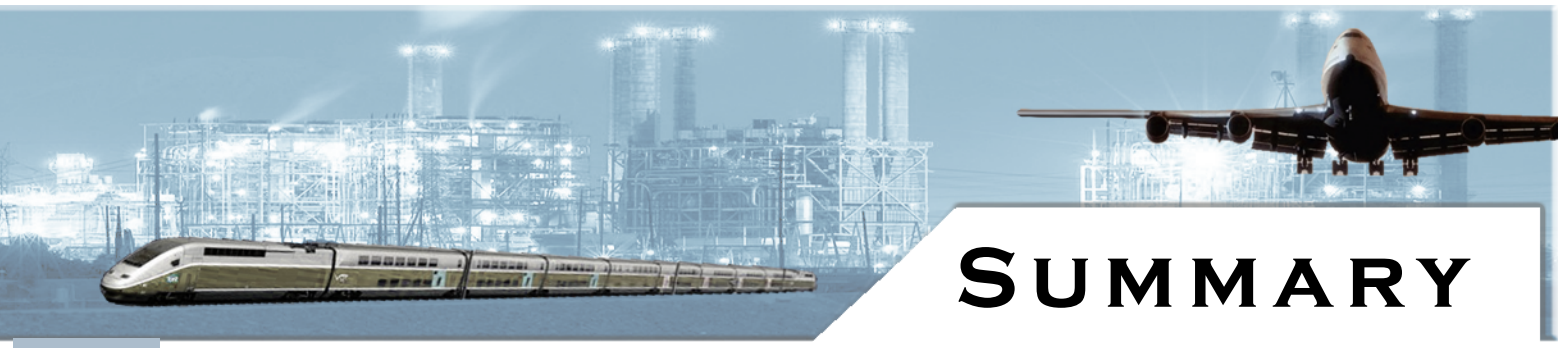
Catalogue 2018

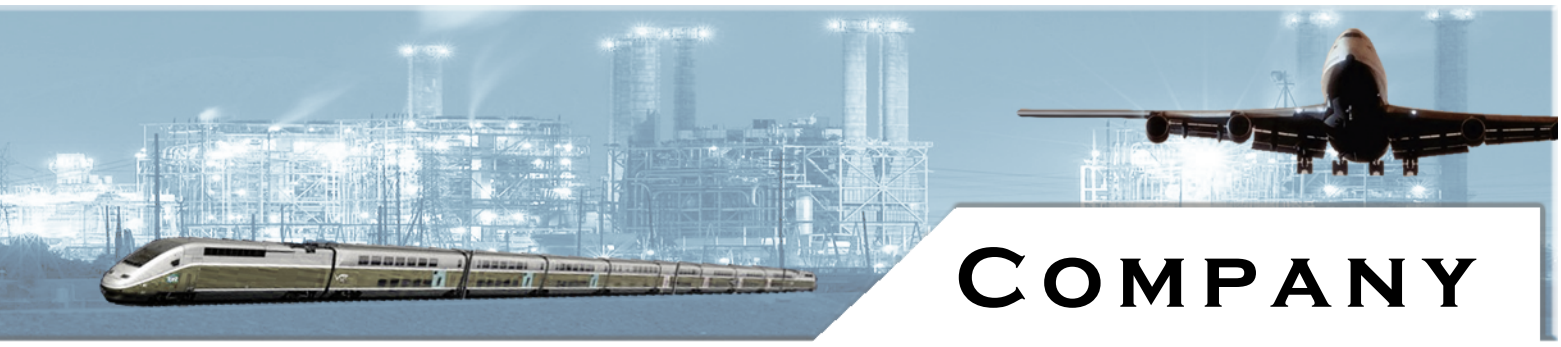
COSDEM

ELECTRONIQUE AMR



SUMMARY

PRESENTATION



COMPANY

AMR ELECTRONIQUE

Located in Saint just (FRANCE) over 35 years AMR Electronique develops and manufactures new production processes for winding trades. Our expertise how has steadily developed which allows us today to accompany our customers in areas such as:

- The agglomeration winding wires with polymerization by Joule Effect
- Analysis and qualification of enameled wire (for new product)
- Connection without unenamelling with COSDEM
- Prototyping of specific products manufactured for the imposed constraints
- The qualification and validation of connections
- Bench Test motors

QUALITY AND MEANS

Now present in 5 continents, we give special attention quality tools in both :

- Analysis and qualification means
- Production
- Production management of our equipment

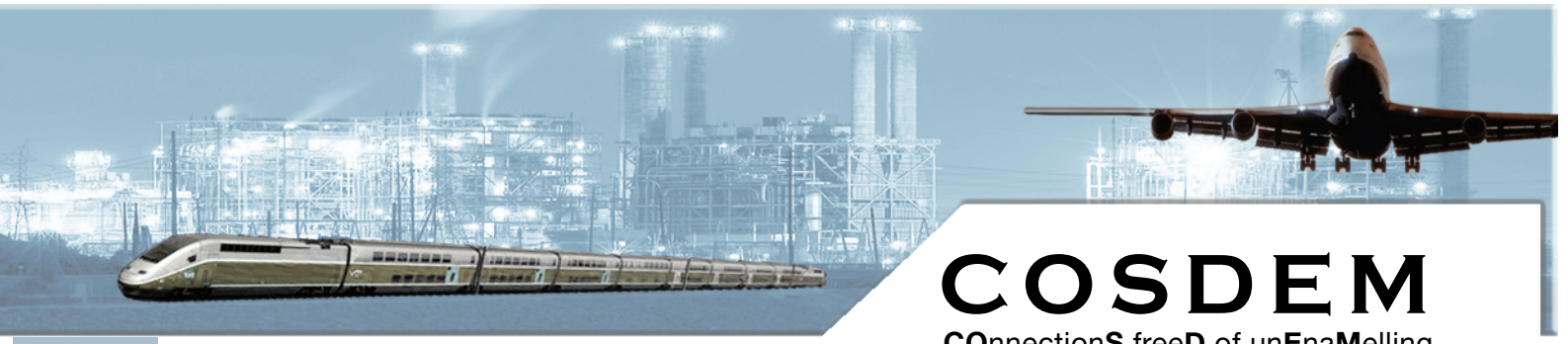
AREAS OF ACTIVITIES

AMR Electronique delivers reliable and sustainable business solutions to our partners in Aeronautics, Automotive, Energy, Medical, Nuclear, Railway ...






PRESENTATION



COSDEM

COnnection**S** free**D** of un**E**na**M**elling

PRESENTATION

This process, perfected by AMR, ensures the connections of magnet wires :

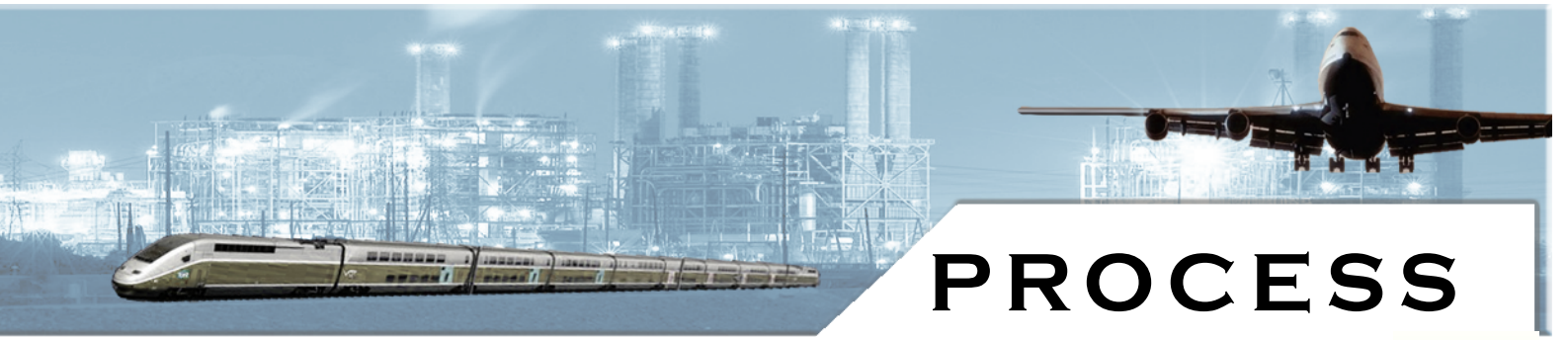
- Copper or Aluminium,
- Same or different diameters,
- Round, flat or CTC
- Single or multi wires
- enamelled, tinned or bare,

and that :

-in a same socket
a same terminal
-a same barrel
-a same lug
-standard to all the manufacturers

by :

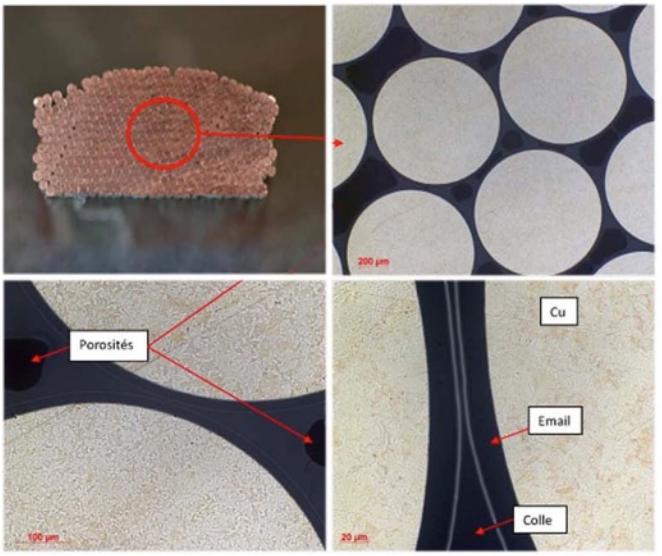
-heat confining
-soft or hard solder with filler metal



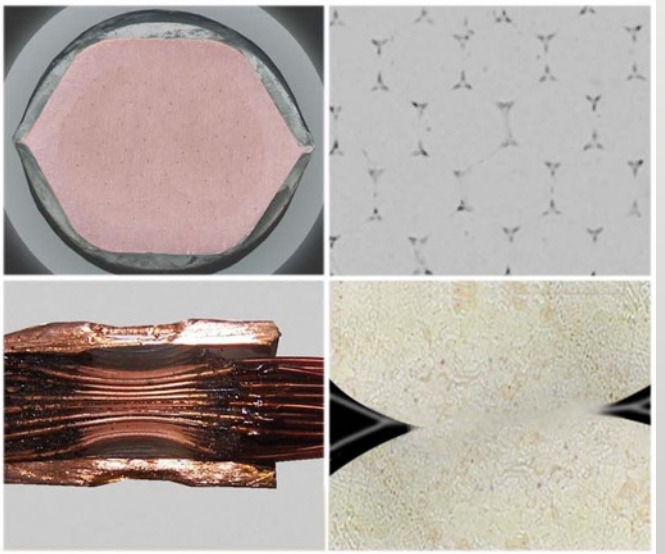
PROCESS

The joint action of the couple pressure X heat applied through a socket, barrel, lug or terminal, induces the creeping of the enamel, which ensures the connection of the enamelled magnet wires.
The process is suitable for any composition and any type of enamel.

Cross section before crimping



Cross section after crimping

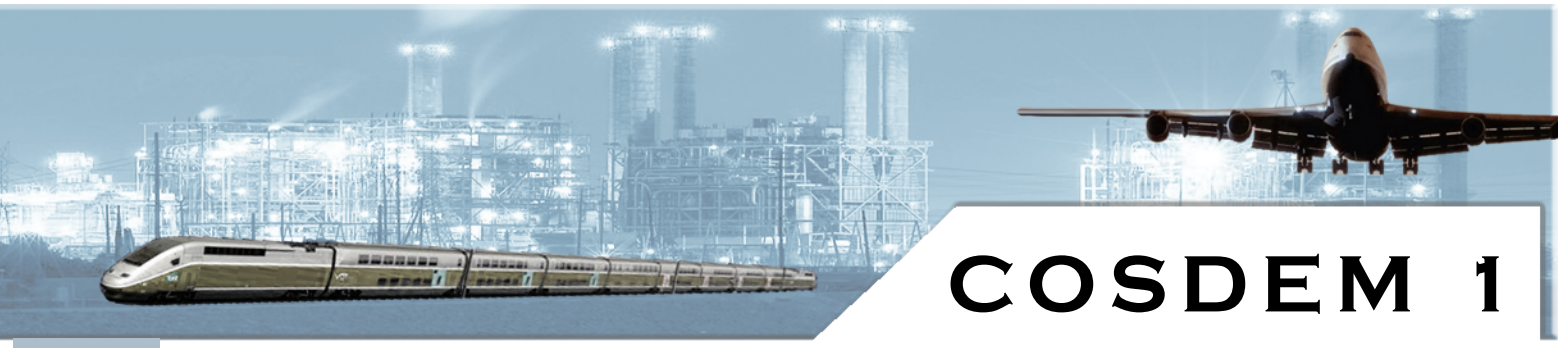


The use of welded wire is no longer inevitable.

Thanks to COSDEM, complex compositions (like litz wires cables) can be now used with high performance insulation.
The prospects of technological and economic developments of your coils have currently no limits.

Cf AMR publication : "Litz wires and coil"
"Polymeres and electrical insulation"
"Enameled wires and coil"
"Rotating machines and coil "

PRESENTATION



COSDEM 1

MACHINE RANGE

PRODUCT

- For copper wires
- For copper tubular lug

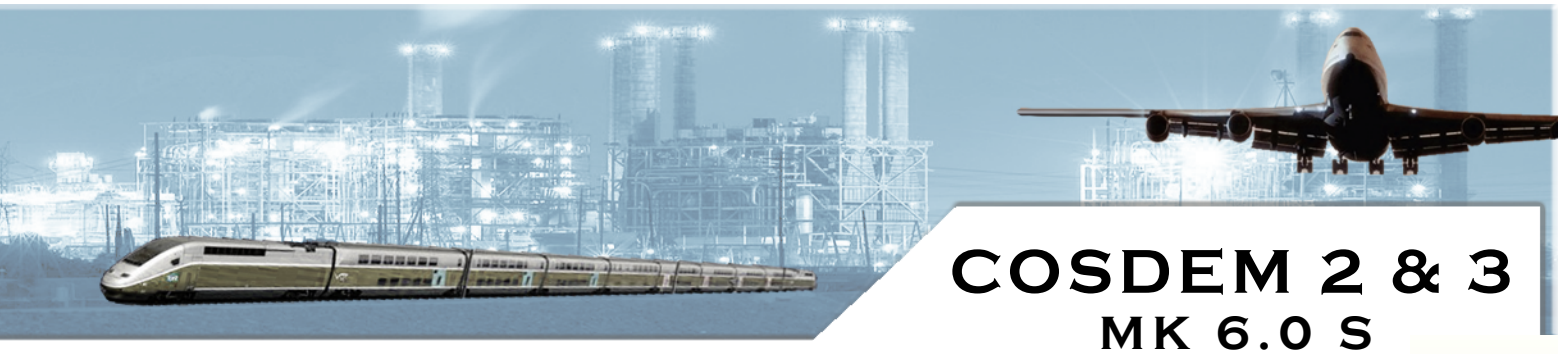
APPLICATION

- Laboratory machine
- Small production

OPTION

- Compensator for easy manipulation
- Smoke extractor for the traitment of emanation

Physical specifications Crimping tool	
Height	240 mm
Length	165 mm
Width	80 mm
Weight head	2,5 Kg
Weight cabinet	1,5 Kg
Output voltage:	1V - 500 A - 500 Hz
Connection capacities	from 0,25 up to 10 mm2
Power supply	230 V, 50 Hz, Monophased
Interchangeable jaws with specific prints on request	



COSDEM 2 & 3
MK 6.0 S

PRODUCT

- For copper or aluminium wires
- For copper or aluminium tubular lug

APPLICATION

- Series production,
- New development,

INTERFACE

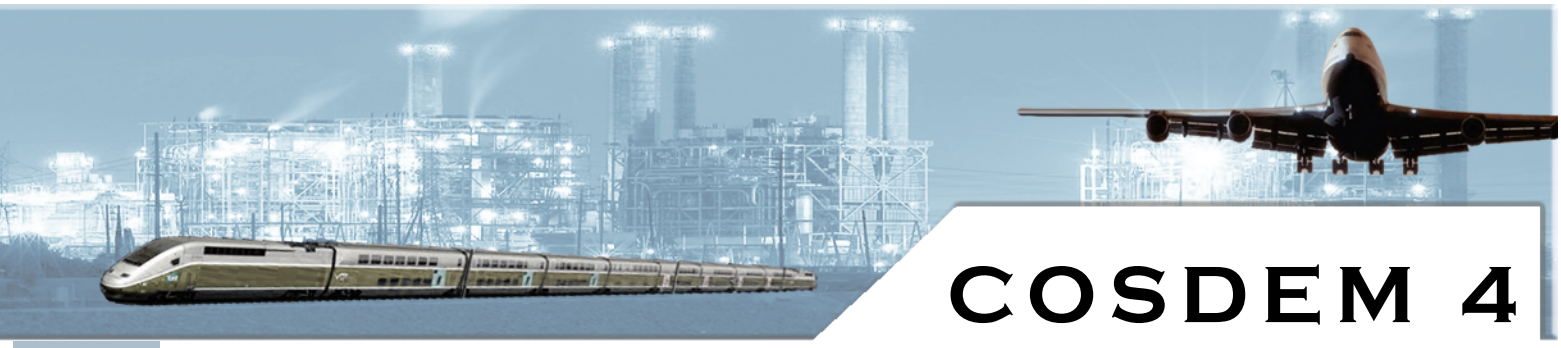
- Viewing crimp curves
- Technical Data : Pressure / Temperature

ALL IN ONE SYSTEME

- Compensator for easy manipulation
- Smoke extractor for the traitment of emanation

Physical specifications Crimping tool		
	COSDEM 2	COSDEM 3
Height	140 mm	180 mm
Length	255 mm	310 mm
Width	160 mm	210 mm
Weight	12 kg	18 kg
Connection capacities	from 10 mm2 to 70 mm2	from 50 mm2 to 185 mm2
Output voltage	1V - 2000 A - 500 Hz /Galvanic insulation > 8 kV	
Smoke extraction	To be defined depending on the section and the volume of production	
Physical specifications Power supply		
Height	900 mm	
Length	600 mm	
Width	600 mm	
Weight	70 kg	
Power supply	230 V , 50 Hz Monophased 16 A	400 V, 50 Hz / 440 V, 60Hz Three-phased 20 A
Automatic range	from 10 mm2 to 70 mm2	from 50 mm2 to 185 mm2
Optional High temperature Wires (Cut through < or soldering 650° C)		
Interchangeable jaws with specific prints on request		

MACHINE RANGE



COSDEM 4
HYDRO

MACHINE RANGE

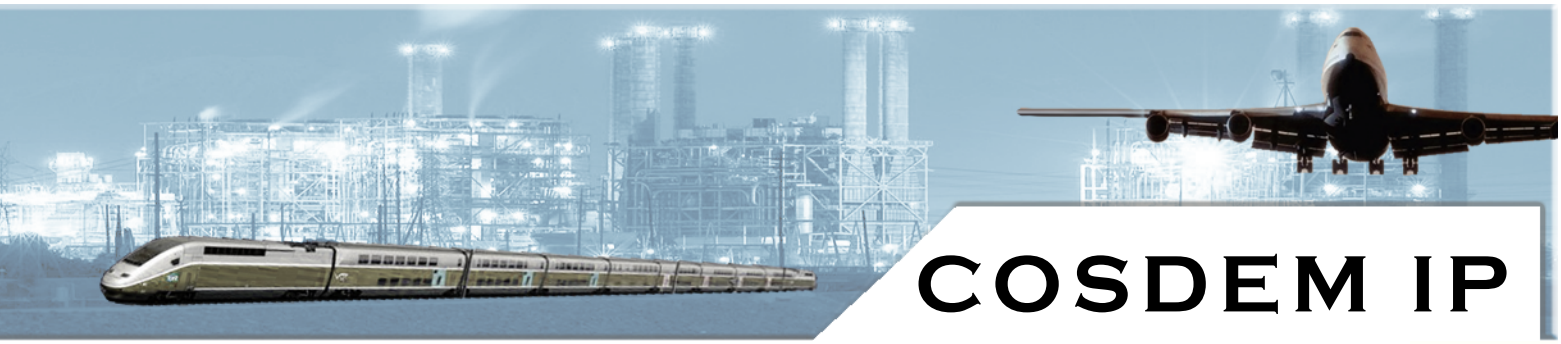
PRODUCT
- For copper or aluminium wires
- For copper or aluminium tubular lug

APPLICATION
- Series production,
- New development,

INTERFACE
- Viewing crimp curves
- Technical Data : Pressure / Temperature

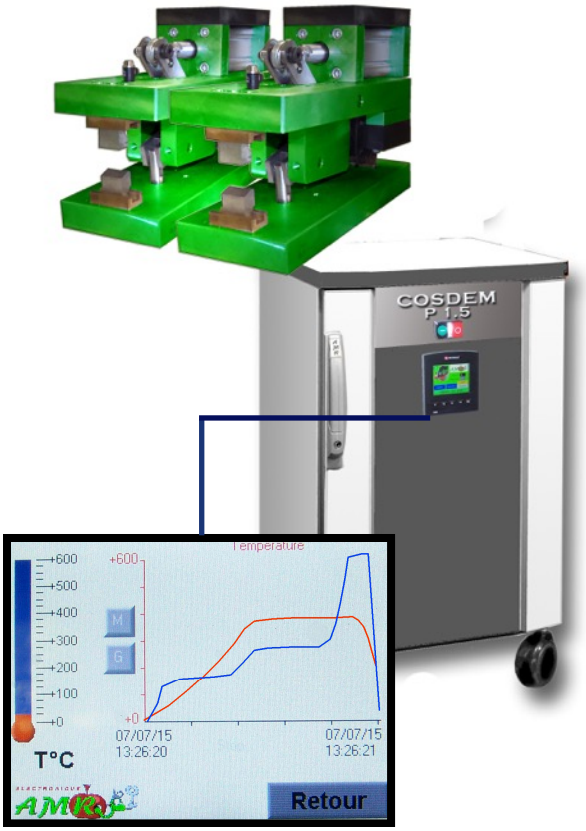
OPTION
- Compensator for easy manipulation
- Smoke extractor for the traitment of emanation

Physical specifications Crimping tool	
Height	200 mm
Length	360 mm
Width	210 mm
Weight	22 Kg
Smoke extraction by ventilation with interchangeable filter	
Output voltage	1V - 2000 A - 500 Hz /Galvanic insulation > 8 kV
Connection capacities	from 150 mm2 to 630 mm2
Physical specifications Power supply	
Height	380 mm
Length	210 mm
Width	525 mm
Weight	20 Kg
Power supply	400 V, 50 Hz / 440 V, 60Hz Three-phased 25 A
Automatic range	from 150 mm2 to 630 mm2
Optional High temperature Wires (Cut through < or soldering 650° C)	
Interchangeable jaws with specific prints on request	



COSDEM IP

NEW



PRODUCT

- For copper or aluminium wires
- For copper or aluminium tubular lug

APPLICATION

- Larges Series production, (severals thousand per day)
- New development,

INTERFACE

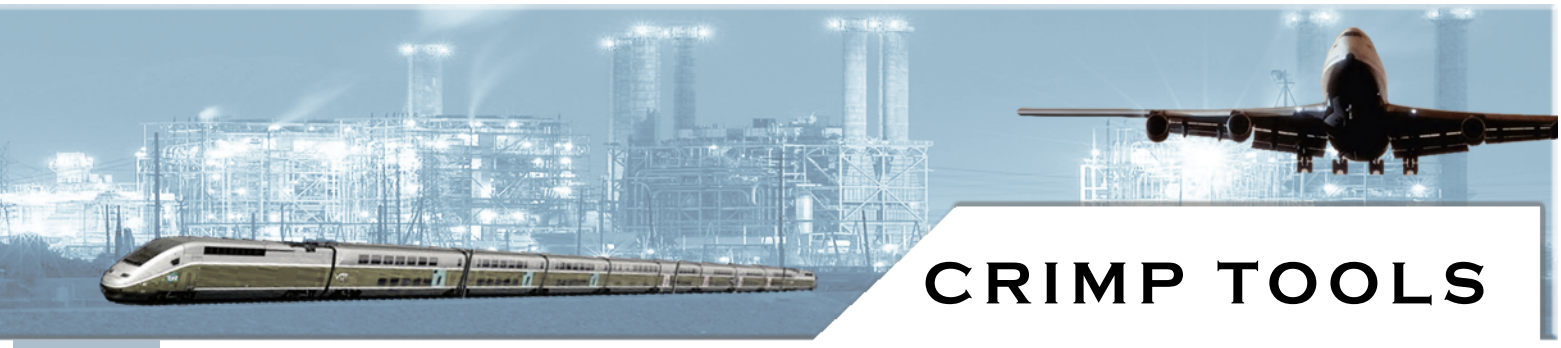
- Viewing crimp curves
- Technical Data : Pressure / Temperature

ALL IN ONE SYSTEME

- Implementation on the production line
- Smoke extractor for the traitment of emanation

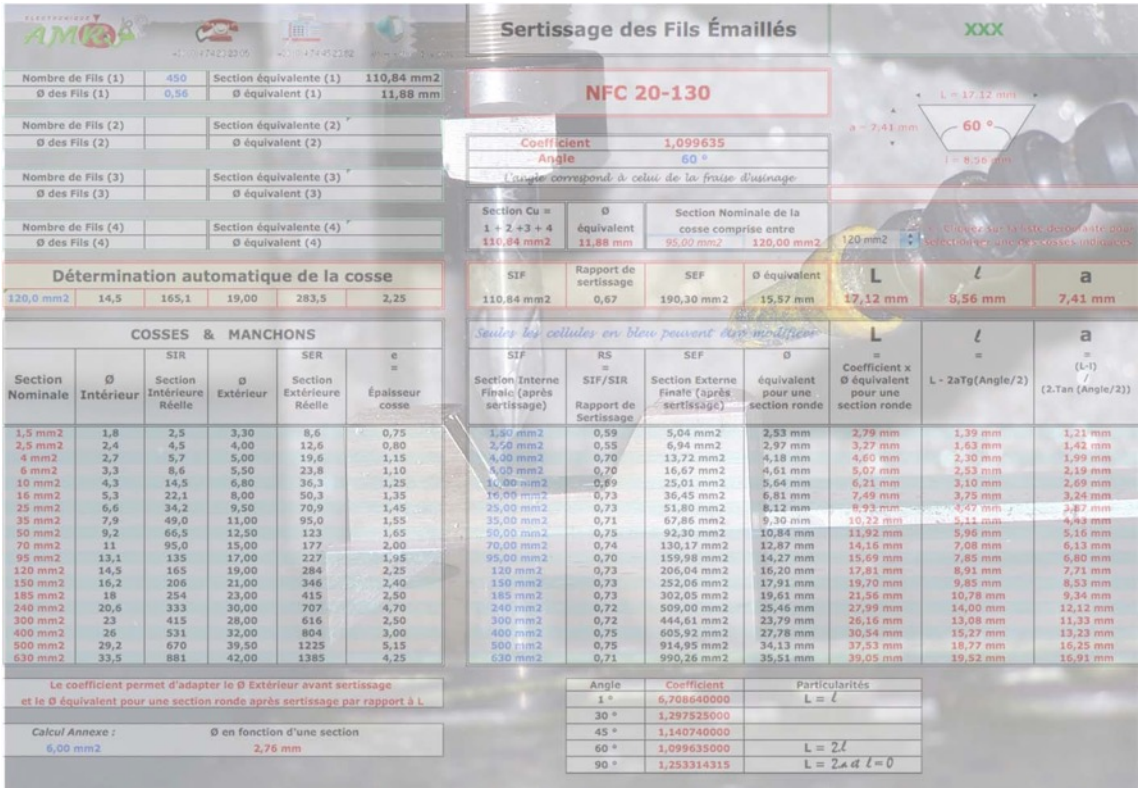
Physical specifications Crimping tool		
	COSDEM 1 IP	COSDEM 2 IP
Height	120 mm	180 mm
Length	250 mm	310 mm
Width	100 mm	210 mm
Weight	4 kg	12 kg
Connection capacities	from 0,5 mm2 to 10 mm2	from 10 mm2 to 70 mm2
Output voltage	1V - 2000 A - 500 Hz /Galvanic insulation > 8 kV	
Smoke extraction	To be defined depending on the section and the volume of production	
Physical specifications Power supply		
Height	900 mm	
Length	600 mm	
Width	600 mm	
Weight	60 kg	
Power supply	230 V , 50 Hz Monophased 16 A	230 V , 50 Hz Monophased 16 A
Automatic range	from 0,5 mm2 to 10 mm2	from 10 mm2 to 70 mm2
Optional High temperature Wires (Cut through < or soldering 650° C)		
Interchangeable jaws with specific prints on request		

MACHINE RANGE



The design of the crimping tools should consider :

- Composition of your cable
- Copper or aluminium cross section
- Your cable geometry (Round, Rectangular or Square)
- From connector use



Step 1 Set up a connector type

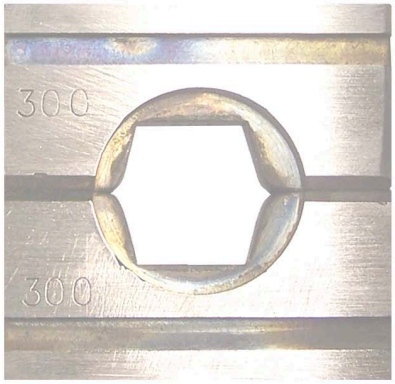
We can help you along this step :

- By directing you to the most appropriate connector, according to the different standards.
- By offering a design specific to your needs pods (see page 18)

Step 2 Design and material selection

AMR set a specific geometry of the crimping tools thanks to a computer program taking part in the elements mentioned above, to ensure the optimum mechanical and electrical resistance values.

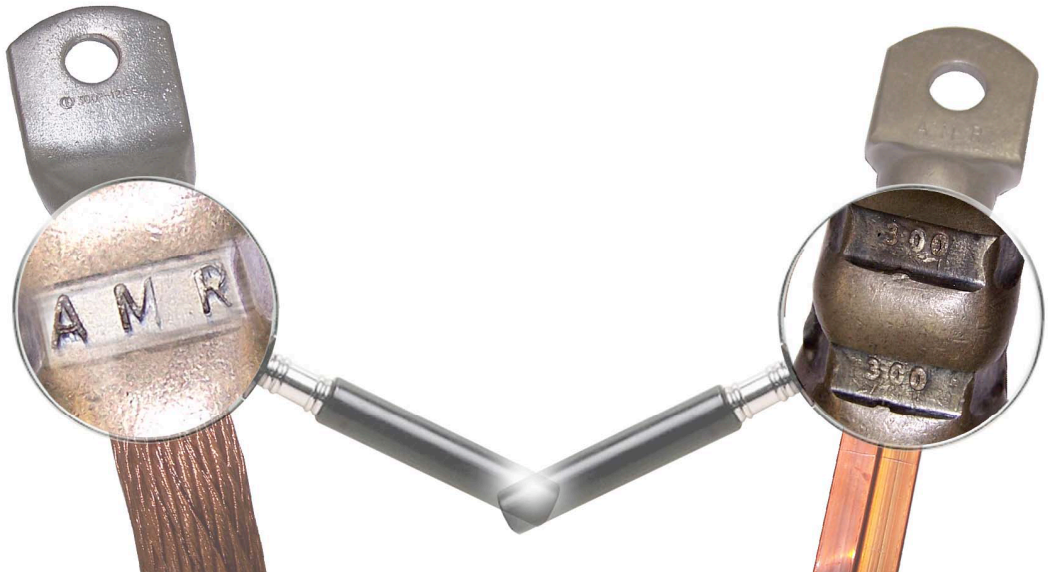
These jaws can be cut into different materials in according to the crimping quantity and the type of connector.

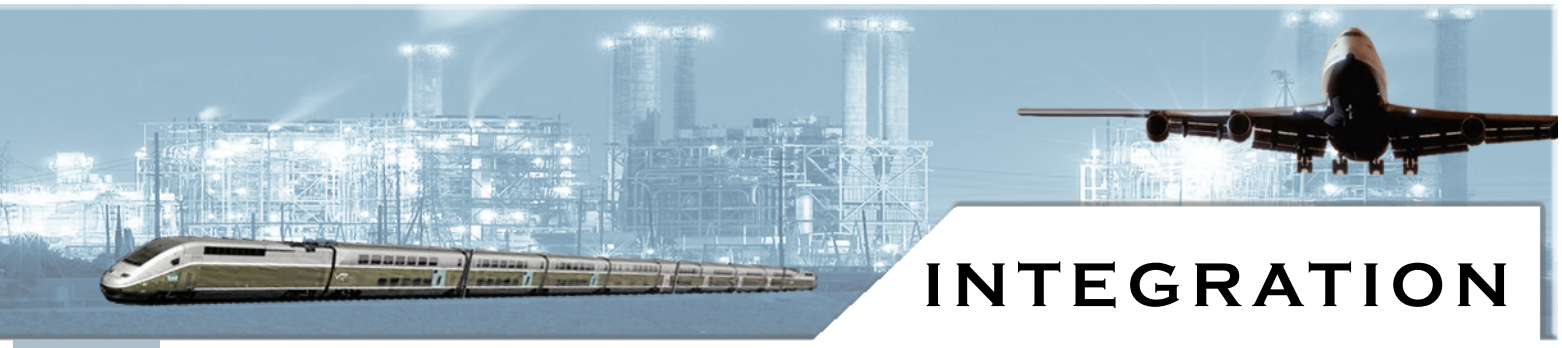


Step 3 Identification and markings

Each jaws can be identified according to your criteria.
Example : Project Number, Section crimp, Code specific to the company.

The crimped connector will be marked by the tools references.

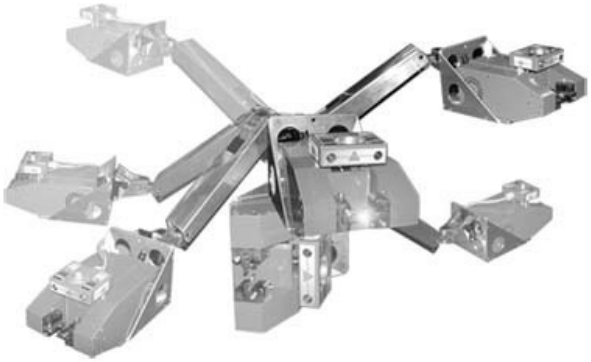




INTEGRATION

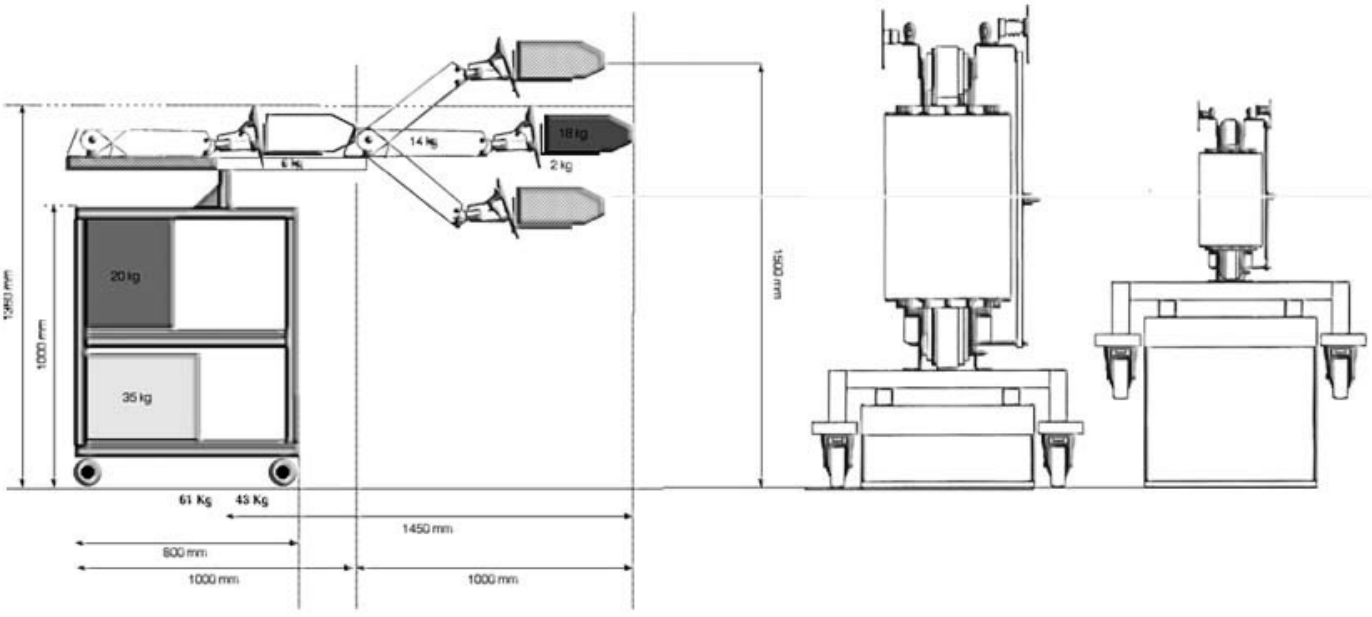
EQUIPMENT

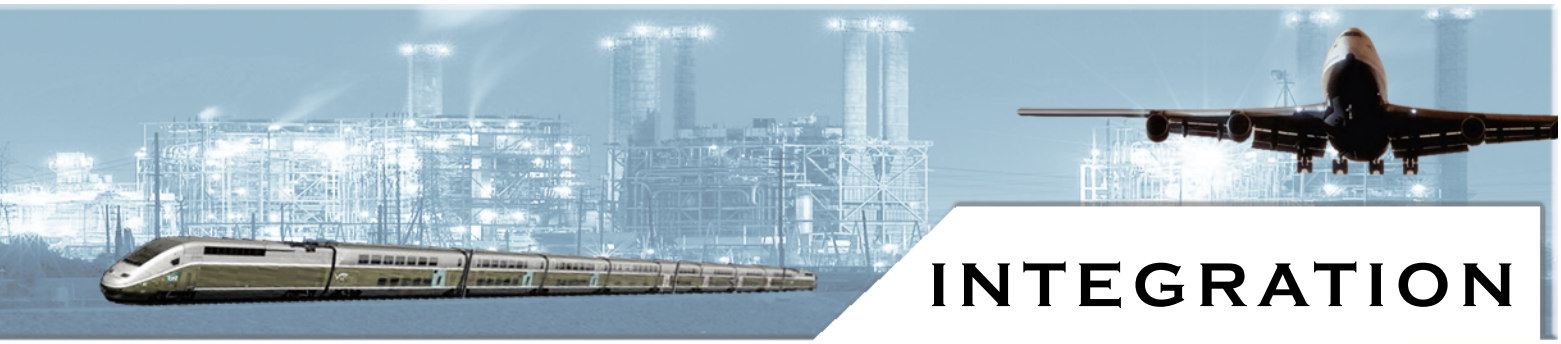
AMR ACHIEVES THE INTEGRATION ACCORDING TO YOUR SPECIFICATION



- Integration of production line
- Congestion of unit
- Perimeter crimping

- Arm length for deployment
- Mobile or fixed unit
- Smoke extraction system



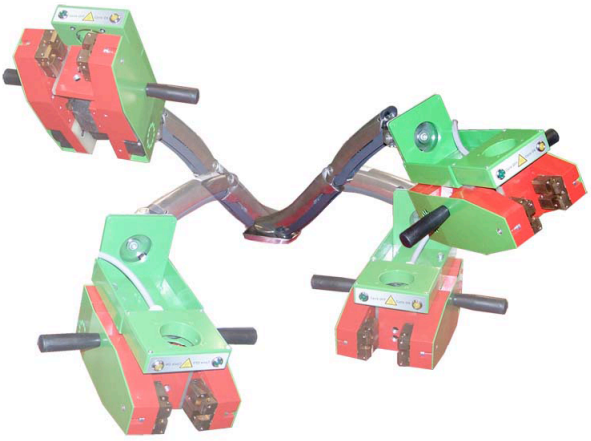


INTEGRATION

COSDEM 2 MANIPULATOR ARM

Fulfilment of the most demanding connections !

This new arm,, allows effortlessly manipulate of your COSDEM in all crimping configurations possible.



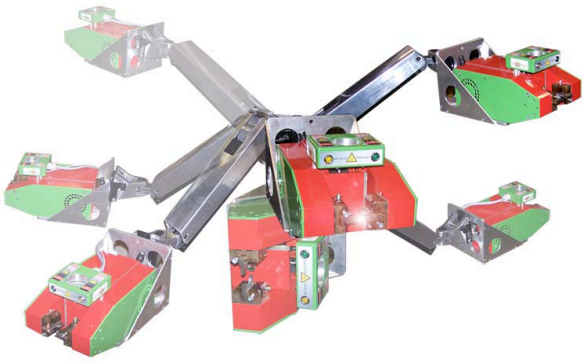
Kinematics

Weight supported	Height adjustement	Tilt	Panoramic (Left /right)	Rotation
13 Kg	13 cm	80°	360°	90°

COSDEM 3 MANIPULATOR ARM

Fulfilment of the most demanding connections !

This new arm,, allows effortlessly manipulate of your COSDEM in all crimping configurations possible.



Kinematics

Poids supporté	Ajustement en hauteur	Inclinaison	Panoramique (Droite / Gauche)	Rotation
31 Kg	51 cm	20°	360°	360°

EQUIPMENT

INTEGRATION

EQUIPMENT

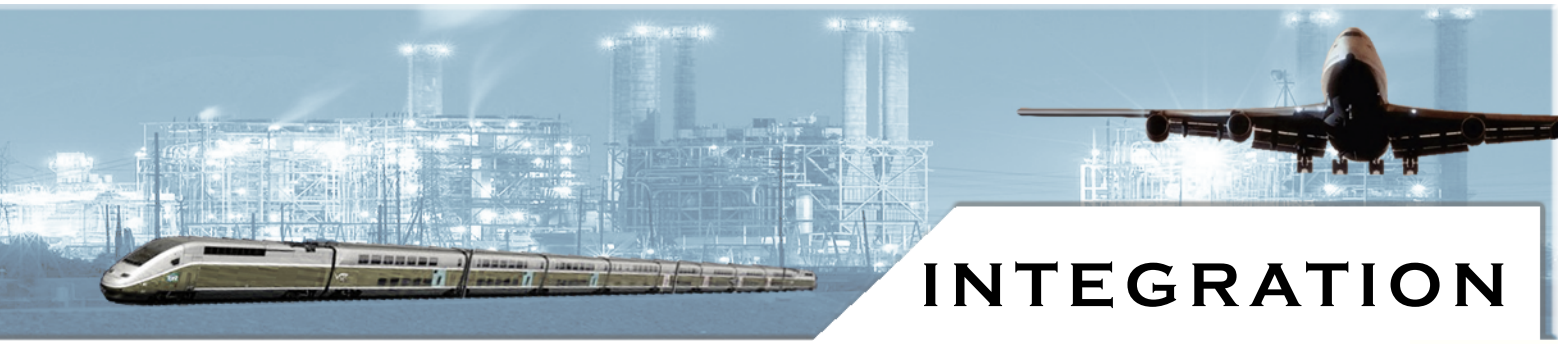
EXAMPLE OF REALISATION

CONNECTION AREA COSDEM 1 / 2 / 3

A single mobile worstation to connect your whole cables

COSDEM 1 COMPENSATOR

The handing in your production service. This COSDEM 1 assistance is a complete set, easy to integrate on your workstations. It preserves the health of the operator compensation weight of the head and thanks to the absorption of fumes during crimping



INTEGRATION

EXAMPLE OF REALISATION

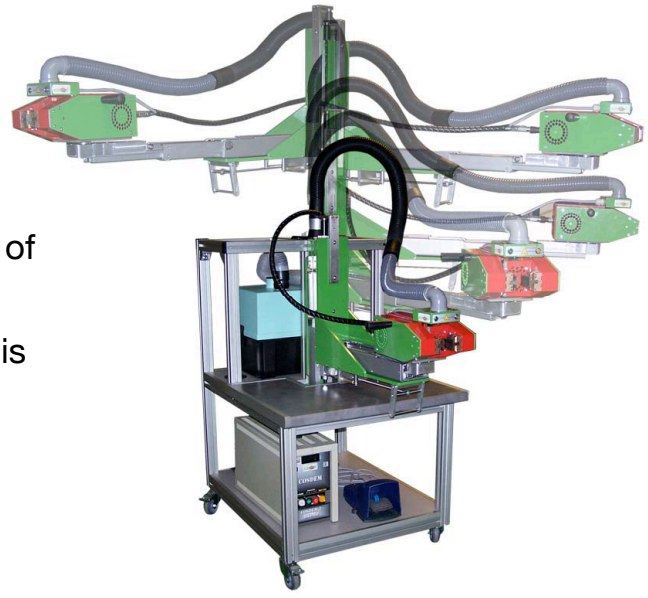
COSDEM 2 COMPACT ASSISTANCE

A compact solution to your probleme of connection.

- Connection System
- Manipulatot arm
- Smoke extraction
- Storage
- H : 750 mm x L : 600 mm x W : 310 mm

COSDEM 3 COMPENSATOR

This COSDEM 3 assistance is distinguisched by the large deployment of the manipulator arm.
The maximum height reached crimping is 1,8 meters



EQUIPMENT

SMOKE EXTRACTOR

E Q U I P M E N T

Certifies your filter unit according to your application to :

- Protecting people against the fumes produced during crimping.
- Process gases and fumes to protect the environment.
- Avoid clogging and extend the life of your equipment

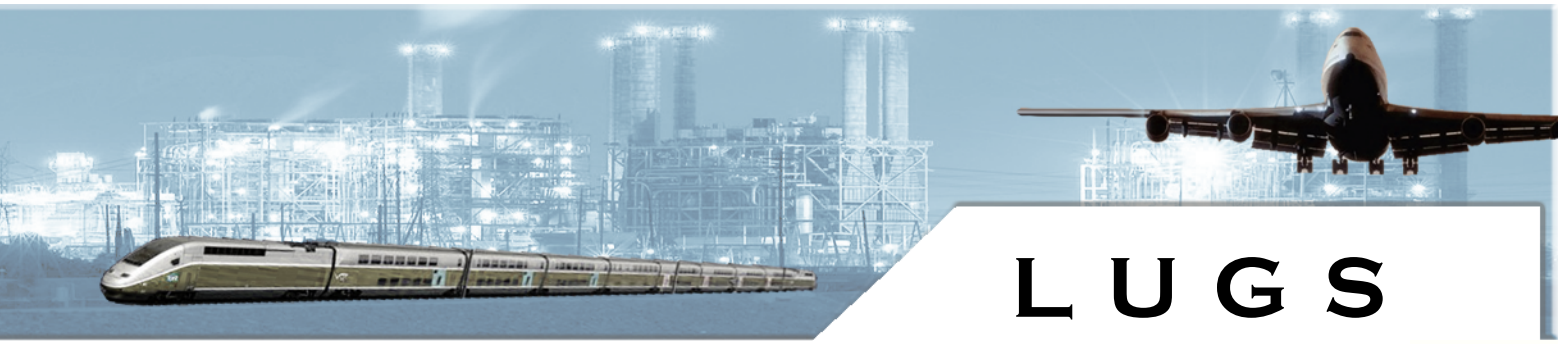
Connection / Days	5		10		20		30		50		100		150		200		300		400	
Enamel	Solderable	Standard	Solderable	Standard	Solderable	Standard	Solderable	Standard	Solderable	Standard	Solderable	Standard	Solderable	Standard	Solderable	Standard	Solderable	Standard	Solderable	Standard
Section																				
1,5 mm2																				
2,5 mm2																				
4 mm2																				
6 mm2																				
10 mm2																				
16 mm2																				
25 mm2																				
35 mm2																				
50 mm2																				
70 mm2																				
95 mm2																				
120 mm2																				
150 mm2																				
185 mm2																				
240 mm2																				
300 mm2																				
400 mm2																				
630 mm2																				

	Low	Extraction CDF 1
	Medium	Extraction CDF 2
	weighty	Extraction CDF 2
	High	Extraction CDF 3
	Very hygh	Extraction CDF 3

The protection of persons

- Technical features

Caractéristiques techniques Extraction de fumée			
Modèle/ Model	CDF1	CDF2	CDF3
Hauteur / Height	180 mm	450 mm	450 mm
Longueur / Length	200 mm	300 mm	600 mm
Largeur / Width	160 mm	300 mm	300 mm
Poids / Weight	6	12 Kg	21 Kg
Puissance / Power :	36	115 Watts	230 Watts
Niveau sonore /Sound level	55 dBA	55 dBA	65 dBA
Filtre / Filter	Filtre particules fines	HEPA 12	HEPA 12
Alimentation / Power supply	230 V, 50 Hz, monophasé / Monophased	230 V, 50 Hz, monophasé / Monophased	230 V, 50 Hz, monophasé / Monophased

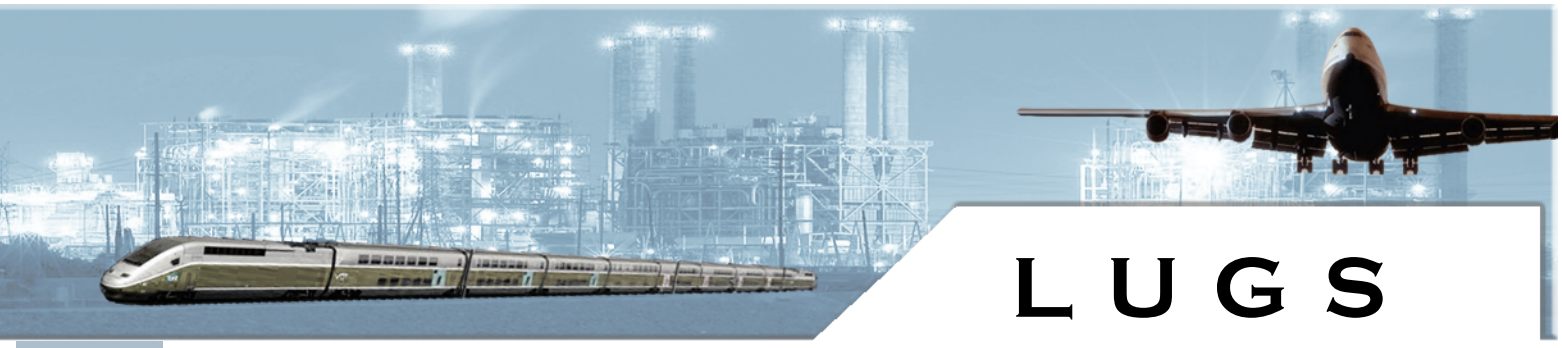


LUGS

Internal sections of different standards

SECTION COMMERCIALE NOMINALE COSSES CUIVRE	NFC 20-130			NFF 00363			DIN 46234			DIN 46235		
	Ø Int.	Section Intérieure Réelle	Ø Ext.	Ø Int.	Section Intérieure Réelle	Ø Ext.	Ø Int.	Section Intérieure Réelle	Ø Ext.	Ø Int.	Section Intérieure Réelle	Ø Ext.
1,5	1,8	2,5	3,3				1,6	2				
2,5	2,4	4,5	4,0				2,3	4				
4	2,7	5,7	5,0				3,6	10				
6	3,3	8,6	5,5				3,6	10		3,8	11	5,5
10	4,3	14,5	6,8	5	20	8,0	4,5	16		4,5	16	6,0
16	5,3	22,1	8,0	6	28	9,0	5,8	26		5,5	24	8,5
25	6,6	34,2	9,5	7,7	47	10,5	7,5	44		7	38	10,0
35	7,9	49,0	11,0	9	64	12,0	9,4	69		8,2	53	12,5
50	9,2	66,5	12,5	10,8	92	14,0	11	95		10	79	14,5
60				*11,8*	*109*	*15,0*						
70	11	95,0	15,0	12,5	123	16,0	13	133		11,5	104	16,5
95	13,1	135	17,0	14,5	165	18,5	15	177		13,5	143	19,0
120	14,5	165	19,0	16,5	214	21,0	17	227		15,5	189	21,0
150	16,2	206	21,0	18	254	23,0	19	284		17	227	23,5
185	18	254	23,0	20,5	330	26,0	21	346		19	284	25,5
240	20,6	333	26,0	23	415	29,0	23,5	434		21,5	363	29,0
300	23	415	28,0	26	531	33,0				24,5	471	32,0
400	26	531	32,0	33	855	39,0				27,5	594	38,5
500	29,2	670	39,5	40	1257	50,0				31	755	42,0
630	33,5	881	42,0							34,5	935	44,0
800										40	1257	52,0
1000										44	1521	58,0
Commentaires	Norme Française Cosse tubulaire			Ferroviaire Cosse tubulaire			Norme Allemande *Cosse roulée*			Norme Allemande Cosse tubulaire		
Comments	French Standard Tubular Cable lug			Railroad Standard Tubular Cable lug			German Standard *Rounded & welded lug*			German Standard Tubular Cable lugs		

SECTION COMMERCIALE NOMINALE COSSES CUIVRE	IEC 61238-1			UL-CSA			VDE 0220			DIN VDE 57295		
	Ø Int.	Section Intérieure Réelle	Ø Ext.	Ø Int.	Section Intérieure Réelle	Ø Ext.	Ø Int.	Section Intérieure Réelle	Ø Ext.	Ø Int.	Section Intérieure Réelle	Ø Ext.
1,5												
2,5												
4				1,7	2							
6	3,3	9	5,0	2,3	4		3,5	10				
10	4,6	17	6,8	3,4	9		4,5	16		5,6	25	8,0
16	5,8	26	8,0	4,5	16		5,5	24		6,6	34	9,5
25	7	38	9,5	5,8	26		7	38		7,9	49	11,0
35	8,9	62	11,8	7,7	47		8,5	57		9,2	66	12,5
50	10	79	13,0	9,4	69		10	79		11	95	15,0
60												
70	11,3	100	14,6	11,4	102		12	113		13,1	135	17,0
95	13,5	143	17,5	13,3	139		13,5	143		14,5	165	19,0
120	15,2	181	19,7	14,5	165		15	177		16,2	206	21,0
150	16,7	219	21,5	16,4	211		16,5	214		18	254	23,0
185	19	284	24,5	19,5	299		19	284		20,6	333	26,0
240	21	346	27,3				21	346		23	415	28,0
300	23,7	441	30,7				23,5	434		26	531	32,0
400	27	573	35,0				27	573				
500												
630												
800												
1000												
Commentaires	Norme Internationale Cosse tubulaire			Norme Américaine *Cosse roulée*			Norme Allemande Cosse tubulaire			Norme Allemande Cosse tubulaire		
Comments	IEC Standard Tubular Cable lugs			US Standard *Rounded & welded lug*			German Standard Tubular Cable lugs			German Standard Tubular Cable lugs		



LUGS

EQUIPMENT

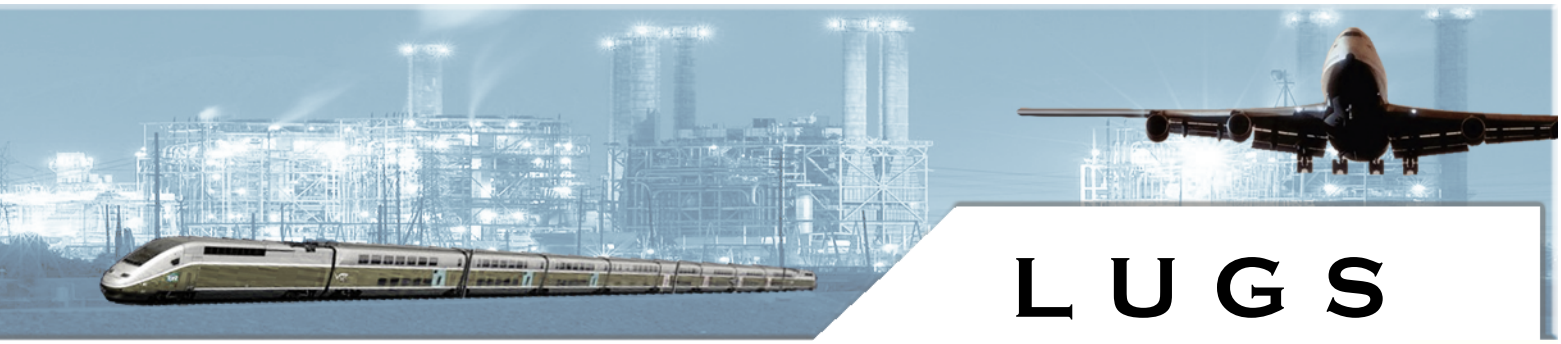
Internal sections of different standards

SECTION COMMERCIALE NOMINALE COSSES ALUMINIUM	NFC 33-090-1		
	Ø Int.	Section Intérieure Réelle	Ø Ext.
1,5			
2,5			
4			
6			
10			
16	5,5	24	16,0
25	6,5	33	16,0
35	8	50	16,0
50	9	64	20,0
70	11	95	20,0
95	12,5	123	20,0
120	13,7	147	25,0
150	15,5	189	25,0
185	17	227	32,0
240	19,5	299	32,0
300	23,3	426	40,0
400	26	531	40,0
500	29,1	665	47,0
630	32,5	830	47,0
800			
1000			
Commentaires	Norme Française Cosse tubulaire Alu		
Comments	French Standard Alu Tubular Cable lug		

SECTION COMMERCIALE NOMINALE MANCHONS	DIN 46228/1		
	Ø Int.	Section Intérieure Réelle	Ø Ext.
0,25	0,8	0,5	1,1
0,34	0,9	0,6	1,2
0,5	1	0,8	1,3
0,75	1,2		1,5
1	1,4	1,5	1,7
1,5	1,7	2,3	2
2,5	2,2	3,8	2,5
4	2,8	6,2	3,2
6	3,5	10	3,9
10	4,5	16	4,9
16	5,8	26	6,2
25	7,3	42	7,8
35	8,3	54	8,8
50	10,3	83	10,9
70	12,5	123	13,3
95	14,5	165	15,3
120	16,5	214	17,5
150	18,5	269	19,5
185	20	314	21,2
Commentaires	Norme Allemande Manchons tubulaire		
Comments	German Standard Tubular Cable lugs		

SECTION COMMERCIALE NOMINALE COSSES NICKEL	Cste TH 650 °C		
	Ø Int.	Section Intérieure Réelle	Ø Ext.
0,5 - 1	1,6	2,0	3,2
1,5 - 2,5	2,3	4,2	3,9
4,0 - 6,0	3,6	10	5,6
10	4,5	16	6,5
16	5,5	24	7,5
25	7	38	10,0
Commentaires	Haute Température		
Comments	Cable lugs for high T°C		

SECTION COMMERCIALE NOMINALE COSSES INOX	Cste TH 400 °C		
	Ø Int.	Section Intérieure Réelle	Ø Ext.
0,5 - 1	1,6	2,0	3,2
1,5 - 2,5	3	7,1	5,0
4,0 - 6,0	4	13	6,0
10	5	20	7,0
16	6	28	8,0
25	7	38	10,0
35	9	64	12,0
50	10	79	14,0
70	12	113	16,0
95	14	154	18,0
Commentaires	Atmosphère corrosive		
Comments	Cable lugs for corrosive		



LUGS

Gauge according to the standards

Allow to detremine the ideal connector for your cable among all the standards

Material :

→ Aluminium 7075

Standards :

→ IEC 61238-1 , NFC 20130,
NFF 00-363, DIN 46235

Custom made :

→ Other standards

Specifical Lugs

Innovative solution for connections in the most demanding application

Material :

→ Copper, Aluminium,
Brass, Bronze

Surface traitement

→ Ag, Ni, Tn, Or

Areas activities

→ Aeronautics, Automotives,
Energy, Nuclear, Railways

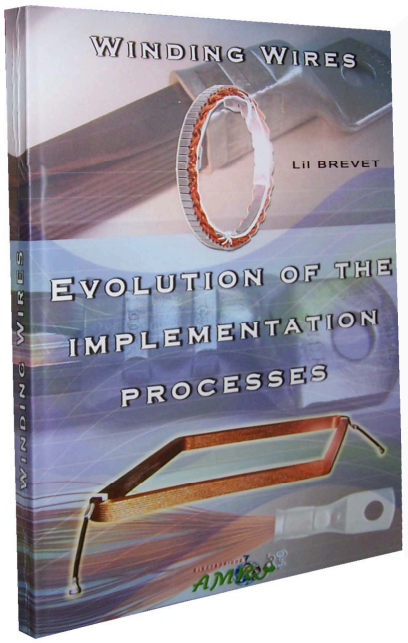
EQUIPMENT

SUPPORT

EQUIPMENT

WINDING WIRES

Evolution of the implementation processes



Éditor : AMR ELECTRONIQUE

Collection / Série : Winding wires ; 1

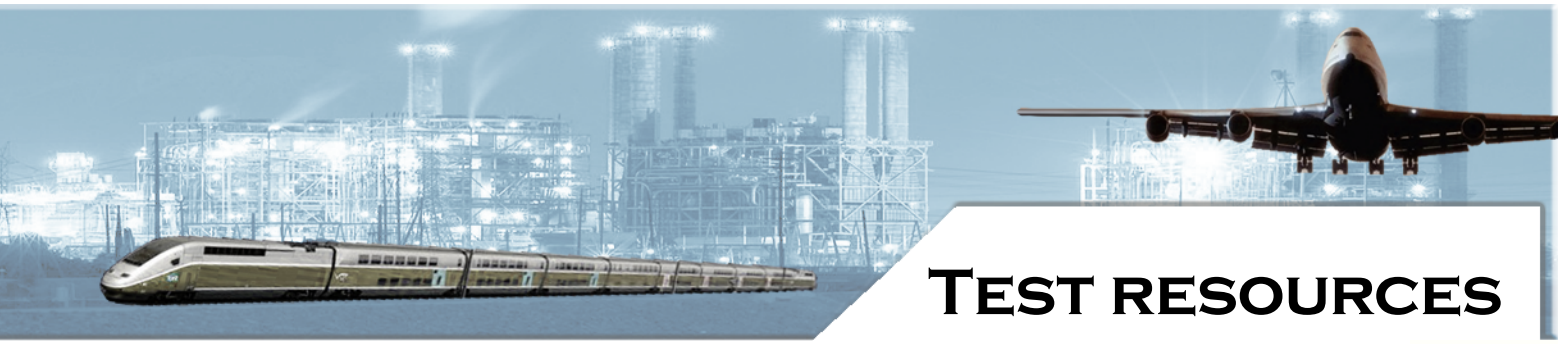
215 pages ; 21 x 15 cm ;

ISBN 978-2-9519035-3-1

This collection is designed for Professionals winding.
It tries to present the state of the art and especially the evolution of products and processes in the coming years.

It shows some new production tools and the Industrial Quality Tools needed for different sectors.

The approach to these tools is pragmatic and some formulas and tables that illustrate these pages are given to indicate to the reader the orientation of its industrial development.
This book tries to debunk some assertions from the nature of things ... ... and ... habits...



Test resources

Mechanical and electrical qualifications according to different standards ensure to our our customers the mastery and quality of their connections.

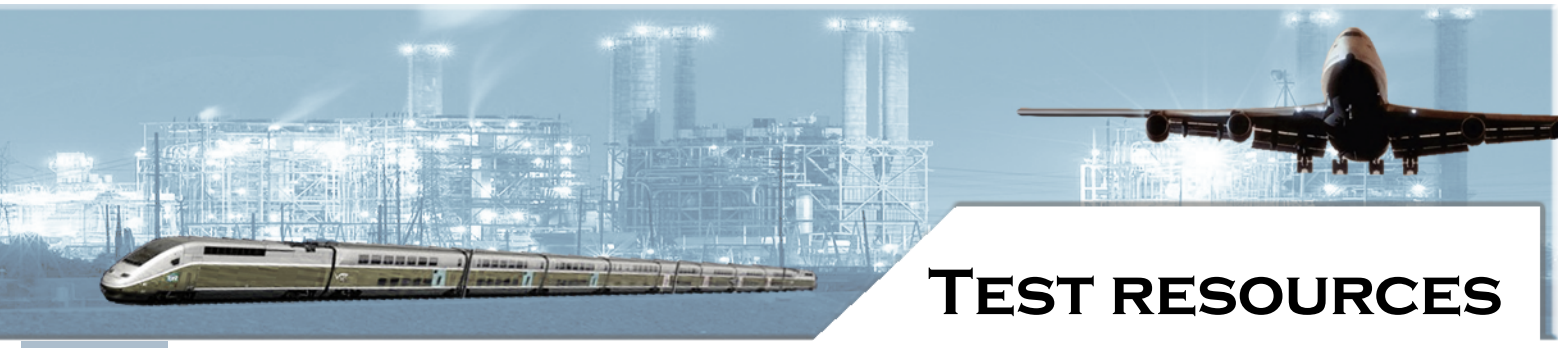
-Tensile test - Standard aging cycle at 120 ° C (Adaptable to the specific needs of the client)	- Shooting current system - Steaming-to + 200 ° C

Tensile test

→ According with among all the standards

Technical specifications			
Model	BTE1	BT2	BT3
AMR number	AMR0123	AMR0856	AMR0427
Capacities	200 N	5000 N	40000 N
Range section	0,1 up to 1,5 mm2	1,5 up to 95 mm2	50 up to 630 mm2
Steamed system	YES	NO	NO
Aquisition system	Force / Time / Temperature		

QUALIFICATION



Test resources

QUALIFICATION

Micro-photography

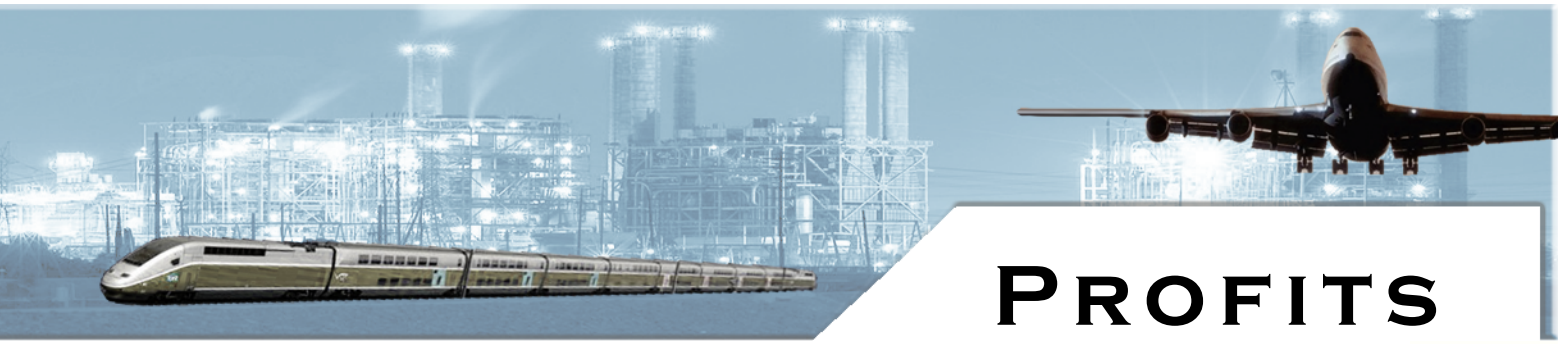
Optical measurement tools allow visualization of the qualification results.

Analysis wire Ø 0.01 mm

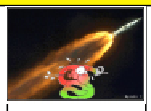
Aging Système

Electrical and mechanical qualification is the best way to validate the quality of your connections.

Physical specifications	
Length	6000 mm
Height	600 mm
Width	600 mm
Insulation	50 mm Rockwool
Aquisition system	Temperature / Resistance connection
Range test	from 1,5 mm2 to 240 mm2
Ventilation	Controled



PROFITS

		TECHNOLOGICAL ADVANTAGE					ECONOMICAL ADVANTAGE	
PERFECT MULTI-SUPPORT CONNEXION, WITHOUT FILLER METAL	SINGLE ENAMELLED WIRE LITZ WIRE FLAT ENAMELLED WIRE FLAT ENAMELLED TRANSPOSED WIRE DIRECT CABLES CONNEXION	Removal of dangerous processes like blowtorch Removal of dangerous and forbidden processes like chemical strip Removal of processes which do not maintain the entirety of the wire, like mechanical stripping devices	 No damage for the enamel nor for the metallurgical properties of the metal due to the baring when using the blowtorch	 Answer to the ageing problems of leadfree welds (RoHs guideline)	 Resistance of the connection up to two times lower, due to the fact that the tin alloys used for soft solders have resistivity ten times upper than copper one.	Removal of oxidation due to electrolytic couples and soft solders fluxes. Moreover, in the car industry, soft solders are prohibited because of the rigidity between the wires flush with the terminal which makes them very flimsy when vibrating.	 Cutting down the time required for making the internal connections (Some seconds instead of several minutes)	 Cutting down the amount of materials employed: flexible sheaths, filler metal, reduction of the contacts sizes
	ADVANTAGES	Mastery of Process Control		Technological improvement			Major financial impact	

TECHNICAL ADVANTAGES WITH IMMEDIATE EFFECT GIVING :

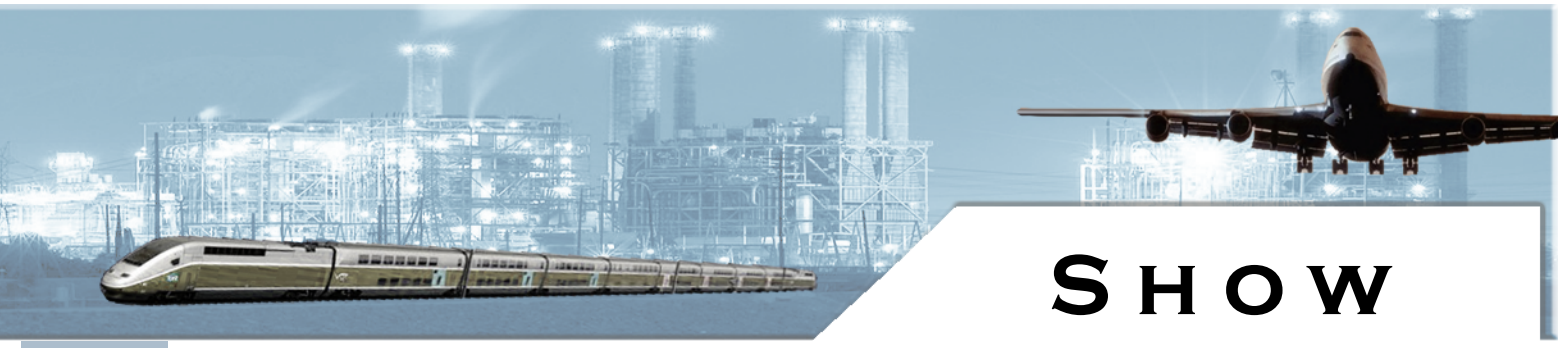
AN OUTSTANDING PROCESS CONTROL : REPRODUCTIBILITY AND SIMPLIFICATION

FINANCIAL ADVANTAGES WITH IMMEDIATE EFFECT, INVOLVING :

LOW INVESTMENT
AND
NOTABLE IMPROVEMENT OF THE QUALITY

IMMEDIATE IMPROVEMENT OF THE QUALITY INDUCING :

THE SATISFACTION OF THE CUSTOMER AND COMPETITIVE BENEFITS



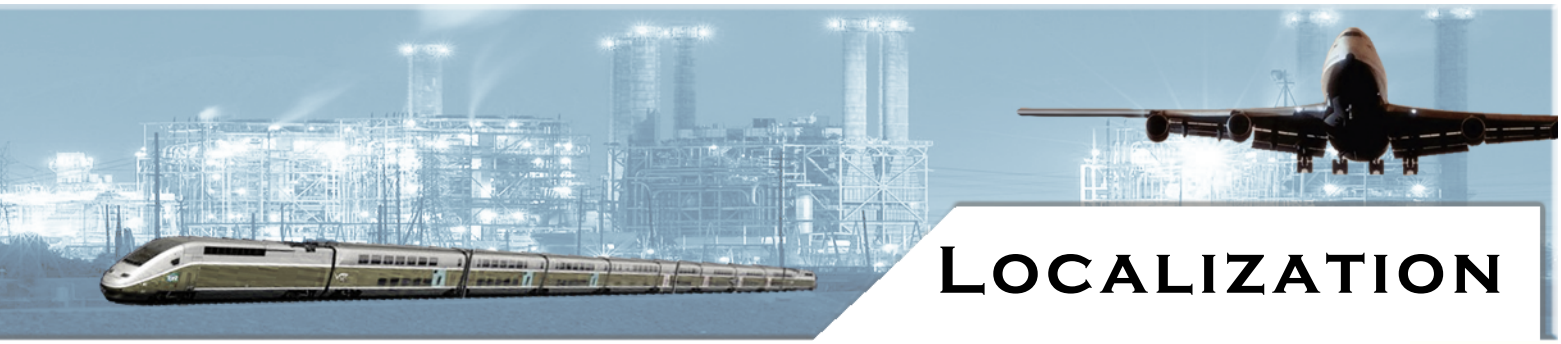
SHOW

COMMUNICATION

→ Appointment in 2017 with our patner SOFILEC to attend the demonstration COSDEM.

→ Type of conductor, insulation system, working frequency, held dielectric, operating temperature, types of converters, efficient connector, connection and agglomeration process, we offer you solutions complete adapted to growing requirements for design your winding.

→ Find our demonstration video on you tube :
https://www.youtube.com/channel/UCqvJm5zm-OpFsiAPhH1AQEg



LOCALIZATION

COMMUNICATION

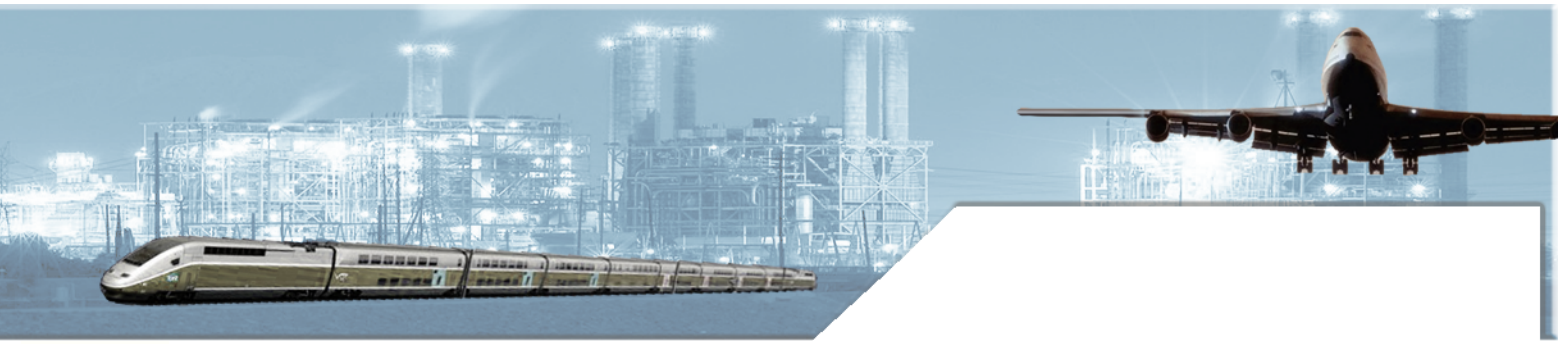
AMR Electronique
ZI Les Fougères
45, Allée du Petit Plan
F-0125 SAINT JUST
FRANCE

Tel. +33(0)4 74 23 23 06

https://www.amr-electronique.com

Localization (GPS)

http://cosdem.com/Fr/Index.htm



A D V E R T I S S E M E N T

This documentation is not contractual.

Items represented are proposed while stock lasts.

AMR reserves the right to discontinue its production or change specification without notice.

Non-contractual picture

Created and printed by AMR-electronique Juillet 2016

ELECTRONIQUE

AMR