



BOHAIN UNIT

**RUBBER FLEXIBLE
INDUSTRIAL CABLES FOR LOW
VOLTAGE**



INTERNATIONAL EXPERT OF CABLES AND CABLING SYSTEMS

• <u>SYMBOLS</u>	Page 1
• <u>IDENTIFICATIONS OF CORES HD 308 S2</u>	Page 2
• <u>MAIN USES OF THE CABLES HO7 RN- F AND THEIR DERIVATIVES</u>	Page 3
• <u>MAIN QUALITIES OF THE CABLES HO7 RN- F AND THEIR DERIVATIVES</u>	Page 6
• <u>FLEXIBLE CABLES</u>	
- HO7RN-F	
NEXANS France	Page 7
- OIL RESISTANT 62	Page 11
- HO7BN4-F	Page 15
- HO7RN8-F	Page 19
- HO7BB-F	Page 23
• <u>FLEXIBLE AND HALOGEN FREE CABLES</u>	
-HO7ZZ-F	Page 27

**•COMPLEMENTARY TECHNICAL DATA
AND CORRECTION COEFFICIENTS OF CURRENT
RATINGS AND TEMPERATURES FOR THE CABLES
HO7RN-F, HO7RN8-F, OIL RESISTANT 62, H07BB-F**

Page 31

**•COMPLEMENTARY TECHNICAL DATA
AND CORRECTION COEFFICIENTS OF CURRENT
RATINGS AND TEMPERATURES FOR
THE CABLES HO7BN4-F**

Page 32

**•MAIN ADVANTAGES OF OUR WELDING
CABLES HO1 N2-D AND HO1N2-E**

Page 33

•WELDING CABLES

- HO1N2-D

Page 34

- HO1N2-E

Page 36

The technical data in this catalog is given for information only and implies absolutely no commitment on our part , except in the case of a specific agreement

SYMBOLS

RANGE OF TEMPERATURE

Ambient temperature of use



WEATHER

Resistance to various weather conditions



IMPACTS

Mechanical resistance to shocks of the cables



CHEMICAL RESISTANCE

Resistance to chemical attacks



FLAME RETARDANT



FUMES-CORROSIF POWER-TOXICITY



FLEXIBILITY OF THE CABLES



RADIUS OF CURVATURE



HALOGEN FREE



UNLEADED



SUBMERSIBLE APPLICATION



ELECTROMAGNETIC INTERFERENCES



IDENTIFICATION OF CORES FOR CABLES

Number of cores	HD 308 edition 1976	HD 308-S2 edition 2001
2		
3		<div> <div>3 G ...</div> </div> <div> <div>$\geq 4 \text{ mm}^2$</div> </div> <div> <div>1.5 & 2.5 mm²</div> </div>
4		<div> </div> <div> </div>
5		

Main uses of the H07 RN-F cables and their derivatives

Major part for needs in mobile facilities as:

- electric cables for machine-tools and robots in the industry (steel industry, metallurgy, chemistry, petrochemistry, wood, automobile industry, and so on...) ; the choice of the insulation compounds and sheathing (crosslinked elastomer) confers to the H07 RN-F cables and their derivative an excellent flexibility and a good hardness (classic H07 RN-F , OIL RESISTANT 62 in case of aggression risks by oils or various liquids) .
- equipment of harbor cranes in power and control cables (H07 RN-F) .
- equipment of hydraulic ramps, of hoists (H07 RN-F) .
- equipment of the mobile machines on public works (H07 RN-F, OIL RESISTANT 62 to possible contact with oil of hydraulic jacks, hydrocarbons or fuel, solvents) .
- equipment of professional portable tools as vacuum cleaners, saws, perforators, machines to wood, various machines for collectivities (H07 RN-F) .
- equipment of submerged pumps up to 10 m of depth (H07 RN8-F) .
- production of portable lamps and professional extension pieces (H07 RN-F).
- equipment of the machines (ex: machines to milk in a dairy) and of the lighting in the agriculture buildings (H07 RN-F) .

- mobile equipment of the stands of exhibitions, of the cultural or attractive events (summer festivals, events in village), mobile equipments of lighting in the cities (Christmas illuminations for example) (H07 RN-F, H07 ZZ-F) .
- equipment of the harbor areas, the ships and offshore platforms in mobile links (Véritas certificate in H07RN8-F and H07ZZ-F) .

But also for needs in static facilities as :

- facilities in public buildings where the flexibility of the cables and the bending radius in static (3 x diameter of the cable) are necessary, especially in the difficult passages; but also when the installation requires halogen free and low smoke fume and fire retardant cables (theaters, movie theaters, rooms of spectacles, gymnasiums) (H07 ZZ-F) .
- facilities in road or railway tunnels (H07 ZZ-F) .
- facilities in very high buildings (H07 ZZ-F) .
- facilities in wind machines for power, control and lighting cables, equipment of cooling machines and heating device (good behaviour to the effects of torsion or twisting and alternating bending movements) (H07 RN-F, H07 BN4-F, H07 ZZ-F).
- equipment of solar panels (photovoltaik), in single-core cables from 2.5 sq.mm to 6 sq.mm (H07 RN-F, H07 BN4-F or H07 ZZ-F with tinned copper or plain copper cores) .
- equipment of the motors submitted to vibrations (avoids the rupture of the conductors at the connection zones) (H07 RN-F) .
- Equipment in power cables of some tramways (H07 RN8-F) .
- Facilities in strategic areas because of the good behaviour at the x-rays effects of the crosslinked elastomer sheaths which are halogen free and fire retardant too.
- (centers of atomic survey in H07 ZZ-F).

Main qualities of the H07 RN-F cables and their derivatives

- the flexibility of the H07 RN-F cables and their derivatives cables allows a bending radius in static (up to 3 x diameter of the cable) for temperatures higher than -20°C, and -10°C (H07ZZ-F); their use can be necessary, especially in difficult passages .
- the cables H07 ZZ-F are especially recommended when the installation of cables requires halogen free low smoke fume and fire retardant cables .
- in case of a protected stationary installation or equipment of the motors, these cables can be used under a tension of 0.6/1 KV, and a permanent conductor temperature of 85°C for H07RN-F and 90°C for H07BN4-F .
- the silicone free raw-materials used for the manufacturing of our cables allow the use of these cables in facilities where silicone is definitively proscribed (rooms for painting, and so on...) .
- the vaste range of use in T°C of our cables (- 50°C in static for the H07 BB-F, + 90 °C for the H07 BN4-F in T°C of conductor, permanently) .
- a good behaviour of the cross linked elastomer sheaths in polluted occasionally environments .
- a good behaviour of the cross linked elastomer sheaths to the accidental mechanical shocks
- A family of rubber flexible cables for low voltage which allows to satisfy the majority of the industrial needs (H07RN-F, OIL RESISTANT 62, H07BN4-F, H07RN8-F, H07BB-F, H07ZZ-F).
- All these cables are in compliance with European harmonization (HAR standard), recognized beyond Europe (Australia, Asia, Middle East, and so on...) .

H07RN-F

I Application

This cable is dedicated for installations with moving equipment, electric appliances, for building sites and every industrial use in general. The cable may be rated 0.6/1kV where the installations of cables are protected and for the equipments of motors.

I Classification of use

- Heavy duty
- Use up to 1000V in case of fixed protected installations
- Presence of water : AD2, AD6
- Corrosive and polluting substances : AF3
- Outdoor use : temporary and permanent
- Frequent flexing
- Impact : AG2
- Oil resistant
- Flame retardant (IEC 60332-1, C2 for NF C 32070)

450/750 V

Max continuous operating conductor temperature:

In normal use (mobile installation) : 60°C
(fixed protected installation) : 85°C
(200° C in short circuit)

I Recommendations of use

The choice of raw-materials for the insulation of the sheath makes the cables very flexible and robust. It's why we recommend the cables H07RN-F for mobile machines on public building sites, cold stores or power supply equipment in an industrial environment for instance.

I Design

1.Conductor

Flexible (class 5)
Annealed plain copper

2.Insulation

Special cross-linked rubber

3.sheath

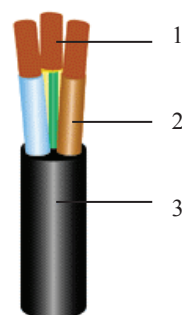
High mechanical performance
special cross-linked rubber,
Resistant to oil
Color : black

I Installation

This cable can be installed in open air or be buried with extra mechanical protection.

I Radius of curvature

Mobile use = 6 to 8 x External diameter.
Static use = 3 x External diameter, if the external diameter < 12mm, 4 x if the external diameter > 12 mm.



I Marking








USE<HAR>H07RN-F
Nb X (ou G) S NEXANS
FRANCE
X = without G/Y
G = with G/Y
S = cross section (mm²)
(metric marking is possible on special fabrications)

I Cores identifications

- 1 core = Black (preferential)
- 2 cores = Brown + Blue
- 3 cores = Green/Yellow + Blue + Brown (G)
Brown + Black + Grey (X S > 4mm²)
Blue + Brown + Black (X S 1.5 & 2.5 mm²)
- 4 cores = Green/Yellow + Brown + Black + Grey (G)
Blue + Brown + Black + Grey (X S 1.5 & 2.5 mm²)
- 5 cores = Green/Yellow + Blue + Brown + Black + Grey
- > 5 cores = 1 Green/Yellow + the other Black (numbered)

I Standards

International
IEC 60245-4 type 66
Europe CENELEC
HD 22-4
National
NF C 32-102-4

						
-25° + 55 °C	Very good	Good AG2	Flexible	Category C2 IEC 60332-1	occasionnal AF 3	AD6

Technical data HO7RN-F						
Number of cores	Permissible	ΔU (cos φ 0,8)	Outer diameter (mm)			Weight (kg/km)
(mm ²)	current rating (A)	V/A.km	Conductor	Mini	Maxi	
1 x 1.5	23	23 . 3	1 . 5	5 . 7	7 . 1	50
1 x 2.5	32	14 . 0	1 . 9	6 . 3	7 . 9	66
1 x 4	43	8 . 7	2 . 5	7 . 2	9 . 0	94
1 x 6	56	5 . 9	3 . 0	7 . 9	9 . 8	109
1 x 10	77	3 . 4	3 . 8	9 . 5	11 . 9	182
1 x 16	102	2 . 2	5 . 0	10 . 8	13 . 4	256
1 x 25	136	1 . 4	6 . 0	12 . 7	15 . 8	369
1 x 35	168	1 . 04	7 . 1	14 . 3	17 . 9	482
1 x 50	203	0 . 75	8 . 7	16 . 5	20 . 6	662
1 x 70	254	0 . 56	10 . 3	18 . 6	23 . 3	895
1 x 95	315	0 . 44	11 . 8	20 . 8	26 . 0	1160
1 x 120	363	0 . 36	13 . 5	22 . 8	28 . 6	1430
1 x 150	416	0 . 31	15 . 0	25 . 2	31 . 4	1740
1 x 185	475	0 . 28	16 . 5	27 . 6	34 . 4	2160
1 x 240	559	0 . 23	18 . 9	30 . 6	38 . 3	2730
1 x 300	637	0 . 20	21 . 0	33 . 5	41 . 9	3480
1 x 400	746	0 . 18	26 . 0	37 . 4	46 . 8	4510
1 x 500	833	0 . 16	30 . 0	41 . 3	52 . 0	5700
2 x 1	18	39 . 4	1 . 3	7 . 7	10 . 0	99
2 x 1.5	23	27 . 0	1 . 5	8 . 5	11 . 0	111
2 x 2.5	32	16 . 2	1 . 9	10 . 2	13 . 1	161
2 x 4	43	10 . 1	2 . 5	11 . 8	15 . 1	238
2 x 6	56	6 . 7	3 . 0	13 . 1	16 . 8	279
2 x 10	77	3 . 8	3 . 8	17 . 7	22 . 6	538
2 x 16	102	2 . 5	5 . 0	20 . 2	25 . 7	744
2 x 25	136	1 . 68	6 . 0	24 . 3	30 . 7	1074

Permissible current rating is measured for an ambient temperature of 30°C and a maximum operating and conductor temperature of 85°C . For other temperature please refer to correction factors .

Technical data HO7RN-F

Number of cores (mm ²)	Permissible current rating (A)	ΔU (cos ϕ 0,8) V/A.km	Outer diameter (mm)			Weight (kg/km)
			Conductor	Mini	Maxi	
3G1	18	39.4	1.3	8.3	10.7	117
3G1.5	23	27.0	1.5	9.2	11.9	134
3G2.5	32	16.2	1.9	10.9	14.0	195
3G4	43	10.1	2.5	12.7	16.2	290
3G6	56	7.0	3.0	14.1	18.0	346
3G10	77	4.0	3.8	19.1	24.2	663
3G16	102	2.5	5.0	21.8	27.6	924
3G25	136	1.7	6.0	26.1	33.0	1345
3G35	168	1.21	7.1	29.3	37.1	1760
3G50	203	0.87	8.7	34.1	42.9	2390
3G70	262	0.64	10.3	38.4	48.3	3110
3G95	320	0.50	11.8	43.3	54.0	4170
3G120	373	0.40	13.5	47.4	60.0	5080
3G150	432	0.35	15.0	52.0	66.0	6220
3G185	495	0.30	16.5	57.0	72.0	7730
3G240	587	0.26	18.9	65.0	82.0	9780
3G300	680	0.22	21.0	72.0	90.0	12620

4 G1	16	34.08	1.3	9.6	12.0	144
4 G1.5	21	23.30	1.5	10.2	13.1	165
4 G2.5	29	14.0	1.9	12.5	15.5	245
4 G4	38	8.71	2.5	14.0	18.0	357
4 G6	50	5.84	3.0	15.7	20.0	443
4 G10	68	3.42	3.8	20.8	26.5	818
4 G16	92	2.20	5.0	23.8	30.1	1150
4 G25	122	1.44	6.0	28.9	36.6	1700
4 G35	150	1.04	7.1	32.5	41.1	2180
4 G50	182	0.75	8.7	37.7	47.5	3030
4 G70	232	0.56	10.3	42.7	54.0	3990
4 G95	281	0.44	11.8	48.4	61.0	5360
4 G120	325	0.36	13.5	53.0	66.0	6500
4 G150	373	0.31	15.0	58.0	73.0	7990
4 G185	425	0.28	16.5	64.0	80.0	9910
4 G240	500	0.23	18.9	72.0	91.0	13120

Permissible current rating is measured for an ambient temperature of 30°C and a maximum operating and conductor temperature of 85°C . For other temperature please refer to correction factors .

Technical data HO7RN-F

Number of cores (mm ²)	Permissible current rating (A)	ΔU (cos φ 0,8) V/A.km	Outer diameter (mm)			Weight (kg/km)
			Conductor	Mini	Maxi	
5 G 1 . 5	21	23 . 6	1 . 5	11 . 2	14 . 4	238
5 G 2 . 5	29	14 . 0	1 . 9	13 . 3	17 . 0	297
5 G 4	38	8 . 72	2 . 5	15 . 6	19 . 9	453
5 G 6	50	5 . 84	3 . 0	17 . 5	22 . 2	557
5 G 10	68	3 . 43	3 . 8	22 . 9	29 . 1	1001
5 G 16	92	2 . 20	5 . 0	26 . 4	33 . 3	1430
5 G 25	122	1 . 44	6 . 0	32 . 0	40 . 4	2096
7 G 1	11 . 5	-	1 . 3	13 . 7	17 . 5	310
9 G 1	10 . 2	-	1 . 3	16 . 0	20 . 4	430
12 G 1	8 . 8		1 . 3	17 . 6	20 . 9	450
24 G 1	7 . 2	34 . 10	1 . 3	20 . 3	24 . 3	640
27 G 1	6 . 2	-	1 . 3	22 . 6	28 . 7	870
30 G 1	5 . 9	-	1 . 3	24 . 3	29 . 2	885
36 G 1	5 . 6	-	1 . 3	27 . 8	30 . 3	960
6 G 1 . 5	16 . 0	-	1 . 5	13 . 4	17 . 2	300<
12 G 1 . 5	11 . 0	23 . 30	1 . 5	17 . 6	22 . 14	510
18 G 1 . 5	9 . 0	-	1 . 5	20 . 7	26 . 3	730
24 G 1 . 5	7 . 8	-	1 . 5	24 . 3	30 . 7	1000
36 G 1 . 5	6 . 3	-	1 . 5	27 . 8	35 . 2	1325

Permissible current rating is measured for an ambient temperature of 30°C and a maximum operating and conductor temperature of 85°C . For other temperature please refer to correction factors.