HFFR-04XZ-R SC INDUSTRIAL CABLE, 1100 V AC

PRODUCT SPECIFICATION

INDOCABLES HFFR-04XZ-R SC INDUSTRIAL CABLE, 1100 V AC

FIG. 1 — SHEATH PRINT AND STRANDED CONDUCTOR

Images not to scale. Follow table for dimensions

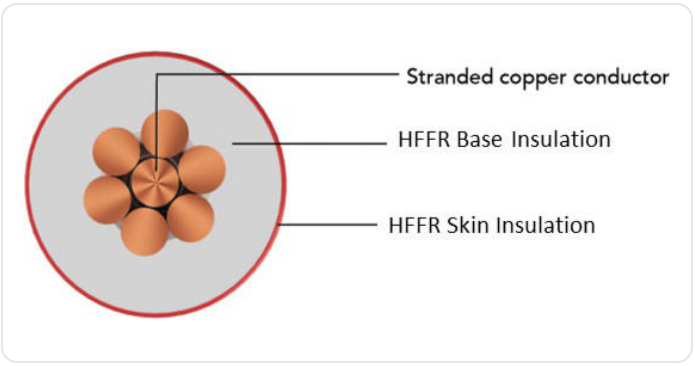

FIG. 2 — CONSTRUCTION, CROSS SECTION

APPLICATION

INDOCABLES HFFR-04XZ-R SC, insulated with cross linked halogen free flame retardant compound having low smoke emission and corrosive gases when exposed to fire condition. This cable is designed to use in conduit and for fixed protected installation. This is also suitable to use high rise buildings, hospitals, and offices where Smoke emission and toxic fume create a potential risk to life as well as the lifesaving equipment.

CHARACTERISTICS

Voltage Rating	1100 V
Operation Temperature	Fixed: −15 °C to + 90 °C
Test Voltage	3000 V AC at room temperature
Bending Radius	Fixed 4 × Overall Diameter · Occasional 6 × Overall Diameter

CONSTRUCTION

- Annealed stranded bare or tinned copper conductor as per IS 8130, class 2
- Insulated with cross linked halogen free flame retardant (HFFR) compound type HFI-XL 90 to IS 17048

Core Identification Red / Black / Blue / Yellow / White / Grey

STANDARD FOLLOWS

IS 8130 · IS 17048 · IEC 60332-1-2

COMPLIANCE

Oxygen Index 31 %	ASTM D2863
Smoke emission test < 6 %	ASTM D2843
Acid gas Generation <0.0	IEC 60754-1
Test on vertical flame	IEC 60332-1-2

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WEIGHT & DIMENSION DATA

PRODUCT CODE	NOMINAL CROSS-SECTIONAL AREA MM²	INSULATION THICKNESS MM	OVERALL DIAMETER (APPROX.) MM	WEIGHT (APPROX.)
IC-HW-01-00100-CU-HFI-H07XZR-1100-IS17048-ZHFR	1	0.7	2.67	15
IC-HW-01-00150-CU-HFI-H07XZR-1100-IS17048-ZHFR	1.5	0.7	3.00	21
IC-HW-01-00250-CU-HFI-H07XZR-1100-IS17048-ZHFR	2.5	0.8	3.62	32
IC-HW-01-00400-CU-HFI-H07XZR-1100-IS17048-ZHFR	4	0.8	4.19	49
IC-HW-01-00600-CU-HFI-H07XZR-1100-IS17048-ZHFR	6	0.8	4.74	68
IC-HW-01-01000-CU-HFI-H07XZR-1100-IS17048-ZHFR	10	1.0	6.07	113
IC-HW-01-01600-CU-HFI-H07XZR-1100-IS17048-ZHFR	16	1.0	7.13	171
IC-HW-01-02500-CU-HFI-H07XZR-1100-IS17048-ZHFR	25	1.2	8.85	269
IC-HW-01-03500-CU-HFI-H07XZR-1100-IS17048-ZHFR	35	1.2	10.00	364
IC-HW-01-05000-CU-HFI-H07XZR-1100-IS17048-ZHFR	50	1.4	11.25	452
IC-HW-01-07000-CU-HFI-H07XZR-1100-IS17048-ZHFR	70	1.4	13.53	707
IC-HW-01-09500-CU-HFI-H07XZR-1100-IS17048-ZHFR	95	1.6	15.72	960
IC-HW-01-12000-CU-HFI-H07XZR-1100-IS17048-ZHFR	120	1.6	17.28	1198
IC-HW-01-15000-CU-HFI-H07XZR-1100-IS17048-ZHFR	150	1.8	19.34	1498
IC-HW-01-18500-CU-HFI-H07XZR-1100-IS17048-ZHFR	185	2.0	21.47	1847
IC-HW-01-24000-CU-HFI-H07XZR-1100-IS17048-ZHFR	240	2.2	24.30	2387
IC-HW-01-30000-CU-HFI-H07XZR-1100-IS17048-ZHFR	300	2.4	27.06	2979
IC-HW-01-40000-CU-HFI-H07XZR-1100-IS17048-ZHFR	400	2.6	30.84	3930
IC-HW-01-50000-CU-HFI-H07XZR-1100-IS17048-ZHFR	500	2.8	34.36	4926
IC-HW-01-63000-CU-HFI-H07XZR-1100-IS17048-ZHFR	630	2.8	37.90	6154

Product codes derived to the ITEM MASTER grammar — no HFFR single-core item is registered yet. See flagged notes.

ELECTRICAL CHARACTERISTICS

Current carrying capacity and maximum DC conductor resistance.

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NOMINAL CROSS-SECTIONAL AREA MM²	REFERENCE METHOD B (enclosed in conduit on a wall or in trunking etc.)		REFERENCE METHOD C (clipped direct)		REFERENCE METHOD F (in free air or on a perforated cable tray etc. horizontal or vertical etc.)			REFERENCE METHOD G (in free air)		MAX. DC CONDUCTOR RESISTANCE AT 20 °C Ω/KM
					Touching			Spaced by one cable diameter 2 cables, single-phase a.c. or d.c. or 3 cables three-phase a.c. flat		
	2 cables, single phase a.c. or d.c. Amp.	3 or 4 cables, three phase a.c. Amp.	2 cables, single-phase a.c. or d.c. flat and touching Amp.	3 or 4 cables, three phase a.c. flat and touching or trefoil Amp.	2 cables, single-phase a.c. or d.c. flat Amp.	3 cables, three-phase a.c. flat Amp.	3 cables, three-phase a.c. trefoil Amp.	Horizontal Amp.	Vertical Amp.	
1	15.5	14	17	16	-	-	-	-	13	18.1
1.5	21	18	23	21	-	-	-	-	17	12.1
2.5	28	38	31	28	-	-	-	-	24	7.41
4	38	34	42	37	-	-	-	-	32	4.61
6	49	44	54	49	-	-	-	-	41	3.08
10	68	60	74	67	-	-	-	-	56	1.83
16	91	80	99	90	-	-	-	-	74	1.15
25	121	106	130	118	147	123	166	147	96	0.727
35	149	131	160	147	182	154	206	183	119	0.524
50	180	159	207	190	220	188	250	224	144	0.387
70	230	202	267	244	282	244	321	289	182	0.268
95	278	245	323	297	343	298	391	354	219	0.193
120	322	284	376	345	398	349	455	413	253	0.153
150	358	311	433	397	459	404	525	480	289	0.124
185	409	349	496	455	523	464	602	551	329	0.0991
240	480	410	586	537	618	552	711	654	386	0.0754
300	549	468	676	620	713	640	821	758	442	0.0601
400	622	531	790	722	855	749	987	917	-	0.047
500	713	606	901	823	986	861	1140	1064	-	0.0366
630	819	695	1028	940	1141	990	1323	1239	-	0.0283

The ambient temperature is 40 °C. Conductor operating temperature 90 °C. The above table is in accordance with Table 4E1A of BS 7671:2018.

DE-RATING FACTOR

De-rating factor for 90 °C thermosetting insulated cable.

AIR TEMPERATURE	35 °C	40 °C	45 °C	50 °C	55 °C	60 °C	65 °C	70 °C	75 °C	80 °C	85 °C
De-Rating Factor	1.04	1.0	0.95	0.89	0.84	0.82	0.77	0.63	0.55	0.45	0.32

OUTSTANDING FEATURES

- LOW SMOKE
- HALOGEN FREE
- FLAME RETARDANT
- HIGHLY FLEXIBLE
- HEAT RESISTANT

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CERTIFICATIONS & APPROVALS

ISO 9001
Cert. 99 100 22646 (TÜV SÜD)

ISI
Bureau of Indian Standards · CM/L to be confirmed

RoHS
Compliant

REACH
Compliant

Make in India
Manufactured in India

INTERNAL FLAGGED FOR THE CODE STEWARD

1. **No HFFR single-core item exists in the register.** The ITEM MASTER carries the HW line only as `CU-PVC-H07VU / H07VR / H07VK-0450-IS694`. All twenty codes on this sheet are derived to the register's grammar: `IC-HW-01⊣<SIZE>⊢CU-HFI-H07XZR-1100-IS17048-ZHFR`. Line HW, cores 01, every size, conductor CU, insulation HFI, voltage 1100 and option ZHFR are registered values; the items themselves are not.
2. **Designation `H07XZR` is not in Ist_DESIG.** Same designation already proposed for the class 2 rows of sheet BW-07. X = cross-linked, Z = halogen free, R = stranded class 2, following the PVC pattern. Please add.
3. **Insulation code `HFI` does not distinguish this compound.** Ist_INS reads "Halogen free flame retardant — HFFR / LSZH" with no cross-linked variant and no temperature rating, so HFI-XL 90 (this sheet), HFI-XL 70 and HFI-TP 70 (BW-02, BW-03) all code identically. A distinct code for the cross-linked 90 °C compound is needed.
4. **Standard `IS17048` is not in Ist_STD.** The nearest register entry is IS 17505 Part 1 (thermosetting insulated, low smoke). Add IS 17048 or confirm the substitute.
5. **Old codes cited IS 694.** Every source code read `HWC1C<SIZE>ZHFRLSIS694` — an FR-LSH IS 694 string — while the sheet text specifies a cross-linked HFFR compound to IS 17048. New codes follow the sheet text. Please confirm.
6. **Voltage grade.** The sheet states 1100 V, so codes carry `1100`. Every registered HW item is `0450` (450/750 V). Reproduced as written — not corrected.
7. **2.5 mm², Reference Method B, 3 or 4 cables = 38 A.** On every other row this figure sits below the 2-cable value; here it is above it (28 A / 38 A), and BS 7671 Table 4E1A gives 25 A. Reproduced as written.
8. **Reference Method G runs below Method B.** At 25 mm² the free-air spaced vertical figure is 96 A against 121 A in conduit; free-air ratings are normally the highest in the table. The 1–16 mm² rows also carry a Vertical figure while Horizontal is dashed. Reproduced as written.
9. **The 630 mm² row sat outside the table in the source** — a loose tab-separated line below it, repeated twice. Placed in the table here; values unchanged.
10. **Weight column carries no unit** in the source table — the header reads "Weight (Approx.)" only. Values reproduced as written; no unit assumed. Kg/km is the unit used on the other building-wire sheets.
11. **Compliance line "Acid gas Generation <0.0".** A limit of less than zero cannot be met as written; IEC 60754-1 is normally quoted as a maximum HCl yield in percent or mg/g. Reproduced as written.
12. **Smoke figures conflict across the family.** This sheet reads "Smoke emission test < 6 %" to ASTM D2843; BW-07, the flexible version of the same compound, reads "Smoke density — Min. 70 %" to the same test. Please reconcile.
13. **Core Identification lists six colours** — Red / Black / Blue / Yellow / White / Grey — for a single-core cable, with no green-yellow earth core. Reproduced as written.
14. **Bending radius.** Fixed 4 × OD and Occasional 6 × OD, as written. Sheet BW-06 states the opposite pairing. Reproduced as supplied — please reconcile across the family.
15. **De-rating steps.** The 55 °C → 60 °C step (0.84 → 0.82) is much smaller than its neighbours. Values reproduced as written.
16. **Third-party marks removed.** The source carried NABL in the accreditation block and FQC and CE in the approval block. All three deleted. ISI retained and ISO 9001 badge added — the pair now sits in the Certifications & Approvals band above this list, not in the running page header.
17. **Images.** Fig. 1 sheath print reads INDOCABLES, so the original render is retained. Fig. 2 cross section (stranded copper conductor / HFFR base insulation / HFFR skin insulation) kept as-is.
18. **Halogen-free icon is a nearest-match stand-in** (lead-free artwork). No halogen-free icon exists in the brand set — please commission one.
19. **Document properties.** The source .docx carried an author and a last-modified-by name in its properties. Neither carries into this sheet.
20. **Make in India mark is low resolution.** The only file in the brand set is 80 × 41 px, which upscales soft at print size. A vector or high-resolution version is needed.

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