No. SP 97-31-9004Rev.1
Date July 2, 2025

SPECIFICATION

FOR

600V ETHYLENE PROPYLENE RUBBER INSULATED
POLYCHLOROPRENE SHEATHED FLAT TYPE FLEXIBLE CABLE (Class2, Class3)

[Code : 600V H-2PNCT
600V H-3PNCT]

Quantity .....

Your Ref. No. .....

Our Ref. No. .....

Signed by T. Watanabe .....

TAKANOBU WATANABE
Manager

Engineering Dept. I
Electric Wire & Cable Business Unit

Proterial, Ltd.

Issue and revision record

REV. NO.	Issue date	Item	Prepared by	Approved by
—	Oct.23, 1997	FIRST ISSUE	M.IINUMA	R.KOIKE
1	Jul.4, 2008	(1) '4.Characteristics' was added. (2) '5.Inspection' (6)～(12) item was deleted. (3) Typing error of insulation resistance was corrected. (4) '7.Attention' was added. (5) Typing error of conductor diameter was corrected. (6) The permissible max. pulling tension was corrected. (7) The permissible max. compression force was added in table. (8) Following comment was added. "The max overall diameter is about 1.05 times the approx. overall diameter." (9) 4 cores and 27 cores of identifications were added.	A. Nakamura	S. Saki

1. Scope

This specification covers 600V Ethylene Propylene Rubber Insulated Polychloroprene Sheathed Flat Type Flexible Cable, which is reference to JIS C 3327-2000 (600V Rubber Insulated Flexible Cables), Japanese Electrical Appliance and Material Safety Law, Japanese Electrical Facility Regulation and Manufacturer's Standard.

2. Construction and materials

2.1 600V H-2PNCT (Class 2)

2.1.1 Conductor

$8mm^2$ or smaller size : Conductor shall be stranded with tinned annealed copper wires and tinned steel wires.
$14mm^2$ or larger size : Conductor shall be stranded with tinned annealed copper wires.

2.1.2 Insulation

Insulation shall be consist of ethylene propylene rubber compound.
Nominal thickness shall be shown in Table 3 and 4.
Ave. thick. : not less than 90% of the nominal thickness
Min. thick. : not less than 80% of the nominal thickness

2.1.3 Cabling of cores (except 3 and 4 cores)

The insulated conductors shall be cabled with suitable rubber filler.
Rubber filled textile tape shall be applied over the cabling.

2.1.4 Core identification

The core identification shall be made by the colour of the insulation, the insulation surface, or the tape over the cabling as shown in Fig. 2.

2.1.5 Assembly

The insulated conductors or the cabled cores units shall be assembled in parallel.

2.1.6 Sheath

Sheath shall be consist of black polychloroprene compound.
Nominal thickness shall be shown in Table 3 and 4.
Ave. thick. : not less than 90% of the nominal thickness
Min. thick. : not less than 80% of the nominal thickness

2.1.7 Dimension

The dimension of the cable shall be in accordance with Table 3 and 4.

2.2 600V H-3PNCT (Class 3)

2.2.1 Conductor

8mm^2 or smaller size : Conductor shall be stranded with tinned annealed copper wires and tinned steel wires.
14mm^2 or larger size : Conductor shall be stranded with tinned annealed copper wires.

2.2.2 Insulation

Insulation shall be consist of ethylene propylene rubber compound.
Nominal thickness shall be shown in Table 5 and 6.
Ave. thick. : not less than 90% of the nominal thickness
Min. thick. : not less than 80% of the nominal thickness

Rubber filled textile tape shall be applied over the insulation.

2.2.3 Core identification

The core identification shall be made by the colour of the tape over the insulation as shown in Fig. 2.

2.2.4 Inner sheath

Inner sheath consisting of black polychloroprene compound shall be applied over the tape.

2.2.5 Reinforcement

Reinforcement consisting of suitable fabric tape shall be applied over the inner sheath.

2.2.6 Assembly

The insulated conductors shall be assembled in parallel.

2.2.7 Outer sheath

Outer sheath shall be consist of black polychloroprene compound.
Nominal thickness shall be shown in Table 5 and 6.
Ave. thick. : not less than 90% of the nominal thickness
Min. thick. : not less than 80% of the nominal thickness

2.2.8 Dimension

The dimension of the cable shall be in accordance with Table 5 and 6.

3. Marking

Manufacturer's name and year of manufacture shall be marked by suitable methods.

4. Characterstics

The characteristics of the cable shall be as shown in Table 1.

5. Inspection

Inspection shall be carried out the following items prior to shipment, and the results shall be comply with the requirement of Table 1.

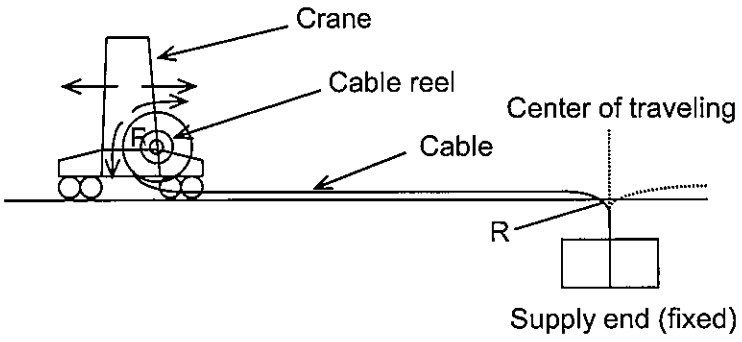
(1) Appearance
(2) Construction
(3) Conductor resistance
(4) Withstand voltage
(5) Insulation resistance

Table 1 : Characteristics

Item			Characteristics	Test method
Appearance			No scratches	4.1 of JIS C 3005
Construction			To be complied with Table 3-6	4.3 of JIS C 3005
Conductor resistance			Not more than the value in Table 2	4.4 of JIS C 3005
Withstand voltage			To withstand 3000V for 1 min.	4.6 a) of JIS C 3005
Insulation resistance			Not less than the value in Table 2	4.7.1 of JIS C 3005
Insulation	Tensile strength		Min. 4MPa	4.16 of JIS C 3005
	Elongation		Min. 300%	
Sheath	Tensile strength		Min. 13MPa	
	Elongation		Min. 300%	
Thermal aging resistance	Insulation	Tensile strength	Not less than 80% of the value before heating	4.17 of JIS C 3005 Heating temperature and Heating time Insulation 100±2℃, 96hrs. Sheath 100±2℃, 48hrs.
		Elongation		
	Sheath	Tensile strength	Not less than 65% of the value before heating	
		Elongation		
Oil resistance	Sheath	Tensile strength	Not less than 60% of the value before oil immersion. However, for the test piece less than 1mm in thickness, not less than 50%.	4.18 of JIS C 3005 Oil temperature and Immersing time 120±2℃, 18hrs.
		Elongation		
Flame retardant			To be extinguished naturally within 60 sec.	4.26 of JIS C 3005 Method 4.26.2 a) of JIS C 3005
Bending resistance ($38mm^2$ or smaller size)			No damage nor crack to develop, number of broken component wires in conductors not to exceed 30%.	4.27.1 of JIS C 3005 $\leqq 3.5mm^2$ r=150mm, l=200mm $5.5mm^2 \leqq$ r=100mm, l=300mm
Impact resistance (only for Class 3)			No damage nor crack to develop, number of broken component wires in conductors not to exceed 30%.	4.28 of JIC C 3005 6.10 Table 5 of JIC C 3327
Abrasion resistance			Sheath not to be so abraded as to expose the insulation.	4.29 of JIS C 3005 6.12 Table 6 of JIS C 3327

6. Guide to usage

This cable is designed for crane installation of reel system (traveling) as shown below.



R : Permissible minimum bending radius

Table 2 : Electrical properties

Nominal Cross-section area (mm^2)	Max. Conductor resistance at 20℃ (Ω/km)		Min. Insulation resistance at 20℃ (MΩ-km)	
	single-core (3 or 4 cores)	multi-cores	Class 2	Class 3
3.5	—	5.54	400	500
8	2.45	2.52	400	400
14	1.39	1.43	300	400
22	0.892	0.919	300	300
(30)	0.661	0.681	300	300
38	0.525	0.541	200	300
(50)	0.411	0.423	200	300
60	0.329	0.339	200	300
(80)	0.243	0.250	200	300
100	0.193	0.199	200	200
(125)	0.156	0.161	200	200
150	0.136	0.140	200	200
200	0.0993	0.102	200	200
250	0.0803	0.0827	200	200

7. Attention to usage

(1) In any case, pulling tension and compression force must not exceed the value in Table 3-6.
For safety, regular pulling tension should be 1/3 of the permissible max. value.
It is necessary to determine the pulling tention considering the compression force.
(2) Compression force = Pulling tention ／ Bending radius

Table 3 : Dimensions
(Code : 600V H-2PNCT)

No. of core	Conductor Size	Conductor Construction	Conductor Diameter	Thick. of insulation	Thick. of sheath	Approx. overall diameter	Approx. weight	Permissible min. bending radius	Permissible max. pulling tension	Permissible max. compression force
	mm^2	No./mm	mm	mm	mm	mm	kg/km	mm	kN	kN/m
3	8	3/0.32TST+50/0.45TA	3.8	1.0	2.2	11.0 × 24	515	140	0.4	2.9
	14	88/0.45TA	4.9	1.0	2.3	12.5 × 28	735	150	1.6	2.9
	22	7/20/0.45TA	7.0	1.2	2.6	15.0 × 34	1 130	180	2.5	2.9
	(30)	7/27/0.45TA	8.1	1.2	2.7	16.0 × 38	1 420	200	3.5	2.9
	38	7/34/0.45TA	9.1	1.2	2.8	17.5 × 41	1 710	210	4.4	2.9
	(50)	19/16/0.45TA	10.4	1.5	3.1	20 × 47	2 220	240	5.8	2.9
	60	19/20/0.45TA	11.6	1.5	3.2	21 × 51	2 640	260	7.0	2.9
	(80)	19/27/0.45TA	13.5	2.0	3.6	25 × 60	3 630	300	9.4	2.9
	100	19/34/0.45TA	15.2	2.0	3.8	27 × 65	4 400	330	11.7	2.9
	(125)	19/42/0.45TA	16.8	2.0	4.0	29 × 70	5 260	350	14.7	2.9
	150	27/34/0.45TA	18.7	2.0	4.2	31 × 74	5 960	380	17.6	2.9
	200	37/34/0.45TA	21.2	2.5	4.7	36 × 87	8 230	440	23.5	2.9
	250	37/42/0.45TA	23.6	2.5	5.1	39 × 96	9 950	470	29.4	2.9

TST : Tinned steel wire
TA : Tinned annealed copper wire
※The max. overall diameter is about 1.05times the approx. overall diameter.

Table 4 : Dimensions
(Code : 600V H-2PNCT)

No. of core	Conductor Size	Conductor Construction	Conductor Diameter	Thick. of Insulation	Thick. of sheath	Approx. overall diameter	Approx. weight	Permissible min. bending radius	Permissible max. pulling tension	Permissible max. compression force
	mm^2	No./mm	mm	mm	mm	mm	kg/km	mm	kN	kN/m
4	8	3/0.32TST+50/0.45TA	3.8	1.0	2.4	11.5 × 31	685	140	0.6	2.9
	14	88/0.45TA	4.9	1.0	2.6	13.0 × 36	990	160	2.1	2.9
	22	7/20/0.45TA	7.0	1.2	2.9	15.5 × 45	1 530	190	3.4	2.9
	(30)	7/27/0.45TA	8.1	1.2	3.1	17.0 × 49	1 920	210	4.7	2.9
	38	7/34/0.45TA	9.1	1.2	3.2	18.0 × 53	2 310	220	5.9	2.9
	(50)	19/16/0.45TA	10.4	1.5	3.6	21 × 62	3 020	260	7.8	2.9
	60	19/20/0.45TA	11.6	1.5	3.7	22 × 66	3 580	270	9.4	2.9
	(80)	19/27/0.45TA	13.5	2.0	4.2	26 × 78	4 930	320	12.5	2.9
	100	19/34/0.45TA	15.2	2.0	4.5	28 × 85	5 990	340	15.6	2.9
	(125)	19/42/0.45TA	16.8	2.0	4.7	30 × 92	7 140	360	19.6	2.9
	150	27/34/0.45TA	18.7	2.0	4.9	32 × 97	8 070	390	23.5	2.9
	200	37/34/0.45TA	21.2	2.5	5.6	37 ×115	11 200	450	31.3	2.9
	250	37/42/0.45TA	23.6	2.5	6.0	41 ×126	13 500	500	39.2	2.9
9	3.5	3/0.32TST+45/0.32TA	2.6	0.8	2.7	16.5 × 38	1 060	200	1.4	2.9
12	3.5	3/0.32TST+45/0.32TA	2.6	0.8	2.9	17.5 × 41	1 300	210	1.9	2.9
15	3.5	3/0.32TST+45/0.32TA	2.6	0.8	3.0	19.0 × 45	1 570	230	2.4	2.9
18	3.5	3/0.32TST+45/0.32TA	2.6	0.8	3.2	21 × 49	1 880	260	2.9	2.9
21	3.5	3/0.32TST+45/0.32TA	2.6	0.8	3.4	23 × 53	2 190	280	3.3	2.9
24	3.5	3/0.32TST+45/0.32TA	2.6	0.8	3.5	24 × 57	2 510	290	3.8	2.9
27	3.5	3/0.32TST+45/0.32TA	2.6	0.8	3.7	26 × 62	2 880	320	4.3	2.9
30	3.5	3/0.32TST+45/0.32TA	2.6	0.8	3.9	28 × 66	3 310	340	4.8	2.9

TST : Tinned steel wire
TA : Tinned annealed copper wire
※The max. overall diameter is about 1.05times the approx. overall diameter.

Table 5 : Dimensions
(Code : 600V H-3PNCT)

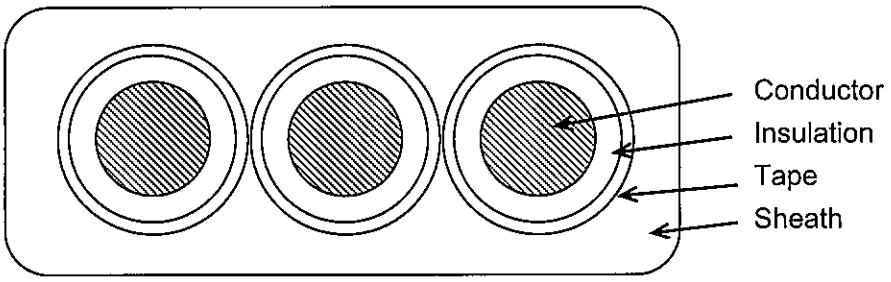
No. of core	Conductor Size	Conductor Construction	Conductor Diameter	Thick. of Insulation	Thick. of sheath*	Thick. of reinforcement	Approx. overall diameter	Approx. weight	Permissible min. bending radius	Permissible max. pulling tension	Permissible max. compression force
	mm^2	No./mm	mm	mm	mm	mm	mm	kg/km	mm	kN	kN/m
3	8	3/0.32TST+50/0.45TA	3.8	1.2	3.1	0.5	14.0 × 34	785	170	0.4	4.9
	14	88/0.45TA	4.9	1.2	3.3	1.0	16.5 × 41	990	200	1.6	4.9
	22	7/20/0.45TA	7.0	1.6	3.6	1.0	20 × 49	1 640	240	2.5	4.9
	(30)	7/27/0.45TA	8.1	1.6	3.7	1.0	21 × 52	1 960	260	3.5	4.9
	38	7/34/0.45TA	9.1	1.6	3.8	1.0	22 × 55	2 290	270	4.4	4.9
	(50)	19/16/0.45TA	10.4	2.1	4.2	1.0	26 × 63	2 970	320	5.8	4.9
	60	19/20/0.45TA	11.6	2.1	4.3	1.0	27 × 66	3 440	330	7.0	4.9
	(80)	19/27/0.45TA	13.5	2.1	4.5	1.0	29 × 72	4 290	350	9.4	4.9
	100	19/34/0.45TA	15.2	2.1	4.7	1.0	31 × 77	5 100	380	11.7	4.9
	(125)	19/42/0.45TA	16.8	2.7	5.1	1.0	35 × 86	6 360	420	14.7	4.9
	150	27/34/0.45TA	18.7	2.7	5.3	1.0	36 × 90	7 110	440	17.6	4.9
	200	37/34/0.45TA	21.2	3.3	5.8	1.0	41 ×104	9 590	500	23.5	4.9
	250	37/42/0.45TA	23.6	3.3	6.2	1.0	45 ×113	11 500	540	29.4	4.9

TST : Tinned steel wire
TA : Tinned annealed copper wire
* Indicated value includes thickness of both inner and outer sheath.
※The max. overall diameter is about 1.05times the approx. overall diameter.

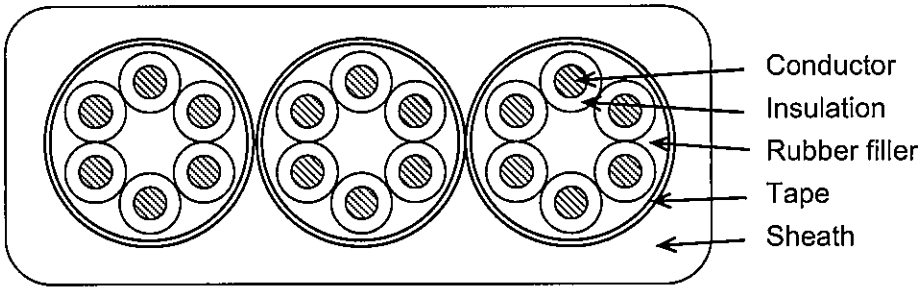
Table 6 : Dimensions
(Code : 600V H-3PNCT)

No. of core	Conductor Size	Conductor Construction	Conductor Diameter	Thick. of insulation	Thick. of sheath*	Thick. of reinforcement	Approx. overall diameter	Approx. weight	Permissible min. bending radius	Permissible max. pulling tension	Permissible max. compression force
	mm^2	No./mm	mm	mm	mm	mm	mm	kg/km	mm	kN	kN/m
4	8	3/0.32TST+50/0.45TA	3.8	1.2	3.3	0.5	14.5 × 44	1 060	180	0.6	4.9
	14	88/0.45TA	4.9	1.2	3.5	1.0	17.0 × 53	1 300	210	2.1	4.9
	22	7/20/0.45TA	7.0	1.6	3.9	1.0	21 × 64	1 970	260	3.4	4.9
	(30)	7/27/0.45TA	8.1	1.6	4.1	1.0	22 × 68	2 400	270	4.7	4.9
	38	7/34/0.45TA	9.1	1.6	4.3	1.0	23 × 72	2 850	280	5.9	4.9
	(50)	19/16/0.45TA	10.4	2.1	4.7	1.0	27 × 83	3 720	330	7.8	4.9
	60	19/20/0.45TA	11.6	2.1	4.8	1.0	28 × 87	4 700	340	9.4	4.9
	(80)	19/27/0.45TA	13.5	2.1	5.1	1.0	30 × 92	5 880	360	12.5	4.9
	100	19/34/0.45TA	15.2	2.1	5.4	1.0	32 ×102	7 030	390	15.6	4.9
	(125)	19/42/0.45TA	16.8	2.7	5.8	1.0	36 ×114	8 180	440	19.6	4.9
	150	27/34/0.45TA	18.7	2.7	6.0	1.0	38 ×119	9 160	460	23.5	4.9
	200	37/34/0.45TA	21.2	3.3	6.8	1.0	43 ×137	12 600	520	31.3	4.9
	250	37/42/0.45TA	23.6	3.3	7.2	1.0	47 ×149	15 000	570	39.2	4.9

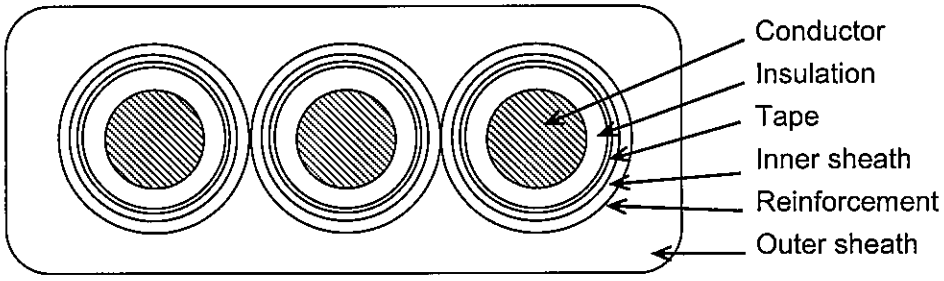
TST : Tinned steel wire
TA : Tinned annealed copper wire
* Indicated value includes thickness of both inner and outer sheath.
※The max. overall diameter is about 1.05times the approx. overall diameter.



600V H-2PNCT 3 × 22mm^2

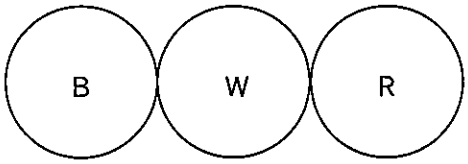


600V H-2PNCT 18 × 3.5mm^2

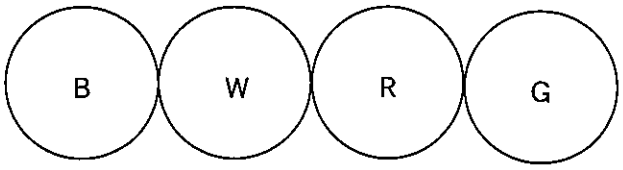


600V H-3PNCT 3 × 22mm^2

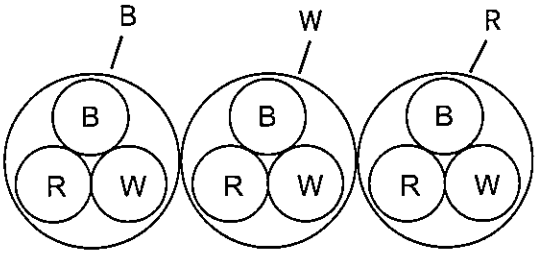
Fig.1 Cable cross section



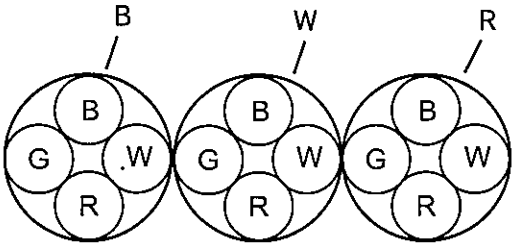
3 cores



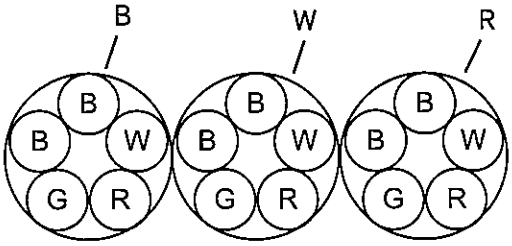
4 cores



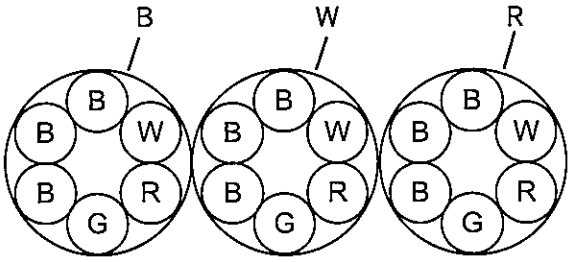
9 cores



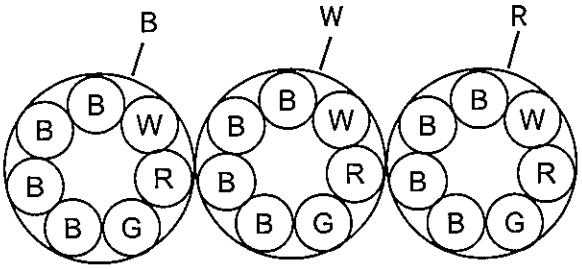
12 cores



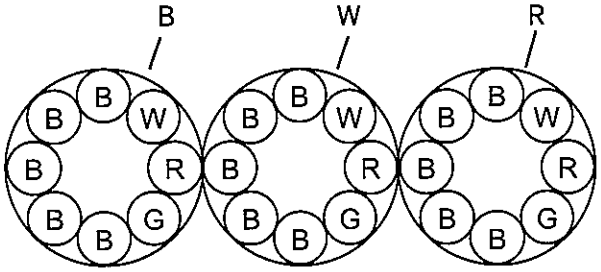
15 cores



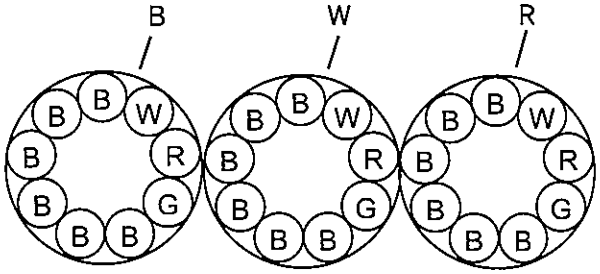
18 cores



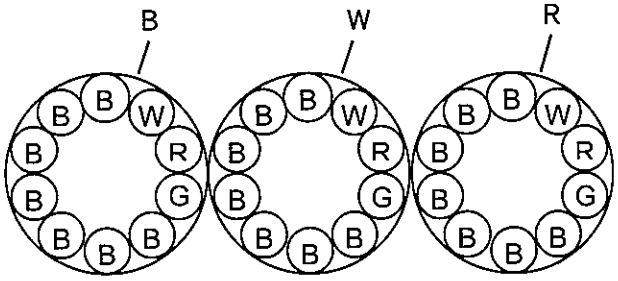
21 cores



24 cores



27cores



30 cores

Note) B : Black
W : White
R : Red
G : Green

Fig.2 Core identification