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# LOW VOLTAGE CABLE ACCESSORIES



# 90 Series 0.6/1kV Resin Splice



## Product Features

- Easy and safe to use
- The branch line runs parallel to the main cable
- High moisture resistance and excellent mechanical protection
- Full range of sizes available

# 90 Series 0.6/1kV Resin Splice

## IN-LINE JOINT



APPLICATION RANGE						
	90-NA-1	90-NA-2	90-NA-3	90-NA-4	90-NBA-6	90-NBA-7
CSA (mm <sup>2</sup> )	1.5 - 10	16 - 25	25 - 50	50 - 95	70 - 120	120 - 240
Cable (mm <sup>2</sup> )	8 - 22	14 - 30	23 - 35	28 - 47	27 - 54	29 - 64

## BRANCH JOINT



Kit	Cable Type	Main Cable mm	Branch Cable	Max. Cable Ø	
				Main	Branch
91-AB 111	Shielded/Non Shielded Armoured	4 x 1,5 - 4 x 6 - - - - -	4 x 1,5 - 4 x 4 - - - - -	15	15
91-AB 112	Shielded/Non Shielded Armoured	4 x 6 - 4 x 10 4 x 4 - 4 x 10	4 x 4 - 4 x 10 4 x 2,5 - 4 x 6	22	21
91-AB 113	Shielded/Non Shielded Armoured	4 x 16 - 4 x 25 4 x 10 - 4 x 16	4 x 6 - 4 x 16 4 x 4 - 4 x 10	29	22
91-AB 114	Shielded/Non Shielded Armoured	4 x 35 - 4 x 70 4 x 35 - 4 x 50	4 x 16 - 4 x 25 4 x 6 - 4 x 16	35	25
91-AB 115	Shielded/Non Shielded Armoured	4 x 95 - 4 x 150 4 x 70 - 4 x 120	4 x 25 - 4 x 50 4 x 10 - 4 x 35	50	30
91-AB 116	Shielded/Non Shielded Armoured	4 x 120 - 4 x 185 4 x 95 - 4 x 150	4 x 35 - 4 x 70 4 x 25 - 4 x 50	58	35
91-AB 117	Shielded/Non Shielded Armoured	4 x 150 - 4 x 240 4 x 150 - 4 x 240	4 x 70 - 4 x 150 4 x 50 - 4 x 120	65	45

P.S. Confirm conductor will fit within cable insulation range

# 0.6/1kV Heat Shrinkable Termination

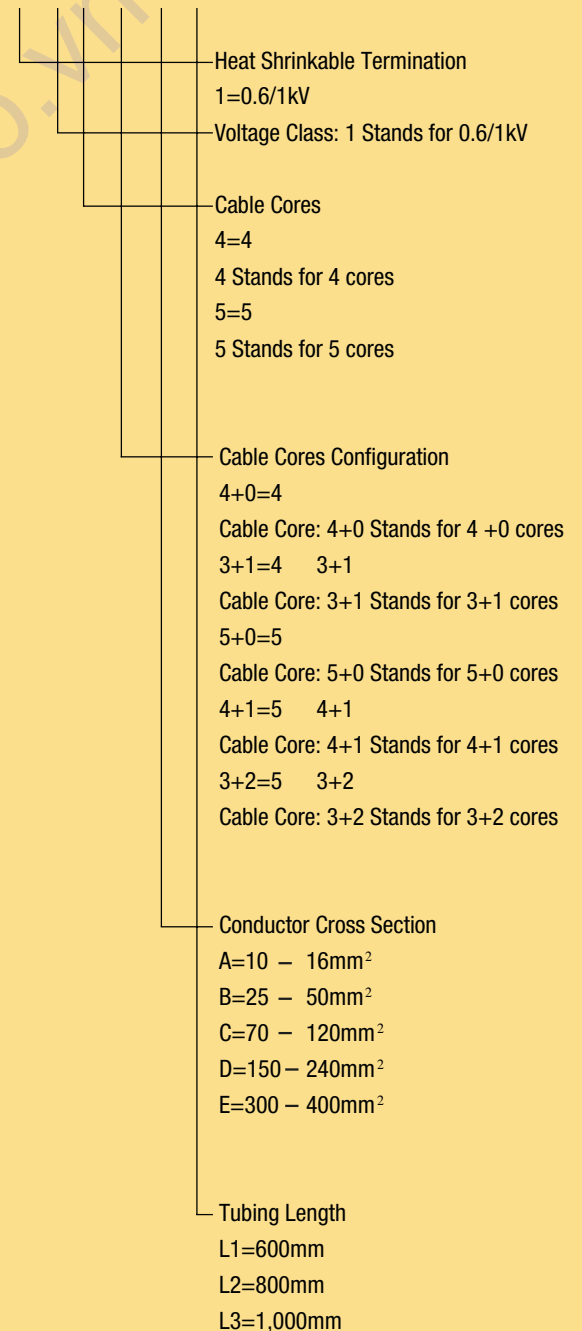
3M 5-Core Termination Configuration



3M 4-Core Termination Configuration

## Nomenclature Philosophy

HST-X/X(X+X)X-XX



### Example:

HST-1/4 (3+1) A-L1=0.6/1kV Heat Shrinkable Termination 4 core (3+1) 10mm<sup>2</sup>-16mm<sup>2</sup> (Tubing Length 600mm)

# 0.6/1kV Heat Shrinkable Termination

## APPLICATION

3M™ LV Heat Shrinkable Termination enables a dependable seal to be made easily at the end of the cable. Our advances in materials science ensure that these crosslinked polyolefin products also provide high-quality electrical insulation while at the same time resisting abrasion, weathering, and chemical attack.

### Performance Data follow VDE 0278 Part 3

Test Sequence	Description	Test result
1 min AC withstand test	4kV	No breakdown – Passed
Load cycle test	70°C	Passed if next AC withstand test passed
4h AC withstand test	2.4kV	No breakdown - Passed

### Material Properties

#### Neutral / Phase Insulating Tube

(Color): (Black)

Properties	Test Method	Typical Value
Tensile Strength	IEC 60684-2-19	> 10.0MPa
Ultimate Elongation	IEC 60684-2-19	> 400.0%
Volume Resistivity	IEC 60684-2-23	> $1.0 \times 10^{14} \Omega \cdot \text{cm}$
Dielectric Strength	IEC 60684-2-21	> 25kV/mm

#### Phase Identification Tube

(Color): (Red, Yellow, Green, Blue)

Properties	Test Method	Typical Value
Tensile Strength	IEC 60684-2-19	> 12.0MPa
Ultimate Elongation	IEC 60684-2-19	> 350.0%
Volume Resistivity	IEC 60684-2-23	> $1.0 \times 10^{14} \Omega \cdot \text{cm}$
Dielectric Strength	IEC 60684-2-21	> 20kV/mm

#### Breakout Boot

(Color): (Black)

Properties	Test Method	Typical Value
Tensile Strength	IEC 60684-2-19	> 12.0MPa
Ultimate Elongation	IEC 60684-2-19	> 350.0%
Volume Resistivity	IEC 60684-2-23	> $1.0 \times 10^{12} \Omega \cdot \text{cm}$
Dielectric Strength	IEC 60684-2-21	> 20kV/mm

# 0.6/1kV Heat Shrinkable Termination

## SELECTION CHART

### Heat Shrinkable Termination (I) - 0.6/1kV 4C (4+0)Termination

Product Number	Application Range:mm <sup>2</sup>	Tubing Length: mm	Kit / Case
HST-1/4(4+0)A-L1	10-16	600	20
HST-1/4(4+0)B-L1	25-50	600	15
HST-1/4(4+0)C-L1	70-120	600	10
HST-1/4(4+0)D-L1	150-240	600	5
HST-1/4(4+0)E-L1	300-400	600	3
HST-1/4(4+0)A-L2	10-16	800	30
HST-1/4(4+0)B-L2	25-50	800	30
HST-1/4(4+0)C-L2	70-120	800	15
HST-1/4(4+0)D-L2	150-240	800	10
HST-1/4(4+0)E-L2	300-400	800	5
HST-1/4(4+0)A-L3	10-16	1000	25
HST-1/4(4+0)B-L3	25-50	1000	20
HST-1/4(4+0)C-L3	70-120	1000	10
HST-1/4(4+0)D-L3	150-240	1000	6
HST-1/4(4+0)E-L3	300-400	1000	3

### Heat Shrinkable Termination (II) - 0.6/1kV 4C (3+1)Termination

Product Number	Application Range:mm <sup>2</sup>	Tubing Length: mm	Kit / Case
HST-1/4(3+1)A-L1	10-16	600	20
HST-1/4(3+1)B-L1	25-50	600	15
HST-1/4(3+1)C-L1	70-120	600	10
HST-1/4(3+1)D-L1	150-240	600	5
HST-1/4(3+1)E-L1	300-400	600	3
HST-1/4(3+1)A-L2	10-16	800	30
HST-1/4(3+1)B-L2	25-50	800	30
HST-1/4(3+1)C-L2	70-120	800	15
HST-1/4(3+1)D-L2	150-240	800	10
HST-1/4(3+1)E-L2	300-400	800	5
HST-1/4(3+1)A-L3	10-16	1000	25
HST-1/4(3+1)B-L3	25-50	1000	20
HST-1/4(3+1)C-L3	70-120	1000	10
HST-1/4(3+1)D-L3	150-240	1000	6
HST-1/4(3+1)E-L3	300-400	1000	3

### Heat Shrinkable Termination (III) - 0.6/1kV 5C (5+0)Termination

Product Number	Application Range:mm <sup>2</sup>	Tubing Length: mm	Kit / Case
HST-1/5 (5+0) A-L1	10~16	600	20
HST-1/5 (5+0) B-L1	25~50	600	15
HST-1/5 (5+0) C-L1	70~120	600	10
HST-1/5 (5+0) D-L1	150~240	600	5
HST-1/5 (5+0) E-L1	300~400	600	3
HST-1/5 (5+0) A-L2	10~16	800	30
HST-1/5 (5+0) B-L2	25~50	800	30
HST-1/5 (5+0) C-L2	70~120	800	15
HST-1/5 (5+0) D-L2	150~240	800	10
HST-1/5 (5+0) E-L2	300~400	800	5
HST-1/5 (5+0) A-L3	10~16	1000	25
HST-1/5 (5+0) B-L3	25~50	1000	20
HST-1/5 (5+0) C-L3	70~120	1000	10
HST-1/5 (5+0) D-L3	150~240	1000	6
HST-1/5 (5+0) E-L3	300~400	1000	3

### Heat Shrinkable Termination (IV) - 0.6/1kV 5C (3+2)Termination

Product Number	Application Range:mm <sup>2</sup>	Tubing Length: mm	Kit / Case
HST-1/5 (3+2) A-L1	10~16	600	20
HST-1/5 (3+2) B-L1	25~50	600	15
HST-1/5 (3+2) C-L1	70~120	600	10
HST-1/5 (3+2) D-L1	150~240	600	5
HST-1/5 (3+2) E-L1	300~400	600	3
HST-1/5 (3+2) A-L2	10~16	800	30
HST-1/5 (3+2) B-L2	25~50	800	30
HST-1/5 (3+2) C-L2	70~120	800	15
HST-1/5 (3+2) D-L2	150~240	800	10
HST-1/5 (3+2) E-L2	300~400	800	5
HST-1/5 (3+2) A-L3	10~16	1000	25
HST-1/5 (3+2) B-L3	25~50	1000	20
HST-1/5 (3+2) C-L3	70~120	1000	10
HST-1/5 (3+2) D-L3	150~240	1000	6
HST-1/5 (3+2) E-L3	300~400	1000	3

### Heat Shrinkable Termination (V) - 0.6/1kV 5C (4+1)Termination

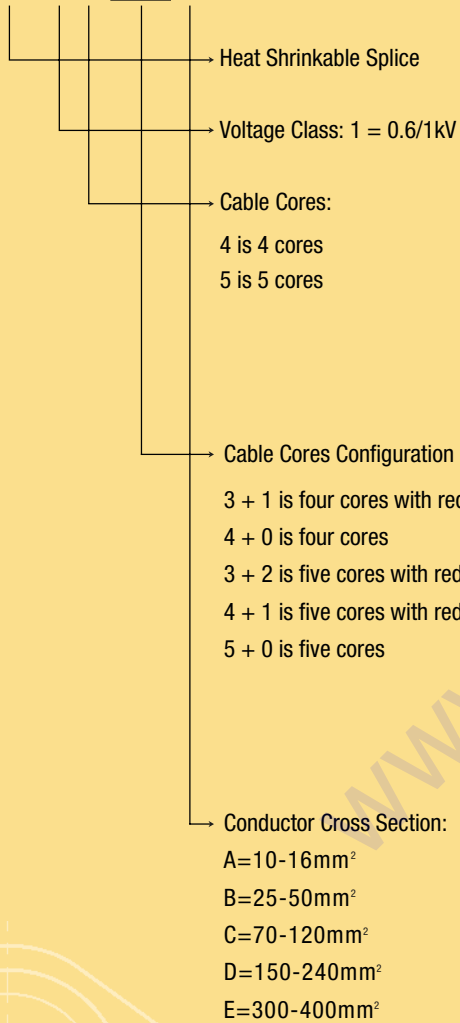
Product Number	Application Range:mm <sup>2</sup>	Tubing Length: mm	Kit / Case
HST-1/5 (4+1) A-L1	10~16	600	20
HST-1/5 (4+1) B-L1	25~50	600	15
HST-1/5 (4+1) C-L1	70~120	600	10
HST-1/5 (4+1) D-L1	150~240	600	5
HST-1/5 (4+1) E-L1	300~400	600	3
HST-1/5 (4+1) A-L2	10~16	800	30
HST-1/5 (4+1) B-L2	25~50	800	30
HST-1/5 (4+1) C-L2	70~120	800	15
HST-1/5 (4+1) D-L2	150~240	800	10
HST-1/5 (4+1) E-L2	300~400	800	5
HST-1/5 (4+1) A-L3	10~16	1000	25
HST-1/5 (4+1) B-L3	25~50	1000	20
HST-1/5 (4+1) C-L3	70~120	1000	10
HST-1/5 (4+1) D-L3	150~240	1000	6
HST-1/5 (4+1) E-L3	300~400	1000	3



# 0.6/1kV Heat Shrinkable Splice

## Nomenclature Philosophy

HSS-1/X(X+X)X



### Example:

HSS-1/4 (3+1) A - Heat Shrinkable Splice for 4 core cable with reduced<sup>2</sup>neutral size 10-16mm

# 0.6/1kV Heat Shrinkable Splice

## APPLICATION

3M™ Heat Shrinkable Splicing contains cross-linked, heat shrinkable polyolefin insulation and re-jacketing tubing that recover to a predetermined diameter upon the application of heat. The tubing provides a reliable method of insulating and sealing to power cable during jointing. The splicing is easily installed with a standard heat gun or torch. When applied, it provides a shrink-tight fit conforming to the object covered. On shrinking, an inner adhesive will melt and bond to the cable.

### Material Properties

#### Neutral / Phase Insulating Tube

Properties	Test Method	Typical Value
Tensile Strength	IEC 60684-2-19	> 10.0MPa
Elongation	IEC 60684-2-19	> 400.0%
Volume Resistivity	IEC 60684-2-23	> $1.0 \times 10^{14} \Omega \cdot \text{cm}$
Dielectric Strength	IEC 60684-2-21	> 25kV/mm

#### Performance Data follow VDE 0278 Part 3

Test Sequence	Description	Test result
Temperature check	15h, 89°C	< 100°C – Passed
1 min AC withstand test	4kV	No breakdown – Passed
Load cycle test	63 load cycles	Passed if next AC withstand & Insulation resistance test passed
Water tightness test of joint in the water bath	1000mm water level, 63 load cycles	Passed if next AC withstand & Insulation resistance test passed
Insulation Resistance in water bath	Follow right after above test sequence	> 10MΩ – Passed
Nominal AC withstand test in water bath	4kV, 1 min	No breakdown – Passed

# 0.6/1kV Heat Shrinkable Splice

## SELECTION CHART

### 4 Cores

Product Number	Cable Size Range (mm <sup>2</sup> )	Phase Insulating Tubing		Neutral Insulating Tubing		Rejacketing Tubing	
		Expanded I.D Min (mm)	Recovered I.D Max (mm)	Expanded I.D Min (mm)	Recovered I.D Max (mm)	Expanded I.D Min (mm)	Recovered I.D Max (mm)
HSS-1/4(3+1)A	10 - 16	15.0	6.0	10.0	4.0	50.0	20.0
HSS-1/4(3+1)B	25 - 50	20.0	8.0	15.0	6.0	50.0	20.0
HSS-1/4(3+1)C	70 - 120	30.0	10.0	20.0	8.0	90.0	28.0
HSS-1/4(3+1)D	150 - 240	40.0	14.0	30.0	10.0	100.0	38.0
HSS-1/4(3+1)E	300 - 400	50.0	20.0	40.0	14.0	120.0	38.0
HSS-1/4(3+0)A	10 - 16	15.0	6.0	N/A	N/A	50.0	20.0
HSS-1/4(3+0)B	25 - 50	20.0	8.0	N/A	N/A	50.0	20.0
HSS-1/4(3+0)C	70 - 20	30.0	10.0	N/A	N/A	90.0	28.0
HSS-1/4(3+0)D	150 - 240	40.0	14.0	N/A	N/A	100.0	38.0
HSS-1/4(3+0)E	300 - 400	50.0	20.0	N/A	N/A	120.0	38.0

### 5 Cores

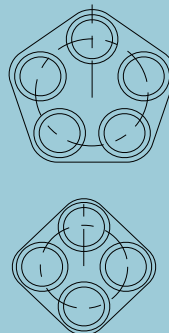
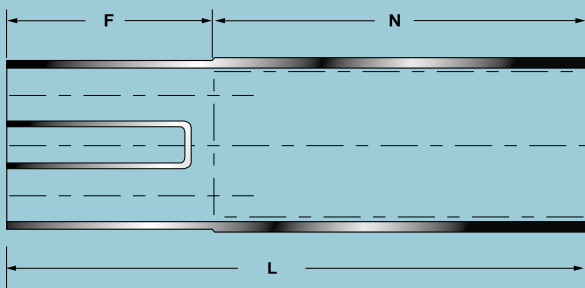
Product Number	Cable Size Range (mm <sup>2</sup> )	Phase Insulating Tubing		Neutral Insulating Tubing		Rejacketing Tubing	
		Expanded I.D Min (mm)	Recovered I.D Max (mm)	Expanded I.D Min (mm)	Recovered I.D Max (mm)	Expanded I.D Min (mm)	Recovered I.D Max (mm)
HSS-1/5(3+2)A	10 - 16	15.0	6.0	10.0	4.0	50.0	20.0
HSS-1/4(3+1)B	25 - 50	20.0	8.0	15.0	6.0	50.0	20.0
HSS-1/4(3+1)C	70 - 120	30.0	10.0	20.0	8.0	100.0	28.0
HSS-1/4(3+1)D	150 - 240	40.0	14.0	30.0	10.0	100.0	38.0
HSS-1/4(3+1)E	300 - 400	50.0	20.0	40.0	14.0	120.0	38.0
HSS-1/4(4+1)A	10 - 16	15.0	6.0	10.0	4.0	50.0	20.0
HSS-1/4(4+1)B	25 - 50	20.0	8.0	15.0	6.0	50.0	20.0
HSS-1/4(4+1)C	70 - 20	30.0	10.0	20.0	8.0	90.0	28.0
HSS-1/4(4+1)D	150 - 240	40.0	14.0	30.0	10.0	100.0	38.0
HSS-1/4(4+1)E	300 - 400	50.0	20.0	40.0	14.0	120.0	38.0
HSS-1/4(4+1)A	10 - 16	15.0	6.0	N/A	N/A	50.0	20.0
HSS-1/4(4+1)B	25 - 50	20.0	8.0	N/A	N/A	50.0	20.0
HSS-1/4(4+1)C	70 - 20	30.0	10.0	N/A	N/A	90.0	28.0
HSS-1/4(4+1)D	150 - 240	40.0	14.0	N/A	N/A	100.0	38.0
HSS-1/4(4+1)E	300 - 400	50.0	20.0	N/A	N/A	120.0	38.0

# Heat Shrinkable Breakout Boot



## Product Features

- Fast and easy installation
- Resists puncture and abrasion
- Versatile, a minimum number of sizes cover the entire application range
- Complete environmental protection



# Heat Shrinkable Breakout Boot

## APPLICATION

3M™ Heat Shrinkable Breakout Boot are designed for dependable insulation and sealing of breakouts in multiconductor armored or sheathed cables. The boots provide excellent electrical and mechanical protection and are supplied with an internal coating of adhesive for reliable environment sealing.

### Material Properties

Properties	Test Method	Typical Value
Tensile Strength	GB1040	≥ 12.0Mpa
Ultimate Elongation	GB 1040	≥ 350.0%
Density	GB 1033	$0.95 \times 10^3 \text{ kg/m}^3$
Shore A Hardness	GB 2411	< 80
Accelerated Ageing	7 days at 136 °C ± 2 °C	GB14049
Tensile Strength Variation Rate	GB 14049	≤ ± 20%
Ultimate Elongation Variation Rate	GB14049	≤ ± 20%
Low Temperature Flexibility	4 hours at -40 °C	GB5470 (No cracking)
Volume Resistivity	GB 1410	≥ $1.0 \times 10^{12} \Omega \cdot \text{cm}$

All values are typical, and are not intended for specifications purpose

### Ordering Information

Product Number	N		F		L		Each/Case
	Neck		Finger		Length as Supplied		
	a (min) m	b (max) mm	c (min) mm	d (max) mm	e (min) mm	f (max) mm	
AA3	34.0	20.0	15.0	5.5	125.0	45.0	50
A3	50.0	26.0	25.0	6.9	170.0	55.0	50
B3	70.0	32.0	32.0	8.5	185.0	70.0	20
C3	86.0	45.0	40.0	14.0	195.0	70.0	20
D3	102.0	60.5	50.0	18.5	200.0	75.0	10
E3	122.0	70.0	62.0	24.0	200.0	75.0	10
A4	35.0	21.5	14.0	4.7	130.0	40.0	100
B4	51.0	26.5	19.0	5.5	160.0	65.0	50
C4	68.0	33.0	23.0	9.0	185.0	65.0	25
D4	84.0	42.0	33.0	12.0	190.0	70.0	20
B5	44.0	24.0	13.0	5.7	165.0	70.0	50
C5	76.0	40.5	24.0	10.0	185.0	70.0	25
D5	98.0	48.0	35.0	12.0	195.0	75.0	20

a.c.e = I. D. as supplied

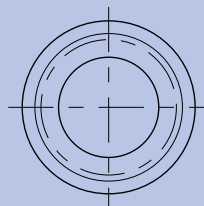
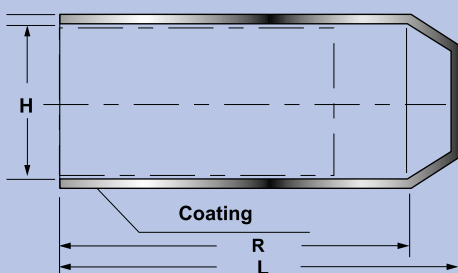
b.d.f = I. D. after free recovery

# Heat Shrinkable End Cap



## Product Features

- Fast and easy installation
- Resists puncture and abrasion
- Versatile, a minimum number of sizes cover the entire application range
- Complete environmental protection



# Heat Shrinkable End Cap

## APPLICATION

3M™ End Caps are cross linked, heat-shrinkable, polyolefin caps designed for quick, reliable end sealing of cylindrical objects. The caps are adhesive lined for excellent environmental and mechanical protection.

### Material Properties

Properties		Test Method	Typical Value
Tensile Strength		GB1040	> 12.0Mpa
Ultimate Elongation		GB 1040	≥ 350.0%
Density		GB 1033	$0.95 \times 10^3 \text{ kg/m}^3$
Shore A Hardness		GB 2411	≤ 80
Accelerated Ageing	7 days at 136°C ± 2°C	GB 1049	
Tensile Strength Variation Rate		GB 1049	≤ ± 20%
Ultimate Elongation Variation Rate		GB 1049	≤ ± 20%
Low Temperature Flexibility	4 hours at -40°C	GB 5470	(No cracking)
Volume Resistivity		GB 1040	≥ $1.0 \times 10^{12} \Omega \cdot \text{cm}$

All values are typical, and are not intended for specifications purpose

### Ordering Information

Product Number	H		Length as Supplied		Each/Case
	a (min)	b (max)	L (min)	R (min)	
	mm	mm	mm	mm	
EC-20	20	8	75	66	200
EC-40	40	15	95	83	100
EC-55	55	25	115	103	100
EC-75	75	30	140	120	20
EC-100	100	45	145	120	20
EC-140	140	70	175	150	10

a = I. D. as supplied

b = I. D. after free recovery