

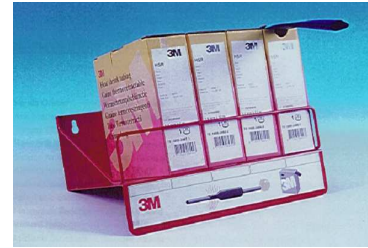


# TECHNICAL DATA SHEET

## HSR

**Base material**  
**Color**

**Polyolefin.**  
**Black**  
**without adhesive:**  
**Red, blue, white**  
**yellow, brown**  
**Yellow/green\*\*)**



### Typical Properties

Physical	Value	Standard	Test Method
Shrink ratio	2:1		
Tensile strength	17 N/mm <sup>2</sup> min.	-	IEC 60684-2-19
Elongation at break	400 % min.	-	IEC 60684-2-19
Longitudinal change	+0/ -5 %	-	IEC 60684-2-9
Concentricity	60 % min. *)	-	IEC 60684-2-3
Secant Modulus	100 N/mm <sup>2</sup>	-	IEC 60684-2-37
Relative Density	1.05 g/cm <sup>3</sup>	-	IEC 60684-2-4
Shore Hardness	93 Shore A		ASTM D-2240

Thermal	Value	Standard	Test Method
Continuous Operating Temperature	-55°C to +135°C *)	-	IEC 60684-2-37
Shrink Temperature	120°C min. 250 °C max.		
Heat Ageing 150 °C / 168 hrs		-	IEC 60684-2-39
Elongation at break	350 % min.	-	IEC 60684-2-19
Low Temperature Flexibility	No cracking after bending	-	IEC 60684-2-14
Copper Corrosion	No corrosion	-	IEC 60684-2-33
Flammability	Self extinguishing *)	-	IEC 60684-2-26

Electrical	Value	Standard	Test Method
Dielectric Strength	200 kV/cm *)	-	IEC 60684-2-21
Volume resistivity	1*10 <sup>15</sup> Ohm/cm	-	IEC 60684-2-23
Comparative Tracking Index	Min. 600 V	-	IEC 60112

Chemical	Value	Standard	Test Method
Chemical Resistance	Good	-	IEC 60684-2-36

Environmental	Value	Standard	Test Method
RoHS compliant	Yes	2002/95/EEC	N/a
Halogen free	No	BS 6853	N/a

Technical Information provided consists of typical product data and should not be used for specification purposes.  
Unless otherwise specified in the test method, all tests are performed at room temperature.

\*) outer wall only

\*\*\*) not available in sizes 1.2/1.6/2.4

#### Important note to the purchaser.

All statements, technical information and recommendations contained herein are based on tests 3M believes to be reliable, but their accuracy and completeness are not guaranteed.

The user shall be responsible for determining the suitability of the products for his particular application.

To discuss your application requirements please contact your representative

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**Product Guide - Table 1**

Part Number	Meter per reel	Expanded ID (min.)		Recovered ID (max.)		Total Recovered Wall Thickness (nominal)		Recovered Adhesive Wall Thickness (nominal)	
		mm.		mm.		mm.		mm.	
1.2**	12	1.2		0.6		0.4			
1.6**	12	1.6		0.8		0.4			
2.4**	11	2.4		1.2		0.5			
3.2	11	3.2		1.6		0.5			
4.8	10	4.8		2.4		0.5			
6.4	9	6.4		3.2		0.6			
9.5	7	9.5		4.7		0.6			
12.7	6	12.7		6.4		0.6			
19.0	5	19.0		9.5		0.8			
25.4	3.5	25.4		12.7		0.9			
ETW 3*	5	3.0		1.0		1.0		0.5	
ETW 6*	4	6.0		2.0		1.0		0.5	
ETW 9*	3	9.0		3.0		1.4		0.6	
ETW 12*	3	12.0		4.0		1.8		0.8	
ETW 19*	2	19.0		6.0		2.2		0.8	

\* only available in black

\*\* not available in yellow/green

### Storage Conditions

Temperature: min. -50 °C  
max. +50 °C

Moisture: max. 75 %

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