ENHANCED TECHNICAL DATA SHEET FOR POLYOLEFIN RECYCLATES

PCEP
POLYOLEFIN
Circular Economy Platform

PCEP HAS DEVELOPED THIS ENHANCED TECHNICAL DATA SHEET TO HELP THE POLYOLEFIN VALUE CHAIN SECURE ACCEPTANCE AND USE OF RECYCLED POLYOLEFINS (rPO) INTO NEW PRODUCTS.

PCEP **aims to facilitate the dialogue along the value chain** by establishing a benchmark of what is needed to be known about rPOs. PCEP has identified key characteristics of rPO which need to be measured and communicated between recyclers and users, such as brand owners and converters, when developing products which incorporate rPO. This will enable alignment of expectations and create greater confidence in the quality and consistency of the recycled material.

This enhanced Technical Data Sheet therefore goes beyond what is generally expected in a standard datasheet by defining the *'minimum required'* rPO characteristics and associated appropriate methodology, as well as additional information which is *'highly recommended'* to further increase the trust and confidence for users of the recycled material.

PCEP envisions this enhanced Technical Data Sheet to be used in assistance to the contractually agreed specification required by the client.

We call on all Polyolefin recyclers to adopt this enhanced Technical Data Sheet when generating information to pass onto their customers.

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POLYMER TYPE

HIGHLY RECOMMENDED ────────────────────────

ORIGIN OF END-OF-USE POLYMERS[1]	*Material info, including whether pre- or post-consumer, origin & reference to standard if used.*
RECYCLING STEPS	*Type of step e.g., shredding, washing, density separation etc.*
SELECTED PROCESSING SUITABILITY	*Type of process most suitable for, e.g. injection molding*
COMPLIANCE	*Standards and regulations material complies with e.g., REACH /RoHS/Recycling norms/% confidence of Certificate of analysis*

MINIMUM REQUIREMENTS ────────────────────────

TECHNICAL DATA	METHOD	CONDITIONS	VALUE/RANGE	UNITS/ COMMENTS
PHYSICAL PROPERTIES				
RECYCLED PLASTIC CONTENT				
• **PRE-CONSUMER**	CPA method		*xx*	%
• **POST-CONSUMER**	CPA method		*xx*	%
MELT FLOW INDEX, MFI	ISO 1133	*As per standard for specific PO*	*x,x to x,x*	g/10 mins
DENSITY	ISO 1183-1-Method A	Immersion	*0,xx to 0,xx*	g/cm3
SHAPE	Visual	Visual inspection	*Regular shaped granules*	
COLOUR	Visual	Visual inspection	*Name of the colour*	
COLOUR VARIATION	CieLAB		*<x.0*	deltaE Range against measured samples
ODOUR	Methods TBC		*Yes/No or Scale*	To be explored
FILTRATION LEVEL	Smallest aperture used	Mesh Size	*xx*	μ
CONTAMINATION	No of defects on extruded film			defects/dm2
OTHER POLYMERS	DSC and/or FT-IR Analysis	xx	*xx*	%
MECHANICAL PROPERTIES (AT 23°C)				
TENSILE STRENGTH	ISO 527-1/2		*27 to 36*	N/mm2 (MPa)
TENSILE MODULUS	ISO 527-1/2		*> 1000*	N/mm2 (MPa)
FLEXURAL MODULUS	ISO 178		*> XX*	N/mm2 (MPa)
CHARPY IMPACT STRENGTH	ISO 179-1	*Unnotched/ Notched*	*xxx to xxx*	kJ/m2
THERMAL PROPERTIES				
MELTING POINT	ISO 11357-1/3		*xxx to xxx*	°C
OTHERS				
ASH CONTENT	ISO3451-1		*< x,x*	%

HIGHLY RECOMMENDED ────────────────────────

DETAILS OF TESTING FREQUENCY AND SAMPLING PROCEDURE:	*Enter details*
DETAILS OF SPECIMEN PREPARATION (INJECTION OR COMPRESSION) APPROPRIATE TO POLYMER TYPE & STANDARD METHODS	*Enter details*
MATERIAL HANDLING INFORMATION	*Enter recommendations from the recycler*
ECO FOOTPRINT[2]	*Indicate Life Cycle Assessment (LCA) or other eco information.*
ACCREDITATIONS[3]	*Indicate ISO accreditations, quality logos etc.*
FOR FURTHER TECHNICAL INFORMATION PLEASE CONTACT:	*Enter contact details*

FOOTNOTES

¹OPTIONAL, REFERENCE TO EN15343:2007

This box provides an opportunity to reference to EN15343:2007 "Plastics recycling traceability and assessment of conformity and recycled content" if used.

This European Standard specifies the procedures needed for the traceability of recycled plastics. This gives the basis for the calculation procedure for the recycled content of a product. This standard is applicable without prejudice to any existing legislation. NOTE The procedures are needed to formulate or describe the traceability, while the traceability can be used as a basis for calculating the recycled content

²OPTIONAL, REFERENCE TO ECOFOOTPRINT/LCA

This box provides an opportunity to highlight any Environmental/LCA information about the material. Information on LCA should specify which system boundaries are adopted e.g. whether a "cut off" or "the avoid burden approach" have been used so that the LCA can be used in a like for like way. Both are currently compliant with ISO standards 14040 and 14044.

³OPTIONAL, REFERENCE TO PNE 53978

It is recommended to use the % confidence of the analysis as laid out in PNE 53978 where appropriate for specific applications or agreed with by the client. This gives details of whether the material has been homogenized or not and an indication of lot size to be able to calculate a certificate of analysis confidence. On the following page is an extraction of how this is calculated for PE:

TYPE OF MATERIAL				
CATEGORY	A	B	C	D
Technical data sheet	√	√	√	√
Certificate of analysis	√	√	√	
% Certificate of analysis confidence	√ (90% minimum)	√	-	-
Coefficient of variation in relation with the certificate of analysis	√	√		
Volatile and ashes contained	≤ Certificate of analysis value	≤ Certificate of analysis value		

1) To establish this degree of confidence, the UNE-CEN / TS 16010 EX and UNE-CEN / TS 16011 EX Standards describe the statistical sampling procedures and sample preparation, respectively.

2) The coefficients of variation with respect to the certificate of analysis in the following required characteristics must be:
   MFI: ≤ 20% ; Specific density: ≤ 0.5%

The coefficient of variation is obtained as a result of dividing the standard deviation by the value absolute of the mean of the set and is usually expressed as a percentage for your better understanding.

The coefficient of variation can be seen expressed with the letters CV or, depending on the manual or the font used. Its formula is the following:

$$CV = \frac{Sx}{|\bar{x}|}$$

WHERE:

Sx is the standard deviation of a data set $|\bar{x}|$ is the absolute value of the mean of a data set $[X_1, X_1...X_n]$ y $\bar{x} \neq 0$