DERWENT ENHANCED POLYMER INDEX SEARCHING ON STNext®

CAS
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American Chemical Society

Agenda

- Introduction and coverage
- Key features of polymer indexing
- Searching polymer indexing
- Essential user guides
- Search tips and indexing conventions

DWPI Enhanced Polymer Indexing

- A deep indexing system covering all important polymer related information from DWPI basic patents
- Both generic and specific concepts are indexed
- The indexing contains additional information not present in the DWPI abstract
- Generates unique hits compared to text searching, IPC's etc.
- Replaced "Plasdoc Coding" in 1993
- Coverage starts from DWPI update 199332
- Searchable by subscribers*
- Using the /PLE field, in either WPIDS or WPIX

(* An appropriate level of Derwent subscription is required.)

Example: DWPI polymer indexing

```
AN   2010-A01652 [201004]   WPIX Full-text
TI   Polishing pad for use in e.g. chemical mechanical planarization process
     has pores in polishing surfaces of polishing elements which are affixed to
     support layer to allow movement only along axis normal to polishing
     surface of elements
DC   A88; P61; U11
IN   JOSEPH W D; JOSEPH W
PA   (MINN-C) 3M INNOVATIVE PROPERTIES CO; (MINN-C) 3M INNOVATIVE PROPERTIES
     CORP; (MINN-C) 3M INNOVATIVE PROPERTIES
PI   WO 2009158665   A1 20091230 (201004)* EN  39[7]
        RW:AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LT LU LV
           MC MK MT NL NO PL PT RO SE SI SK TR OA BW GH GM KE LS MW MZ NA SD
           SL SZ TZ UG ZM ZW EA
         W:AE AG AL AM AO AT AU AZ BA BB BG BH BR BW BY BZ CA CH CL CN CO CR
           CU CZ DE DK DM DO DZ EC EE EG ES FI GB GD GE GH GM GT HN HR HU ID
           IL IN IS JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LY MA MD ME
           MG MK MN MW MX MY MZ NA NG NI NO NZ OM PE PG PH PL PT RO RS RU SC
           SD SE SG SK SL SM ST SV SY TJ TM TN TR TT TZ UA UG US UZ VC VN ZA
           ZM ZW
     KR 2011019442   A  20110225 (201119)  KO
     TW 2010008701   A  20100301 (201122)  ZH
     EP 2318180      A1 20110511 (201131)  EN
        R:AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU
           LV MC MK MT NL NO PL PT RO SE SI SK TR AL BA RS
     US 20110159786  A1 20110630 (201143)  EN
     CN 102131618    A  20110720 (201153)  ZH
     JP 2011526218   T  20111006 (201165)  JA 26
     TW I396603      B  20130521 (201361)  ZH
     SG 167517       A1 20110128 (201407)  EN
     SG 167517       B  20130715 (201416)  EN
     US 8821214      B2 20140902 (201458)  EN
     JP 5596030      B2 20140924 (201462)  JA 19
```

Example: DWPI polymer indexing

```
PLE  UPA   20100115
     [1.1]     2004 G0828 G0817 D01 D12 D10 D51 D54 D56 D58 D69 D84 Cl 7A DCN:
               R01079 DCR: 140524; H0000; H0124-R; S9999 S1309-R; S9999
               S1605-R; P0328; P0340;
     [1.2]     2004 G0102 G0022 D01 D02 D12 D10 D19 D18 D31 D51 D53 D58 D76 D88
                DCN: R00708 DCR: 368; G0828 G0817 D01 D02 D12 D10 D51 D54 D56
               D58 D84 DCN: R00806 DCR: 129411; H0022 H0011; H0124-R; S9999
               S1309-R; S9999 S1605-R; P0328; P1741; P0351; P0362;
     [1.3]     2004 D01 D02 D03 D12 D10 D51 D53 D59 D85 P0599 H0124 B5061 DCN:
               R24073 DCR: 135413; S9999 S1309-R; S9999 S1605-R;
     [1.4]     2004 P1445-R F81 Si 4A; S9999 S1309-R; S9999 S1605-R;
     [1.5]     2004 ND01; K9416; Q9999 Q6600; K9870 K9847 K9790; B9999 B4397
               B4240; ND07; K9745-R; B9999 B5221 B4740; N9999 N6484-R N6440;
               K9778 K9745; N9999 N6940 N6939; N9999 N6291 N6268; N9999 N6315
               N6268; N9999 N6086; N9999 N5721-R;
     [1.6]     2004 G2335 D00 F20 C- 4A O- 6A DCN: R01066 DCR: 255; A999 A282
               A260;
     [1.7]     2004 A999 A475;
     [2.1]     2004 P1707 P1694 D01;
     [2.2]     2004 G0260-R G0022 D01 D12 D10 D26 D51 D53; H0000; P0088;
     [2.3]     2004 H0317; P1592-R F77 D01;
     [2.4]     2004 ND01; K9416; Q9999 Q6600; K9870 K9847 K9790; B9999 B4397
               B4240; ND07; K9745-R; K9574 K9483;
     [3.1]     2004 P0000;
     [3.2]     2004 ND01; ND07; Q9999 Q6600; Q9999 Q6644-R; N9999 N5721-R;
               B9999 B3407 B3383 B3372; K9745-R; K9574 K9483;
```

DWPI polymer indexing is searched and displayed using the PLE field.

Information indexed

- All polymer related information is indexed from:
  - The patent claims
  - DWPI documentation abstract
  - Claims related example(s)

Not covered

- Starting materials and intermediates for polymer formers and additives
- Chemical processes for catalyst production
- Generic or Markush Modifying Agents
- Starting materials, chemical processes, intermediates, or catalysts for modifying agent production
- Compounds present which are not additives, catalysts or modifying agents for the polymer
  - e.g., a cosmetic containing vitamin E and carboxymethylcellulose

Key features of polymer indexing (/PLE)

- Separate hierarchies (Facets) of related codes
  - Structural and Non-structural Facets
  - Each Facet has a unique code format
- Chemical aspects (fragment) codes for indexing chemical structures (polymers, additives, etc.)
- Auto-posting of codes to simplify searching
  - Up-posting of generic terms within code Facet
  - Cross-posting of related terms between Facets
- Precision linking of related terms
  - Using multiple proximity operators

Structural Facets (hierarchies)

	CODE FORMAT
- Polymer Formers	(Rnnnnn, Gnnnn)
- i.e., monomers and condensants	
- Polymer Types	(Pnnnn)
- Modified Polymers	(Mnnnn)
- Natural Polymers	(Rnnnnn, Gnnnn)
- Chemicals	(Rnnnnn, Gnnnn)
- Modifying Agents	(Rnnnnn, Gnnnn)
- Chemical Aspects	(Dnn, Dnnn, Enn, Fnn, Fnnn)
- i.e., chemical fragment codes	

Non-structural Facets (hierarchies)

	CODE FORMAT
- Novelty Descriptors	(NDnn)
- Universal Terms	(Knnnn)
- Polymer Descriptors	(Hnnnn)
- e.g., thermoplastic, graft copolymer	
- Shape & Form	(Snnnn)
- e.g., fibre, powder, foam	
- Additive Type	(Annn)
- Catalyst Type	(Cnnn)

Non-structural Facets (hierarchies) (cont.)

	CODE FORMAT
- Chemical Processes	(Lnnnn)
- Physical Operations	(Nnnnn)
- Equipment	(Jnnnn)
- Properties	(Bnnnn)
- Polymer Applications	(Qnnnn)

Chemical aspects (fragment) codes

- Chemical Aspects are chemical fragment codes indexed for:
  - specific compounds (in addition to the SCN)
  - generic compounds
  - Markush structures
  - atoms incorporated into a polymer by modification
- Chemical aspects index all polymers, additives, catalysts and modifying agents
- Code format
  - Dnn, Dnnn, Enn, Fnn, Fnnn
  - element symbols & groups

Chemical aspects codes (cont.)

- General terms
  - e.g., organic or inorganic
- Ring systems
  - number of rings
  - atoms in rings
  - size of rings
- Broad functionality terms
  - e.g., D60 - Acid
- C-C unsaturation

Chemical aspects codes (cont.)

- Carbon count
- Specific functionality terms (Fnn)
  - e.g., F70 - carboxylic amide
- Acid Derivative terms (Enn)
  - e.g., E21 - terephthalic derivatives
- Elements and groups of the periodic table
  - Including generic terms for General Metal & for Transition Metal

Specific Compound Numbers (SCNs)

- Common fully defined compounds are indexed with their own specific codes – known as SCNs
  - Code format: Rnnnnn
  - e.g. R24001 – sodium acrylate
- The corresponding DWPI Chemistry Resource (DCR) numbers are also indexed and searchable
  - e.g. 135176 – sodium acrylate
- All polymer formers are indexed either by SCNs or generic codes (Gnnnn)

Auto-posting of codes

- In addition to the codes chosen by the indexer, the online record contains related codes that are automatically indexed
- Two types of auto-posting:
  - Up-posting
    - All broader codes further up the hierarchy from the indexed code are automatically indexed
  - Cross-posting
    - Related codes from other hierarchies are additionally indexed
- Benefit – easy generic searching

Example: Up-posting of codes

Polymer Formers

G0022 Monoolefinic

.....

G0260 NT Acrylics monoolefinic

(+ G0022 auto-posted)

G0271 NT Acrylic acids monoolefinic

(+ G0022, G0260 auto-posted)

G0282 NT Acrylic acid/salts

(+ G0022, G0260, G0271 auto-posted)

R00446 NT Acrylic acid

(+ G0022, G0260, G0271, G0282 auto-posted)

R24001 NT Sodium acrylate

(+ G0022, G0260, G0271, G0282 auto-posted)

```
PLE  UPA   20110302
     [1.1]      2004 G0282 G0271 G0260 G0022 D01 D12 D10 D26 D51 D53 D58
                D61 D83 F36 F35 Na 1A DCN: R24001 DCR: 135176; H0000; P0088;
```

Example: Cross-posting of codes

R24001 Sodium Acrylate CH2=CHCOONa

All relevant chemical aspect codes are auto-posted:

D01	Organic
D26	Acrylic unsaturated chain (96)
D12	Unsaturated chain
D10	Aliphatic chain
D53	Monoolefinic unsaturation
D51	Unsaturation containing
D58	Terminal olefinic unsaturation
D61	Salt/Complex
D83	Carbon Count
F36	Monocarboxylic acid (salt)
F35	Carboxylic acid (salt)
Na	Sodium
1A	Group 1A

```
PLE  UPA   20110302
     [1.1]     2004 G0282 G0271 G0260 G0022 D01 D12 D10 D26 D51 D53 D58
               D61 D83 F36 F35 Na 1A DCN: R24001 DCR: 135176; H0000; P0088;
```

Precision linking of related terms

- Each separate polymer concept is indexed with its associated terms (additives, catalysts, properties, applications, etc.) to form a “Linking group” of codes
- There may be several Linking groups included in the indexing – each Linking group represents a different polymer concept in the record
- Each Linking group is completely separated from other Linking groups in the record, maximizing precision and minimizing noise

Why are Linking groups important?

- **Example 1** - A patent describing a new bottle made from polyethylene terephthalate and having a cap made from polyolefin, e.g., polypropylene or ethylene copolymer.

  This patent has two polymer concepts (bottle and cap) and so would be indexed as two Linking groups.

- **Example 2** - A patent for a new tri-layer film, the outermost layer is heat resistant polyamide, the middle layer is aluminium and the inner layer is impermeable PVC.

  Again this patent has two polymer concepts (outer layer and inner layer), so two Linking groups would be made.

Three levels of linking

- All the codes within a single Linking group are linked together at **Level 3**
- **Level 2** and **Level 1** linking are used to indicate very closely related codes within a Linking group
  - e.g. “copolymer” linked to “acrylonitrile” and “butadiene”
- To search for codes from across different Linking groups (polymer concepts) the AND operator is used

Three levels of linking (cont.)

- **Level 3**: Widest level – a “Linking group”
  - Links related substances together
    - e.g. polymer with additive(s) or catalyst(s)
  - Links the polymer concept with properties and applications
- **Level 2**: Middle level – indexing for each substance
  - Links a compound with its function, shape or form
  - Links co-monomers together in a copolymer
- **Level 1**: Tightest level – Chemical Aspect (fragment) codes
  - Links structural fragments together within a substance

Three linking operators on STNext

Linking level	Proximity operator	
(3) (widest)	(L)	Linking Group
(2) (middle)	(P)	Paragraph
(1) (tightest)	(S)	Sentence

Hypothetical linking group example

Polymer composition

- Styrene-maleic anhydride binary copolymer
- Calcium carbonate filler
- Zinc stearate lubricant
- Granulation into a powder

Linking diagram

- To help visualise the linking levels

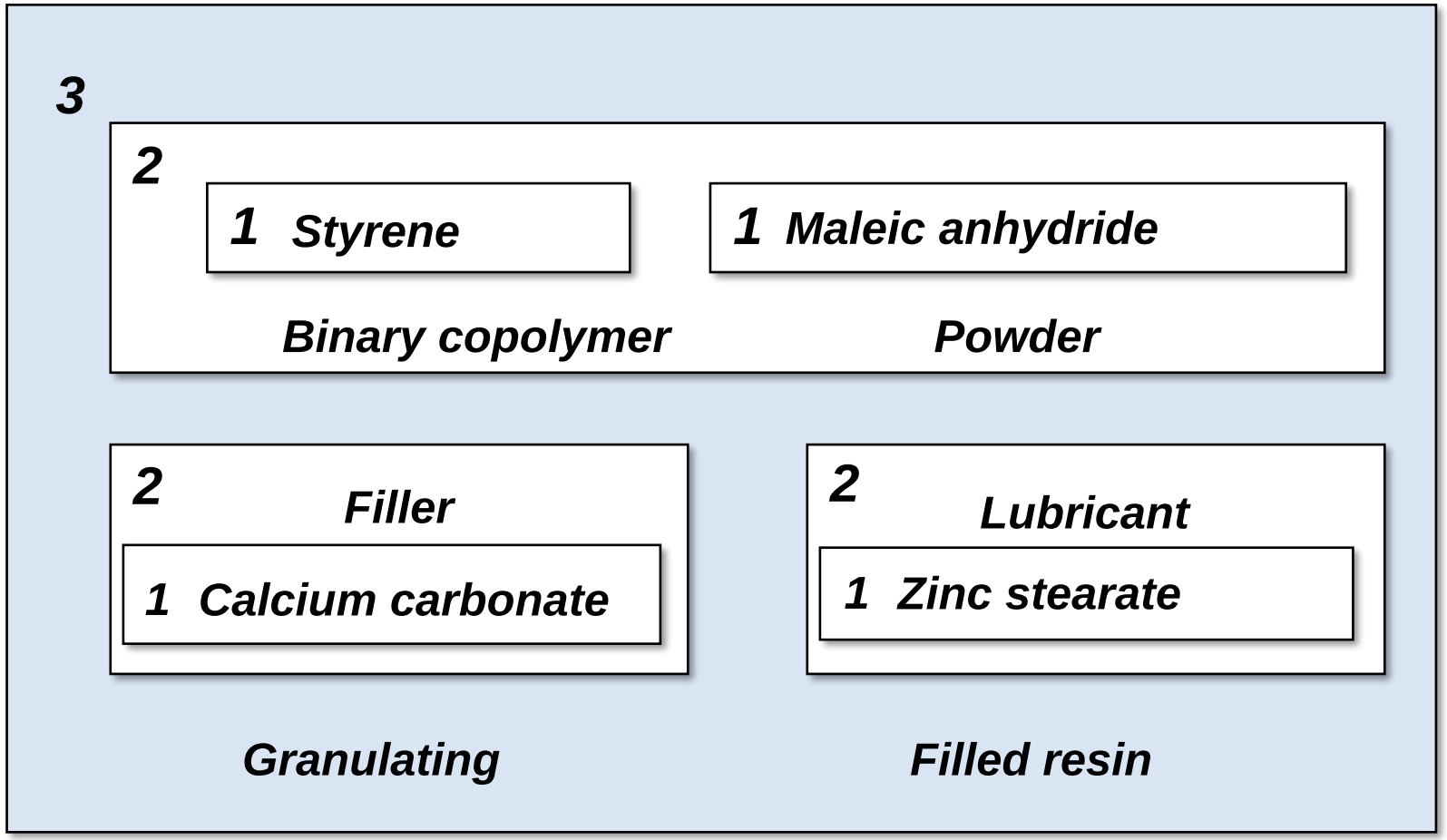
Format for an online record

- What the indexing would look like online

Format for a search strategy

- How terms would be combined with operators

Linking group diagram for the example



The linking group example as it would look indexed in DWPI

(L)

[1.1] 2004 ; **R00708** G0102 G0022 D01 D02 D12 D10 D19 D18 D31 D51 D53 D58 D76 D88 ; **R00843** G0760 G0022 D01 D23 D22 D31 D42 D51 D53 D59 D65 D75 D84 F39 E00 E01 ; **H0022** H0011 ; S9999 **S1514** S1456 ; P1741 (P)

[1.2] 2004 ; N9999 **N6144** ; **K9449**

(S)

[1.3] 2004 ; **R01278** D00 F44 C- 4A O- 6A Ca 2A ; A999 **A237** (P)

[1.4] 2004 ; **R01377** D01 D11 D10 D50 D61D95 F36 F35 Zn 2B Tr ; A999 **A340-R** (P)

The codes shown in **bold** are those which are intellectually indexed. All others are auto-posted codes.

The linking group example as it would look as a search strategy

L1: => S (R00708 (P) R00843 (P) H0022 (P) S1514)/PLE

L2: => S (R01278 (P) A237)/PLE

L3: => S (R01377 (P) A340)/PLE

L4: => S (N6144 (L) K9449)/PLE

L5: => S L1 (L) L2 (L) L3 (L) L4

L1 = polymer; L2 = filler; L3 = lubricant; L4 = granulating + filled resin.

Polymer Indexing display formats

PLE	All enhanced polymer indexing
HITPLE	Hit polymer indexing paragraphs
CODE (IND)	All patent classifications, Manual Codes, DCR indexing, chemical and polymer subscriber indexing
HITCODE	Hit classification codes, and hit subscriber indexing paragraphs

Example: HITPLE display

```
=> S (R00708(P)R00806(P)H0022)/PLE

        350196 R00708/PLE
        191607 R00806/PLE
        578394 H0022/PLE
L1       69173 (R00708(P)R00806(P)H0022)/PLE

=> D BIB HITPLE


L1   ANSWER 1 OF 69173  WPIX COPYRIGHT 2022   CLARIVATE ANALYTICS on STN
AN   2022-28176D [2022019]   WPIX Full-text
TI   Making aggregate used as replacement for natural aggregate in concrete,
     comprises treating plastic particles with low pressure plasma and/or
     electron beam to provide treated particles, where plasma comprises ions
     formed from precursors
DC   A93; L02
IN   BOULDING N A; BUCKLEY P D; BUSH S P
PA   (SPHE-N) SPHERA LTD
CYC  135
PIA  WO 2022038354   A1 20220224 (2022019)* EN 63[16]
ADT  WO 2022038354  A1 WO 2021-GB52141 20210818
PRAI GB 2020-12895         20200818
PLE  UPA   20220309
     [1.8]     2004 G0102 G0022 D01 D02 D12 D10 D19 D18 D31 D51 D53 D58 D76 D88
                DCN: R00708 DCR: 368; G0828 G0817 D01 D02 D12 D10 D51 D54 D56
               D58 D84 DCN: R00806 DCR: 129411; H0022 H0011; P0328; P1741;
               P0351;
```

R00708 = Styrene
R00806 = Butadiene
H0022 = Binary copolymer

Searching for polymers

- Polymer formers
- Polymer types
- Modified polymers
- Natural polymers
- Chemical aspects

Addition polymers

- Addition polymers have monomer-based indexing
  - e.g., Polymethylmethacrylate:

    methylmethacrylate + homopolymer

    => S (R00479 (P) H0000)/PLE
  - e.g., Ethylene-propylene binary copolymer:

    ethylene + propylene + binary copolymer

    => S (R00326 (P) R00964 (P) H0022)/PLE
- Common addition polymers are also searchable as a single cross-posted polymer type code, e.g.,
  - polymethylmethacrylate: => S P0113/PLE
  - ethylene-propylene binary copolymer: => S P1285/PLE

Addition polymers (cont.)

```
=> S (R00326 (P) R00964 (P) H0022)/PLE

        479661 R00326/PLE
        330925 R00964/PLE
        578394 H0022/PLE
L1       31791 (R00326 (P) R00964 (P) H0022)/PLE

=> S P1285/PLE

L2       31791 P1285/PLE
```

Search monomer indexing:

R00326 = Ethylene

R00964 = Propylene

H0022 = Binary copolymer

Search Polymer Types:

P1285 = ethylene-propylene binary copolymer

Condensation polymers

- Monomers/condensants are typically only indexed when stated in the patent
  - e.g., Polyethylene terephthalate (PET) from ethylene glycol and terephthalic acid:

    PET + ethylene glycol + terephthalic acid + binary copolymer

    => S (P0884(P)R00822(P)R00702(P)H0022)/PLE

  - PET with no further monomer/condensant details is indexed as *PET* only: => S P0884/PLE

    i.e. for all references to PET, just search P0884

Condensation polymers (cont.)

```
=> S (P0884 (P) R00822 (P) R00702 (P) H0022)/PLE

        185160 P0884/PLE
         38878 R00822/PLE
         23228 R00702/PLE
        578394 H0022/PLE
L3        3408 (P0884 (P) R00822 (P) R00702 (P) H0022)/PLE

=> S P0884/PLE

L4       185160 P0884/PLE
```

R00822 = Ethylene glycol
R00702 = Terephthalic acid
H0022 = Binary copolymer

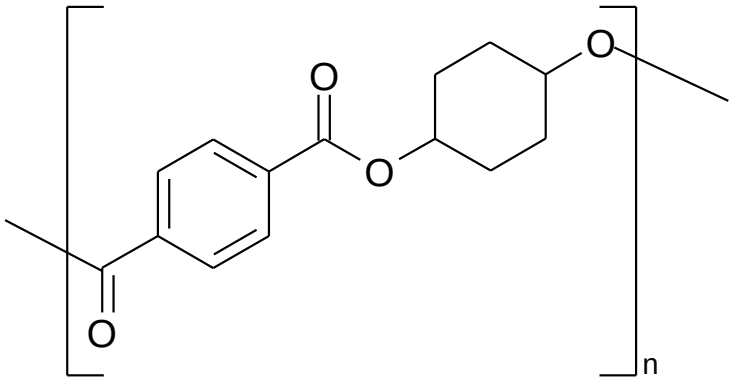
P0884 = Polyethylene terephthalate (PET)

i.e., for all references to PET, just search P0884 (L2).

Condensation polymers (cont.)

When no polymer formers are stated, polymers are often indexed by structural repeat unit (SRU)

– e.g.,



Indexed as:
(P1978-R (2) D01 (2) D14 (2) D19 (2) D32 (2) D76 (2) D50 (2) D93 (2) E21 (2) F90)

i.e. polyester polymer type code + chemical aspects for the repeat unit

Each chemical aspect is indexed at Level (2) to the polymer type code.

Condensation polymers (cont.)

```
=> S (P1978-R (P) (D01 (S) D14 (S) D19 (S) D32 (S) D76 (S) D50 (S) D93 (S) E21 (S) F90))/PLE

         93672 P1978-R/PLE
       3215492 D01/PLE
        130124 D14/PLE
       1022005 D19/PLE
        423098 D32/PLE
       1460109 D76/PLE
       1746027 D50/PLE
        527235 D93/PLE
        236512 "E21"/PLE
        312935 F90/PLE
L1          92 (P1978-R (P) (D01 (S) D14 (S) D19 (S) D32 (S) D76 (S) D50 (S)
               D93 (S) "E21" (S) F90))/PLE

=> D HITPLE


L1    ANSWER 1 OF 92  WPIX COPYRIGHT 2022   CLARIVATE ANALYTICS on STN
PLE   UPA   20201111
      [1.9]     2004 G0997-R D01 F26 E21 E00 D11 D10 D19 D18 D76 D50
                F90 F41 D14 D13 D32 D93; H0011-R; H0293; P1978-R P0839
                D01 D50 D63 F41;
```

SRU search – see previous slide.

Note: Each chemical aspect code is searched using (P) to the polymer type.

Condensation polymers (cont.)

If polymer formers are stated, these are indexed

- e.g., if the polymer from the previous slide is prepared from terephthalic acid and 1,4-cyclohexane diol

Indexed as:
(P1978 (2) R00702 (2) (G1069 (1) D01 (1) D14 (1) D31 (1) D76 (1) D50 (1) D86 (1) F28) (2) H0022)
i.e. polyester polymer type + terephthalic acid + (other diol + chemical aspects for cyclohexane diol) + binary copolymer

For complete retrieval, search both SRU and monomer based indexing

Searching for additives

Additives can be searched

- by chemical composition
- by function

Triethylphosphate heat stabilizer

```
=> S (R00424 (P) A511)/PLE

          1735 R00424/PLE
         37676 A511/PLE
L2         100 (R00424 (P) A511)/PLE

=> D HITPLE


L2   ANSWER 1 OF 100  WPIX COPYRIGHT 2022   CLARIVATE ANALYTICS on STN
PLE  UPA   20211227
     [1.4]     2004 D00 D60 H- O- 6A P- 5A DCN: R01711 DCR: 63; G3327 D01 D11
               D10 D50 D63 D83 F53 DCN: R01309 DCR: 201; G3327 D01 D11 D10 D50
               D63 D86 F53 DCN: R00424 DCR: 514; G3327 D01 D19 D18 D33 D50
               D63 D76 D93 F53 DCN: R00973 DCR: 1275; A999 A511-R A486;
```

Searching for catalysts

Catalysts can be searched:

- by chemical composition
- by type
- by function

Potassium persulphate free radical initiator

```
=> S (R01737 (P) C088)/PLE

         18499 R01737/PLE
         90292 C088/PLE
L3       15716 (R01737 (P) C088)/PLE

=> D HITPLE


L3   ANSWER 1 OF 15716  WPIX COPYRIGHT 2022   CLARIVATE ANALYTICS on STN
PLE  UPA   20220304
     [2.3]     2004 D00 F48 F60 K- 1A O- 6A S- DCN: R01737 DCR: 448; D00 F16
               F48 F60 H- N- 5A O- 6A S- DCN: R03252 DCR: 532; D00 Na 1A O- 6A
               S- DCN: R01745 DCR: 107368; C999 C099-R C088 C000; C999
               C293-R; C999 C340-R;
```

Building search strategies

Create separate search statements for each component

- for polymeric components
- for non-polymeric components

Combine the statements together with the appropriate proximity operators

Building strategies (cont.)

Emulsion copolymerization of a vinyl halide and an alpha-olefin using sulphonate dispersant

- ***Polymer:***
  - L1 => S (G0544 (P) G0033 (P) H0022 (P) L2551) /PLE
- ***Additive:***
  - L2 => S (A624 (P) F62) /PLE
- ***Combine together:***
  - L3 => S L1 (L) L2

Building strategies (cont.)

```
=> S (G0544 (P) G0033 (P) H0022 (P) L2551) /PLE

        227793 G0544/PLE
        725823 G0033/PLE
        578394 H0022/PLE
         31546 "L2551"/PLE
L1         129 (G0544 (P) G0033 (P) H0022 (P) "L2551") /PLE

=> S (A624 (P) F62) /PLE

        114820 A624/PLE
        141572 F62/PLE
L2       12682 (A624 (P) F62) /PLE

=> S L1 (L) L2

L3          21 L1 (L) L2
```

```
=> D HITPLE


L3   ANSWER 1 OF 21  WPIX COPYRIGHT 2022   CLARIVATE ANALYTICS on STN
PLE  UPA   20150506
     [1.1]     2004 G0033-R G0022 D01 D02 D51 D53; G0577 G0566 G0022 D01 D12
               D10 D51 D53 D58 D63 F41 F89; G0588-R G0022 D01 D12 D10 D51 D53
               D58 F34; G0102-R G0022 D01 D12 D10 D18 D51 D53; G0475-R G0260
               G0022 D01 D12 D10 D26 D51 D53 F12; G0793 G0760 G0022 D01 D51
               D53; G0544 G0022 D01 D12 D10 D51 D53 D58 D69 D82 C1 7A DCN:
               R00338 DCR: 621; L9999 L2528 L2506; L9999 L2551 L2506; S9999
               S1025 S1014; S9999 S1047 S1014; H0022 H0011; P1150; P1741;
               P1796; P0088;
     [1.4]     2004 D01 D11 D10 D50 D63 D84 F89 F41 F62; D01 D12-R D10 D53
               D51 D58 F62; D01 D11 D10 F53; G2028 D01 D19 D18 D31 D50 D60
               D76 D86 F62 DCN: R00667 DCR: 453; D01 F35-R D60; D11 D10 D01
               D60 F62; F60 D01 D11 D10; A999 A635 A624 A566; A999 A771;
```

Essential User Guides

- Polymer Indexing System Description
- Polymer Indexing Hierarchy
- Polymer Indexing Reference Manual
- Polymer Indexing Thesaurus
- Available in print or as PDF download from:

  https://clarivate.com/intellectual-property/training-support/derwent/dwpi-reference-center/indexing-user-guides/polymer-indexing/

Documentation ‘operators’

BT	Broader Term
NT	Narrower Term
UF	Used For
USE	*…directs the user to the preferred code concept*
SEE	*...nearest concept available*
SA	See Also
(96)	Code only available from Derwent update 199601
	(04) Code only available from Derwent update 200403
(2004)	Code only available from Derwent update 200403

Remember: Level (1) = (S), Level (2) = (P) and Level (3) = (L).

Polymer Indexing Hierarchy

- Concepts grouped by hierarchy
- Codes for all the primary terms
- Narrower Terms or sub-divisions (NT)
- Used For terms (UF) to indicate synonyms
- See Also terms (SA) for other related concepts
- Scope notes “...“ to explain the use and limitation of the term

Example: Polymer Indexing Hierarchy

Physical Operations

N6611 **Process control**

N6622 NT Automation

UF Computer control

N6633 NT Temperature control

SA pH control

N6644 **Purging**

UF Flushing

Example: Polymer Indexing Hierarchy

Chemicals

R05085	**Carbon black**
	UF Acetylene black
	UF Activated charcoal
	SA Carbon
	SA Graphite
G2675	**Chromium chlorides (gen)**
	"Used when no specific chromium chloride given"
R10690	NT Chromium (II) chloride
R01883	NT Chromium (III) chloride

Polymer Indexing Thesaurus

- Alphabetical listing of concepts
- All main concepts with hierarchies
- Secondary concepts (synonyms)
- Codes for both main and secondary concepts
- All relationships listed under the concepts
- Only the next level of Narrower or Broader Terms shown

Example: Polymer Indexing Thesaurus

A113 **Compatibility improver** [*additives*]

K9756 **Compatible polymer blend** [*universal terms*]

NT Interpenetrating network

BT Polymer blend

A124 **Complexing agent** [*additives*]

UF Chelating agent

UF Sequestering agent

{Compliance} [*properties*]

USE Rigidity properties B3930

Polymer Indexing Reference Manual

- Polymer Indexing Code list
  - alphanumeric order
  - including all autoposted terms
- Polymer Indexing Molecular formula list
  - molecular formulae for all SCNs with known structure
- Polymer Indexing Chemical Aspects - graphical definitions
  - graphical representation of certain chemical aspects

Searching using “-R”

- Codes that have narrow terms can either be auto-posted or manually indexed
  - these are codes at the top of a hierarchy
- When manually indexed, a “-R” suffix is added to these codes
- When auto-posted, no “-R” is added
- Searching for codes with a -R suffix will retrieve answers where the code has been manually indexed
  - auto-posted codes are not retrieved
  - the number of hits is reduced
- The Polymer Indexing Dictionary labels entries with -R as (general) and entries without -R as (all references)

Searching using “-R” (cont.)

Polymer Applications hierarchy

Q7603	**Friction materials**
Q7614	NT Brakes
Q7625	NT Clutches
Q7636	**Fuels**

=> S Q7603 /PLE

retrieves all references to friction materials, (both manually indexed and auto-posted) including all brakes and clutches

=> S Q7603-R /PLE

retrieves only manually indexed references to generic and other friction materials, *excluding* brakes and clutches

Modified polymers & modifying agents

- Modified polymers are indexed as the original un-modified polymer plus codes for the modification
  - All linked at Level 2 (P)
  - e.g., brominated polyethylene:

    polyethylene + brominated

    => S (P1161 (P) M2233) /PLE
- For modifying agents to be indexed they must be specifically referred to in the patent
- Most records online containing modified polymer indexing will therefore not include modifying agents
- To search for a modifying agent
  - Link the chemical SCN or chemical aspects with modifying agent code (H0226) at Level 2 (P)

Modified polymers & modifying agents (cont.)

To link a modified polymer to a specific modifying agent, the modifying agent is indexed in a separate paragraph to the modified polymer, so

- Search for the modified polymer linked at Level 2 (P) to the modified polymer codes (Mnnnn)
- Search for the modifying agent SCN linked at Level 2 (P) to the modifying agent code (H0226)
- Link the two search statements together at Level 3 (L)

Modified polymers & modifying agents example

Brominated polyethylene – prepared by reacting bromine and polyethylene

Search for bromine SCN as modifying agent

Search for polyethylene + brominated polymer

Link the searches together at Level 3 (L)

```
L1      => S (R01735 (P) H0226) /PLE
L2      => S (P1161 (P) M2233) /PLE
L3      => S L1 (L) L2
```

R01735	bromine SCN
H0226	modifying agent
P1161	polyethylene
M2233	brominated polymer

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Polymerization catalysts

- Search for the polymer which is produced using the catalyst
- Search for the catalyst type linking at Level 2 (P) to appropriate chemical aspects or SCN
- Link the polymer and catalyst search statements at Level 3 (L)

Polymerization catalysts example

Production of polyolefins using metallocene catalyst

Search for polyolefins using the polymer type code

Search for the metallocene catalyst

Link the searches at Level 3 (L)

```
L1      => S P1150 /PLE
L2      => S (D62 (P) C293) /PLE
L3      => S L1 (L) L2
```

P1150 polyolefin

D62 metallocene

C293 catalyst

Summary

- Derwent Enhanced Polymer indexing is an important tool for polymer searching
- Looks at the polymer from many different perspectives
- Proximity operators allows for greater precision
- For complete polymer searching (pre-1994), also use Plasdoc indexing

For more information…

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