MEETING LOG
UPHOLSTERED FURNITURE

Event: Seminar on Upholstered Furniture Flammability sponsored by American Furniture Manufacturers Association (AFMA)

Date: March 28, 1994

Location: Greensboro Airport Marriott Hotel, Greensboro, North Carolina

Log Entry by: Dale R. Ray, EC, Project Manager, Upholstered Furniture Petition

Participants: Manufacturers, distributors, retailers, material & component suppliers, and testing and trade organizations; mostly members of AFMA (CPSC representative: Dale Ray)

Summary:

AFMA sponsored a one-day seminar to inform businesses and other interested parties about recent developments in upholstered furniture flammability regulations and voluntary programs around the world, and to discuss research work underway to assist the furniture industry in meeting mandatory and voluntary standards. The seminar featured speakers on various topics noted below; Joe Ziolkowski, Executive Director of the Upholstered Furniture Action Council (UFAC), directed the seminar and moderated the panel of assembled speakers.

The speakers and their topics were as follows:

- Dr. Richard Gann, NIST: Cigarettes, Soft Furnishings, and Fires;
- Hugh Talley, Talley Consultants: The Maze of Upholstered Furniture Flammability Tests--What Do They Really Mean and Are They Relevant?;
- Jim Williams, The Knoll Group, & Mark Heckenliable, Hon Industries: Classification of Product to Reduce Testing Needs;
- Marty Gurion, Design Tex Fabrics: A Report on the DFA/ACT TB-133 Research Project (*note: DFA=Decorative Fabrics Ass'n.; ACT=Ass'n. for Contract Textiles*);
- Sue Brighten, Fire Industry Research Ass'n. (U.K.): England Furniture Flammability Update;

- Bart de Turck, European Furniture Manufacturers Ass'n (EUA): European Furniture Flammability Update;

- Mary Martha McNamara, Counsel to AFMA (*former CPSC staffer*): Flammability Regulation & Litigation: Does It Ever End?; and

- Joe Ziolkowski, AFMA/UFAC: UFAC Update.

Copies of most of the speakers' remarks are attached. Mr. Ray answered a number of questions from the floor about the status of the petition on upholstered furniture now before the Commission. CPSC's procedures for evaluating petitions and for the proposal and comment rulemaking process were also discussed. Since the CPSC staff briefing package on the petition was not yet publicly available, the contents and conclusions in that package could not be discussed. The NASFM petition was characterized by AFMA as a challenge to the efficacy of the UFAC program. There was some speculation by industry members that Chairman Brown's interest in cigarette fire safety might signal a willingness on the Commission's part to deny the petition.

Attachments

AMERICAN FURNITURE MANUFACTURERS ASSOCIATION
223 South Wrenn Street P O Box HP-7 High Point, North Carolina 27261 Phone 910.884.5000 FAX 910.884.5303

NAMES AND ADDRESSES OF SPEAKERS
FLAMMABILITY WORKSHOP
MARCH 29, 1994
GREENSBORO, NC

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Center for Fire Research
National Institute of Standards & Technology
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DesignTex Fabrics, Inc.
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Meeting Code: UFF03/29/94

REGISTRATION LISTING

ME	COMPANY	REGISTRANT BADGE NAME	SPOUSE / COMPANION BADGE NAME	CITY	ST	ZIP CODE
RNETT, KEN	AMOCO FABRICS AND FIBERS CO.	KEN		CHARLOTTE	NC	
ATY, ROBERT	SYNFIN INDUSTRIES	ROBERT		NORTH WALES	PA	
NDER, GERALD	ENTELA, INC.	GERALD		GRAND RAPIDS	MI	
LICK, DAN	LEATHERCRAFT, INC.	DAN		CONOVER	NC	
NDS, WILFORD D.	MYDRIN, INC.	DOUG		CALHOUN	GA	
OTH, DENNIS	GUARDSMAN PRODUCTS, INC.	DENNIS		GRAND RAPIDS	MI	
VERS, GARY	CAROLINA MILLS	GARY		HICKORY	NC	
EHM, SUSAN	BOMAR INDUSTRIES,INC.	SUSAN		LAKE WORTH	FL	
GGS, E.L.	U.D.M. MAGAZINE	ROY		HIGH POINT	NC	
GHTEN, SUE	F I R A	SUE		HERTS	EN	
WN, JERRY T.	LA FRANCE INDUSTRIES	JERRY		LA FRANCE	SC	
CKINGHAM, TOM	NORWALK FURNITURE CORP.	TOM		NORWALK	OH	
SH, GORDON	GUARDSMAN PRODUCTS, INC.	GORDON		GRAND RAPIDS	MI	
REY, C.M.	UFAC - CO-CHAIRMAN	CHARLIE		MORGANTON	NC	
INE, SHERRI	AMERICA OF MARTINSVILLE	SHERRI		MARTINSVILLE	VA	
NNELLY, WES	THE WOOL BUREAU	WES		ATLANTA	GA	
VINGTON, DAVID	MASTERCRAFT/C&A	DAVID		SPINDALE	NC	
OSS' IM R.	SEDGEWICK RATTAN	KIM		HIGH POINT	NC	
NCY FRED	BERNHARDT INDUSTRIES	FRED		LENOIR	NC	
RLINGTON, RICHARD	E.I. DUPONT	DICK		CHARLOTTE	NC	
RNELL, MARK	PEXTILE KNITTING MILLS	MARK		STONEVILLE	NC	
UGHTRIDGE, ALVIN	FAIRFIELD CHAIR COMPANY	ALVIN		LENOIR	NC	
VIS, DANNY	DAVIS FURNITURE INDUSTRIES,INC	DANNY		HIGH POINT	NC	
VIS, JO	CONSO PRODUCTS COMPANY	JO		UNION	SC	
TURCK, BART	UEA	BART		BRUSSELS	BG	
AN, ALAN	GUILFORD OF MAINE	ALAN		EAST DOUGLAS	MA	
NNIS, PAMELA	THOMASVILLE UPHOLSTERY, INC.	PAMELA		STATESVILLE	NC	
ULF, DAVID W.	HERCULES INCORPORATED	DAVID		COVINGTON	GA	
LLARD, ROBIN	CULP, INC.	ROBIN		HIGH POINT	NC	
CTOR, RONNIE	F.M.C. CORPORATION	RONNIE		PHILADELPHIA	PA	
NOVAN, JIM	MALDEN MILLS INDUSTRIES, INC.	JIM		LAWRENCE	MA	
YLE, DEBBIE	KIESLING-HESS	DEBBIE		PHILADELPHIA	PA	
LA, CHRISSIE	BERNHARDT INDUSTRIES	CHRISSIE		LENOIR	NC	
LIS, WALTER	HOMECREST INDUSTRIES INC.	WALTER		WADENA	MN	
LEY, ALBERT	THIS END UP FURNITURE CO.	ALBERT		RALEIGH	NC	
VA, JAMES	ICI POLYURETHANES	JAMES		STERLING HEIGHTS	MI	
Y, JUDY	LA-Z-BOY	JUDY		MONROE	MI	
NCHER, HANDLEY H.	DREXEL HERITAGE FURNISHINGS	HANDLEY		MORGANTON	NC	
RSTEN, HERMAN	E.I. DUPONT	HERM		WILMINGTON	DE	
RINESS, MIKE	LEE INDUSTRIES, INC.	MIKE		NEWTON	NC	
NN, RICHARD G.	NIST	DICK		GAITHERSBURG	MD	
BBONS, WILLIAM A.	GASTON FABRICS, INC.	BILL		GASTONIA	NC	
OBOUT, ALAN	TEX-TECH INDUSTRIES, INC.	ALAN		N. MONMOUTH	ME	
AFF 'E	SYNTHETICS FINISHING	STEVE		HICKORY	NC	
AY,	CENTURY FURNITURE INDUSTRIES	MAX		HICKORY	NC	
RIAN, MARTY	DESIGNTEX	MARTY		WOODSIDE	NY	
LL, PAT	AMERICAN OF MARTINSVILLE	PAT		MARTINSVILLE	VA	
RRIS, HAL T.	MORBERN USA INC.	TEE		RALEIGH	NC	

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ME	COMPANY	REGISTRANT BADGE NAME	SPOUSE / COMPANION BADGE NAME	CITY	ST	ZIP CODE
RTZOG, DOUG	LEXINGTON FURINTURE IND.	DOUG		LEXINGTON	NC	
WKINS, TOMMY	HOECHST CELANESE	TOMMY		SALISBURY	NC	
YNES, JEWAL	LEE INDUSTRIES, INC.	JEWAL		NEWTON	NC	
CKENLIABLE, MARK	HON INDUSTRIES	MARK		MUSCATINE	IA	
RRING, GREG	SYNTHETICS FINISHING	GREG		HICKORY	NC	
LL, RICK	COUNCILL CRAFTSMEN, INC.	RICK		DENTON	NC	
LTON, JAYME	LINEAGE HOME FURNISHINGS, INC.	JAYME		HIGH POINT	NC	
N, KENNETH B.	MICROFIBRES, INC.	KEN		WINSTON-SALEM	NC	
DSON, STEVE	PHILLIPS WEAVING MILLS, INC.	STEVE		MONROE	NC	
NTER, W. D.	COTTON, INC.	BILL		RALEIGH	NC	
GLE, CHARLES A.	BLUE RIDGE PRODUCTS	CHARLES		HICKORY	NC	
NNINGS, TERRY	CENTURY FURNITURE INDUSTRIES	TERRY		HICKORY	NC	
YLOR, PHIL	CUMULUS FIBRES, INC.	PHIL		STATESVILLE	NC	
NGSMORE, STAN	HOECHST CELANESE CORP.	STAN		MOORE	SC	
ZIAH, BOYD W.	CENTURY FURNITURE-CHAIR DIV.	BOYD		HICKORY	NC	
UMRIE, ARNOLD	STEELCASE, INC.	ARNIE		GRAND RAPIDS	MI	
NE, STEPHEN	TEXTILE INNOVATORS CORP.	STEPHEN		WINDSOR	NC	
AR, JEFF	ARCO CHEMICAL	JEFF		SOUTH CHARLESTON	WV	
MON YS D.	MCNAIR & SANFORD, P.A.	CHRYS		WASHINGTON	DC	
OYL ELL	BERNHARDT INDUSTRIES	DARRELL		LENOIR	NC	
WE, RAY	SACKNER PRODUCTS	RAY		STATESVILLE	NC	
BRYDE, PHIL	PARA-CHEM SOUTHERN, INC.	PHIL		SIMPSONVILLE	SC	
CONNELL, BOB	BURLINGTON HOUSE FABRICS	BOB		BURLINGTON	NC	
KINNEY, RON	COLLINS & AIKMAN	RON		CONCORD	NC	
MANUS-RODGERS, JOY	CENTURY FURNITURE INDUSTRIES	JOY		HICKORY	NC	
NAMARA, MARY MARTHA	LEGAL COUNSEL	MARY MARTHA		ALEXANDRIA	VA	
SSINA, SALVATORE	THE GOVMARK ORGANIZATION, INC	SAL		BELLMORE	NY	
LAN, BILL	CHATHAM MFG.	BILL		ELKIN	NC	
LLER, GLENN M.	BRAYTON INTERNATIONAL	GLENN		HIGH POINT	NC	
RGAN, SONNY	BARN DOOR FURNITURE CO.	SONNY		HENDERSON	NC	
RGAN, VICKI	CONSO PRODUCTS COMPANY	VICKI		UNION	SC	
RRISON, TERRY	MITY-LITE	TERRY		OREM	UT	
RPHY, HARRISON	VENTEX, INC.	HARRISON		RESTON	VA	
IK, BHARAT	ICI POLYURETHANES	BHARAT		STERLING HEIGHTS	MI	
MSCHOFF, MARK	NEMSCHOFF CHAIRS, INC.	MARK		SHEBOYGAN	WI	
WMAN, ROBERT	UNIVERSAL CONVERTORS	BOB		TULSA	OK	
CHOLS, MIKE	CUSTOM LAMINATIONS, INC.	MIKE		PATERSON	NJ	
DEN, RAY	INTEK - DIV. OF SPRINGS IND.	RAY		ABERDEEN	NC	
RROTT, BOB	F. SCHUMACHER & CO.	BOB		RICHBURG	SC	
TERS, LOU	POLYURETHANE FOAM ASSOCIATION	LOU		WAYNE	NJ	
LLACK, SHERMAN	ARC COM FABRICS	SHERMAN		ORANGEBORG	NY	
OLE, JERRY	CONSULTANT/LEGGETT & PLATT	JERRY		HIGH POINT	NC	
WELL, CELIA SURATT	ALBRIGHT & WILSON AMERICAS	CELIA		RICHMOND	VA	
CHELS, MARK	COUNCILL CRAFTSMEN, INC.	MARK		DENTON	NC	
NDC R., MILTON L.	E.I.DUPONT - FIBERS	MILT		WILMINGTON	DE	
Y,	CONSUMER PRODUCT SAFETY COMM.	DALE		WASHINGTON	DC	
IMANN, DR. KURT A.	BASF CORPORATION	KURT		WYANDOTTE	MI	
ZENDES, FRANK	MICROFIBRES, INC.	FRANK		PAWTUCKET	RI	

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	COMPANY	REGISTRANT BADGE NAME	SPOUSE / COMPANION BADGE NAME	CITY	ST	ZIP CODE
SUSAN	GOTCHA COVERED, INC.	SUSAN		GREENSBORO	NC	
)SON, DWAN	MOMENTUM TEXTILES	DWAN		CERRITOS	CA	
)UR, MIKE	CHAIRCRAFT	MIKE		HICKORY	NC	
)N, CHARLES D.	PRECISION FABRICS GROUP	CHARLIE		GREENSBORO	NC	
JR., JOHN J.	GUILFORD OF MAINE TEXTILE	JOHN		BALTIMORE	MD	
G, WALTER J.	BASF CORP.-INDUSTRIAL FIBERS	JERRY		CHARLOTTE	NC	
)AVID	CRAFTEX MILLS, INC.	DAVID		AUBURN	PA	
ES, CAROLE	LANGENTHAL CORP.	CAROLE		RURAL HALL	NC	
I, ANTHONY M.	PARA-CHEM SOUTHERN, INC.	TONY		PHILADELPHIA	PA	
MATT	LINEAGE HOME FURNISHINGS, INC.	MATT		HIGH POINT	NC	
, JOHN	HICKORY CHAIR COMPANY	JOHN		HICKORY	NC	
LL, ARTHUR R.	LANE UPHOLSTERY	ART		CONOVER	NC	
LL, LEE	CONOVER CHAIR CO., INC.	LEE		CONOVER	NC	
STEIN, DARREN	CUSTOM LAMINATIONS, INC.	DARREN		PATERSON	NJ	
S, BILL	BAKER FURNITURE CO.	BILL		HIGH POINT	NC	
S, DWAYNE	SYNTHETICS FINISHING	DWAYNE		HICKORY	NC	
S, LINDA	HICKORY SPRINGS MANUFACTURING	LINDA		HIGH POINT	NC	
CKI, [illegible]ERT	BROYHILL FURNITURE	ROBERT		LENOIR	NC	
E,	3M-SPECIALTY CHEMICALS DIV.	BRIAN		MAPLEWOOD	MN	
AND,	CENTURY FURNITURE IND.	ANDY		HICKORY	NC	
DAVID L.	HAG, INC.	DAVID		GREENSBORO	NC	
, KEN	HYDRIN, INC.	KEN		CALHOUN	GA	
K, GARY	LA-Z-BOY	GARY		MONROE	MI	
R, TONY	HANES CONVERTING COMPANY	TONY		CONOVER	NC	
S, GLADE	F.M.C. CORPORATION	GLADE		PHILADELPHIA	PA	
NS, RONALD	BROYHILL FURNITURE INDUSTRIES	RON		LENOIR	NC	
T, BILL	CONSO PRODUCTS COMPANY	BILL		UNION	SC	
OW, RUSS	BRAYTON INTERNATIONAL	RUSS		HIGH POINT	NC	
E, CONNIE	FAIRFIELD CHAIR COMPANY	CONNIE		LENOIR	NC	
, THERESE	RAXON FABRICS CORPORATION	TRACY		ALLENTOWN	PA	
, HUGH	TALLEY CONSULTANTS	HUGH		MORRISTOWN	TN	
, WILLIAM J.	BASF CORP.-INDUSTRIAL FIBERS	BILL		CHARLOTTE	NC	
S, SHARON	CULP, INC.	SHARON		HIGH POINT	NC	
SON, BETTIE	A.F.M.A.	BETTIE		HIGH POINT	NC	
NG, KEN	FMC CORP./CHEMICAL PRODUCTS	KEN		PHILADELPHIA	PA	
, ANTHONY	PETCO	TONY		NEWTON	NC	
, KAY	A T M I	KAY		WASHINGTON	DC	
R, RICK	DAVIS FURNITURE INDUSTRIES,INC	RICK		HIGH POINT	NC	
RS, BILL	HOECHST CELANESE	BILL		SALISBURY	NC	
DOUG	PARA-CHEM SOUTHERN, INC.	DOUG		SIMPSONVILLE	SC	
N, RICHARD F.	AFMA	RICH		WASHINGTON	DC	
LOYKE, DOUG	HERMAN MILLER, INC.	DOUG		ZEELAND	MI	
AMS, SR., JAMES M.	KNOLL GROUP	JIM		GREENVILLE	PA	
R, AL[illegible] W.	ROWE FURNITURE CORPORATION	ALLAN		SALEM	VA	
AM,	VECTA	ED		GRAND PRAIRIE	TX	
T, CL	CARPENTER CO.	CLINT		CONOVER	NC	
, TIM	AMERICAN OF MARTINSVILLE	TIM		MARTINSVILLE	VA	
OWSKI, JOE	A F M A	JOE Z.		HIGH POINT	NC	

CIGARETTES, SOFT FURNISHINGS, AND FIRES

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Presented at the
Annual Flammability Workshop
American Furniture Manufacturers Association
Greensboro Airport Marriott
March 29, 1994

NIST

CIGARETTE SAFETY ACT OF 1984

DIRECTION

DETERMINE THE TECHNICAL AND COMMERCIAL FEASIBILITY, ECONOMIC IMPACT, AND OTHER CONSEQUENCES OF DEVELOPING CIGARETTES THAT WILL HAVE A MINIMUM PROPENSITY TO IGNITE UPHOLSTERED FURNITURE OR MATTRESSES, INCLUDING:

- ANALYSIS OF THE FEASIBILITY OF ALTERING ANY PERTINENT CHARACTERISTICS TO REDUCE IGNITION PROPENSITY,
- ANALYSIS OF THE POSSIBLE COSTS AND BENEFITS, BOTH TO THE INDUSTRY AND THE PUBLIC, ASSOCIATED WITH SUCH PRODUCT MODIFICATION.

CIGARETTE SAFETY ACT OF 1984

GENERAL CONCLUSION

THE TECHNICAL STUDY GROUP FINDS THAT IT IS TECHNICALLY FEASIBLE AND MAY BE COMMERCIALLY FEASIBLE TO DEVELOP CIGARETTES THAT WILL HAVE A SIGNIFICANTLY REDUCED PROPENSITY TO IGNITE UPHOLSTERED FURNITURE OR MATTRESSES.

FURTHERMORE, THE OVERALL IMPACT ON OTHER ASPECTS OF THE UNITED STATES SOCIETY AND ECONOMY MAY BE MINIMAL.

THUS, IT MAY BE POSSIBLE TO SOLVE THE PROBLEM AT COSTS THAT ARE LESS THAN THE POTENTIAL BENEFITS, ASSUMING THE COMMERCIAL FEASIBILITY OF THE MODIFIED CIGARETTES.

FIRE SAFE CIGARETTE ACT OF 1990

DIRECTION

NIST: DEVELOP A STANDARD TEST METHOD TO DETERMINE CIGARETTE IGNITION PROPENSITY.

COMPILE PERFORMANCE DATA FOR COMMERCIAL CIGARETTES.

CONDUCT LABORATORY STUDIES ON AND COMPUTER MODELING OF IGNITION PHYSICS TO DEVELOP VALID, USER-FRIENDLY PREDICTIVE CAPABILITY.

CPSC: DESIGN AND IMPLEMENT A STUDY TO COLLECT BASELINE AND FOLLOW-UP DATA ABOUT THE CHARACTERISTICS OF CIGARETTES, PRODUCTS IGNITED, AND SMOKERS INVOLVED IN FIRES.

DEVELOP INFORMATION ON SOCIETAL COSTS OF CIGARETTE-IGNITED FIRES.

DEVELOP INFORMATION ON CHANGES IN THE TOXICITY OF SMOKE AND RESULTANT HEALTH EFFECTS FROM CIGARETTE PROTOTYPES.

TEST METHODS FOR QUANTIFYING CIGARETTE IGNITION PROPENSITY (NIST)

MOCK-UP IGNITION METHOD

- 3 DIFFERENT 20 cm x 20 cm (8") MOCK-UPS
  - #4, #6, OR #10 100% COTTON DUCK
  - FLEXIBLE POLYURETHANE (POLYETHER POLYOL) FOAM

    50 mm THICK; DENSITY: 32 kg/m^3 (2 lb/ft^3)
  - POLYETHYLENE FILM (#4 DUCK SUBSTRATE ONLY)
- CLEAR PLASTIC ENCLOSURE
- LIT CIGARETTE PLACED ON SUBSTRATE
- IGNITION (FAILURE) DEFINED AS CHAR ZONE PROPAGATING AWAY FROM THE BURNING TOBACCO COLUMN BY AT LEAST 10 mm
- 48 REPLICATES ON EACH SUBSTRATE

TEST METHODS FOR QUANTIFYING CIGARETTE IGNITION PROPENSITY

CIGARETTE EXTINCTION METHOD

- MEASURES WHETHER THE SUBSTRATE ABSORBS ENOUGH HEAT FROM THE CIGARETTE COAL TO EXTINGUISH THE CIGARETTE
- SAME HEAT ABSORPTION CHEMISTRY AS COTTON
- SUBSTRATE IS 3, 10, OR 15 LAYERS OF CELLULOSE FILTER PAPER
- CLEAR PLASTIC ENCLOSURE
- LIT CIGARETTE PLACED ON SUBSTRATE
- FAILURE DEFINED AS FULL-LENGTH BURNING OF THE CIGARETTE
- 16 REPLICATES ON EACH SUBSTRATE

TEST CONDITIONS

- NO EXTERNALLY-IMPOSED AIR FLOW
  - NIST: NO EFFECT ON IGNITIONS FROM A FAN WITHIN THE ENCLOSURE.
  - BATTELLE (CIGARETTE INDUSTRY) DATA SHOWS NO REVERSALS.
- FLAT SUBSTRATES
  - 1987 RESULTS SHOWED NO DIFFERENCE FROM CREVICE IN IGNITABILITY FROM LOW-TO-MODERATE IP CIGARETTES.
  - AUSTRALIANS SHOWED HIGH TEST VARIABILITY FOR CREVICE TESTING.

TABULATION OF BATTELLE RESULTS

Substrate K^+ Concentration	Cigarette IP (Thirds)	Flow velocity (cm/s)		
		0.05	2.35	3.5
2660	High	528 529 508 506 505 J	528 529 508 506 505 G J	528 529 508 506 505 G J
	Middle	G		
	Low			
1670	High		505	
	Middle		508 506	508 506 505 J
	Low	528 529 508 506 505 G J	528 529 G J	528 529 G
1180	High			
	Middle		508 505	508 505
	Low	528 529 508 506 505 G J	528 529 506 G J	528 529 506 G J

100% COTTON DUCK TEST FABRICS

- DISCRIMINATE AMONG CIGARETTES
- REPRODUCIBLE IGNITION TEST RESULTS
- AVAILABLE: PRODUCED IN LARGE QUANTITIES FOR A LONG TIME
- LOW PHYSICAL PROPERTY VARIABILITY
- ION CONTENT VARIABILITY IS ACCEPTABLE
- REPRESENTATIVE OF THE IN-USE FABRICS THAT CAN IGNITE OVER FLEXIBLE POLYURETHANE FOAM
- CIGARETTE INDUSTRY'S 500 FABRIC STUDY SHOWS THAT $\approx$ 80% BEHAVE LIKE COTTON DUCKS

ROUND ROBIN RESULTS

- 9 LABORATORIES: 5 CIGARETTE INDUSTRY, 3 GOVERNMENT, 1 PRIVATE
- MOCK-UP IGNITION METHOD: 5 CIGARETTES, 3 SUBSTRATES, 48 REPLICATES
- CIGARETTE EXTINCTION METHOD: 5 CIGARETTES, 3 SUBSTRATES, 16 REPLICATES
- EFFECT FOUND FOR: CIGARETTE TYPE, LABORATORY, SUBSTRATE
- NO OR LITTLE EFFECT FOUND FOR: TEST ROOM CONDITIONS, CONDITIONING ROOM CONDITIONS, TIME AND DATE OF TEST, OPERATOR, TEST CHAMBER, OPERATOR
- VARIABILITY IN IGNITION MEASUREMENT WITHIN USEFUL RANGE

REPEATABILITY AND REPRODUCIBILITY FOR FIRE TEST METHODS

TEST METHOD		r	R
ASTM E-648:	Standard Test Method for Critical Radiant Flux of Floor-Covering Systems	0.07-0.17	0.11-0.31
ASTM E-662:	Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials	0.05-0.51	0.16-0.91
ASTM E-1354:	Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter	0.52	1.63
Mock-Up Ignition Test Method (48 Replicates)		0.09-0.20	0.17-0.39
Cigarette Extinction Test Method (16 Replicates)		0.15-0.35	0.16-0.37

RESULTS OF COMMERCIAL CIGARETTE TESTING

CIG.	MOCK-UP IGNITION TEST METHOD			CIGARETTE EXTINCTION TEST METHOD		
	Duck #4	Duck #6	Duck #10	15 Layers	10 Layers	3 Layers
A	2/5/41	44/0/4	8/0/0	6/10	15/1	6/0
B	35/1/12	44/0/4	8/0/0	15/1	6/0	6/0
C	0/0/48	13/0/35	4/0/4	2/14	8/8	16/0
D	22/1/25	35/0/13	8/0/0	14/2	15/1	6/0
E	0/31/17	46/0/2	8/0/0	15/1	16/0	6/0
F	0/6/42	38/0/10	8/0/0	3/13	8/8	16/0

IGNITIONS/NON-IGNITIONS/SELF-EXTINCTIONS

FULL BURN/PARTIAL BURN

Percent Ignitions or Full Length Burns on Test Method Substrates

SUBSTRATE → CIGARETTE ↓	3 Layers	Duck #10	10 Layers	Duck #6	15 Layers	Duck #4
B	100	100	100	92	94	73
503	100	100	100	100	100	53
501	100	100	100	100	100	11
D	100	100	94	73	88	46
E	100	100	100	96	94	0
531	99	98	94	95	88	0
A	100	100	94	92	38	4
F	100	100	100	79	19	0
529	57	30	6	8	2	0
530	6	3	0	0	0	0

SMOKE COMPONENT YIELDS FROM COMMERCIAL CIGARETTES

CIGARETTES	TAR (mg)	NICOTINE (mg)	CO (mg)
1-14	14.4 ± 4.2	1.04 ± 0.27	13.7 ± 2.2
A-F	11.7 ± 4.8	0.98 ± 0.38	12.5 ± 6.2

TEST METHOD DEVELOPMENT

CONCLUSIONS

- TEST METHODS HAVE VALID LINKS TO THE REAL WORLD
- TEST METHODS HAVE SUITABLE REPRODUCIBILITY
- TEST METHODS CAN BE USED FOR A PRODUCT SAFETY STANDARD

- THERE ARE COMMERCIAL CIGARETTES THAT HAVE REDUCED IGNITION PROPENSITIES
- THESE CIGARETTES HAVE ORDINARY TAR, NICOTINE, AND CO YIELDS

IGNITION MODELING (NIST)

- NIST HAS DEVELOPED TWO COMPUTER MODELS:
  - *SUBSTRAT* MODELS THE TIME-DEPENDENT HEATING OF A SUBSTRATE WHEN SUBJECTED TO A MOVING HEAT SOURCE AND ESTABLISHES A CRITERION FOR IGNITION
  - *CIGARET* MODELS A BURNING CIGARETTE LYING ON A SURFACE
- THE TWO PROGRAMS ARE USED TOGETHER TO SIMULATE A BURNING CIGARETTE ON A SUSCEPTIBLE SUBSTRATE

FIELD STUDY OF CIGARETTE-INITIATED FIRES (CPSC)

- *NFPA* WORKED WITH FIRE DEPARTMENTS IN 8 CITIES, COLLECTING DATA ON 564 FIRES, SMOKERS, AND IGNITING CIGARETTES
- *MATHEMATICA* OBTAINED TELEPHONE DATA ABOUT 1611 OTHER SMOKERS
- NOTED EFFECTS ON RISK OF A FIRE:

  PRESENCE AND LENGTH OF A FILTER, PAPER POROSITY, PACK TYPE
- OTHER FACTORS SHOWED NARROW RANGE OF VALUES:

  TOBACCO DENSITY, CIRCUMFERENCE

SOCIETAL COSTS OF CIGARETTE-INITIATED FIRES (CPSC)

- CONDUCTED BY *NATIONAL PUBLIC SERVICES RESEARCH INSTITUTE*
- ANNUAL COST OF THESE FIRES IS $4 BILLION
- BASED ON NEW RESEARCH, REVIEW OF EXISTING LITERATURE, AND LATEST COST ESTIMATION TECHNIQUES

TOXICITY OF CIGARETTE SMOKE (CPSC)

- SPENDING LIMITED TO $50k
- 4-TIER PROTOCOL DEVELOPED
- LIMITED, INEXPENSIVE TESTING DEMONSTRATED THAT CIGARETTE TYPES CAN BE DISTINGUISHED BY A FEW TOXICOLOGICAL PARAMETERS:
  - TAR, NICOTINE, CO
  - pH
  - BENZO(A)PYRENE & TOBACCO-SPECIFIC NITROSAMINES
  - SALMONELLA MUTAGENICITY

GENERAL CONCLUSIONS

"THE TECHNICAL ADVISORY GROUP, BY A VOTE OF 11 TO 4, BELIEVES THAT SUFFICIENT TECHNOLOGY AND INFORMATION IS AVAILABLE TO DEEM PRACTICAL THE DEVELOPMENT OF A PERFORMANCE STANDARD TO REDUCE CIGARETTE IGNITION PROPENSITY."

" ... THE (CONSUMER PRODUCT SAFETY) COMMISSION CONCLUDES THAT IT IS PRACTICABLE TO DEVELOP A PERFORMANCE STANDARD TO REDUCE CIGARETTE IGNITION PROPENSITY ... "

FIRE SAFE CIGARETTE ACT OF 1994

H.R. 3885

- INTRODUCED FEBRUARY 23, 1994 BY CONGRESSMAN MOAKLEY (D-MASS).
- DIRECTS THE CONSUMER PRODUCT SAFETY COMMISSION, WITHIN 1 YEAR, TO ISSUE A CIGARETTE FIRE SAFETY STANDARD FOR CIGARETTES TO REDUCE THE RISK OF IGNITION PRESENTED BY CIGARETTES.
- EFFECTIVE DATE NO MORE THAN 2 YEARS AFTER THE ENACTMENT OF THIS ACT.
- APPLIES TO DOMESTIC AND IMPORTED CIGARETTES.
- STOCKPILING NOT ALLOWED.
- ALLOWS FOR STATE STANDARDS THAT ARE MORE STRINGENT.

NIST/BFRL RESEARCH ON FURNITURE FLAMMABILITY

OBJECTIVE: DEVELOP BY 1997, AN INITIAL SET OF GUIDELINES FOR HELPING FURNITURE MANUFACTURERS TO DESIGN RESIDENTIAL UPHOLSTERED FURNITURE WITH LOW RATE OF HEAT RELEASE.

TECHNICAL APPROACH: EXPERIMENTAL INVESTIGATION OF EFFECTS ON HEAT RELEASE RATE OF IGNITION AND DESIGN/CONSTRUCTION FACTORS; MODELING OF IGNITION PATTERNS, FLAME SPREAD ACROSS SURFACES, BURNING RATE, AND POSSIBLE IGNITION OF OTHER ITEMS; USE OF CONE CALORIMETER AND LIFT APPARATUS; TESTING OF RESULTS AGAINST REAL-SCALE FIRES OF COMMERCIAL FURNITURE.

THE MAZE OF UPHOLSTERED FURNITURE FLAMMABILITY TESTS WHAT DO THEY REALLY MEAN AND ARE THEY RELEVANT?

BY:
T. HUGH TALLEY

For at least twenty years, many attempts have been made to regulate the upholstered furniture industry. Regulators have attempted and, in some cases, succeeded in regulation of the furniture utilizing many types of flammability standards and test methods. The vast majority of these standards and test methods lack relevancy to real safety, published proof of their reliability, published proof of their accuracy, and published proof of their reproducibility. It is also interesting that virtually all of the published ASTM and NFPA fire test standards contain a statement similar to the following: "This test method is intended to measure and describe the properties of materials, products, or assemblies in response to heat and flame under controlled laboratory conditions and shall not be used to describe or appraise the fire hazard or fire risk of materials, products, or assemblies under actual fire conditions." The fact is that ASTM and NFPA are not so certain themselves as to the real reliability and relevancy of many of the fire test methods. Further, much of what has been published and what exists now regarding fire testing of furniture and materials is a disconnected maze of different regulations, tests, and methodologies which create many problems and much confusion for the furniture manufacturer.

The first of these problems is reliability. Reliability, from a furniture manufacturers' standpoint, means several different and important things. First, true reliability means that test methods or regulations do not give one manufacturer an advantage over other manufacturers--in other words, all manufacturers using those regulations and test methods are playing on the same "level field."

Secondly, reliability to a manufacturer also means that the regulations and test methods must actually accomplish what was intended for them to accomplish at the onset of the regulation and testing. The basic intent for all of the test methods is virtually always stated to be to make furniture which is more fire safe. The problem is that after the dust settles, few of the tests and regulations result in furniture which is demonstrably safer in fires.

Many of the present flammability test methods and regulations are simply exercises in passing a test. With the exception of the cigarette tests, very few of the present furniture test methods and regulations really accomplish what they were intended to accomplish, that is to demonstrably make more fire safe furniture. After being in effect for over 15 years, the voluntary and mandatory programs related to cigarette ignition have demonstrated clearly that both fires and deaths have decreased significantly, nationally. However, a wide

majority of the non-cigarette related flammability regulations and test methods have no proof of their relevancy in making furniture which is demonstrably and provably safer in fires.

The reliability of any test method is also a direct function of the reproducibility of that test method. If test data cannot be reproduced within a laboratory or from laboratory to laboratory, the test method is, for practical purposes, useless. There are two basic types of reproducibility, and two different nouns are classically used to describe them--precision and bias.

The first type of reproducibility is the ability to reproduce the test results within a single laboratory with minimum variation test-to-test and day-to-day when testing the same material(s) within the same laboratory. Tied to the the within-a-laboratory reproducibility is the ability to reproduce the test data from one laboratory to other different laboratories with a minimum of variation between the different laboratories when testing the same material(s). The within-a-laboratory and laboratory-to-laboratory reproducibility is called "precision." There are some very specific statistical methods for determining the precision of test methods within a laboratory and laboratory to laboratory.

The second type of reproducibility of any test method is the study of the variation of the test data obtained from a specific test method compared to absolutely known values of the parameter being tested. This method for predicting and studying reproducibility is called "bias." When the results of a test are compared to precisely known values, the variation from the known values is called "bias."

To elaborate further on the meaning of "bias," Let's look at the following example. Pure, dried table salt can be accurately weighed and then dissolved in a defined quantity of distilled water, containing no table salt. The resulting solution contains an exactly known amount of table salt. This "known" solution can now be used to determine the bias of test methods used to analyze for the quantity of table salt dissolved in water solutions.

The known, table salt water solution is then chemically analyzed by a specific test method to try, by that test method, to accurately determine the amount of salt dissolved in the water. In other words, we are analyzing a solution with a known quantity of dissolved table salt to check the accuracy of a specific test method--testing the test method, so to speak.

If the test method in question consistently measures the amount of the salt in the water as 97% of the amount known to be in the distilled water, the test method is said to be 97% accurate. Another way of saying the same thing is that the test method has a three percent bias error. So, we can--using that particular test method--predict the salt in water to an accuracy of 97% with a bias error of 3%. So, with that particular test method, the very best prediction of the amount of salt in the water that can ever be expected would be 97% of the actual amount--with a 3% bias error.

Then, the science of statistics gives guidance on how many tests should be performed before a statistically meaningful bias statement can be written about that specific test method.

Once both the precision and bias of a test method are proven and known, that test method can then be used to test for values which are not known. For example, in the case of the table salt test just described, one could now arbitrarily place a "pinch" of unweighed, dried, pure table salt in a know quantity of distilled water and analyze that unknown specimen to determine the amount of table salt in the water and expect to get test results that have only 3% bias error.

Very often, it is impractical and even impossible to know the absolute value of something that is being tested and analyzed. Then, the only remaining way to judge the reliability of a test method is to judge that test method by the within-a-laboratory and laboratory-to-laboratory precision attained during testing. If a test method can be run with good precision, that does not mean it is necessarily correct in what it is measuring. Waht is really meant is that whatever errors are being made are being made consistently. For example, the burning properties of materials are not known well enough to make a bias statement about them. All that is known about any of the flammability test methods is that some of them are reprocucing the same error very well from test to test.

It is very important to reiterate that the burning properties of materials, such as ignitability, ignition time, peak heat release, total heat released, amount and type of smoke released, etc. are not known quantitatively for furniture materials; and thus, test methods cannot be calibrated using known test specimens and then used to analyze unknown test specimens. In other words, when testing a chair, sofa, love seat, or other pieces of upholstered furniture or furniture components, the quantitative values of each of the burning qualities are not known so that a test can be calibrated in advance to known quantities.

Thus, the quantitative "bias" error of <u>all</u> of the fire tests used for upholstered furniture is not known and probably will never be known. So, for any of the fire tests used for upholstered furniture, the only values we can obtain are the values for precision which "hopefully" can be reproduced within-a-laboratory and laboratory-to-laboratory. Since the "true" values of the burning properties of furniture materials are not known, it is even more important to have test methods which are reliably reproducible--in every respect. Even with the precise of the furniture flammability test methods, all we may be doing is reproducing the errors from test to test with good precision.

Now, let's look at the major fire tests for furniture and furniture components.

Cigarette Tests, United States

Some of the most widely used cigarette test methods for upholstered furniture and/or components in the United States are:

1.. The UFAC program

2.. California Technical Bulletin 116 (TB-116)

3.. California Technical Bulletin 117 (TB-117)

4.. ASTM E 1352 for Mock-Up Assemblies

5.. ASTM E 1353 for Components

6.. NFPA 260 for Components

7.. NFPA 261 for Mock-Up assemblies

8.. BOCA 1993 Fire Prevention Code

9.. BIFMA F-1-1978

Let's briefly look at each of these tests:

The UFAC Program

The single largest cause of fires and deaths in residences in the United States is the ignition of upholstered furniture by smoldering cigarettes. That statement was true in 1970 and is still true today. The furniture industry addressed the problem of cigarette ignition by the development and implementation of the voluntary UFAC program for residential furniture. There are two key things to remember about the UFAC program: the UFAC program is purely voluntary--not mandatory; and the UFAC program works and is working as intended.

The following statistics from the U.S. Consumer Products Safety Commission gives us an idea how well the UFAC program is working nationally:

Table 1, Fires

	1978	1991	%Change
All Upholstered Furniture Fires	43,000	16,600	-61.4
Smoking Materials Ignition	28,000	8,500	-69.6
Open Flame Ignition	7,900	3,700	-53.2
Other	7,100	4,400	-38.0

Table 2, Deaths

	1978	1991	% Change
All Upholstered Furniture Fire Deaths	1,600	700	-56.2
Fire Deaths Related To Smoking Materials Ignition	1,300	470	-63.8
Fire Deaths Related To Open Flame Ignition	200	150	-25.0
Fire Deaths Related To Other Ignitions	100	80	-20.0

The unbiased fire statistics clearly show that the UFAC voluntary program is working as intended!

The UFAC program involves testing the major upholstered furniture components individually using lighted cigarettes. Components tested include covering fabrics, deck fabrics, interior fabrics, deck pad materials, arm foams, back foams, cushion foams, batting and padding materials, welt cords, and decorative trim and fringes. Components are tested and then used in furniture construction according to specific UFAC construction criteria. Prior to the formal adoption of the UFAC program as a national voluntary standard, The United States Consumer Products Safety Commission (CPSC) tested upholstered furniture made to the UFAC construction criteria against furniture made prior

to the UFAC construction criteria. This series of CPSC tests demonstrated that the UFAC program was definitely relevant and effective.

The precision of the UFAC test method has been shown to be 85-90% reproducible from laboratory-to-laboratory and within-a-laboratory. These values of precision of the UFAC test methods were determined several times by the UFAC Technical Committee and Laboratory Alliance. They were validated again by the ASTM E05 committee where extensive round-robin test studies were performed.

Another important indication of the real worth of any program is shown by its acceptance by national and international communities and acceptance by the technical community. *Since it adoption in 1978, the UFAC program has been adopted by the NFPA, ASTM, Canada, and The European Common Market countries. Presently, since the passage of NAFTA, the country of Mexico is very close to adopting the UFAC program. The UFAC program has also been adopted as a part of the NFPA Life Safety Code.*

TB-116

California TB-116 is a voluntary standard for furniture sold in the state of California. The test method contained within TB-116 involves placing lighted cigarettes on various locations of the finished article of furniture. The cigarettes are placed in locations where they might become lodged if dropped accidently on the piece of furniture. The test cigarettes are covered with a piece of bed sheeting and allowed to burn. The test is reported as a failure if the char smoldering from any cigarette spreads in any direction more than 2".

Although it is not clearly written in the official TB-116 standard, a full-scale mockup of the exact fabric, furniture construction, and furniture design used may also be tested. In most cases, because preparation of an exact mockup will be as expensive as preparing the actual finished piece of furniture, it will be just as financially prudent to test a finished article of furniture. It should also be noted that individual components cannot be evaluated using TB-116.

Since the introduction of TB-116 in the early 1970's, no documents have been published demonstrating the quantitative precision, accuracy, or relevancy of TB-116. Further, TB-116 has not been adopted by any other standards setting group, such as ASTM or NFPA.

TB-117

California TB-117 is a mandatory standard for furniture sold in the state of California. The test method contained within TB-117 involves a series of nine tests using both cigarette smoldering and flaming ignition. Those nine tests are:

a.. Open-flame test for resilient cellular materials, such as polyurethane foams, rubber foams, and neoprene foams

b.. Open-flame test for shredded resilient cellular materials

c.. Open-flame test for expanded polystyrene foam beads

d.. Open-flame test for non-man-made fiber filling materials, such as, cotton and woolen batting

e.. Open-flame test for cushions containing feathers and/or down

f.. Open-flame test for man-made fiber filling materials, such as polyester fiber batting

g.. Smoldering (cigarette) test for all filling materials, except resilient cellular materials

h.. Smoldering (cigarette) test for resilient cellular materials, such as, polyurethane foams, rubber foams, and neoprene foams.

i.. Open-flame screening test for upholstery fabrics

There are several important facts to be considered regarding the TB-117 test method and requirements:

1.. TB-117 is mandatory only for the state of California.

2.. Since its enactment into law in California in 1975, there has been no published information concerning the quantitative accuracy, precision, or relevancy of the test methods within TB-117. TB--117 was developed and mandated in the state of California without the benefit of any studies of its true quantitative relevancy, accuracy, or precision.

3.. TB-117 has not been shown to be any more effective than the national, voluntary UFAC program.

4.. Since its passage into California law in 1975, the TB-117 program has not been adopted or proven relevant by ASTM, NFPA, or any other code or standards setting body in the United States.

5.. All upholstered furniture sold within the State of California must meet the requirements of TB-117 regardless of the point of manufacture of that furniture.

6.. Furniture manufactured to meet the requirements of TB-117 should not be considered to be "flame proof." Furniture made to meet the requirements of TB-117 will definitely burn.

ASTM E 1352 and NFPA 261 for Testing Furniture Mock-Up Assemblies

These two test methods are identical, and they both utilize test methodology developed by the U.S. National Bureau of Standards (NBS--now called The U. S. National Institute for Standards and Technology--NIST). NBS developed this test method for the CPSC under the designation of PFF 6-76. ASTM adopted the NBS test as ASTM E1352, and NFPA adopted the NBS method as NFPA 261. .

In ASTM 1352 and NFPA 261, mock-up upholstered furniture assemblies are exposed to lighted cigarettes. The mock-up assemblies tested are intended to represent the actual items of furniture. Lighted cigarettes are placed on the mockups, covered with sheeting materials, and allowed to burn. Ignition is not permitted, and the length of char for each mockup is measured after the termination of the test. Since neither ASTM or NFPA do not include pass/fail criteria in their test methods, the code or standards setting authority must specify the maximum char length.

Interlaboratory studies by NBS and ASTM have demonstrated the precision of NFPA 261 and ASTM E1352 to be 80-87%. NFPA 261 is referenced and adopted in the NFPA Life Safety Code.

ASTM E 1353 and NFPA 260 for Furniture Component Testing

These two test methods are also identical and are identical to the UFAC test methods. The use of ASTM and NFPA designation numbers simply means that ASTM and NFPA have adopted the UFAC tests and after adoption, have assigned them numbers using their own system of numbering terminology.

Interlaboratory studies performed by ASTM and the UFAC Laboratory Alliance again demonstrated the precision of these two test methods to be 85-90%.

The BOCA 1993 Fire Prevention Code for Cigarettes

Section F-307.3 of the Building Officials and Code Administration (BOCA) "1993 Fire Prevention Code" requires that upholstered furniture should show resistance to cigarette ignition when tested using NFPA 261 (ASTM E1352). The precision and relevancy of both of these referenced test methods has been discussed earlier.

BIFMA F-1-1978

This standard is titled "First Generation Voluntary Upholstered Furniture Flammability Standard for Business and Institutional Markets." The cigarette ignition part of this standard utilizes ASTM 1352 or NFPA 261. The test criteria state that a char length measured in any direction from the cigarette shall not exceed 3". In this test and criteria, fabrics are rated into four classes, A, B, C, and D with the A rating being most resistant to cigarette ignition and D being the least resistant to cigarette ignition.

A 45 degree angle open flame test for all cushion and filler materials is also included within this BIFMA standard. The open flame utilizes the same CS 191-53 test used in California TB-117.

The quantitative precision of the BIFMA F-1-1978 test is the same as ASTM E1352 and NFPA 261.

International Cigarette Tests

British Standards Institute 5852, Part I and ISO 8191-1, Part I

Part I of the BSI 5852 and ISO 8191-1 standards utilize an assembly of furniture components placed on a metal test jig forming a simulated seat and back. The test cigarette is placed in the crevice formed by the intersection of the seat and back. Flaming ignition and/or what the BSI describes as progressive smoldering are to be considered test failures.

No published data exists demonstrating the quantitative precision or relevancy of Part I of the BSI 5852, Part I test or the ISO 8191-1 test. It should be noted that Canada adopted the UFAC test rather than the BSI 5852 test or the ISO 8191-1 test.

Open Flame Tests in the United States

The major open flame tests for furniture and components in the United States are:

1.. California Technical Bulletin 117

2.. The Furniture Calorimeter

3.. California Technical Bulletin 133

4.. Boston BFD IX-10

5.. NFPA 266

6.. ASTM E1537

7.. UL 1056

8.. ASTM E1354 and E1474

9.. NFPA 264 and NFPA 264A

10. ASTM E906 (The OSU Calorimeter)

11. The NFPA Life Safety Code

12. The BOCA "1993 Fire Prevention Code"

13. The New York/New Jersey Port Authority Specifications

Now, let's look briefly at each of these open flame test methods:

California Technical Bulletin 117

The open flame portions of this test have been discussed earlier. However, it should be reiterated that the relevancy and precision of this test method have yet to be determined.

Heat Release of Burning Objects

Before the major open flame test methods are discussed, some of the terminology

and technology should be reviewed. Everyone who has stood in front of a campfire, a fireplace, or an equivalent heat source knows that when something burns, it gives off heat or releases heat. The amount of heat released from burning objects is proportional to the intensity of the fire. The hazard of a fire is directly proportional to the amount of heat released from the burning objects.

Fire scientists have been attempting to quantify heat release and measure heat release for many years, and one of the first modern devices to measure heat release was the thermopile. Several devices based on thermopile type technology have been used by the fire science community, but the vast majority of these types of thermopile devices demonstrated poor precision and were difficult and expensive to use in full-scale room fire testing. As a result, the thermopile based devices were basically limited to small or bench scale testing of components or mock-up assemblies. The most predominant device based on thermopile technology was a calorimeter developed at Ohio State University which has been named the OSU Calorimeter. The OSU calorimeter was accepted by the ASTM as ASTM E906.

ASTM E906 (The OSU Calorimeter)

In the OSU Calorimeter, test samples are exposed to a radiant heat (heat flux) source and are ignited by a pilot flame or by the radiant heat itself (autoignition). The air flowing through the chamber containing the test specimen flows at a constant rate, and the temperature of the air entering the chamber and exiting the chamber is monitored constantly. The rate of heat release is then computed from the mass of the burning specimen and the differences in temperature of the air entering the burn chamber and the hot air exiting the chamber where the test sample is being burned. In many cases, the optical density of the smoke generated by the burning test sample is also measured.

Since ASTM does not specify pass/fail criteria, there are no pass/fail criteria in the OSU test method. There are some scanty published data demonstrating that the OSU test method may be reproducible to no better than plus or minus 60-70% either within a laboratory or laboratory to laboratory, and many in the fire community state that to give the OSU test even a plus or minus 65-75% reproducibility precision rating is totally incorrect.

However, in all fairness to the OSU test method, it should be stated that recent meticulous and thorough attempts at improving the precision of the test method have shown that the precision can be improved. Recent attempts have indicated that approximately plus or minus 25% precision may be possible. However, improved precision numbers can only be achieved when the testing technicians are very meticulous and thorough and the equipment is thoroughly and efficiently calibrated.

The NFPA Life Safety Code

Other groups such as the NFPA have utilized heat release criteria in their specifications and codes for furniture and furnishings for public occupancies. For example, for each item of furniture in certain public occupancies which do not have sprinkler systems installed, the NFPA Life Safety Code specifies a maximum heat release of 250 Kw. In public occupancies which do have sprinklers, the NFPA Life Safety Code allows a maximum heat release of 500 Kw for each item of furniture. The NFPA Life Safety Code does not specify how the heat release values are to be measured, but one could assume that the OSU Calorimeter or other open flame tests could be utilized.

The BOCA "1993 Fire Prevention Code"

Section F-307.2 of the 1993 BOCA "Fire Prevention Code" states that "Any item of upholstered furniture, mattress, or wardrobes shall produce a maximum instantaneous net peak heat release of 500 Kw or less." Like NFPA, BOCA does not specify how the maximum heat release is to be measured, and it is thus presumed that the OSU test or any other of the open flame test methods would suffice.

Oxygen Consumption Calorimetry

Before tests 2-13 above are discussed and because they involve new technology, terminology, and/or concepts relatively new to our industry, the concept of "Oxygen Consumption Calorimetry" should be discussed briefly.

Over the years, the perceived accuracy and precision of the OSU calorimeter has been questioned, and the precision of the OSU test has yet to be statistically determined. Because of the lack of accuracy and precision of the OSU test method, fire scientists developed another way to measure the heat released by burning objects. Fire scientists found that the consumption of oxygen of burning objects was directly proportional to the amount of heat released. The equipment developed to make the measurements of the consumption of oxygen was called an Oxygen Consumption Calorimeter, and the process of measuring the heat released by consumption of oxygen is called Oxygen Consumption Calorimetry.

..STM E1354, ASTM E1474, NFPA 264, and NFPA 264A, The Bench-Scale Tests

All of the tests in this group are essentially equivalent, and they all utilize an oxygen consumption calorimeter device called a "Cone Calorimeter." The term "cone" comes from an electrical heating device used to provide a constant source of radiant heat energy on the entire surface of the sample being tested. All of these tests are "bench scale" tests in that these tests test samples very much smaller than full-scale size furniture.

In the Cone Calorimeter, a small test sample is placed into a metal holder. The metal holder is accurately positioned under the cone heater, and the test sample is exposed to a predetermined, controlled amount of radiant heat energy or flux. The test sample is then ignited with a spark igniter. A controlled amount of air passes over the burning sample, and the products of combustion are trapped within the air stream. The air stream is then drawn up into a hood and finally into a duct system where there are devices which constantly measure the oxygen consumed as well as the concentration of other gases which are important to the test. Thus, by measuring the oxygen consumed by the burning sample, the amount of heat released can be calculated.

In the case of furniture materials, fabrics, barriers, and foams are used to make composites which are tested in the Cone Calorimeter. There are no published data showing how the Cone Calorimeter is related to full-scale fires or fire tests or how the data from the Cone Calorimeter can be used to design more fire-safe furniture. The reproducibility of all tests made utilizing the Cone Calorimeter with furniture components has been shown to be approximately 77-85% within a laboratory and 70-80% laboratory-to-laboratory. It is believed by the fire science community that the Cone Calorimeter can--in the future--be made to be more reproducible and more relevant to real scale fires. It is also believed by the fire community that in the future, Cone Calorimeter test data can be used to even design more fire-safe furniture.

Real-Scale or Full-Scale Open Flame Furniture Test Methods in the United States

In real or full-scale fire tests, actual full-size pieces of upholstered furniture or full-scale mock-ups of actual pieces of furniture are tested. The full or real scale tests can be divided into two categories: the first category test method is called "open calorimeter," and the second category test method is called a "room calorimeter."

The "open calorimeter" involves the use of an unlimited size room in which the calorimeter is used. The furniture item to be tested is placed on a platform under a hood and is ignited by one of several techniques to be described later. A constant, controlled flow of air across the burning specimen traps the gaseous products of combustion, carries those products into a hood and into a duct which contains devices which constantly measure the oxygen content of the air and other gasses necessary to the test method.

The "room calorimeter" works on the exact same principle as the "open calorimeter" except the room calorimeter exists in a room of defined size and volume. In the "room calorimeter," oxygen and other gases are also measured in the same way as they are measured in the "open calorimeter."

California Technical Bulletin 133, TB-133

TB-133 was developed for furniture for public occupancies only, and when TB-133 was originally introduced, it did not involve oxygen consumption calorimetry. In the beginning, TB-133 utilized a metal/chicken wire container into which were placed five double sheets of newspaper as an ignition source. The chicken wire ignition source was placed on the seat cushion, and the newspapers were ignited to begin the test. The older TB-133 test required the measurement of temperature at a four foot height in front of the test sample and at the ceiling above the test sample. The older TB-133 test also required the measurement of carbon monoxide, smoke opacity, and weight loss of the burning furniture piece.

A few months prior to becoming law in March of 1992 in California, the TB-133 test was converted to oxygen consumption calorimetry using a rectangular gas burner as the controlled ignition source. The pass/fail criteria of TB-133 using oxygen consumption calorimetry specifies a maximum heat release of 80 kw and a maximum, total heat release of 25 mega-joules for the first 10 minutes of the test.

No published data exists which shows the quantitative precision or relevancy of the older TB-133 test methodology; and some scant data on one interlab, directed by the California BHF, using the oxygen consumption calorimetry TB-133 test method suggests that the reproducibility of the test data is no better than plus or minus 50%, either within a laboratory or laboratory to laboratory.

Boston BFD IX-10

BFD IX-10 is a test method and test criteria which applies to upholstered furniture and solid plastic chairs sold in the city of Boston. The Boston Fire Department will accept testing using the TB-133 protocol or the protocols described in ASTM E1537 using the pass/fail criteria required in TB-133. However, the Boston Fire Department officials want to see the actual test data before final approval.

Previous to the development and passage into law of TB-133, and previous to the publication of ASTM E1537, the city of Boston required a series of component tests; but at this time, TB-133 or ASTM E1537 test results will be accepted by the city of Boston Fire Department after they have reviewed the TB-133 or ASTM E1537 test data. In addition

there are also some limitations on the use of certain types of vinyl fabrics in the city of Boston. Definitions and rulings on the unacceptable vinyls should best come from the chief chemist of the Boston Fire Department.

The BFD IX-10 regulations cover furniture made for assembly buildings, businesses, mercantile, and certain residential occupancies. There are no exclusions for buildings with sprinklers. When shipping into Boston, it is best to check with the BFD to make certain that the occupancy type ordering the upholstered furniture is or is not covered by the BFD regulations.

As with TB-133 and ASTM, no published data or information exists regarding the quantitative precision or relevancy of the test methods used for Boston BFD IX-10.

The Furniture Calorimeter

The furniture calorimeter is the first of the "open type" calorimeters developed by the National Institute of Standards and Technology. No published data or information exists which shows the quantitative precision or relevancy of the Furniture Calorimeter.

UL 1056

UL 1056 is an open calorimeter test which utilizes a wooden crib as the ignition source. UL has considered converting to a rectangular gas burner as an ignition source, but as of this writing, it is not known whether or not the conversion has been made.

No published quantitative data exists which demonstrates the precision or relevancy of UL 1056.

NFPA 266

NFPA 266 is not yet a published standard, but it is expected that at the national meeting of the NFPA in May this year, the method will be balloted favorably by the full membership. NFPA 266 is also an open calorimeter test method which utilizes a rectangular gas burner as the ignition source.

No published quantitative data exists which demonstrates the precision or relevancy of NFPA 266.

ASTM E1537

ASTM E1537 allows the use of a room calorimeter test, two separate room sizes, and an open calorimeter test. The ASTM method included the use of all of these separate methods based on some research at NIST. Significant research at NIST demonstrated that if a fire was 600 kw or less, the room size and/or configuration made no significant difference. The NIST research demonstrated that since 600 kw was almost 8 times the amount allowed in the criteria of some of the oxygen consumption calorimetry tests, the use of two different room sizes, room calorimetry, and open calorimetry would all give similar results.

No published quantitative data exists which demonstrates the precision or relevancy of ASTM E1537.

The New York/New Jersey Port Authority Specifications

The official title of this specification is "Specifications Governing the Flammability of Upholstery Materials and Plastic Furniture." Upholstery component materials used in the jurisdiction of the port authority should comply with FAR 25.853, section (b) and ASTM E162. Self supporting plastics components must comply with FAR 25.853 section (a). FAR 25.853 is a vertical bunsen burner test, and ASTM 162 is a radiant heat energy source.

A recent addition to the port authorities requirements is the specification of California TB-133 for upholstered furniture which is to be used in buildings under the Port Authority's jurisdiction. Furniture must meet all of the past Port Authority's requirements in addition to TB-133. tests.

Quantitative precision and relevancy data are not published regarding any of the test methods used by the port authority.

International Open Flame Tests

BSI 5852, Part II

Part II of BSI 5852 is strictly an open flame test utilizing a specially designed "test rig" (jig or fixture) for all of the following different ignition scenarios:

Source 2.. 145 mm butane gas flame for 40 seconds

Source 3.. 240 mm butane gas flame for 70 seconds

Source 4.. an 8.5 gram wooden crib

Source 5.. a 17 gram wooden crib

Source 6.. a 60 gram wooden crib

Source 7.. a 126 gram wooden crib

An assembly of the actual furniture components is attached to the defined test rig, and the ignition source is then placed at the intersection of the simulated back and seat of assembly in the test rig. A number of test criteria are specified. These test criteria ..lude "progressive smoldering" and "flaming failure." Before manufacturing and shipping furniture into The United Kingdom, one should check with the ordering and specifying authorities as to which of the ignition sources and criteria apply to the actual furniture in question.

No published data or information exists on the quantitative precision or relevancy of the BSI 5852 test methods.

ISO 8191-2

The ISO 8192-2 test is essentially the Source 2 portion of the BSI 5852, Part II test including the use of a metal test rig. A small butane flame is placed in the crevice formed by the simulated back and seat for about 20 seconds, and the test piece is rated as pass/fail by whether or not "progressive smoldering" and/or "flaming ignition" occurs.

No quantitative published data exists demonstrating the precision or relevancy of the ISO-8191-2 test method.

Nordtest Method NT Fire 032

Nordtest 032 is used in the country of Finland, and several other European countries have considered using this test; but, as yet, no specifications or laws have been written and published. The Nordtest 032 method is basically the same test as UL 1056 in that it is a full-scale, open flame test ignited by a wooden crib and an open calorimeter type test.

As in all of the other full-scale, open flame tests, no quantitative data exists demonstrating the precision or relevancy of this test.

What's the Meaning and/or Purpose for All These Tests

There are some individuals and associations in the fire science community who are truly interested in fire safety and developing test methods which are truly relevant to real fire safety. It is a fact that if something in a room ignites and burns with enough intensity to ignite other items in that room, that room will probably proceed to a condition known as "flashover." Flashover is defined briefly as a condition in fires where the heat given off, i.e. the heat release, by the burning objects in a room is sufficient to lead to the ignition of all combustible materials in that room. Flashover is very dangerous, and post flashover fires, i.e., fires that still burn after flashover, are also very dangerous.

Fire scientists are now developing methods where combustible items in a room can be located at distances from each other such that the possibility of one item igniting another item is minimized--thus minimizing the possibility of flashover. Another significant point in limiting the possibility of flashover is also limiting the heat released by the objects which do ignite and are burning in a room. If those objects burn with minimum intensity and are then located in the room so that the possibility of igniting other combustibles is minimized, then the possibility of flashover is minimized. Presently the NFPA Life Safety Committee is developing methodology to accomplish both the placement of items in a room and selecting items for that room based on heat release. The work at NFPA is being done presently for occupancies where egress is limited or restricted.

The principal problem with the NFPA room design concept is the precision of the test methods used to determine the heat release of the items selected to go into the rooms as furnishings. Presently, several types of adjustments must be made to accomodate the high degree of error in precision of the present fire test methods.

Computer Modeling of Fires

No paper on fire tests and methodology would be complete without the mention of computer modeling of fires and fire scenarios. Events in room and building fires occur

with such rapidity and in such extremely high orders of magnitude of variables that simply measuring those events in full scale becomes very difficult--to almost impossible. Organizations such as NIST are developing computer technology to model room and building fires. By using basic elements, such as, room and building geometry, heat released from the objects burning, location of burning objects, mass transfer of the heat, mass transfer of smoke, and many other very complicated and varied mathematical interrelationships, what actually happens during room and building fires can be estimated. As the systems knowledge and usage is increased and more accurate input data and information are used, the computer modeled estimates become more and more valid. In the future, computer modeling may drastically minimize the need for expensive full-scale or real-scale testing.

Final Commentary

It should now be obvious that there is a literal maze of flammability test methods and regulations used for and intended for upholstered furniture. It is also sad to report that the list of methods in this paper is far from being complete. This paper gives only the major test methods and regulations. Regulators and others are constantly looking at a more and more other "possibilities" for our industry. Among these "other possibilities" being considered are toxicity tests, more severe fire tests, and a broader scope for furniture regulations.

As is clearly evident in this paper, the vast majority of the test methods used and proposed to be used for furniture have yet to be proven relevant or precise, nor have they been proven to make furniture which is truly more fire-safe. Our industry will constantly need much assistance from everyone in the industry to continue to attempt to try to make some degree of sense from the maze in which we now find ourselves.

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SUE BRIGHTEN

FURNITURE FLAMMABILITY

There is often an initial confusion in peoples' minds concerning the inter-relationship between legislative controls and British Standards. In the UK, the Standards themselves normally have no legal compulsion associated with them in their own right, but they are provided for the voluntary adoption by manufacturers and specifiers.

Where there is a proven safety problem, the Government will bring in laws to control the hazard. These laws are in the form of regulations which must be complied with and which, in describing the requirements, will refer to the British Standard Test Method as the means of assessing the ignitability, and set the limits required.

In the case of domestic furniture (furniture for private dwellings) the UK has legislative control. These regulations are properly described as **The Furniture and Furnishings (Fire) (Safety) Regulations 1988 Amended 1989**, and refer to the British Standard 5852 which is a method of test for measuring the ignitability of upholstery.

Before the provision of the regulations can be described, it is necessary first to be familiar with the British Standard Test Method.

Measurement of Ignitability

Early in the 1970's it was established through research that the test methods that existed at that time for measuring ignitability were of little value for assessing the ignitability of upholstery because they generally tested the component materials, such as the cover fabric or the foam, separately and in isolation. However, when these materials were assembled together on a piece of furniture, the behaviour of the composite assembly was often very different to that which had been indicated by the tests on the individual materials.

This could be overcome by testing the complete finished piece of furniture, but this was an impractical approach for widespread control. Consequently, a test was needed that would measure the ignitability of the cover/filling assembly in composite form. BS5852 was produced in response to this need.

The Test Method

The way in which the materials were assembled together for test was specifically designed to model the worst way in which they may be used on a piece of furniture. This fail-safe approach ensured that the result obtained for a composite would be equally applicable to any application in any piece of furniture and theoretically the behaviour of the real piece of furniture would be safer than the test would indicate.

The specific features incorporated into the test assembly are the provision of a cigarette trap, thick insulating upholstery, a vertical surface up which flaming sources can play, a horizontal surface to catch any molten drips or burning debris and a control of cover tension.

There are three different types of ignition source that need to be considered:-

- radiant heat
- smouldering sources
- flaming sources

Radiant heat is rarely a problem for furniture, since the furniture needs to be in extremely close proximity to high energy radiant sources before any problems occur, and in this respect they differ little from other items in the domestic environment.

With regard to smouldering sources, there is only one source that is considered to be of serious concern and that is a cigarette. This is an extremely common cause of accidental furniture ignition, as a result the test needs to reflect this type of source. In order to fail-safe, the cigarette used is a full-sized cigarette without a filter.

With flaming sources, there can be a range from the smallest practical source which is roughly equivalent to a match, up to extremely high sources. In order to be reasonable the highest for the purpose of this test is considered to be equivalent in thermal output to a few sheets of newspaper. These sources are formalized into seven different sources where each source is roughly double the severity of the source beneath it. This gives a range of sources where numbers 1, 2 and 3 are gas flames and 4, 5, 6 and 7 are various sizes of wood crib.

This standard therefore allows specifiers to select the most appropriate ignition resistance level to ensure adequate safety in the environment that is being controlled, and therefore is equally applicable as a test method to domestic and contract situations.

The Domestic Regulations

In the late 1970's it was established in the UK that there were an unacceptable number of fires occurring in domestic premises because of accidental ignition of upholstery by smokers' materials. In 1980 regulations were made that required all domestic upholstery to be cigarette resistant after 1983. However, in the ensuing years it became clear that these measures were not sufficient and that they would be supplemented by flame-resistance requirements as well. Matters came to a head early in 1988 when strong pressure was placed on the Government to extend the laws. Accordingly The Furniture and Furnishings (Fire) (Safety) Regulations were published in that year. These regulations have two main objectives:-

- To supplement the existing mandatory cigarette resistance with the additional requirements that the upholstery must be match resistant.

- To ban all types of polyurethane foam, except the newest variety that is referred to as combustion-modified foam.

It is important to realise that this second requirement to control the use of urethane foams specifically was in response to fears, not over the ignition resistance of furniture but over the way in which some furniture could burn if it was ignited. Some furniture would burn extremely rapidly and the fire would develop so quickly that the room would become engulfed in what fire officers term as a flash-over situation. This made escape or rescue extremely difficult.

There were no tests available to measure rate of fire development, but many of the pressure groups that were lobbying for controls by Government considered that rapid rate of fire development was primarily due to the inclusion and use of conventional polyether foams and high-resilient foams. Since the new forms of combustion-modified foams had been developed, which was regarded as a considerable improvement in this respect of fire development, it was decided to allow only these new types of foam to be used and to ban the older forms of conventional polyether and high-resilient foams.

In order to achieve these objectives, the regulations set out six main provisions:-

- All filling materials must meet a minimum level of ignition resistance as described.
- All covers must be match resistant.
- All upholstery must be cigarette resistant.
- Furniture must carry a display label.
- Furniture must have a permanent label fitted.
- Furniture suppliers must maintain records for five years.

The regulations apply to all upholstered furniture (that is furniture that has on it somewhere a padded area consisting of a cover over a resilient filling) that is intended for private use in a dwelling. The term dwelling includes caravans, but does not include vehicles or boats. This definition of upholstered furniture is extremely wide and includes nursery goods such as prams, pushchairs, cots, playpens and any other item designed to contain a baby or small child. The only furniture specifically exempted from the regulations is furniture for export, furniture manufactured prior to 1950 and furniture in second-hand caravans. The regulations also apply to mattresses and bed bases (when upholstered), but with these items only the first of the provisions (the control of the fillings) applies.

Scatter cushions and pillows are also included in the regulations, but only in respect of control of the ignitability of fillings and the requirement to carry a permanent label.

Loose covers and stretch covers are also controlled in that they are required to be match resistant and to be permanently labelled.

The ignitability of re-upholstered furniture is also controlled by the control of the materials used on the re-upholstering process, and second-hand furniture is, since 1993 also required to comply fully with the regulations.

Requirements for Fillings

Before outlining the specific requirements, it is important to realise that although British Standard 5852 relates to testing a composite, it has been decided in these regulations to apply separate requirements to the different materials used in the upholstery. This is in response to the requirements for practicality, since the furniture manufacturer will buy his materials from different sources and needs to know before purchase whether or not they are acceptable. Consequently, the British Standard test has been modified so that each material is tested not in combination with the actual materials it will be used with on the chair, but instead combined with standard materials. Thus a filling is tested in combination with a standard cover, and covers are tested in combination with standardised fillings.

Modifications to BS5852 are contained in the regulations within Schedules and in quoting test reports or compliance with these regulations, it is important that reference is made to these Schedules rather than to the British Standard itself.

Foam Fillings

Whenever a foam material is used in furniture it must comply with the following:-

- Polyurethane foam must meet Test Schedule 1 Part I. This is an adaptation of BS5852 with Ignition Source 5, and FR polyester cover and mass loss introduced.

- Polyurethane foam crumb must be prepared from stock material (provably) complying with Schedule 1 Part I and in crumb form must meet Schedule 1 Part II. This is an adaptation of BS5852 with Ignition Source 2, an FR polyester cover and changed criteria.

- Latex rubber foam must meet Test Schedule 1 Part III. This is an adaptation of BS5852 with Ignition Source 2, and an FR polyester cover.

Many people are concerned that the requirements for urethane foams are higher than for other fillings which appears to be illogical. It is true that this is illogical where only ignitability is concerned, but it should be remembered that this aspect is in response to the second objective of the regulations, and the test in this form (Schedule 1 Part I) is not so much to measure its ignitability, but rather to provide a definition of combustion-modified foam.

Non-Foam Fillings

- Non-foam fillings must meet Test Schedule 2 Part I. This is an adaptation of BS5852 with Ignition Source 2, an FR polyester cover and changed criteria.

Composite Fillings

In many pieces of furniture the filling consists not of a single material, but of a number of layers of different materials built up to create the specific comfort requirements. Where these multiple layers occur they are referred to as composite fillings and there are two ways in which they can be made to comply with the regulations.

- Each filling material complies with Schedule 1 Part I, II or III, or Schedule 2 Part I as appropriate.

or

- Any foam complies with Schedule 1 Part I, II or III as appropriate and the total filling lay-up complies with:-

  - Schedule 2 Part II: for furniture
  - Schedule 2 Part III: for pillows and cushions
  - Schedule 2 Part IV: for mattresses

Part II and Part III tests are adaptations of BS5852, Ignition Source 2.
Part IV is an adaptation of BS6807, Ignition Source 2.

Requirements for Covers

Requirements for permanent covers which are fitted to furniture when supplied (these covers may be removable for cleaning purposes) are for them to be match resistant.

- Each permanent cover must be match resistant, that is it must comply with Schedule 5, Part I. this is an adaptation of BS5852 with Ignition Source 1, standard non-FR polyether foam and watersoak if the fabric is FR treated.

The only exceptions are:-

- Covers composed of 75% or more of cotton, viscose, modal, flax, silk or wool need not be match resistant, but only if used over a Schedule 3 interliner.

- 'Non-visible' covers used on reverse sides of loose cushions, platforms and underneath dust covers. Then the test is Schedule 5 Part III, adapted form BS5852 with Ignition Source 1 over CM foam and no water soak.

Loose Covers

A loose cover is a cover supplied separate to furniture, which is intended to be placed on top of completed pieces of furniture to improve its appearance and extend its life. Each loose cover must be match resistant, that is it must comply with Schedule 5 Part I. This is an adaptation of BS5852 with Ignition Source 1, standard non-FR polyether foam and watersoak if the fabric is FR treated.

Stretch Covers

These are similar to loose covers made of stretch material to provide a tight fit on the furniture. Each stretch cover must comply with Schedule 5 Part II. This is an adaptation of BS5852 with Ignition Source 1, combustion modified foam and watersoak if the fabric is FR treated.

Cigarette Resistance

All upholstery must comply with Schedule 4 Part I. This is based on BS5852 cigarette test with a watersoak requirement for treated fabrics. This watersoak requirement is waived for 'non-visible' permanent covers. In theory every cover/ filling composite should be tested, but in practice enforcement officers accept 'worst case' test results of the cover.

Display Labelling

Each item of furniture to which the regulations apply are required to carry a display label. The regulations contain full-size illustrations of display labels in colour. (This does not apply to loose covers, stretch covers, scatter cushions or pillows or to mattresses.)

Permanent Labels

A permanent label must be fitted to each item of furniture (apart from the exceptions already mentioned) and the label must be durable and securely attached. There is not a standard design for the label or a standard form of wording, but rather the information contained on it is very clearly described.

Supply of Information

The first supplier of the furniture in the UK, who in the case of imported furniture is the importer, is not only responsible for ensuring that the labelling is correct, but is also required to maintain records for the Trading Standards Officers (who are the enforcement agency) to inspect and confirm that the items of furniture do truly comply with the regulations. The information that should be stored includes the results of any tests prescribed by the regulations and carried out on either the furniture or any of its components, the means by which those results are cross-referenced to the furniture or components of a particular description or batch, and how these records correspond to the labels, batch numbers or marks appearing on any of the goods. This information needs to be maintained for a period of five years.

In essence, this means that it will not be good enough to simply supply a statement of assurance from the manufacturer who is outside the UK, but this will need to be backed up by test reports from recognised test sources, and for the whole item to be fully documented.

The purpose of all this paperwork is to ensure that the enforcement officers in the UK are presented with a total traceability from the item of furniture offered for sale at retail premises via the labels back to the first supplier in the UK, and there to check out fully the compliance without the need for him to carry out tests himself.

For this reason, manufacturers outside the UK should work closely with the UK importer to ensure that adequate tests and information are supplied.

THE CONTRACT FURNITURE SECTOR

There are no mandatory regulations in the contract furniture sector that detail precisely the ignition resistance requirements for furniture. However, the fire safety of the premises in which contract furniture is used is controlled by legislation such as the Fire Precautions Act. These controls relate not only to the building itself with regard to materials and constructions used, provision of scape routes, fire detection and fire fighting systems and so on, but also the building contents. It is considered that fire safety in this context depends not just on the designated use of category of the building, but on the circumstances applicable in each individual case and so the actual requirements are usually decided by the local Fire Officer.

Thus, although they may be no universal prescription required by regulation for the ignition resistance of contract furniture, a Fire Officer's demands themselves carry the weight and authority of law.

The application of this control is particularly strong in some sectors such as for hotels and boarding houses where the Fire Officer is required to issue a fire certificate, and in other leisure applications such as bars, restaurants and dance halls where a licensing authority may also be involved. In such areas furniture suppliers should take all possible steps to determine the precise requirements of the Fire Officer prior to fulfilling the contract, since these may vary from one Officer to another.

In an attempt to unify requirements, the Home Office periodically issues guidance notes and, in the case of the guidance notes relating to hotels and boarding houses, these recommend following the requirements given in BS7176 for medium hazard applications. It is stressed however, that this should not be assumed and confirmation should always be sought from the local Fire Officers.

Ignition Resistance for Contract Furniture

As explained above, where furniture is supplied against a specific contract, any requirements of the responsible Fire Officer should be sought. However, there are many circumstances where contract furniture is produced in manufacturers' standardised designs and materials and offered through catalogues. This is particularly so in the case of office furniture, educational furniture and institutional furniture. Although there are not national requirements for the fire safety of such items, it is strongly recommended that furniture suppliers evaluate their products and declare its suitability for different types of application through the system provided in BS7176.

This approach places onus clearly on the purchaser of the furniture to decide on what level of safety is appropriate for the envisaged end use. Reference to BS7176 will indicate that such a decision cannot be made by anyone without an intimate knowledge of the precise circumstances of end use and so cannot be done in the majority of instances by the furniture manufacturer.

BS7176 incorporates four main sections:-

- Ignitability Requirements
- Durability of Treatment
- Frequency of Testing
- Labelling Requirements

Ignition Resistance Requirements

The basis for measuring the ignition resistance of the upholstery is BS5852. for the majority of applications tests on the L-shaped rig as contained in Section 4 of the Standard is appropriate, but in some circumstances, a test on the complete finished item of furniture, as described in Section 5, may be more appropriate. The actual requirements depend on the hazard present in the end use circumstances.

Performance Requirements

	Low Hazard	Medium Hazard	High Hazard	Very High Hazard
Test Methods	Section 4 of BS5852:1990	Section 4 of BS5852:1990	Section 4 of BS5852:1990	Section 4 or Section 5 of BS5852:1990 (or other as specified)
Requirements	Resistant to Ignition Sources 0 & 1	Resistant to Ignition Sources 0, 1 & 5	Resistant to Ignition Sources 0, 1 & 7	At the discretion of the specifier, but at least high hazard requirements
Typical Examples	Offices, Schools, Colleges, Universities, Museums, Exhibitions, Day Centres	Hotel Bedrooms, Public Buildings, Restaurants, Services' Messes, Places of Public Entertainment, Public Halls, Public Houses and Bars, Casinos, Hospitals, Hostels	Sleeping accommodation in certain hospital wards and in certain hostels, offshore installations	Prison cells

Durability of Treatment

Any covering fabric or fire barrier that has been treated with a flame retardant to reduce ignitability of the upholstery is required to be subjected to a 30 minute water soaking (BS5651) prior to any ignitability test being carried out.

If a covering fabric or fire barrier material is claimed to be dry-cleanable it is required to be dry cleaned as described in Clause 4 of BS5651 prior to fire tests.

Frequency of Testing

Each cover filling composite is required to be tested every 2,500 furniture units produced or once per month whichever is the more practicable.

It should be noted that this standard requires a direct test of the actual cover filling combinations used. This means to say that there is no specific requirement for either the cover or the filling, but only for the performance on any assembly. It therefore follows that a cover may be unsuitable with one type of filling, but satisfactory with another and it also allows that additional materials such as interliners or fire barrier layers can be incorporated into a composite to enable the appropriate level to be reached. This is unlike the situation with regard to domestic furniture where regulations sets specific requirements for the individual covers and fillings and none for the composite.

In one set of circumstances, where orders are small (less than 200 units in a year) it is possible to claim compliance with the appropriate hazard level requirements without a direct test of every composite by using the predictive test route. In this, provided that the cover has passed the appropriate test with a defined standardised filling, it may be used with a range of fillings without further test. Thus if a fabric has passed Ignition Source 5 with the grade of non-combustion modified high resilient foam defined in the appendix to the standard, compliance with BS7176 medium hazard can be claimed using the predictive test route provided the fabric is used directly over a combustion modified foam and the number of units produced is less than 200.

Fabric suppliers will often use the test over the standardised HR foam as a means of promoting the fire resistance of their materials.

Labelling

Each piece of upholstered furniture that claims compliance is required to carry a permanently attached and clearly readable label. This label is illustrated in the standard and in addition to a pictograph depicting a smouldering cigarette, and a flame with ignition source number in black on a white background with a green boarder, words will be used to indicate that it complies with BS7176 by direct test or predictive test for low, medium or high hazard as appropriate.

Use of Combustion Modified Foam in Contract Furniture

The use of combustion modified foam is only demanded by law in domestic furniture. However, it is strongly recommended that all fillings used in furniture of any type, including all forms of contract furniture, comply with the appropriate requirements of the furniture and furnishings fire and safety regulations. This is because the insistence of combustion modified foams is designed to moderate the rate of fire development should a fire occur so that the maximum opportunity for escape is provided.

BS7176 only addresses ignitability controls which are aimed at fire prevention. All new guides produced by the Home Office and other Government departments recommend the use of such upgraded fillings and, in addition to BS7176 requirements, Fire Officers are likely to react in the same way. Should an accident occur that caused loss or injury and such foams had not been used, any defence against a civil action would be extremely weak.

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AFMA FLAMMABILITY WORKSHOP
MARCH 29, 1994

EUFAC
EUROPEAN UPHOLSTERED FURNITURE ACTION COUNCIL

Before starting my presentation, first of all I wish to thank UFAC, not only for giving me the opportunity of making this presentation for you here today, but above all for all the support and assistance they have given their European colleagues to get this initiative started. Our special thanks go to Joe Ziolkowski, Joe Z, whose help has been invaluable.

My presentation contains two parts: the first tries to explain the reasons for creating EUFAC, the second how it is organised. I will try to take you through a sometimes confusing continental landscape of conflicting national positions, conflicting consumer concerns and conflicting industry interests.

Although Europe now has a voluntary furniture fire safety industry initiative similar to the one in the United States, the reasons that led to this creation were different in the United States from those in Europe.

Of course concern for the consumer safety lies at the basis of both. But where UFAC was born out of the conviction that a voluntary industry programme is more cost efficient and effective than a legislation for both consumers and industry, in Europe, EUFAC is the hopefully successful alternative to an impossible legislation.

Initially, the European furniture industry was not opposed against a legislation at all. Rather the opposite. You must realise that even now,

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although the European Union has a single market since 1993, trade barriers resulting from national technical regulations on one or the other aspect of public safety are still legio. When the United Kingdom, after the public outcry fostered by a media campaign in the Sunday newspapers, decided to change its legislation, the obvious step for the industry was to ask the Commission of the European Union to block this legislation and to substitute it with a European directive. According to certain directives, the Commission has this power. We even went as far as furnishing them with a blue print of a possible legislation which regulated the problem not only in the domestic area, but also in the public area. But the Commission did not block the U.K. legislation but let the English go ahead. Gossipers intimate that the fact that the English Commissioner Lord Cockfield was responsible for the matter had something to do with this decision, or rather absence of decision.

slide 1

Nevertheless, the Commission anounced that it would start work on a directive with as goals the elimination of trade barriers, a high level of protection, without lowering existing levels of safety and with minimum cost to industry and consumers. But they quickly realised that they face a political problem. Indeed, in the reactions on the U.K. legislation, it became very clear that most countries of the European Union would not accept a copy of this legislation at all. Germany specifically would not accept any legislation at all. An eventual directive would have to be based on the Article 100A of the European Treaty which foresees a decision by qualified majority. A disagreement of Germany, which did not want anything at all and of the U.K., where the Parliament declared that they would not accept anything but their own legislation de facto made it impossible to reach the necessary majority for what could be considered as a sensible legislation. So the administrator in charge finds what he considers as the perfect solution and he executes a manoeuvre which is called in french "la fuite en avant" the flight forward. He introduces the concept of post ignition beheavior. The English he promises a directive that attacks smoke and toxicity problems more rationally than their own as it will put separate requirements on these matters. The other countries he promises a directive with lower ignition requirements than the U.K. legislation, perhaps cigarette resistance or match resistance instead of the crib 5 ignition resistance as required for foams in the U.K. He puts this post ignition requirement in a non definable form such as escape time, the time a person should have to leave a room with a burning piece of furniture in it unharmed.

slide 2

The structure of his draft directive becomes as follows: three essential

requirements are specified, one concerning ignition, a second one concerning post ignition and a last concerning information labelling. There was discussion about adding a fourth on not using material dangerous to health or environment.
The fire retardants industry approves, fire research laboratories applaud, vendors of test apparatus jubilate: their sales boom.
The furniture industry, together with the textile industry and the latex and polyurethane foamers take stock of the changed situation and see a number of unsolvable problems.
slide 3
The ignition levels required in the domestic area eliminate the use of many fabrics and lead to a strong increase of the use of fire retardants which is not without its problems. In the other area's, the definition of the levels is very unclear as is the definition of the application area's. But the major problem is undoubtably the second essential requirement: post ignition. Not only are there no requirements defined, the concept "escape time" is so dependent on so many factors that the furniture cannot be responsible for that. The post ignition characteristics are defined in laboratories during research in many different ways, not one of which is generally accepted. The best selling test method, the cone calorymeter cannot be used by the furniture industry.
The Commission decides that all these problems can be solved in a short time and starts a series of research programmes:
slide 4
For the ignitability test methods, it writes out a CEN mandate, it also pays for pre-standardisation research on a grid system and on the higher sources. Arguments concerning health and environmental aspects of the fire retardants are examined in a separate although very minor research project. For post ignition a major research project was mounted costing serveral million ECU and called CBUF by its participants in a publicity folder. It is by the way the first time that I have seen publicity made for a research project paid for by the European Commission.
While the industry definitely profits from projects such as the examination of a grid system, a judicious choice by the Commission of the laboratories involved in the research programme to validate the cone calorymeter assures that the outcome will be positive. Similarly, the parameters for the research on health and environmental aspects of the fire retardants are set in such a way that the outcome is positive, the more so that the only industry consulted by the expert is the fire retardant industry. Influences on workers in the textile and furniture industries are excluded and not examined.

Confronted with all this, the furniture industry no longer saw any advantage in a legislation and casted out for an alternative which it found in the success of the UFAC programme here in the United States. The success of this project is confirmed by an examination of the basic risk. It is actually almost unbelievable that the whole discussion in Europe on the safety levels needed takes place in absence of statistical evidence. The only country that has fire satistics connecting upholstered furniture to fire is the United Kingdom and the information available there confirms the premises of the UFAC system: cigarette resistance is the single major problem. It may be interesting to look at this evidence in some detail.

slide 5

First of all, those statistics which come from the Home Office Fire Statistics show that while the incidence of fires involving upholstered furniture amounts to around 5000 fires out of a total of around 65000, the death toll of such fires is substantially higher than average.

slide 6

This probably has to do with the circumstances of the fires: the most frequent fires are those caused by kitchen fires (around 40% of the total fires). When this happens, the fire is quickly visible, the persons are wide awake and run out of the house. A frequent scenario for furniture fires on the other hand, is a carelessly dropped cigarette which results in a fire a substantial time lateron, often when the inhabitants of the house went to bed.

slide 7

The sources of ignition of fires due to upholstered furniture show us that cigarettes are by far the largest cause. The second largest cause is arson. Only three weeks ago, the largest insurer in France and Belgium UAP/Royale Belge in its annual report revealed results of a study that indicated that one out of three fires were caused by arson. Spaceheaters follow next. If we consider that an average of twice as many deadly fires take place in the winter months as in the summer months; it is clear that this is a cause not to be underestimated.

slide 8

It is also clear that with the exception of matches which are a minor cause, none of these ignition sources correspond or have any relation with those proposed by the Commission of the European Union in its draft proposal for a directive.

slide 9

The sources of furniture fires involving deaths show an even greater importance of the ignitions caused by cigarettes. In 1991, 70% of deathly fires involving upholstery were caused by cigarettes.

To give you an idea of the detail of these statistics, I am showing you just two tabels which contain the number of fires by item first ignitiod by ignition source and one showing the number of deaths in fires by item first ignited by ignition cause.
slide 10 & 11
So the only statistical information available in Europe very strongly supports the case of UFAC.
It is also clear that if we can eliminate the cause of ignition in all these cases, the whole post ignition concept becomes somewhat irrelevant. Specifically as it is no guarantee in any case: retarding a fire for three minutes as was proposed in an early version of the draft directive becomes completely useless if the persons are sleeping in another room.
All this information, coupled with the well documented success of UFAC has convinced the furniture industry that cigarette resistance is the appropriate safety measure.
Another reason to favour the voluntary system is that it addresses materials rather than finished pieces of furniture. The impossibility of doing even simple tests on all the actual combinations of materials used in the upholstered furniture sector is well known. Obviously this would even be more so for more complicated tests such as the cone calorymeter test, where the official price for one test is 1000 ECU, 1300 $. A pretesting of materials that can be combined in approved combinations is the only possibility. An interesting piece of information came up in the research project for a grid system which the U.E.A. coordinated. More than 5000 test on 360 different combinations were executed by 7 different laboratories. The tests used were the newly approved CEN cigarette and match resistance tests.
slide 12
In 25% of the cases, the cigarette test was not reproducible, or, in other words, the test results differed from laboratory to laboratory. If both cigarette and match test were made, the combined non reproducibility increased to 42%.
slide 13
This clearly sollicits questions on the quality of the tests, but above all it means a legal uncertitude for the manufacturer in case of contention. The UFAC approach of predicting on the bases of pretested materials pre-eliminated all these doubtfull cases so that we can seriously argue that the system is actually safer than composite testing. The accuracy of the prediction was found to be 66% and, based on the 360 combinations tested in the research programme, in not one single case a prediction was made for a combination to pass where in reality it failed.

A last reason to favour the voluntary system is that the trade barrier we initially feared with the U.K. has not realy materialised. Although it theoretically exists, the trade with the U.K. has not been influenced by their legislation. As a matter of fact import of upholstered funiture in the U.K. out performed imports of other furniture where no legislation exists.

slide 14

Summerizing the aguments that are in favour of adopting EUFAC:

slide 15

A voluntary systyem allows an immediate action, it is possible as there are no real distorsions to the trade, and it gives an alternative to a legislation. Cigarette resistance has been shown to be the real problem, this is confirmed by the success of UFAC here in the U.S., the ignition levels proposed in the EU draft have no relation to the reality, the second essential requirement is of doubtfull usefulness. A voluntary system is furhter more uncomplicated and economically feasible which is not the case with the test proposal in the directive.

So how did we organise our European equivalent of UFAC. We essentially took over the UFAC system although we adapted it to the CEN test. Manufacturers combine their materials which pass the test, or if they use fabrics which are not resistant by themselves, they have to use an interliner as shown in this schemetic presentation.

slide 16

You should have received a small brochure together with the text of this presentation in which you can find the details. The organisational aspects are somewhat more complex as we have to deal with different countries.

slide 17

Currently EUFAC has a member organsiation in nine countries and a licensee in two more. One of these is the FIRA in the United Kingdom as we felt that also our english collegues should be able to participate. An executive committe which manages the initiative contains persons such as Mr. Luebke from Germany, Mr. Roset of France and Mr. Busnelli of Italy. A hangtag with a special label was developed and internationally registered as a trade mark. You will find it also in your documentation. It contains a short statement in all languages of the European Union. A difference with the UFAC system is that we require manufacturers to attach a permanent numbered label to their qualifying furniture. The purpose of this is to make the control system more efficient.

slide 18

This control happens on three levels: first of all furniture manufacturers are checked as to their compliance with the rules; secondly, guarantees given by the suppliers are audited; and in the stores, there is a control whether hangtags and labels are not abused.
Our technical committee follows the developments both here and in Europe. Currently, a large glue manufacturers is examining the influence of glues used to fix fabrics or interliners on the foams and their possibility to act as a fire barrier.

By late spring, early summer, the first labels will start appearing in the stores. We are trying to follow the approach that was successful here and we are motivating large retailers and purchasing groups to start using the label. To name one that you all know, IKEA has already indicated its active participation.

A recent development which is important is the public outcry against fire retardants in Germany which is starting to take proportions similar to the U.K. publicity against foams a few years ago.
slide 19 & 20
Since it does not create any technical problems and as it adds an important commercial and political value to the label, our executive committee will shortly decide whether to make non use of fire retardants a requirement for obtaining the label.

On the legislative level, only France has continued with work on a project. Its current version foresees cigarette resistance for the domestic area.

Thank you for your attention. I will be happy to answer any questions you may have.

The situation

- 1988-89: U.K. & Ireland fire safety regulations domestic
  - 6 EC Member States protest
  - C.E.C. sends comments
  - Industry protests and asks for EC law
- EC starts working draft Directive with goals:
  - eliminate trade barriers
  - give high level of protection
  - without lowering existing levels of safety
  - minimum cost to industry and consumers

Solution: second essential requirement

- *scares the industry into accepting higher ignition requirements*
- *convinces the U.K. government to lower ignition requirement for domestic (crib 5 -- match)*
- *impresses the M.S. with the rationality of the Directive*

DRAFT DIRECTIVE

- *1st essential requirement*
  Ignition
  - domestic: cigarette/match
  - public: higher source (double sheet newspaper)
  - high risk: higher source (6 double sheets newspaper)
- *2nd essential requirement*
  Post-ignition: toxicity, rate of heat release, opacity, etc.
  - domestic (?3 min escape time)
  - others ?
- *3rd essential requirement*
  Information labelling
- *4th ? essential requirement*
  No dangerous substances used ?

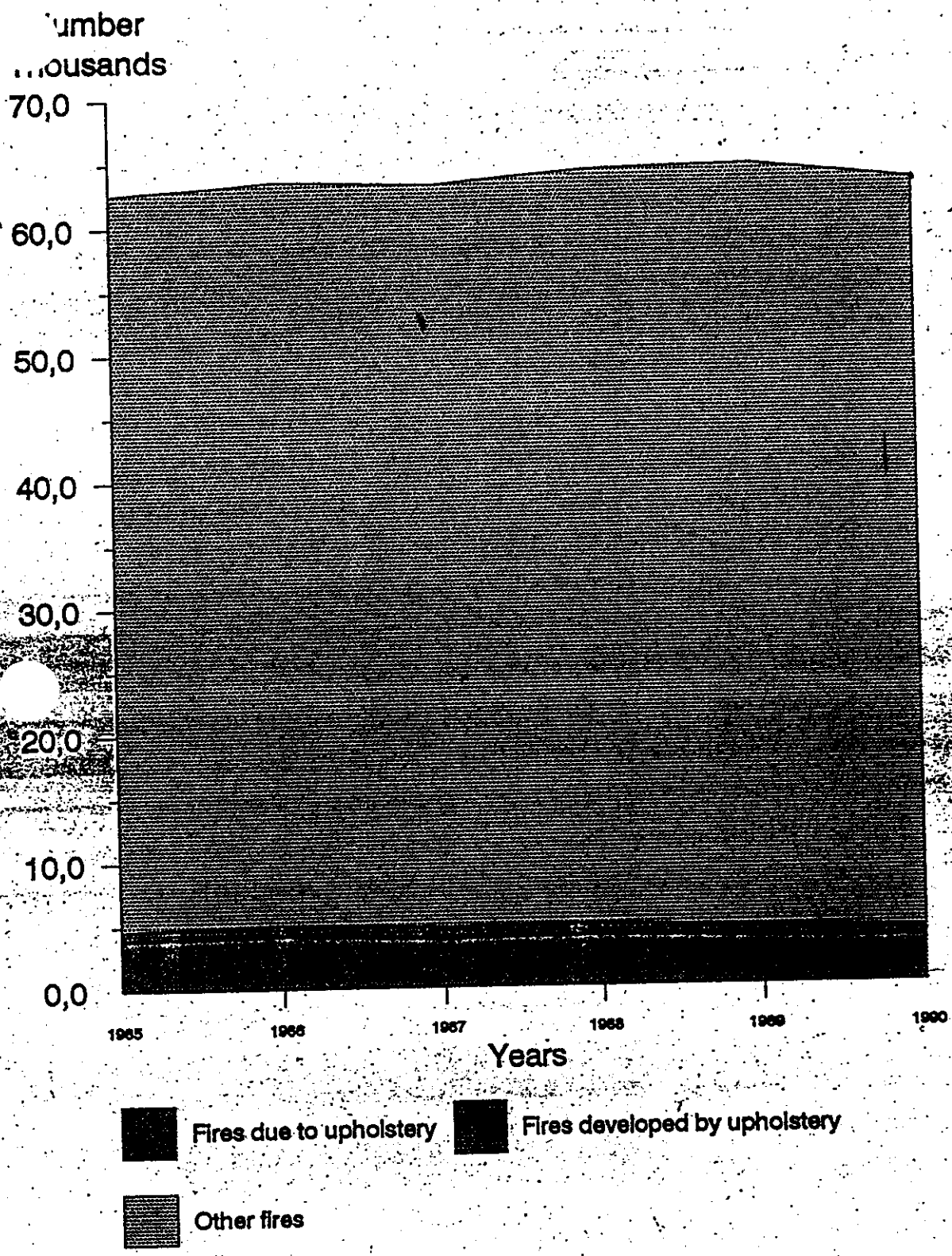
Problems with current version of draft Directive

- Ignition domestic cigarette - match
  - strong increase fire retardants health/eco problems
- Ignition public: double sheet newspaper
  - equivalent crib 5
  - elimination of use of domestic furniture in offices, reception area, foyer, etc
- high risk: 6 double sheet newspaper (crib 7)
  - definition of high risk, f.i. hospitals, etc.
- Post ignition:
  - no requirements defined, escape time ?
  - no test method generally accepted
  - most widespread test method unusable by the furniture industry

EC (co)funded research

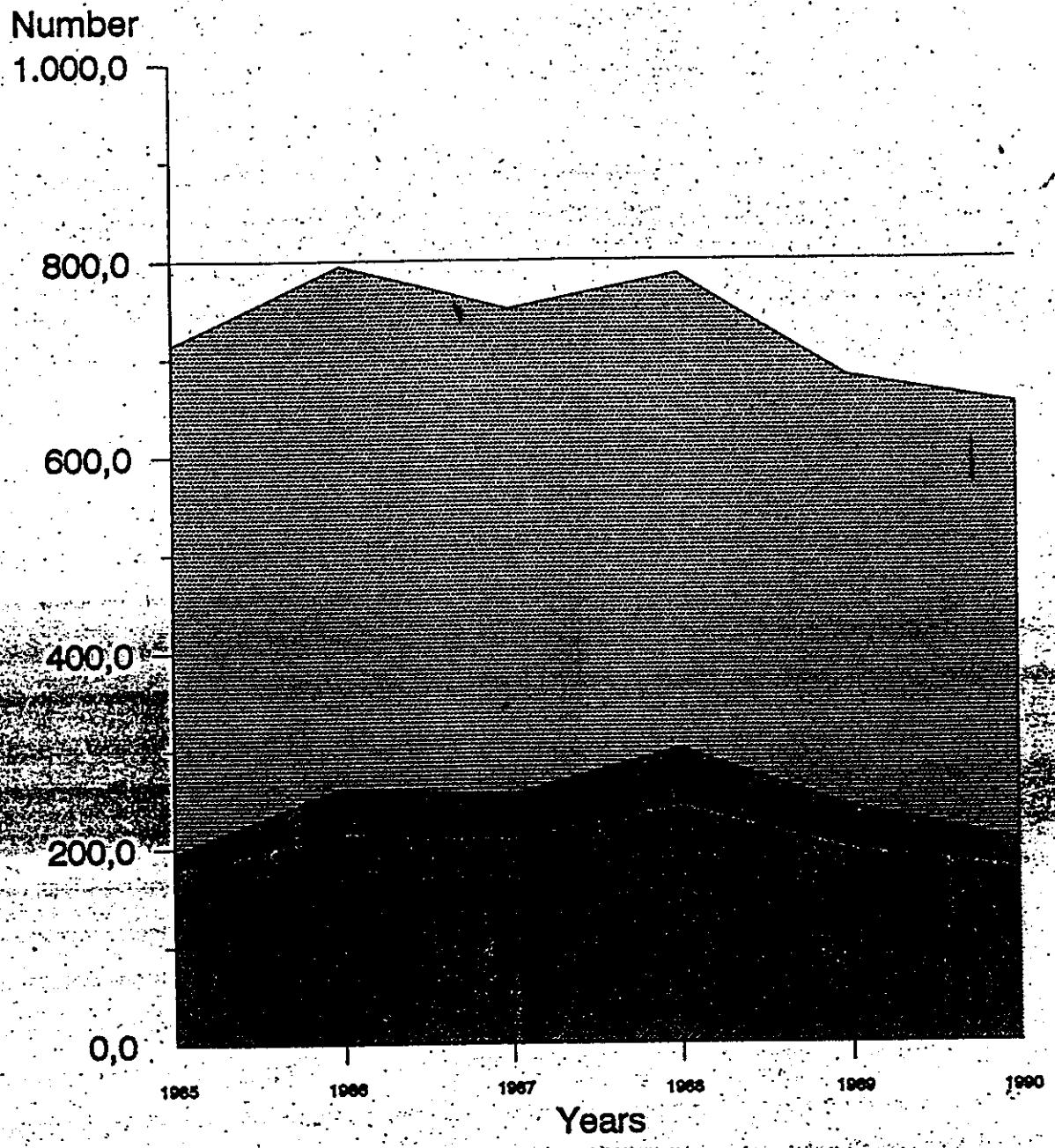
- Ignitability
  - CEN mandate for test methods: cigarette - match - larger sources
  - Pre-standardization research:
    - *grid system*
    - *sources 2 - 3.*
- Toxicity and eco-toxicity of fire retardants.
- Post ignition behavior

Total fires, fires due to upholstery & fires developed by upholstery. U.K. 1985 - 1990.



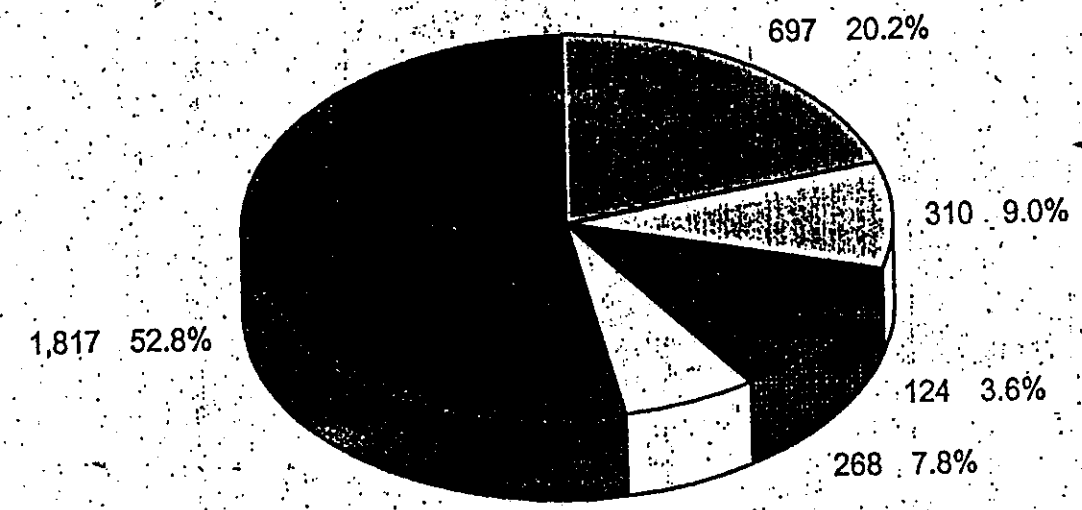
Source: Home Office (U.K.).

Deaths due to fires first ignited by upholstery, to fires developed by upholstery & other deaths. U.K. 1985-1990



Source: Home Office (U.K.).

Fires started in upholstery according to sources of ignition. United Kingdom. 1991



Source: Home Office (UK).

Table 46a Fires in dwellings and other occupied buildings by cause/source of ignition and material or item first ignited

United Kingdom 1991

Source of ignition	Total	Material or item first ignited								
		Mains gas	Petroleum	Other liquids	Clothing		Bedding[1]	Upholstery, covers	Floor coverings
					On person	Other			
Dwellings	64,061	697	607	681	74	1,738	3,223	3,456	807
Malicious	9,909	19	354	251	5	247	258	697	156
Accidental	54,152	678	253	430	69	1,491	2,965	2,759	651
Faults	9,942	489	26	170	–	115	774	11	31
Faulty wiring	3,026	35	4	3	–	22	17	2	5
Faulty blanket or bedwarmer	767	–	–	–	–	–	746	1	–
Other faults in appliances	6,149	454	22	167	–	93	11	8	26
Careless handling of smokers' materials	5,801	3	12	4	11	232	863	1,817	111
Accidents with matches	2,889	49	33	26	5	119	358	227	47
Misuse of matches	242	48	21	15	1	3	1	1	1
Playing with matches	2,204	1	11	7	2	100	322	180	31
Careless handling of matches	441	–	1	4	2	15	35	46	15
Other accidents with matches	2	–	–	–	–	1	–	–	–
Misuse of cookers	22,924	27	13	36	17	51	1	2	3
Accidents with space heaters	3,098	17	74	67	24	532	187	392	317
Misuse of space heaters	756	15	69	62	24	101	20	38	136
Placing articles too close	1,573	–	4	4	–	425	164	268	37
Other space heater accidents	769	2	1	1	–	6	3	86	144
Accidents with naked lights	1,223	6	11	11	4	68	131	98	45
Accidents with blankets or bedwarmers	432	–	–	–	–	1	403	2	–
Other	6,993	75	78	110	7	356	235	170	93
specified	850	12	6	6	1	17	13	40	4
Other occupied buildings	43,342	157	1,489	1,481	31	611	412	827	250
Malicious	14,953	10	706	374	15	226	209	399	66
Accidental	28,389	147	783	1,107	16	385	203	428	184
Faults	8,107	95	174	481	1	59	12	3	9
Faulty wiring	2,813	10	32	19	–	4	–	–	–
Faulty blanket or bedwarmer	10	–	–	–	–	–	10	–	–
Other faults in appliances	5,284	85	142	462	1	55	2	3	9
Careless handling of smokers' materials	3,285	1	13	17	7	104	125	180	29
Accidents with matches	1,991	5	45	31	3	21	23	56	10
Misuse of matches	115	5	19	15	–	3	1	–	–
Playing with matches	1,587	–	19	12	–	11	14	47	7
Careless handling of matches	281	–	7	4	3	6	8	9	3
Other accidents with matches	8	–	–	–	–	1	–	–	–
Misuse of cookers	2,093	5	3	9	1	3	–	–	2
Accidents with space heaters	918	–	86	64	–	80	11	59	25
Misuse of space heaters	320	–	79	47	–	14	3	11	10
Placing articles too close	424	–	7	6	–	65	8	44	8
Other space heater accidents	174	–	–	11	–	1	–	4	7
Accidents with naked lights	359	2	8	9	2	15	7	9	8
Accidents with blankets or bedwarmers	10	–	–	–	–	–	7	–	–
Other	10,284	37	446	447	1	95	15	101	96
Unspecified	1,342	2	8	19	1	8	3	20	5

[1] Including fires started by electric blankets where the material first ignited was reported as electrical insulation.

Summary of cumulative results of the laboratories:
Number of passed tests in % of all the tests

	Cigarette tests		Match tests	
By all labos	58.3%	Reproducibility 74.7%	52.8%	Reproducibility 77.2%
By no labo	16.4%		24.4%	
By 6 labos out of 7	6.1%	Differences 25.3%	4.7%	Differences 22.8%
By 1 labos out of 7	7.8%		6.4%	
Others	11.4%		11.7%	
Total tests	100.0%		100.0%	

Calculations: U.E.A.

Arguments EUFAC

- Voluntary system
  - ▲ Immediate action
  - ▲ No statistically noticeable trade distorsion
  - ▲ Alternative Directive
    - * Subsidiarity
    - * Undemocratic: Rules labs
- Based on cigarette resistance
  - ▲ Real problem U.K.
  - ▲ Success U.S.A.
  - ▲ Unreal ignition levels
  - ▲ 2nd essential requirement doubtful effectiveness
- Uncomplicated & easily applicable
- Economically feasible & cost efficiency
- No need for Directive
  - ▲ Legal
  - ▲ Safety
  - ▲ Emotion

EUFAC TEST METHODS

UPHOLSTERED FURNITURE

COMPONENT TEST
BASIC CONSTRUCTION CRITERIA

COMPOSITE TEST
prEN 1021-1

COVER CLASSIFICATION
EUFAC TEST A
- EUFAC CLASS I — Can be used without interliner
- EUFAC CLASS II — Must be used with approved interliner

INTERLINER
EUFAC TEST B
- + — Can be used
- − — Cannot be used

FILLING / PADDING
EUFAC TEST C
- + — Can be used
- − — Cannot be used

WOOD
EUFAC TEST D
- + — Can be used
- − — Cannot be used

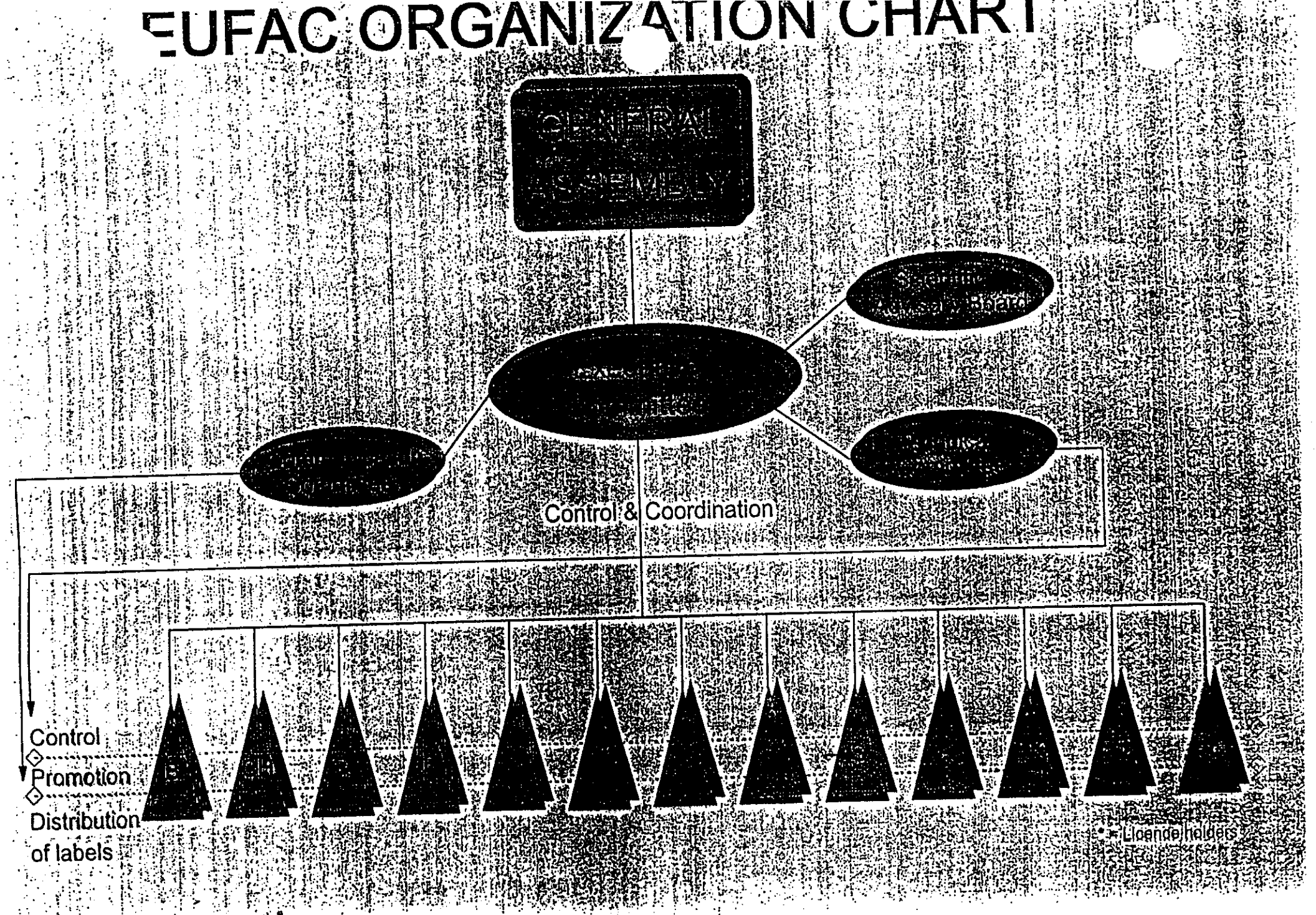
DECORATIVE TRIM
EUFAC TEST E
- + — Can be used
- − — Cannot be used

SUSPENSION
EUFAC TEST F
- + — Can be used
- − — Cannot be used

EUFAC LABEL

EUFAC LABEL

EUFAC ORGANIZATION CHART



COMPLIANCE PROCEDURES

- Random visits to manufacturers to control proper application of EU technical rules.
- Verification of guarantee given by the materials suppliers.
- Random visits to retailers to control proper use of labels and hangtags.

_ hosphor auf dem Bett

Die Flammenschutz-Richtlinie der Europäischen Union

tst. FRANKFURT. Brom, Chlor, Phosphor, Antimon – nicht gerade vertrauenerweckend klingt die Liste jener Chemikalien, die einmal in zahlreichen Polstermöbeln und Matratzen enthalten sein werden, wenn eine geplante Richtlinie der Europäischen Union (EU) durchgesetzt wird.

Dem Regelwerk liegt ein ehrenwertes Anliegen zugrunde. Schätzungsweise 3000 Menschen sterben jährlich bei Gebäudebränden, drei Viertel davon in Privatwohnungen. Deshalb sollen nach dem Entwurf der Richtlinie alle Polstermöbel und vergleichbaren Gegenstände, die auf dem europäischen Markt verkauft werden sollen, zuvor den „Streichholz-Test" bestanden haben – auch Produkte für Privathaushalte. Um das zu erreichen, muß ein Großteil der Sofas, Sessel, Matratzen, Bettauflagen und Kopfkissen mit Flammschutzmitteln behandelt werden.

gen das Vorhaben wehren sich nicht Verbraucherschützer, sondern auch die Bundesregierung, Hersteller, Händler und Gewerkschaften; sie sehen Gefahren für Umwelt und Gesundheit von Verbrauchern und Arbeitern, die Flammschutzmittel verarbeiten, falls die Richtlinie durchgesetzt wird.

„Wenn das Material altert, wird es brüchig und staubt", warnt Peter Trepte, Geschäftsführer des Verbands der deutschen Heimtextilien-Industrie. Reste der Flammschutzmittel könnten dann ungehindert durch Wohn- oder Schlafzimmer wirbeln. Zwar sei bisher nicht bekannt, ob dieser Staub wirklich gefährlich ist, aber die Vorschriften für die Verarbeitung der Mittel „lassen vermuten, daß die Substanzen nicht unbedenklich sind", wie es in einer Erklärung der Bundesregierung zu der Richtlinie heißt.

Eine weitere Gefahr: Beim Verbrennen der Flammschutzmittel entstehen giftige Dämpfe (Dioxine). „Die Polstermöbel müssen dann alle einmal als Sondermüll entsorgt werden", gibt Trepte zu bedenken; allein 22 Millionen Matratzen, die nach seinen Angaben in Europa jährlich produziert werden, landeten so auf der Sondermülldeponie.

Dabei gibt es nach Ansicht der Kritiker Möglichkeiten, das Brandrisiko auch ohne den Einsatz von Flammschutzmitteln zu verringern. So sind einige Fasern bereits von Natur aus oder durch das Verarbeitungsverfahren flammenfest, zum Beispiel Wolle.

Mehrere Verbände der europäischen Möbelindustrie haben jetzt einen Kompromißvorschlag gemacht. Auf den Möbelmessen von Köln und Paris haben die Hersteller eine freiwillige Etikettierung vorgeschlagen: Diejenigen Produkte sollen mit einem Signet ausgestattet werden, die den „Zigarettentest" bestanden haben. Dieser ist weniger streng als der für die EU-Richtlinie vorgesehene „Streichholztest"; ihn bestehen die Produkte zum großen Teil auch ohne den Einsatz von bedenklichen Chemikalien.

Für Verbandsgeschäftsführer Trepte steht hinter dem Entwurf der EU-Richtlinie vor allem eines: die Lobby der britischen Flammschutzmittelindustrie. Aus England nämlich kommt die Initiative zu der Richtlinie. Um alle Polstermöbel in Europa auszurüsten, würden jährlich 10 000 Tonnen Flammschutzmittel benötigt, schätzt Trepte.

Beelzebub im Bett

Nach einer EU-Richtlinie sollen Polstermöbel künftig mit brandabweisenden Chemikalien bearbeitet werden – Experten warnen vor gefährlichen Ausgasungen.

Die Toxikologen halten den Stoff für etwa so giftig wie Arsen: Schon eine Messerspitze des Halbmetalles Antimon (chemisches Zeichen Sb) führt zu Erbrechen, Durchfall, Kollaps und Leberschäden.

Wenn Antimon-Verbindungen an Staubkörnern haften, können kleinste Partikel eitrige Entzündungen an Augen- und Nasenschleimhäuten auslösen. Die bundesweite „MAK-Werte-Liste gesundheitsschädlicher Arbeitsstoffe"

eue Halle zum iebzigsten«

Das Großhandelshaus Ger- d Bock in Aachen bestand im gangenen November siebzig re; aus diesem Anlaß wurde die neue 1400 Quadratmeter große Lagerhalle auch „offiziell eingeweiht". Der Kunstförderpreis des Landes Nordrhein-Westfalen, den Architekt *Horst Fischer* für den Umbau des Kundenberatungszentrums von Bock bereits 1991 verliehen bekam, war Ansporn und Maßstab für den Neubau. Nicht nur von der Architektur her sucht die Halle im Industriegebiet „Grüner Weg" ihresgleichen, sondern sie erfüllt auch hohe ökologische und umweltschutzrelevante Ansprüche. Beim Bau wurde streng darauf geachtet, möglichst wenig Bodenoberfläche zu versiegeln. Eine nicht geforderte Maßnahme war die Erstellung eines 1,5 Millionen Liter fassenden Löschwasser-Rückhaltebeckens. Durch den neu gewonnenen Platz konnte jetzt ein großzügiges Farbmischzentrum mit integriertem Farbdesignstudio auf 200 Quadratmeter installiert werden. Der Servicebereich für Maschinen und Werkzeuge ist auf das Fünffache gewachsen.

VERBÄNDE & ORGANISATIONEN: BERICHTE · BILDER · NOTIZEN

randverhalten von Möbelstoffen in Privaträumen

Ein Verbraucherschutz, der weiteren Sondermüll produzieren würde

Nd-Gespräch im Verband der Deutschen Heimtextilien-Industrie mit Peter Trepte und ürgen Hoeltz

ehe. Wehren sich nicht nur die deutsche öbelstoffindustrie, sondern mit ihr auch die olstermöbelindustrie, die Gewerkschaft Textil-ekleidung und die Verbraucherzentrale Nordrhein-estfalen gegen die von der EG-Kommission jetzt ieder neu bekundete Absicht, eine nach Meinung on Experten unsinnige und schädliche Regel für as Brandverhalten von Polstermöbelstoffen in rivaträumen einzuführen. Die bwd-Redaktion sah ich bei ihrem Gespräch mit Verbandsgeschäftsihrer Peter Trepte und Jürgen Hoeltz, Sprecher der achgruppe Möbelstoffe, der Erkenntnis konfrontiert, aß in Brüssel offenbar manches tatsächlich so vor ich geht, wie es sich der sprichwörtliche kleine loritz vorstellt.

bwd: Achtzig Prozent aller in Westeuropa hergestellten Polstermöbelstoffe gehen in den Privatbereich, wie wir hier hörten. Um zu verstehen, mit welchen offenbar vom „Grünen Tisch" aus formulierten Regeln, die weitgehend Sach- und Fachkenntnis vermissen lasse mündige Bürger lernen bedacht werden soll, sollten wir noch einmal die Vorgeschichte kurz skizzieren.

Trepte: Es fing damit an, daß es in der Neujahrsnacht von 1987 auf 1988 in Großbritannien einige spektakuläre Wohnungsbrände gab, bei denen Menschen zu Schaden und ums Leben kamen. Das war Anlaß zu einer Verordnung, im privaten Sektor strenge Prüfungen für die Zulassung von Polstermöbeln und Matratzen einzuführen. Galt 1988 noch der Zigarettentest, so folgte ihm mit höheren Anforderungen bald der Streichholztest. 1988/89 wurde dieser in Großbritannien und in der Republik Irland Gesetz. Die EG-Kommission stand mit Blick auf die Harmonisierung vor der Aufgabe, diese Regelung entweder für alle Mitgliedsländer wieder rückgängig zu machen, oder eine eigene Verordnung zu schaffen, oder das Gesetz zu übernehmen. Man entschied sich dafür, eine eigene, auf den britischen Vorschriften basierende Regel zu erarbeiten. Das Testverfahren gilt dabei sowohl für den Möbelstoff als auch für dessen Unterpolsterung.

bwd: Weil also etwa fünf Prozent der Bevölkerung, in diesem Fall ausschließlich auf Großbritannien und Irland bezogen, in alkoholisiertem Zustand mit glimmenden Zigaretten sich und ihre Häuser anzünden, bekommen mündige Bürger in zwölf Ländern künftig ein Gesetz auferlegt, das sie nicht nur für das Verhalten anderer Menschen bestraft, sondern ihnen auch noch vermutlich gesundheitliche Schäden zufügen kann?

Trepte: Das sieht leider ganz so

Peter Trepte

Jürgen Hoeltz

A JOINT INDUSTRY UPHOLSTERY FLAMMABILITY STUDY OF THE CONE CALORIMETER AS A SCREENING TOOL.

PRESENTED AT THE "*UPHOLSTERED FURNITURE FLAMMABILITY UPDATE*", AMERICAN FURNITURE MANUFACTURERS ASSOCIATION.

GREENSBORO N.C.
MARCH 29th 1994

BY:
MARTY GURIAN
MANAGER,
TECHNICAL INFORMATION SERVICES
DESIGNTEX FABRICS

AS A REPRESENTATIVE OF JOINT INDUSTRY PROJECT STEERING COMMITTEE

PURPOSE OF THE PROJECT

DEVELOP A DATABASE ON FLAMMABILITY BEHAVIOR OF COMMON FABRIC TYPES USED FOR UPHOLSTERY AND TO ASSESS THE VALUE OF THE CONE CALORIMETER LABORATORY INSTRUMENT AS A SCREENING TOOL.

PROVIDE A MORE *"WORKABLE"*, TIMELY AND LESS COSTLY ALTERNATIVE FOR EVALUATING AND POSSIBLY CERTIFYING PERFORMANCE OF AN EVER INCREASING ARRAY OF COMBINATIONS OF COMPONENTS FOR COMPLIANCE WITH CALIFORNIA TECHNICAL BULLETIN #133, IN EFFECT REDUCING THE NUMBER OF FULL CHAIR BURNS.

PARTICIPATING ORGANIZATIONS:

SSOCIATION FOR CONTRACT TEXTILES (A.C.T.)*

ECORATIVE FABRICS ASSOCIATION (D.F.A.)*

ALIFORNIA BUREAU OF HOME FURNISHINGS*

USINESS AND INSTITUTIONAL FURNITURE ASSOCIATION (BIFMA)

MERICAN TEXTILE MANUFACTURERS INSTITUTE (ATMI)

OCIETY OF PLASTICS MANUFACTURERS ASSOCIATION

OLYURETHANE FOAM ASSOCIATION

ATIONAL COTTON COUNCIL

MERICAN FURNITURE MANUFACTURERS ASSOCIATION

MERICAN FIBERS MANUFACTURERS ASSOCIATION

- SPEARHEADED PROJECT

WHO IS THE ASSOCIATION FOR CONTRACT TEXTILES AND THE DECORATIVE FABRICS ASSOCIATION?

- APPROXIMATELY 80 COMPANIES PRIMARILY CONVERTER/JOBBER TYPE COMPANIES SELLING INTERIOR FABRICS, PREDOMINANTLY UPHOLSTERY, DRAPERY, WALLCOVERING AND HEALTHCARE TEXTILES TO THE INTERIOR DESIGN INDUSTRY.
- SALES VOLUME OF ACT AND DFA MEMBERS IS ESTIMATED AT CLOSE TO $1 BILLION.
- MANY ACT AND DFA MEMBERS ARE CUSTOMERS OF AMERICAN TEXTILE MILLS AND SUPPLIERS TO AMERICAN FURNITURE MANUFACTURERS.

ASSOCIATION FOR CONTRACT TEXTILES

ARC-COM FABRICS

A. SOMMER TEXTILE COMPANY

BEN ROSE/HENDRICK TEXTILES

BRAYTON TEXTILES

BRUNSCHWIG & FILES

CORAL OF CHICAGO

DESIGNTEX FABRICS

HBF TEXTILES

J.M. LYNNE/ADAM JAMES

MA RAM/VERTICAL SURFACES

PALLAS TEXTILES

POLLACK & ASSOCIATES

RODOLPH, INC.

SOUVERAN FABRICS

UNIKA VAEV USA

STEELCASE (ASSOCIATE MEMBER)

ARCHITEX

BAKER TEXTILES

BERNHARDT TEXTILES

BRICKEL ASSOCIATES

CARNEGIE FABRICS

DEEPA TEXTILES

DOUGLASS INDUSTRIES

INTERNATIONAL FABRICS

KNOLL TEXTILES

MOMENTUM TEXTILES

PALLAS TEXTILES

ROBERT ALLEN/AMETEX CONTRACT FABRICS

SINA PEARSON TEXTILES

STRATFORD HALL

YOMA TEXTILES

DECORATIVE FABRICS ASSOCIATION

ROGER ARLINGTON, INC.

BAILEY & GRIFFIN, INC.

BASSETT MCNAB COMPANY

BARBARA BECKMANN DESIGNS, INC.

GRETCHEN BELLINGER, INC.

BERGAMO FABRICS, INC.

BLUMENTHAL, INC.

ANDRE BON, INC.

BOUSSAC OF FRANCE, INC.

BRUNSCHWIG & FILS, INC.

HENRY CALVIN FABRICS

MANUEL CANOVAS, INC.

CARLETON V. LTD.

CHINA SEAS, INC.

CLARENCE HOUSE FABRICS LTD.

CORAGGIO TEXTILES

BILL CORRY COMPANY

COWTAN & TOUT, INC.

IAN CRAWFORD LTD.

DECORATIVE FABRICS, INC.

A.L. DIAMENT & COMPANY

DONGHIA TEXTILES, INC.

DURALEE FABRICS LTD.

FIRST EDITIONS WALLCOVERINGS

FONTHILL LTD.

GALACAR & COMPANY

DAVID S. GIBSON, INC.

GLANT TEXTILES CORP.

YVES GONNET, INC.

GREEFF FABRICS, INC.

HINES & COMPANY

KIRK-BRUMMEL ASSOC., INC.

KRAVET FABRICS, INC.

KRUPNICK BROTHERS, INC.

JACK LENOR LARSEN, INC.

DONGHIA TEXTILES, INC.

LEE JOFA, INC.

CHRISTOPHER NORMAN, INC.

OLD WORLD WEAVERS

OSBORNE & LITTLE

PAYNE FABRICS

PLACE VENDOME, INC.

QUADRILLE WALLPAPERS & FABRICS, INC.

DECORATIVE FABRICS ASSOCIATION

RODOLPH, INC.

SAMARCAND SELECTIONS

F. SCHUMACHER & COMPANY

SILK DYNASTY, INC.

JACK VALENTINE, INC.

GREY WATKINS LTD.

WOODSON WALLPAPERS

CAROLYN RAY, INC.

ROSECORE HANDPRINTS

SCALAMANDRE, INC.

J. ROBERT SCOTT TEXTILES, INC.

THE TWIGS, INC.

IAN WALL LIMITED

WESTGATE FABRICS, INC.

ZIMMER & RHODE LTD.

BACKGROUND INFORMATION

- CALIFORNIA TECHNICAL BULLETIN #133 IS AN *ASSEMBLY TEST*, NOT A COMPONENT TEST.

- CURRENT TEST PROTOCOL ALLOWS *FULL CHAIR* TEST OR *MOCK-UP* CUSHION TEST, BOTH INVOLVING CONSIDERABLE EXPENSE AND TIME TO ARRANGE.

- CURRENT TEST PROTOCOL FAVORS USE OF APPROVED *STANDARD* (ALREADY APPROVED) FABRICS RATHER THAN CUSTOMER'S OWN MATERIAL (C.O.M.), WHICH MAY REQUIRE NEW TEST AND COSTLY DELAY.

- *C.O.M.* IS THE ESSENCE OF THE JOBBER/CONVERTER UPHOLSTERY BUSINESS AND PROVIDES BROAD SELECTION OF FABRICS BY SPECIFIERS.

- *CONE CALORIMETER* IS A PROMISING LABORATORY INSTRUMENT THAT PROVIDES MOST FLAMMABILITY TEST RESULTS AS FULL CHAIR TESTS, EXCEPT FURNITURE DESIGN CRITERIA, USING A SMALL ASSEMBLY OF COMPONENTS, ACCORDING TO REPUTABLE STUDIES (E.G. DUPONT, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, ETC.). RATE OF HEAT RELEASE IS WIDELY THOUGHT AS MOST IMPORTANT TEST MEASUREMENT.

- CONE CALORIMETER RESULTS IF *CORRELATE* WITH FULL CHAIR BURN TESTS, AS ANTICIPATED BY STATE OF CALIFORNIA AND OTHER TECHNICAL EXPERTS, CAN PROVIDE, A FAST LOWER COST SCREENING METHOD AND AN ADJUNCT METHOD OF *CODE COMPLIANCE*, BASED ON FULL CHAIR BURN CORRELATIONS.

PROJECT MANAGEMENT

STEERING COMMITTEE PROJECT DIRECTOR

GORDON DAMANT (INTER-CITY TESTING & CONSULTING CORPORATION OF CALIFORNIA AND RETIRED CHIEF, CALIFORNIA BHF)

ORGANIZATIONAL REPRESENTATIVES -

A.C.T. - MARTY GURIAN (DESIGNTEX)

D.F.A. - EMILY NOMER (DONGHIA FURNITURE/TEXTILES)

A.F.M.A./A.T.M.I. - HUGH TALLEY (CONSULTANT)

CONSORTIUM OF 6 ASSOCIATIONS

BIFMA - ALAN DEAN (GUILFORD OF MAINE)

COMPONENTS

(DONATED BY SUPPLIERS)

PASSIVE BARRIER

KEVLAR Z-11 2 OZ. (DUPONT)

ACTIVE BARRIER

FIREGARD F187 (SPRINGS INDUSTRIES)

117 PU FOAM

1.4 MINIMUM DENSITY (HICKORY-SPRINGS)

(LBS./CU. FT.)

CODE RED

2.8 MINIMUM DENSITY (HICKORY-SPRINGS)

(LBS./CU. FT.)

SEWING THREAD

KEVLAR ARAMID FOR Z-11

FIBERGLASS FOR F187

ZIPPERS FOR MOCK-UP CUSHIONS

NOMEX (YKK)

CONE CALORIMETER

- BID PROCESS THROUGH STATE OF CALIFORNIA (BUREAU OF HOME FURNISHINGS AND INSULATION)

  5 BIDS RECEIVED

  PROJECT AWARDED

TO OMEGA POINT LABORATORIES, ELMENDORF, TEXAS

UNDER DIRECTION OF ART GRAND, DIRECTOR OF RESEARCH, OMEGA.

CALIFORNIA TECHNICAL BULLETIN #133

FULL CHAIR TEST

- PROVIDED AT NO CHARGE BY STATE OF CALIFORNIA BUREAU OF HOME FURNISHINGS AND INSULATION UNDER DIRECTION OF SAID NURBAKHSH, TEST ENGINEER.

- ALSO ALL SERVICES REQUIRED FOR ANALYSIS OF FABRICS AND COMPONENTS PROVIDED FOR STUDY AND COORDINATION OF MAKE-UP OF MOCK-UP CUSHIONS FOR FULL CHAIR TESTS PROVIDED BY THE CALIFORNIA BHF.

A.C.T./D.F.A. FABRIC SURVEY RESULTS			ACTUAL FABRIC TESTED (ANALYZED BY CALIFORNIA BUREAU OF H.F.)		
CATEGORY BY FABRIC COMPOSITION	WEIGHT RANGE (OZ./54" YD)	RESPONSES	FABRIC COMPOSITION	WEIGHT (OZ./54" YD)	% BACKCOATING
1. 100% Cellulosic	10-20	46	100% COTTON	13.4	0.0
2. 100% Wool	15-24	45	100% Wool	17.0	0.0
3. 100% Cellulosic	20-30	35	51% Cotton/ 49% Polyester	20.1	0.0
4. 50%+ Cellulosic/ Polyester	14-23	35	59% Cotton/ 41% Polyester	18.1	15.0
5. 50%+ Wool or Mohair/ Cellulosic	16-30	32	58% Mohair/ 42% Cotton	22.3	0.0
6. 50%+ Wool/Nylon	13-20	30	58% Wool/ 42% Nylon	17.5	0.0
7. 100% Silk	8-20	30	100% Silk	8.2	0.0
8. 50%+ Cellulosic/Wool	14-21	29	73% Cotton/ 27% Wool	16.2	0.0
9. 100% Inherently Flame Retardant Polyester	11-19	25	100% Inherently Flame Retardant Polyester	12.7	0.0
10. 100% Nylon	14-19	24	100% Nylon	14.7	15.0
11. 50%+ Silk/Cellulosic	15-20	23	51% Silk/ 49% Cotton	16.2	0.0
12. 50%+ Cellulosic/Nylon	16-25	21	58% Cotton/ 42% Nylon	10.5	0.0
13. 50%+ Modacrylic/Nylon	15-22	17	75% Modacrylic/ 25% Nylon	16.9	15.8
14. Leather	27-68	18	100% Leather	32	0.0
15. 50%+ Wool/Polyester	16-20	14	83% Wool/ 17% Polyester	16.1	0.0
16. 100% Polyester	14-20	13	100% Polyester	12.7	0.0

CATEGORY BY FABRIC COMPOSI	WEIGHT RANGE (OZ./54" YD)	RESPONSES	FABRIC COMPOSITION	WEIGHT (OZ./54" YD)	% BACK NG
17. 100% Polyolefin	11-16	10	100% Polyolefin	14.8	9.9
18. 100% Polyolefin	16-20	10	100% Polyolefin	19.8	11.4
19. 100% PVC	15-40	9	87% PVC/13% Polyester	37.3	0.0
20. 100% Nylon	19-25	9	100% Nylon	19.3	7.6
21. 50%+ Cellulosic/Wool	to 38	4	64% Cotton/ 36% Wool	27.6	0.0
22. 50%+ Cellulosic/Silk	10-30	3	66% Cotton/ 34% Silk	9.7	0.0
23. 50%+ Silk/Polyester	12-20	2	70% Silk/ 30% Polyester	16.2	0.0
24. 100% Wool	to 35	2	100% Wool	30.2	0.0
25. 50%+ Wool/Modacrylic	to 35	2	85% Wool/ 15% Modacrylic	26.1	0.0
26. 50%+ Nylon/Polyester	-	2	79% Nylon/ 21% Polyester	14.2	15.6

CONE CALORIMETER TESTS

TEST MATRIX					
FABRIC CATEGORY		SUBSTRATE - NO BARRIER		SUBSTRATE BARRIER A	SUBSTRATE BARRIER B
COMPOSITION	WEIGHT OZ/LIN. YD.	INERT	CODE RED	117 PU	117 PU
100% Cellulosic	10-20				
100% Wool	15-24				

FULL CHAIR BURNS

TEST MATRIX				
FABRIC CATEGORY		SUBSTRATE - NO BARRIER	SUBSTRATE BARRIER A	SUBSTRATE BARRIER B
COMPOSITION	WEIGHT OZ/LIN. YD.	CODE RED	117 PU	117 PU
100% Cellulosic	10-20			
100% Wool	15-24			

STATUS OF PROJECT

- $45M BUDGET

  FUNDS PLEDGED FROM ORGANIZATIONS AND COLLECTION CONTINUES.

- 50% OF THE CONE CALORIMETER TESTS COMPLETED BY MARCH 18TH.
- 25% OF THE FULL CHAIR BURNS COMPLETED BY MARCH 18TH.
- ALL TEST DATA IN HAND BY MAY '94
- ANALYSIS OF DATA MAY/JUNE '94
- RE-TESTING OR REFINEMENTS JUNE '94 IF NEEDED
- PRESENTATION OF FINAL REPORT TO INDUSTRY SOMETIME IN '94 AFTER THOROUGH AND CONFIDENTIAL REVIEW
- SUBSEQUENT DECISION ON THE NEED FOR PHASE II

A FURNITURE DESIGN STUDY SUGGESTED BY BIFMA, REVIEWED, TO EVALUATE EFFECT OF FURNITURE DESIGN ON FULL CHAIR TEST RESULTS.

MARY MARTHA McNAMARA
Attorney at Law
5810 Jane Way
Alexandria, VA 22310
(703) 971-8008 • FAX (703) 971-8007

FLAMMABILITY REGULATION & LITIGATION:

DOES IT EVER END?

In 1977, when I joined the staff of the Chairman of the Consumer
duct Safety Commission (CPSC), I endured long nights of passionate debates
ut upholstered furniture flammability. Commissioner Pittle, the engineer, was
mar hat the furniture industry could manufacture upholstery that was resistant
ig ignition. Chairman Byington was obstinate in his belief that a
idat y flammability standard for upholstered furniture would be cost prohibitive.
her one ever won the debate. Seventeen years later, only Bill Clinton has long
its of passionate debate but the issue of upholstered furniture flammability
ains.

Recently, the debate flared again when the National Association of
e Fire Marshals (NASFM) petitioned the CPSC to mandate a flammability
idard for upholstered furniture based on the requirements of California
hnical Bulletin (TB) 116, 177 and 133. The AFMA and UFAC submitted
iments opposing the petition. My purpose today is to discuss these comments
you and the implications the Commission's decision will have on the litigation
is area.

I. THE BACKGROUND

To better understand the current petition, it is helpful to recall the past
ory of this issue at the Commission. In 1977, the Chief of the California Bureau
lome Furnishings (BHF) petitioned the Commission to begin a rulemaking to
mulgate a flammability standard for upholstered furniture based on the
uirements of California Technical Bulletins 116 and 117. In 1980 the Los
eles Department of Fire petitioned for the same rule. During the same year, the
ı C oration petitioned the agency to develop a small, open flame test for
yur ane foam used in upholstered furniture.

In 1981, the Commissioners voted to defer any mandatory action until the agency could evaluate the effectiveness of the voluntary UFAC program. Later that year, they denied the Olin petition and in 1982 denied the petitions submitted by the California Bureau of Home Furnishings and the Los Angeles Department of Fire. During the period 1983 - 1984, the CPSC evaluated the UFAC program. Based on the results of this study, the Commission terminated its project on upholstered furniture flammability in 1986 and issued its final report on this project in 1987.

Nevertheless, in July 1992, the NASFM submitted its first petition to the Commission requesting a mandatory flammability standard for upholstered furniture based on the California standards. Because no particular relief was specified, the Commission staff characterized this petition as a request for reconsideration of the prior two petitions on the same subject. The petition was not accepted by the CPSC's General Counsel as no new or changed circumstances were demonstrated.

In April, 1993, the NASFM resubmitted its petition with the claim that it contained new information. The agency staff had difficulty ascertaining the "new" information so an exchange of correspondence ensued. It would appear that able counsel was obtained. Ultimately, the General Counsel's office accepted it and docketed the petition.

THIS IS THE PROCESS

The administrative practice at CPSC is filled with hoops which must be successfully navigated before a rule becomes final. Getting a petition docketed is simply the first hoop to jump through. When the General Counsel determines that a petition meets all the requirements of the regulations, then the Commissioners agree to expend staff resources to evaluate the petition. In a relatively new procedure adopted by the Commission, the petition is published in the Federal Register and public comments on the petition are solicited. It is in response to this invitation that the AFMA and UFAC submitted their comments.

The staff will prepare a briefing package summarizing the comments received and the results of their own research on this issue. The briefing package will contain a staff recommendation to grant or deny the petition. The Commissioners will review the package and arrive at a decision. If they decide to deny the petition, that is the end of the matter, at least until the next petition arrives.

If they decide to grant the petition, then the staff will prepare an Advance Notice of Proposed Rulemaking for publication in the Federal Register requesting public comment. Another briefing package will be prepared and the Commissioners will vote again whether to proceed with the rulemaking. If that vote is in the affirmative, then the staff will prepare a Notice of Proposed Rulemaking for the Federal Register. Comments will be solicited and yet another briefing package

b\ pared. Finally, the Commissioners must vote to promulgate a Final Rule erminate the rulemaking. Aggrieved parties have 60 days within which to appeal adverse decision to the U.S. Court of Appeals.

Throughout this process, the criteria against which the Commissioners st judge the information collected by the staff is whether upholstered furniture a home, office, or other place of assembly or accomodation presents an easonable risk of injury due to its flammability and whether a rule is reasonably cessary to eliminate or reduce the risk of injury. Moreover, if the Commission ows of a voluntary standard that would likely result in the elimination or adequate luction of the risk of injury, and that there is substantial compliance with the ndard, then the Commission must rely upon that voluntary standard and minate its rulemaking for a mandatory safety standard.

III. THE ARGUMENTS

Given those statutory requirements then, what the NASFM petition ounts to is a debate on the efficacy of the voluntary UFAC program. Of course, SFM could not put it that starkly and have its petition docketed. Rather, they had come up with "new or changed circumstances" to force the Commission to dres- his issue again. This is how they structured their argument.

A. The NASFM Petition

The NASFM utilized data from the California Fire Incidence Reporting stem (CFIRS) over the period 1980-1989 to calculate the number of deaths and uries from cigarette ignited fires in upholstered furniture in California. They then justed the data for the expansion of the California population over the last cade. They further declared that the critical measure should be the number of s and deaths on a per capita basis. Ultimately they came up with the following ures: a 64% decline in the number of upholstered furniture fire deaths in lifornia and a 72% decline in the number of upholstered furniture fire injuries in lifornia over the last decade.

Comparing these figures with those for the rest of the nation, the SFM found there to be a 25% per capita differential reduction in California fire aths and injuries as compared to the rest of the nation. It contends that the IRS data demonstrates compellingly that under the BHF regulations California s achieved a dramatic reduction in the number of deaths and injuries due to holstered furniture fires as compared to the rest of the nation. This data is the w" circumstance which should propel the CPSC to reconsider the question of ndatory federal flammability standards for upholstered furniture. The NASFM ncludes that the BHF regulations are a model for what CPSC can be expected to

achieve if it acts promptly.

NASFM does not rest its case there. It proceeds in its next breath to attack the UFAC program as suffering from "significant flaws". It claims that participation in the UFAC program is only 20% of the industry and not 60% as CPSC found. It alleges that 66% of the UFAC tagged chairs tested by CPSC failed the cigarette ignition test. Finally, it laments that failure of the Commission to remain actively involved with the UFAC program to push UFAC to address the "important work that remains to be done."

Finally, the petitioner points to recent fabric usage data that shows a "dramatic increase over the last six years in usage of cellulosic fabrics". According to NASFM, recent literature confirms research showing that a major source of the fire hazard for cellulosic fabrics is a result of the failure of producers or sellers of upholstered furniture fabrics to remove unnecessary contaminants by steps as simple as rinsing fabrics. Since these cellulosic fabrics are most prone to ignition, NASFM concludes that the hazard presented by unregulated furniture is increasing and therefore federal action is warranted.

B. The UFAC/AFMA Comments

UFAC and AFMA opposed the petition. They recommended that the Commission deny it on the grounds that NASFM failed to provide the agency with sufficient data to demonstrate that the California flammability standards provide a higher level of safety to consumers than the voluntary UFAC program. They also pointed out that the NASFM data are irrelevant to the Commission's consideration of TB 133 because the data are for residential occupancies and are from a time period preceding the effective date of TB 133.

While UFAC and AFMA have long encouraged states to adopt TB 133 for certain public occupancy areas, they cautioned CPSC against considering it for residential upholstery. TB 133 complying furniture would be cost prohibitive for a residential consumer. Moreover, virtually no research and testing have been performed on residential furniture made to TB 133 specifications.

Next UFAC and AFMA turned to NASFM's statistical argument on behalf of TB 117. UFAC and AFMA analyzed NASFM's data and simply completed the calculations by finding the <u>average rate of change</u> in fire deaths per million per year for California and for the rest of the United States. See the enclosed tables for the data. Viewed from this perspective, it is clear that the average rate of change in fire deaths per million in California (0.073/year) is clearly not any greater or better than the average rate of change in fire deaths per million in the rest of the United States (0.193/year). This data indicates that there is no significant difference in the rate of change in fire deaths over the study period between California and the rest of the

ati Without such a difference, it cannot be maintained that the California tandard, TB 117, is more effective than the UFAC program. A regression analysis f these data confirmed that the rate of change in the United States is not any ower than the rate of change in California on a year to year basis.

Further, UFAC and AFMA pointed out that there is no need for an open-ame test as in TB 1117 because the data show that cigarette ignition remains the ajor cause of fires in upholstery. There has been no change in the percentage of re deaths caused by open flame ignition of upholstery in the United States xcluding California. The UFAC voluntary program correctly targets its efforts on ne issue of cigarette ignition of residential upholstered furniture and continues its fforts to develop construction criteria that will make upholstery materials more esistant to cigarette ignition.

UFAC and AFMA also corrected the record about fabric usage in pholstery. During the past ten years, the usage of lightweight cotton print fabrics UFAC Class I fabrics) has increased while the use of the heavier cotton velvets, laitian cotton fabrics, and duck cloth (UFAC Class II fabrics) has actually lecreased. Nor is washing cotton fabrics to remove the contaminants a viable pproach to improving the ignition characteristics of cotton fabrics. Washing auses the fabrics to loose their aesthetic qualities and it is not a permanent olu Normal use in a household will reintroduce the contaminants back into the c

In concluding their comments, UFAC and AFMA pointed out that uccesses of the UFAC voluntary program. CPSC's own data verify that UFAC onstructed upholstered furniture is resistant to cigarette ignition. In the CPSC testin eferenced by NASFM, cigarette ignitions of upholstered furniture were reduced rom 55.6% to 10%. The UFAC program has several advantages over TB 117. The pholstered furniture products of the small, medium, and large UFAC participating anufacturers constitute the vast majority of the dollar volume of all the pholstered furniture sold in the United States. It features a compliance verification rogram that requires participants to submit UFAC materials to an independent hird party laboratory for testing annually. Its Technical Committee meets regularly o facilitate technical innovation through research and testing. The education of oth consumer and industry sectors is an integral part of the UFAC program. Last, ut not least, the value of the UFAC program has been recognized internationally. anada and eleven European Community Countries have adopted the UFAC rogram. It is anticipated that Mexico will join the list by the end of the year.

IV. THE PROSPECTS

The Commission staff expects to have a briefing package to the Commissioners by April. Normally, that would indicate that a decision could be

expected within a few weeks. However, there is a new Chairman, Ann Brown, who was just sworn in on March 10. Therefore, it is possible that she will ask for a delay in the consideration of the issue until she has had more time to familiarize herself with the issue.

Other events could affect the outcome of the vote on the petition. Interestingly, the Chairman has announced that a fire safe cigarette is one of her priorities. She is reported to have met with Mr. Moakley, the sponsor of H.R. 3885, "The Fire Safe Cigarette Act of 1994" and endorsed his bill. H. R. 3885 would give the CPSC the regulatory authority to develop a standard for a fire safe cigarette.

At the same time, the Department of Justice initiated an investigation into whether tobacco companies illegally agreed not to produce or sell self-extinguishing cigarettes. Finally, the focus seemingly has turned from upholstered furniture to cigarettes. Hopefully, the solution to the cigarette ignition of upholstered furniture will be found in the fire safe cigarette.

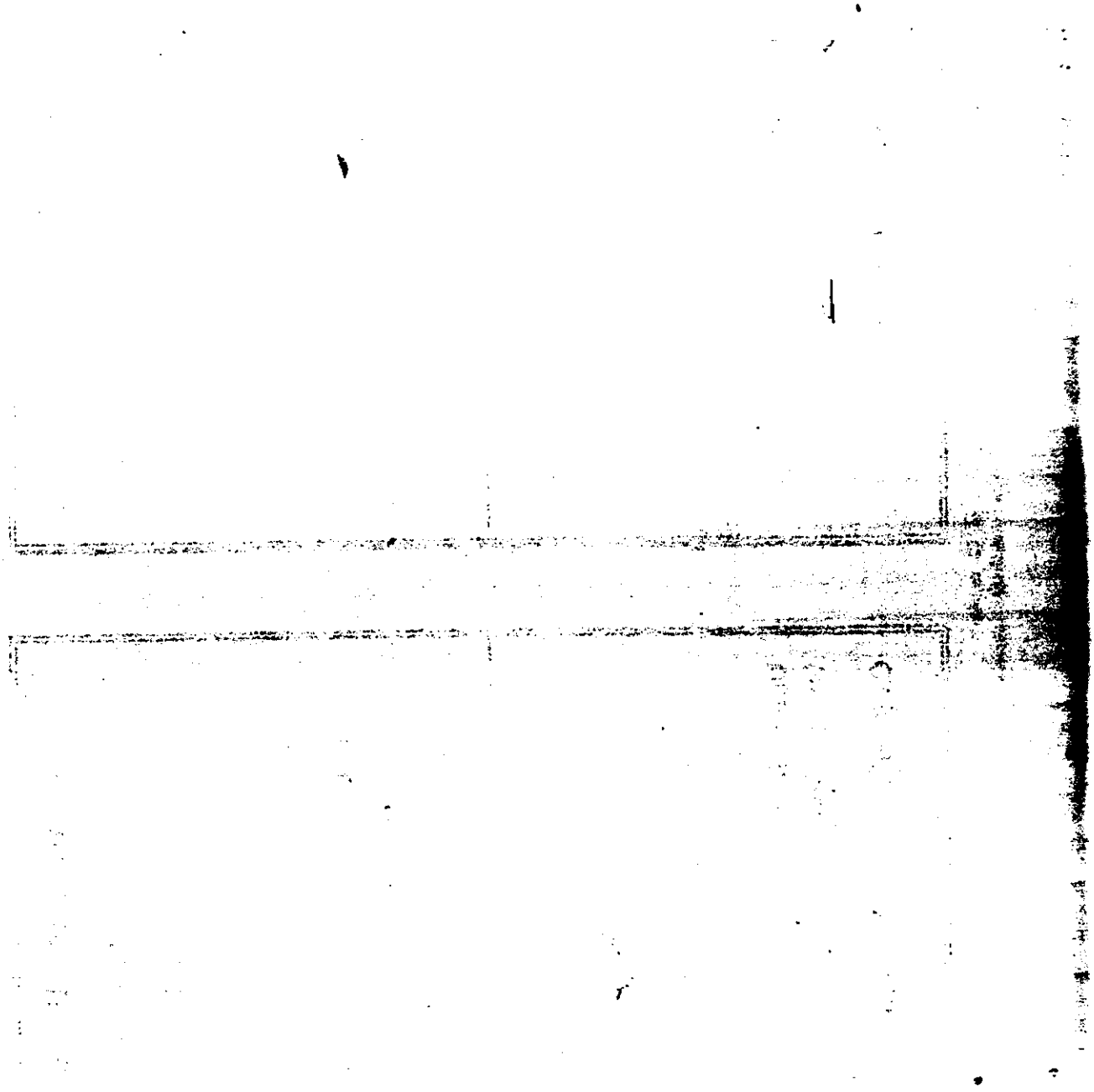
V. THE IMPACT ON LITIGATION

The good news is if the Commission denies the NASFM petition and continues to rely upon the voluntary UFAC program. The bad news is that decision will force furniture manufacturers to assume more responsibility for the defense of their products in the event of a lawsuit. Rather than having a federal mandatory standard to rely upon, the manufacturer must act in his own defense. He can best do this by participating in the UFAC program. The manufacturer should make sure that his product complies with all UFAC construction criteria. As a participant, he should assiduously check to insure that his component suppliers have provided him with current certifications. He should keep these certifications in a file as well as the annual results of the UFAC verification tests. The manufacturer should buy UFAC hangtags and make sure that they are placed on the upholstery. He should encourage his customers to keep the hangtag affixed to the product so that it reaches the consumer in the home.

More troubling from a defense point of view are the assertions by Gordon Damant and other so called expert witnesses that TB 117 foam allows more egress time in the event of a fire than conventional foam. To date these statements have not been challenged despite the fact that there is no basis in the literature to support them. It will be important for the furniture industry to support research in this area and have the results of that research published. Likewise, if any of you in the audience have done work in the area of upholstered furniture flammability, I urge you to have it published. We have to be just as aggressive as the trial lawyers in getting out the facts on this issue.

Thank you for this opportunity to speak with you today. I will be happy

ans any questions that you might have.



-NASFM'S TABLE 1

CHANGE IN FIRE DEATH RATES
(1980-1989)
CALIFORNIA VS. REST OF
THE UNITED STATES

Upholstered Furniture Ignition by Cigarettes
in Residential Structures

DEATHS (per million population)

	1980	1989	% Change
United States (except California)	4.97	3.04	-39%
California	1.14	.41	-64%

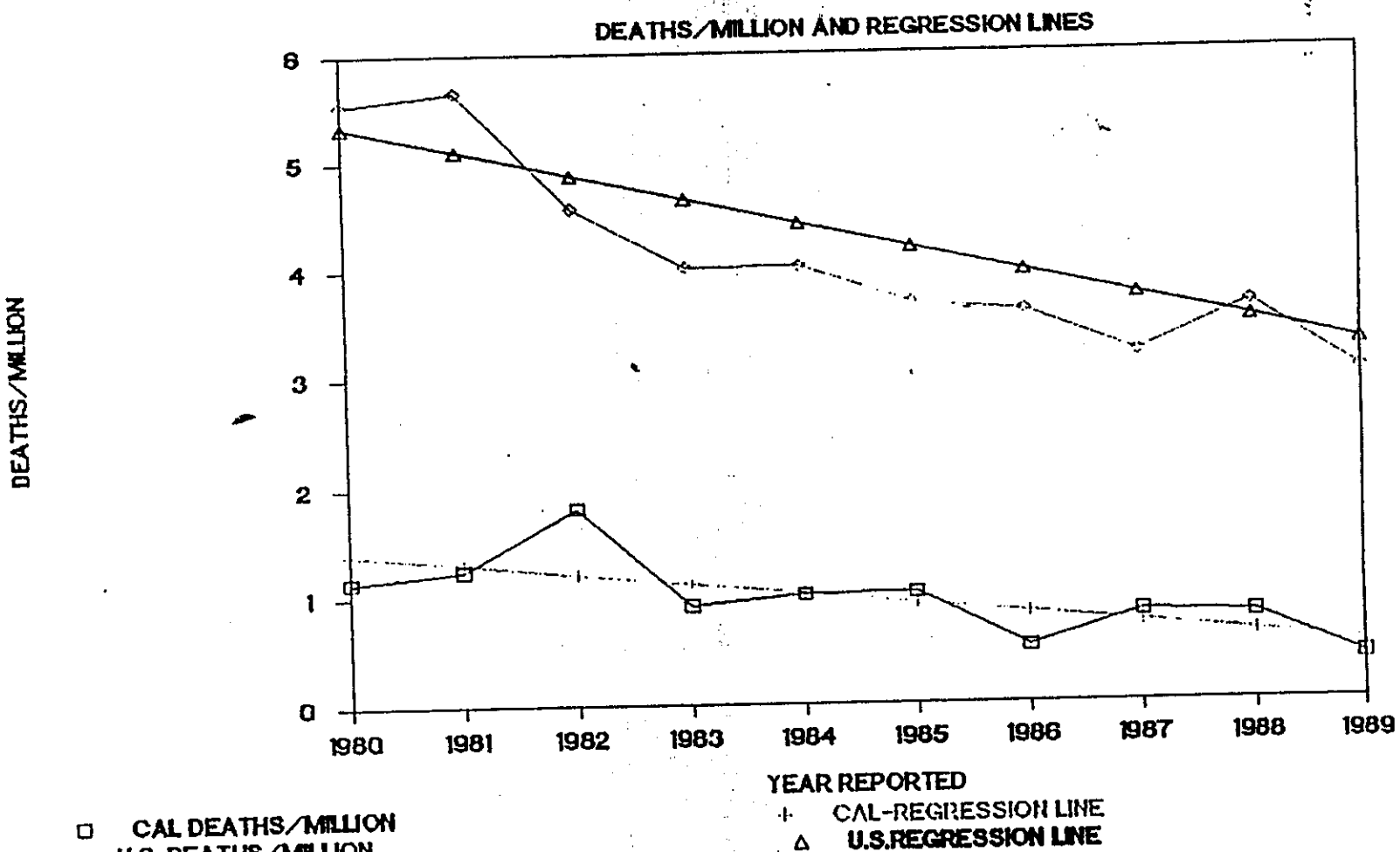
UFAC'S TABLE 2

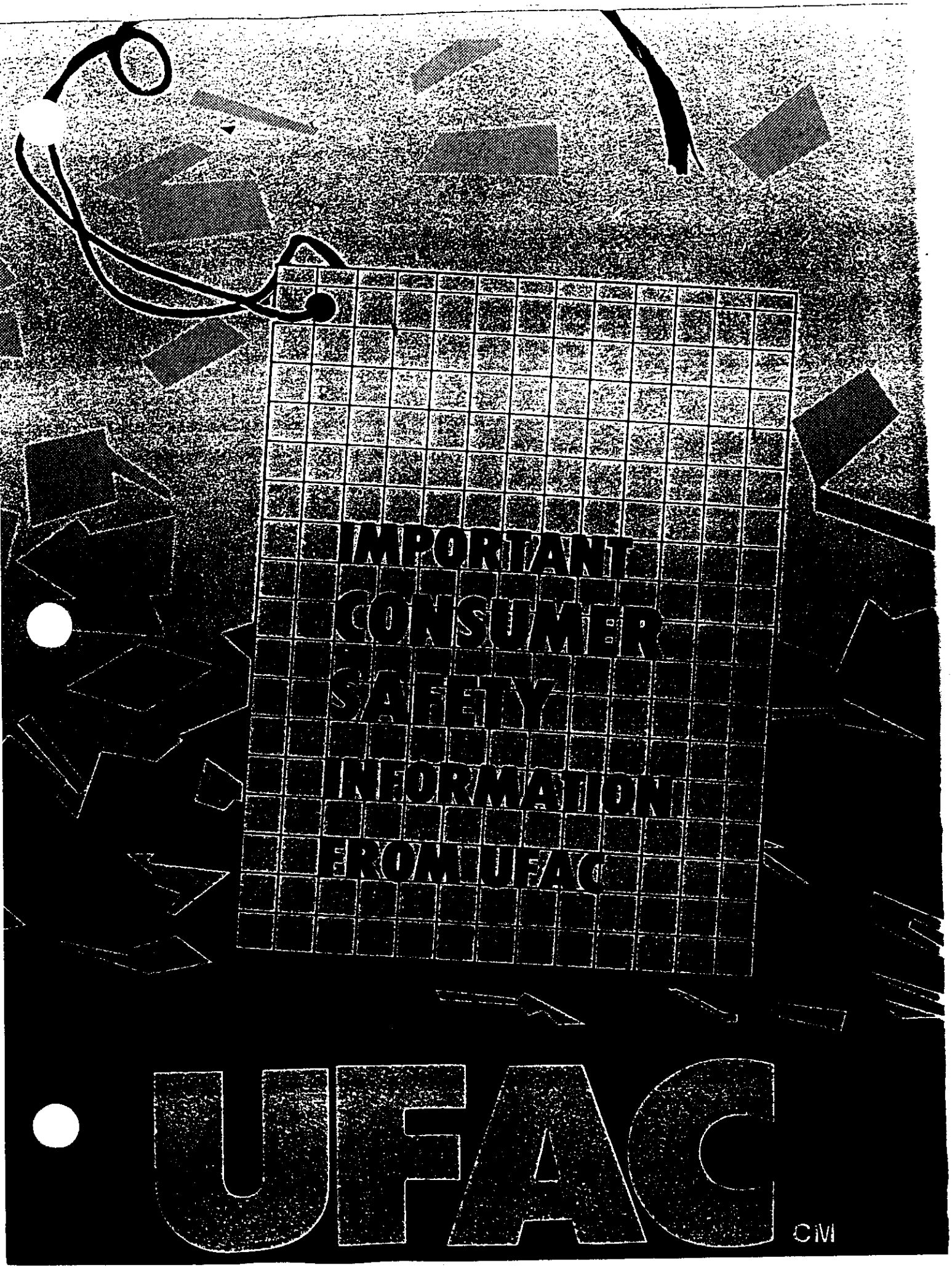
CHANGE IN FIRE DEATH RATES
(1980-1989)
CALIFORNIA VS. REST OF
THE UNITED STATES

Upholstered Furniture Ignition by Cigarettes
in Residential Structures

	Change in Deaths/Million (1980-1989)	Average Rate of Change in Deaths/ Million/Year
United States (except California)	1.93	0.193
California	0.73	0.073

GRAPH 2 CALIFORNIA VERSUS REST OF U.S.




IMPORTANT
CONSUMER
SAFETY
INFORMATION
FROM UFAC
UFAC
CIM

UFAC™

The Action Guide

Understanding your role in making our voluntary safety program work.

UFAC, The Upholstered Furniture Action Council is an association of furniture manufacturers, retailers, and suppliers organized for the purpose of [illegible] ongoing research into more cigarette resistant upholstering methods and encouraging voluntary compliance throughout the industry. For further information contact: UFAC (shipping address) 223 South Wrenn Street, High Point, NC 27260 (mailing address) Box 2436, High Point, NC 27261.
Telephone 919-885-5065. FAX 919-884-5803.

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Q&A What Is the Furniture Flammability Issue?

The increased focus on fires in the home and in public buildings has caused concern in the private sector and in government. Many studies have been made to identify the ways that fires start, how they can be prevented and how consumers can be warned in time to go to safety. A behavorial problem, lighted cigarettes left on upholstered furniture was found to be one of the most common causes of fire.

Although the furniture industry feels that its major charge is to produce furniture for the home that is visually attractive, comfortable and serviceable, we have answered the call of the Consumer Product Safety Commission, a federal agency, to find construction methods that will make upholstered furniture more resistant to cigarettes.

During the past twenty years, the furniture industry working through UFAC, the Upholstered Furniture Action Council, has invested millions of dollars and thousands of hours in the search for advances in technology that will retain consumer choice of fabrics and keep furniture cost increases to a minimum.

The furniture industry and CPSC continue to work toward reducing the hazard of furniture flammability. The problem, however, is a very complex one.

Over 24 million pieces of upholstered furniture are sold annually in the United States. These pieces join, rather than replace, the estimated 350 million pieces in current use. Unlike appliances or other similar replaceable products, the arrival of new furniture in the home does not assure that existing furniture will no longer be in use.

Older furniture is recycled so its life can be extended for decades beyond its original utilization. Aging furniture is often placed in another room or a second house. After that, it is often sold or donated to a resale shop, such as the Salvation Army, or passed on to adult children living away from home. This extends the cycle to second and even third users.

The life span of furniture cannot be determined accurately, but has been calculated to average 30 years or more. Even though new furniture on the market today is significantly more cigarette resistant, this added safety factor is not present in many homes.

FECTED?

Q Who Is Affected by Fires Related to Upholstered Furniture?

A We all are. Whether there is a fire in our own home, smoke damage from a fire in the apartment next door, or an increase in home insurance premiums to pay for the rising costs of coverage.

Although three-fourths of adult Americans do not smoke, smoldering cigarettes are the most common cause of home fires. Experts identify high-risk smokers as: 1) the elderly, infirm, and disabled; 2) those who abuse alcohol, medicinal or recreational drugs, and 3) the very poor. Studies by CPSC found that most victims were asleep at the time of their injury. Data also indicates that a high percentage of the victims were partially incapacitated by alcohol, drugs, or infirmity associated with illness or old age.

Careless smokers place not only themselves in jeopardy but also the other inhabitants of the home and all the family's possessions. This high-risk group of smokers must realize that the way to avoid the major fire peril in the home is to eliminate careless cigarette smoking.

Smokers and nonsmokers alike should install smoke detectors in [illegible] The Canadian government found smoke detectors to be 35 percent effective in giving the first warning of a home fire. This early warning can provide valuable time in which a family can execute a prearranged escape plan. Fire officials also encourage families to practice using escape routes at night. Families should rendezvous at a predetermined place where members can assure themselves that everyone is safely out of the house.

Consumers also need to learn about recent advances in upholstered furniture construction which have made it more cigarette resistant. This safer furniture carries a different hangtag on the retail sales floor.

Changes in furniture construction, press and consumer education, as well as the increased use of smoke detectors have all contributed to a 44% decline in upholstered furniture fires started by burning cigarettes. These figures are based on data from the National Fire Protection Association and the United States Fire Administration for years 1978-1989.

Q. How Has Furniture Flammability Become a National Issue?

A. The Flammable Fabrics Act, which primarily regulates wearing apparel and home textiles, was passed by Congress in 1952. In 1967, the law was extended to include other products which conceivably might constitute an unreasonable flammability risk to the American public. Interior furnishings was named as such a product.

In November, 1972, the Department of Commerce published in the *Federal Register* a "Notice of Finding that a Flammability Standard or Other Regulation May Be Needed and Institution of Proceedings for Upholstered Furniture." The National Bureau of Standards then began work on a proposed standard.

When the Consumer Product Safety Commission (CPSC) came into being in 1973, this government agency became the administrator of the Flammable Fabrics Act. In 1976, a "Proposed Standard for the Flammability (Cigarette Ignition Resistance) of Upholstered Furniture, FFF6-76" was drafted for the CPSC. Following revisions, it was submitted in 1978 with a staff recommendation that it be published in the *Federal Register*.

This action would have produced a mandatory federal standard which would have:

- Reduced consumer choice of fabric, virtually eliminating the use of fabrics made from natural fibers like cotton, silk, and linen as well as rayon.
- Substantially raised the wholesale and retail cost of upholstered furniture.
- Required taxpayers to bear the cost of testing, record keeping and compliance.
- Threatened the existence of small manufacturers who form the majority of companies in the industry as they have limited personnel and no laboratory facilities.

The most conservative projection from the CPSC indicated that upholstery prices would increase from 20 to 60 percent at retail depending on the size of the manufacturing company. Yet even these increased costs would not produce completely reliable technology and testing methods which would assure full protection from smoldering cigarettes.

Q. How Has the Furniture Industry Responded to This Challenge?

A. The upholstered furniture industry strongly opposed the concept of a mandatory federal standard and formed the Upholstered Furniture Action Council (UFAC) in 1974 to focus on this problem. UFAC, along with industry leaders, worked to develop and implement a voluntary industry program which would be just as effective as the proposed CPSC standard at a fraction of the cost.

CPSC estimated for its proposed mandatory standard a factory cost of $145 million annually. UFAC placed the real cost of the mandatory program at closer to $1.3 billion at retail in its first year of operation. We estimated that our voluntary program would cost only $75 million per year at retail.

UFAC and CPSC share the common goal of making upholstered furniture safer. The CPSC, however, assumed that it was reasonable and economically feasible to produce upholstered furniture which would be totally resistant to cigarette ignition. UFAC's position is that this goal is impossible to achieve under today's technical and economic conditions.

Faced with the choice of either totally cigarette-resistant upholstered furniture in the near future, UFAC had to come up with an alternative. Our voluntary program was designed to make upholstered furniture as safe from cigarette ignition as the industry knew how to do and could afford to do under current technological, economic and competitive conditions.

The concept of the UFAC voluntary program was first presented to the CPSC in September, 1977, and was fully operational in April, 1979. It is the result of extensive research and testing which has led to a system of fabric classifications and furniture construction methods which dramatically improve the ability of upholstered furniture to resist ignition by a burning cigarette.

The UFAC program is designed to:

- Be cost effective
- Retain designer and consumer choice of fabric
- Keep furniture cost increases to a minimum level
- Eliminate the need for the taxpayer to bear the costs of another government regulation and its enforcement

Several times since the beginning of its voluntary program, UFAC continuously reevaluates its criteria and revises to recommendations as improved furniture materials become available.

Following lengthy debate of the UFAC program and the review of the UFAC criteria and test methods by the CPSC, the Commission unanimously agreed in November, 1979, to defer regulatory action. The CPSC also voted to monitor the progress of the UFAC voluntary program.

CURRENT STATUS OF THE UFAC PROGRAM

The UFAC program is now the most successful voluntary product safety program in the United States. It has been cited as the outstanding model for future efforts to reduce mandatory government regulation through voluntary industry programs.

By the end of 1988, UFAC reported that 91 percent of the United States furniture market is pledged to compliance with UFAC. UFAC continues to work toward cost-effective improvements in its program. The UFAC Laboratory Alliance, a group of test facilities in the upholstered furniture industry, has been formed to evaluate new products and processes which might reduce the cigarette ignition potential and provide an extra measure of resistance for upholstered furniture.

UFAC INFORMATION AVAILABLE TO INDUSTRY

1. UFAC, The Action Guide - This booklet.
2. Directory of Materials Suppliers - companies who have certified that their products meet UFAC test criteria.
3. Honor Roll of Manufacturers - who are committed to use UFAC construction and place a hangtag on each piece of furniture.
4. Honor Roll of Retailers - companies pledged to purchase only UFAC-tagged upholstery.
5. "The Volunteer" - UFAC activities newsletter.
6. "Our Tag Means Business" - video cassette or slides with sound cassette, an 8 minute program available for industry training.
7. "Be A Winner" - training video for retail sales people.

Videos are available on a free loan basis or purchase.

Q. What Are the Four Parts of the UFAC Voluntary Program?

A. The UFAC voluntary action program includes four parts:

FABRIC CLASSIFICATION divides cover fabrics into two categories of ignition propensity. This rating system measures the ability of these fabrics to resist ignition when exposed to a burning cigarette.

The UFAC Fabric Classification Test Method--1990 uses a burning cigarette to test each fabric over a standard foam substrate. A burning cigarette placed on the fabric produces a length of char which determines the fabric class. Those with vertical surface char of less than 1 3/4 inches above the crevice are Class I. All other fabrics are Class II. Fabric Classification is used to determine which construction methods must be used with a given fabric in order to comply with UFAC construction criteria.

Class I fabrics may be used directly over conventional polyurethane foam anywhere in the construction of upholstered furniture. Class II fabrics require a complying barrier between the fabric cover and conventional polyurethane foam in horizontal seating surfaces, such as cushions. Safer furniture is being produced from both Class I and Class II fabrics.

CONSTRUCTION CRITERIA must be met by manufacturers in order to qualify for participation in the UFAC voluntary action program and use of the UFAC hangtag.

There now are six UFAC Construction Criteria:

1. Welt cords must meet the requirements of the UFAC Welt Cord Test Method--1990.
2. Decking substrates must meet the requirements of the UFAC Decking Materials Test Method--1990.
3. Filling material in vertical walls of the seating cavity as well as the seat, arm and back cushions, pillows and bolsters, must meet the requirements of the UFAC Filling/Padding Materials Test Method--1990, Part A or Part B. An interliner may be necessary to protect particulate filling material.
4. Interior fabric used directly beneath the exposed cover fabric must meet the requirements of the UFAC Interior Fabrics Test Method--1990.
5. A barrier which will pass the UFAC Barrier Test Method--1990 must be used between any Class II cover fabric and the horizontal surfaces of the polyurethane foam cushions.
6. Any decorative trim or edging used in a similar application as upholstery welt in seats, backs or pillows must meet the requirements of the UFAC Decorative Trim Test Method--1993.

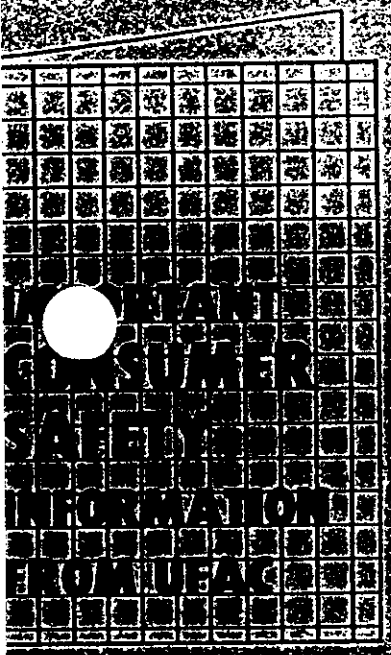
The first four requirements apply to both Class I and Class II fabrics. The fifth requirement applies to Class II fabrics only. The sixth is effective for shipments beginning July 1, 1994.

HANGTAG LABELING designates furniture which meets UFAC criteria. The gold hangtag is attached to furniture by the manufacturer, is displayed to consumers at retail locations, and is left on furniture when delivered.

The hangtag identifies this **safer** furniture to consumers at point of sale. It also warns of the dangers of ignition by a burning cigarette regardless of UFAC construction improvements.

Hangtags must be ordered from UFAC. They are protected by certification mark and copyright.

The distinctive gold UFAC hangtag, now a common sight in stores, reads:



The manufacturer of this furniture certifies that it is made in accordance with the new, improved UFAC methods, designed to reduce the likelihood of furniture fire from cigarettes. However, upholstery fires are still possible.

CLEANING INFORMATION
Caution: Never remove cushion covers even if they have zippers. Woven and Knit Fabrics: Vacuum or brush with soft bristle brush weekly. Use a professional furniture cleaning service for overall soiled condition. Vinyl: Sponge periodically with a warm, mild soapy water. Remove soapy solution with clean, damp, soft cloth. Leather: Follow furniture manufacturer's instructions.

Some materials used in upholstery, when ignited, will burn rapidly and emit toxic gases. Remember to practice careful smoking habits. For early warning, equip your home with properly placed smoke detectors and maintain them regularly.

UFAC
The Upholstered Furniture Action Council is a voluntary industry association that sponsors research into more effective methods of upholstered furniture. For further information write: UFAC, Box 2436, High Point, NC 27261

UFAC provides hangtags to the industry at a nominal cost. Revenues derived from the sale of hangtags are used only to finance the UFAC voluntary program, to fund additional research and to promote our program to the industry and consumers.

COMPLIANCE PROCEDURES are an important part of the voluntary program. UFAC carefully verifies compliance by both manufacturers and suppliers.

UFAC officials visit participating companies to observe manufacturing and tagging practices. They observe construction methods being used and recommend changes if any are necessary.

Once each year, each participating manufacturer is asked to send small samples of all complying materials to an independent laboratory for testing. Results are reported to the company and to UFAC Central. Failure to submit samples results in the manufacturer's deletion from the UFAC program.

All technical assistance from the UFAC staff is provided at no charge, subsidized by the sale of hangtags.

Q: What New Benefits Have Emerged for Companies Who Comply With the UFAC Voluntary Program?

A: Our program has two major benefits to retailers and manufacturers. THE STATE OF THE ART. By definition, because of the extensive research and testing that UFAC has done over the years, our methods and materials are the best possible "state of the art" in construction of cigarette-resistant upholstered furniture. In a product liability lawsuit, one of the best available legal defenses is for the manufacturer and the retailer to be able to say that the furniture in question was built to the "state of the art" at the time of its construction.

A WARNING. If there is a hazard associated with any product, its manufacturer and sellers have a legal duty to warn the ultimate user, in order that the user may be aware and take proper precautions. The wording of our hangtag conveys a warning, telling the customer that "upholstery fires are still possible." Having been warned, the customer's duty is to use the product accordingly and protect himself. Our warning is coupled with a positive message. It tells the customer that the manufacturer has taken steps to reduce the possibility of cigarette ignition and encourages the consumer to use some discretion and exercise care.

For these two reasons, the retailer who purchases only furniture with UFAC hangtags, and the manufacturer who puts a tag on every piece, are helping protect themselves from any product liability lawsuit in which they may be involved.

Q. How Can Upholstery Manufacturers Be Sure Supplier Materials Comply With UFAC Requirements?

A. **SUPPLIER CERTIFICATION:**

Under the mandatory regulation, the CPSC would hold the upholstery manufacturer ultimately responsible for the performance of his product. Consequently, it becomes a matter of what assurance the manufacturer needs from his suppliers in order to be confident that he is using materials that are in compliance.

As purchasers, manufacturers have a right to expect suppliers to certify their materials. If they refuse, you have the alternative of buying elsewhere.

Certification may be either blanket or lot-by-lot. A certification, on company letterhead, should read somewhat as follows:

> We, the undersigned, certify that all (material to be certified) now being sold or which may hereafter be sold or delivered to (name of manufacturer) is in compliance with the construction criteria of the UFAC voluntary action program. This certification is effective until (date) _____
> signed and executed this _____ day of _____
> 19 _____, at (city, state) _____

An individual lot or shipment may be certified on its invoice as follows:

> This welt cord meets the requirements of the UFAC Welt Cord Test Method
>
> or
>
> This decking material meets the requirements of the UFAC Decking Materials Test Method
>
> or
>
> This treated cotton batting meets the requirements of the UFAC Filling/Padding Materials Test Method.

In the absence of a blanket certification, it is recommended that certifications by lot or individual shipment appear on the invoice. In order to effect this, the manufacturer might stamp on his order the following:

> Acceptance of this order affirms that the upholstered filling materials covered by this order are in compliance with the construction criteria of the UFAC voluntary action program.
>
> or
>
> Confirmation of this certification must appear on the invoice covering shipment of the upholstery filling materials covered by this order.
>
> or
>
> This upholstery fabric is UFAC Class I (or Class II) according to the UFAC Fabric Classification Test Method.

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How Does the UFAC Program Affect The Furniture Industry?

Manufacturers, suppliers, and retailers in the upholstered furniture industry are working together to increase participation in the UFAC voluntary program and to continue to improve the cigarette ignition resistance of upholstered furniture. Their efforts stem from industry loyalty, the extremely competitive nature of the marketplace, and concern for consumers.

MANUFACTURERS:

There are more than 2,200 manufacturers of upholstered furniture in the United States. Most of these companies are small, regional producers. There are few national manufacturers with coast-to-coast distribution. About 80 percent of all these companies employ 25 employees or less, so this is not an industry of "giants."

Manufacturing of upholstered furniture requires manual skills since there is virtually no automation in this industry. It remains a fashion and craft industry which, during the past three years, produced an average of 24 million pieces of upholstery annually. This amounted to approximately $12.5 billion in annual retail sales.

Today, companies representing approximately 91 percent of the upholstered furniture dollar volume have pledged to conform to UFAC criteria. These manufacturers are committed to reducing the hazards of cigarette ignition of their products by adopting all elements of the UFAC voluntary program.

RETAILERS:

Upholstered furniture is sold to consumers through about 32,000 retail outlets including furniture stores, chain stores, warehouse showrooms and professional interior designers. In most cases, consumers may choose the fabric they want and have furniture "custom made" in the sense that the furniture style will be manufactured with fabrics selected by the consumer. Providing customers with this freedom of choice limits opportunities for mass production because each piece may be requested from a wide range of fabrics in many patterns and colors.

The National Home Furnishings Association, the organization of retail stores who sell approximately 80% of household furniture, is a strong supporter and member of UFAC. Most major furniture and department stores are pledged to purchase and sell only upholstered furniture that is manufactured according to UFAC specifications.

Retailers who support the UFAC program:

- Specify UFAC tagged furniture on all orders.
- Check to see that UFAC hangtags are on furniture when it is received and delivered.
- Make sure that hangtags are maintained on floor samples to inform consumers and reassure the CPSC.
- Explain to consumers that, while UFAC furniture is safer, care must still be exercised to avoid possible ignition from all sources.
- Build confidence and good will by showing concern for the safety of the customer's family and home.

SUPPLIERS

Manufacturers purchase their fire components from a number of suppliers: textile products, cover/padding materials, foams, barriers, interior fabric, welt cords, and fabricated cushions. There are at least 220 sources for fabrics, several hundred resources for padding materials and six major producers of welt cord. Suppliers to the industry have invested countless of time and money in the research and development of materials which would combine to prevent cigarette ignition.

MANUFACTURERS SALES REPRESENTATIVES

A major link in the furniture chain is the sales representative who sells and represents the manufacturer to the retailer. In addition to being key to distribution, the representative is a principal source of product information to retail people, who in turn sell to the consumer. There are 10,000 to 12,000 manufacturers representatives in the industry, 5,000 of whom are members of the International Home Furnishings Representatives Association. IHFRA supports UFAC and includes the UFAC sales training materials in the curriculum of its course which qualifies the professional Certified Homefurnishings Representative.

Q. What Effort Has UFAC Made to Inform Consumers of the Possible Hazard of Lighted Cigarettes on Upholstered Furniture?

A. **CONSUMER COMMUNICATION** is an essential part of the UFAC program. Leaders from many public sectors have been enlisted to carry UFAC messages to urban and "grassroots" audiences. Millions of consumers are being reached with messages in both English and Spanish. This publicity program is targeted to reach: current purchasers of furniture, the owners of the more than 350 million pieces of upholstered furniture now in use, and the "high risk" groups--the elderly, low income and minorities, including the growing Spanish-speaking population.

THE UFAC HANGTAG communicates several basic messages to shoppers throughout the country. It alerts them to the added value of safer upholstery, warns of the possible hazard of ignition, urges the practice of good safety habits, and encourages the installation and maintenance of smoke detectors.

HOMES ARE SAFER FROM FIRES TODAY. There has been a 65% decline in upholstered furniture fires started by smoldering cigarettes from 1978 to 1989. This improvement has resulted from use of smoke detectors, fewer smokers, UFAC-tagged safer furniture and consistent warnings from media, educators, industry and community groups.

PRESS, MEDIA ACTIVITIES are directed toward newspapers, trade press, home magazines, trade associations, television and radio. The vast network of University Extension Specialists and Home Economists is effectively covering this safety problem. Public service announcements and consumer interest columns are released regularly.

MAJOR CLUBS, COMMUNITY SERVICE ORGANIZATIONS, AND CLASSROOM TEACHERS use UFAC programming which includes "Upholstered Furniture to Live With," a 10 minute slide program with cassette, a VHS cassette, and a Leader's Guide. Visuals are sent on a no-charge loan basis; printed materials are available to the public free of charge.

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RESOLUTION

The UFAC Technical Committee and UFAC Laboratory Alliance and its Task Group on Decorative Trim, Edging, and Brush Fringe recommend to the UFAC Board of Directors that the UFAC Standard Construction Criteria for Decorative Trim, Edging, and Brush Fringe be amended to include a revision of the test procedure for Decorative Trim, Edging, and Brush Fringe which incorporates the following:

I.. UFAC construction criteria for decorative trim, edging, and brush fringe classified by the UFAC test method are to be used in any area of upholstered furniture where a lighted cigarette could become lodged if dropped on the upholstered piece.

II.. The construction criteria for the use of decorative trim, edging, and brush fringe is as follows:

A.. All decorative trim, edging, and brush fringe will be classified as follows using the UFAC Standard Test Method for Decorative Trim, Edging, and Brush Fringe:

1.. Type I

2.. Type II

3.. Type III

B.. The classification types are identified as follows:

1.. When tested using the UFAC Standard Test Method for Decorative Trim, Edging, and Brush Fringe, a UFAC Type I decorative trim, edging, or brush fringe will not ignite using the standard Type II UFAC test fabric.

2.. If the decorative trim, edging, or brush fringe ignites in test B..1.., the decorative trim, edging, or fringe is then to be tested using the UFAC standard Type II UFAC test fabric with the UFAC standard polyester fiber barrier between the fabric and foam in the test apparatus. If the decorative trim, edging, or brush fringe does not ignite when using the UFAC standard polyester barrier fiber between

the foam and the standard Type II fabric, the decorative trim, edging, or brush fringe will then be classified as UFAC Type II.

3.. If the decorative trim, edging, or brush fringe ignites in test B..2.., the decorative trim, edging, or brush fringe will then be classified as UFAC Type III.

C.. The UFAC Standard Construction Criteria are then as follows:

1.. Decorative trim, edging, and brush fringe classified as UFAC Type I may be used in any UFAC upholstered furniture construction, and a UFAC hang tag is permitted to be attached to or used with such upholstered furniture.

2.. Decorative trim, edging, or brush fringe classified as UFAC Type II may only be used with a polyester fiber barrier (or other barrier material) which has been demonstrated to pass the UFAC standard barrier test or has passed when tested with the UFAC Standard Test Method for Decorative Trim, Edging, and Brush Fringe.

3.. In the UFAC voluntary program, decorative trim, edging, and brush fringe classified as UFAC Type III may not be used in areas on upholstered furniture where lighted cigarettes could become lodged if dropped on the upholstered piece.

. The combined UFAC Technical Committee, UFAC Laboratory Alliance, and its Task Group on Decorative Trim, Edging, and Brush Fringe also recommend that the Board of Directors of UFAC adopt the "Proposed Standard Test Method for Decorative Trim, Edging, and Brush Fringe along with the method of classification of decorative trim, edging, and brush fringes incorporated in the proposed test method.

. The UFAC Technical Committee, UFAC Laboratory Alliance, and its Task Group on Decorative Trim, Edging, and Brush Fringe recommend that the UFAC Board of Directors communicate and publicize to all segments of the furniture industry the planned implementation date and technical details of implementation of the decorative trim, edging, and brush fringe program into the UFAC voluntary program.

solved on this the 14 day of July, 1993 by the UFAC Technical Committee, the UFAC boratory Alliance, and its Task Group on Decorative Trim, Edging, and Brush Fringe.

TRENDS IN UPHOLSTERED FURNITURE FIRES AND FIRE CASUALTIES

FIRES

	1978	1991	% CHANGE
TOTAL RESIDENTIAL FIRES	757,500	478,000	-36.9
ALL UPHOLSTERED FURNITURE FIRES	43,000	16,600	-61.4
SMOKING MATERIALS	28,000	8,500	-69.6
OPEN FLAME	7,900	3,700	-53.2
OTHER	7,100	4,400	-38.0

SOURCE: U.S. CONSUMER PRODUCT SAFETY COMISSION

TRENDS IN UPHOLSTERED FURNITURE FIRES AND FIRE CASUALTIES

DEATHS

	1978	1991	% CHANGE
TOTAL RESIDENTIAL FIRES	6,840	3,575	-47.7
ALL UPHOLSTERED FURNITURE FIRES	1,600	700	-56.2
SMOKING MATERIALS	1,300	470	-63.8
OPEN FLAME	200	150	-25.0
OTHER	100	80	-20.0

SOURCE: U.S. CONSUMER PRODUCT SAFETY COMISSION