Thermo Bulbs

JOB THERMO BULBS
PRODUCT RANGE

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Sprinkler-History

HISTORY

Since their introduction in the mid-1970's JOB THERMO BULBS have become the standard heat responsive glass bulbs for the sprinkler industry. Due to their high quality and reliability more than 1.000 Million JOB THERMO BULBS are now being installed world-wide by all major sprinkler manufacturers for service in fire protection and life safety. The JOB THERMO BULB was quickly considered not only as a functional element but also as an aesthetically pleasing component allowing the sprinkler industry to adjust sprinkler designs in accordance with decorative requirements. JOB continuously developes smaller and faster THERMO BULBS retaining the superior features of previous designs thus meeting all requirements of effective life safety.

Headquarter JOB GmbH

Special Applications, e.g. CNG, Fog. Micro Bite

CUSTOMER SUPPORT

In order to give the best possible support to customers JOB has a full time separate Customer Service Department. Qualified engineers assist customers utilizing JOB THERMO BULBS to solve all technical questions either from the head office in Germany or – if necessary – they visit customer's facilities. JOB provides equipment to unpack the THERMO BULBS out of the Bulb Tape. Furthermore JOB provides equipment (bath test, strength test) to carry out the final tests at the end user. The Thermal Bath Test Equipment is adapted to the ISO-Standard and is used in the laboratories of UL, FM, VdS and TFRI. The final test of the assembled sprinkler on the Bulb Integrity Test Machine detects every possible damage of the glass bulb that could occur during the assembly procedure. JOB is an active member of NPFA, IFSA, EFSN and participates in ISO, CEN, DIN and UL task groups.

Micro Bite

HiFog

Flexibility in length and RTI

PRODUCT RANGE

	Type	Length	RTI*		Strength				Temperature							Comp. Listed
			Response Time Index		Average Crush Load		Lower Tolerence Limit		Additional temperatures available							
Response		[mm]	[ms]$^{1/2}$	[fts]$^{1/2}$	kN	lbs	kN	lbs	57°C 135°F orange	68°C 155°F red	79°C 175°F yellow	93°C 200°F green	141°C 286°F blue	182°C 360°F mauve	260°C 500°F black	
Standard	**G5**	16 / 20	90	163	4,0	880	2,5	550	■	■	■	■	■	■	■	UL, LPCB, VdS
	G5-XS	16 / 20	90	163	5,5	1210	4,0	880	■	■	■	■	■	■		UL
Inter	**F5**	16 / 20	68	123	4,0	880	2,5	550	■	■	■	■	■			TFRI
mediate	**F4**	16 / 20	58	105	4,0	880	2,5	550	■	■	■	■	■	■		UL
Fast	**F3-SP**	20	32	58	4,1	900	2,3	500	■	■	■	■	■	■		UL, LPCB
	F3	16 / 20	32	58	3,5	770	2,0	440	■	■	■	■	■	■		UL, LPCB, TFRI
	F3-XS	16 / 20	32	58	4,5	990	3,0	660	■	■	■	■	■	■		UL
Super	**F3-F**	16 / 20	24	43	4,1	900	2,3	500	■	■	■	■	■	■		UL
Fast	**F2.5**	16 / 20	24	43	2,5	550	1,25	275	■	■	■	■	■		■	UL, TFRI
	F2.5-XS	16	24	43	4,0	880	2,1	460	■	■	■	■	■			
	F2	16	19	34	2,0	440	1,0	220	■	■	■	■	■			UL
Ultra	**F1.5**	16	14	25	1,0	220	0,5	110	■	■	■	■	■			

More details and other temperature ranges are available on request
*Tested in a test fixture: c=0,5 ** in progress

Product Description

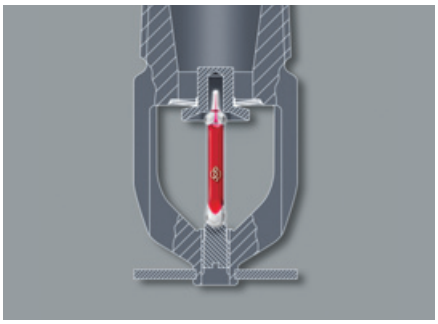
JOB THERMO BULBS are thermally actuated release elements for automatic sprinklers, smoke vents, fire dampers and other release devices. A hermetically sealed liquid (G or F-type) in the glass bulbs expands with rising temperatures breaking the bulbs into small fragments at a predetermined release temperature. The unique bone shape design of JOB THERMO BULBS (US Patent No. 4,796,710 and other international patents) combined with the special liquid (F-type; US Patent No. 4,938,294) are decisive factors for the outstanding thermal response performance and strength of the glass bulbs. All the main features of JOB THERMO BULBS can be taken from the above chart.

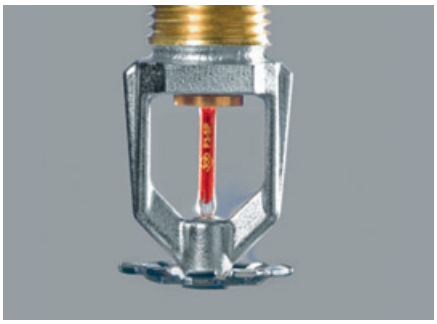
The Latest Generation of Glass Bulbs

The latest developments in sprinkler design require glass bulbs having extremely low Response Times and very high strength characteristics. JOB has established a development team that continuously improve the quality and the characteristics of JOB THERMO BULBS in order to fulfill the needs for high quality and leading technology for life safety products.

JOB Thermo Bulbs

With their unique bone shape design reinforced ends are used to absorb loads from the mounting supports and to introduce these axially into a shaft of reduced diameter thus avoiding unfavourable shearing and bending stresses in the glass. Furthermore the outstanding tension condition allows a low mass structure, which, combined with the special filling liquid, provides very low Response Times. Because of these characteristics JOB is the world-wide leading company for the supply of glass bulbs with superior thermal response and strength.





PRODUCT

F3-F THERMO BULBS

The super fast THERMO BULB Type F3-F is a high performance fast response THERMO BULB featuring improved strength and sensitivity characteristics. The response time is 25 % faster than of the standard fast response bulb type F3/F3-SP with superior strength condition.

F3-SP THERMO BULBS

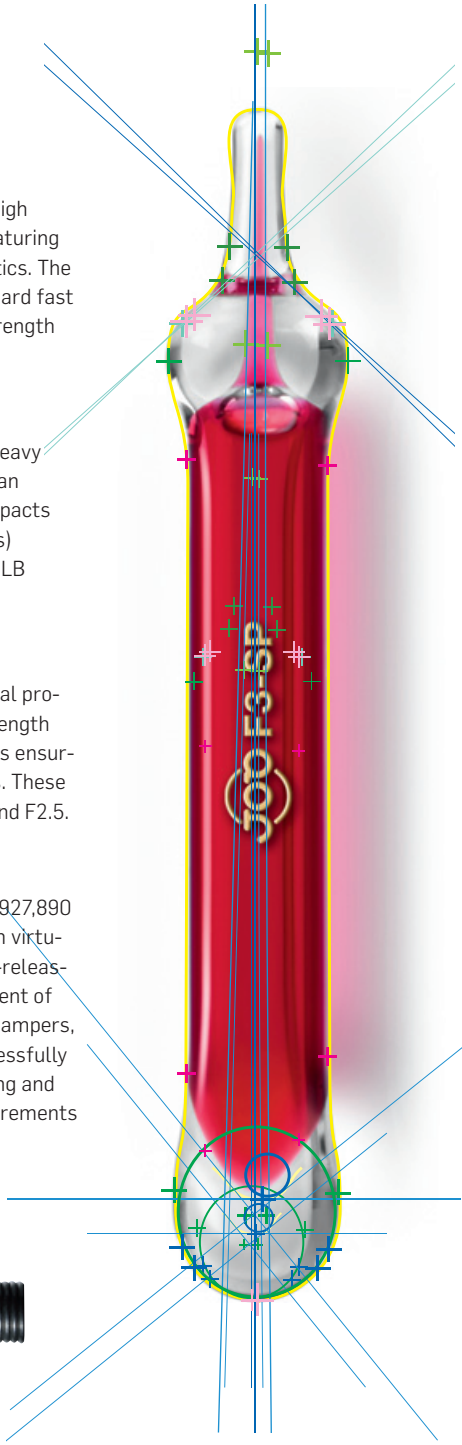
The superior THERMO BULB Type F3-SP is a Heavy Duty Fast Response THERMO BULB featuring an approx. 50 % higher resistance against side impacts with the same Response Time Index of 32 (ms) [58 (fts)] as our well established THERMO BULB type F3.

XS THERMO BULBS

XS stands for EXTRA STRENGTH. Due to special production methods these bulbs have an axial strength approximately 30 % higher than standard bulbs ensuring high safety factors for special applications. These extra strong bulbs can be supplied as G5, F3 and F2.5.

JOB THERMO BULBS Links

JOB THERMO BULBS Links (U.S. Patent No. 5,927,890 and other international patents) can be used in virtually any area where a thermally actuated self-releasing mechanism is required to operate in the event of fire, such as kitchen hoods, paint booths, fire dampers, smoke vents, etc. JOB has combined the successfully proven THERMO BULB technology with a strong and innovative Link design to meet the latest requirements for Quick and Standard Response Links.



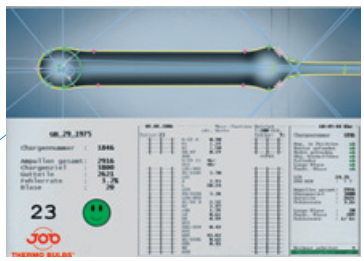
QUALITY

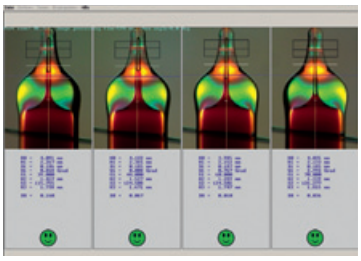
JOB Quality Control

JOB THERMO BULBS are produced to stringent in-house quality Standards under the latest version of ISO 9001 to meet all requirements of approval authorities worldwide, e.g.:

UL	(Underwriters Laboratories Inc.)
FM Global	(Factory Mutual Global)
LPCB	(Loss Prevention Council)
VdS	(Vb. der Schadenverhütung GmbH)
TFRI	(P.R. China)
KENTEI	(Japan)
KFI	(Korea)

as well as governmental codes or ordinances whenever applicable. JOB's optical measurement equipment automatically measures more than 576 internal and external dimensions on each glass bulb on 12 different plans. Additional unique test procedures are carried out to guarantee 100 % quality. In total 805 measurements are taken on each single glass bulb prior to dispatch. All data obtained during production are recorded in the QM system and guarantees zero failure shipments.





FEATURES

Design Flexibility

JOB uses its own drawn glass tubes. That offers huge flexibility for glass bulbs with diff erent lengths, aspect ratios and strength / RTI specications towards customer's demand.

Operating Temperatures

The differnet colours of the fluid in the JOB THERMO BULBS signify differnet operating temperatures. The bulb colouring complies with all national and international standards for colour/temperature ratings, e.g., UL 199, FM, TFRI, EN 12259-1 and ISO 6182:1.

Marking

In order to guarantee forward – backward traceability JOB invented the marking processes. Each individual JOB THERMO BULB is marked with the type and the individual batch number. Each batch can be traced back to the raw material as well as to all test data obtained during the manufacturing and quality procedures.

RTI

Response Time Index (RTI)

The Response Time Index is a calculated figure describing the actual operating time of a glass bulb mounted in a sprinkler or other devices in given standard conditions. The RTI is an indication of the thermal sensitivity of the glass bulb. The lower the value of the RTI, the faster the response time of the bulb. JOB THERMO BULBS are able to meet any RTI requirements the user may have by combining diff erent actuating liquids (G or F) with various bulb diameters. Each JOB THERMO BULB can be identified regarding its Response Time by the type classification marked on the bulb.

Standard Response Applications RTI>80

JOB THERMO BULBS G5 are used for all products requiring Standard Response functional properties as defined by local agencies or authorities in the USA, Europe and Asia.

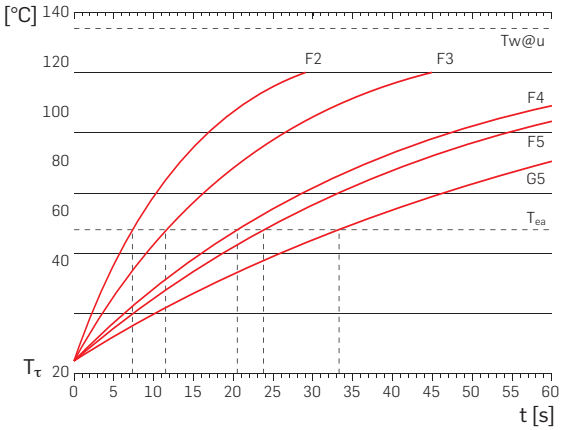
Special Response Applications 80>RTI>50

JOB THERMO BULBS F5 and F4 are used for applications where insurers hazard classifications require sprinklers, which have an avg. RTI between 50 and 80.

Fast, Super Fast and Ultra Fast-Response Applications RTI<50

JOB THERMO BULBS F3 and F3-SP are used for applications where products are used for life safety, e.g., Residential Sprinklers – and in cases where insurers hazard classifications require Fast Response Sprinklers. The Super Fast and Ultra Fast bulbs F3-F, F2.5, F2 and F1.5 are especially for use in high performance products where a very early activation is essential such as ESFR Sprinklers or water mist products.

Grafical Comparison of RTI Values: Tested under UL Conditions



RTI	=	Response Time Index	$[(m\ s)^{1/2}]$
t_R	=	actual response time of	
		thermal release element	[s]
u	=	actual gas velocity in the test	
		section of the windtunnel	[m/s]
T_{ea}	=	mean liquid bath operating temperature of sensitive detector element	[°C]
T_g	=	actual gas temperature in test section	[°C]
T_u	=	ambient air temperature during testing	[°C]
C	=	Conductivity Factor	$[(m/s)^{1/2}]$

UL Conditions: 135°C at 2,54 m/s

$$RTI = \frac{\left(-t_R \cdot \sqrt{u}\right)}{\ln\left[1 - \left[\frac{\left(T_{ea} - T_u\right)\left(1 + \frac{C}{\sqrt{u}}\right)}{T_g - T_u}\right]\right]} \cdot \left(1 + \frac{C}{\sqrt{u}}\right)$$

Type	tR [s]
F2	7,3
F3	11,4
F4	20,6
F5	23,8
G5	33,3

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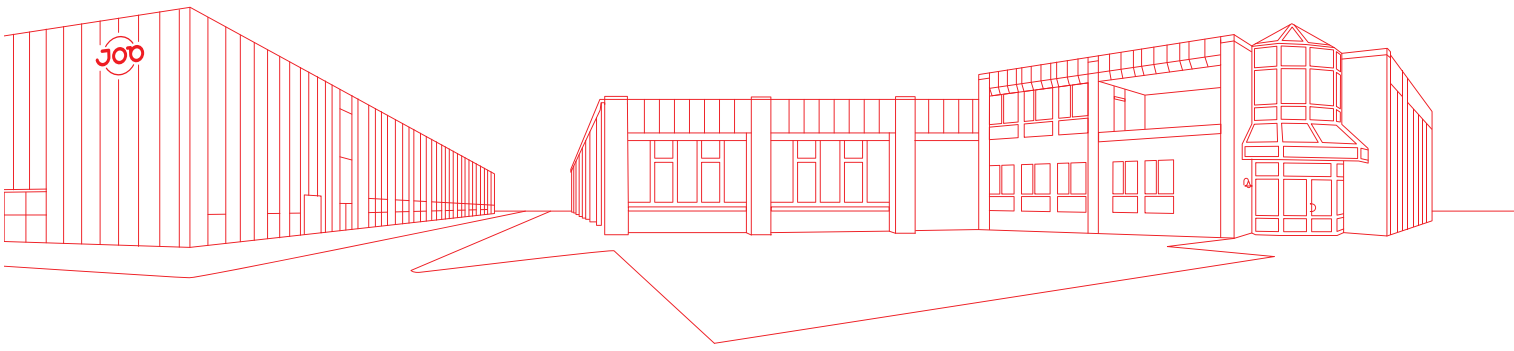

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